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Final Environmental Assessment Projects BLRI 2D17 and BLRI 2A16

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

August 2019



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

EXECUTIVE SUMMARY

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

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

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

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

The Proposed Action Alternative would have a less than significant adverse impact on vegetation; hydrology and water quality; wetlands; rare, threatened, endangered, and special status species; historic structures; and transportation and visitor use. The impacts to these resources are primarily direct impacts due to construction activities. During construction, vegetation and wetlands would be cleared to allow for machinery movement and access to the structures. These impacts would be minimized by re-grading and re-establishing the vegetation. An increase in water turbidity and noise would impact water quality. These impacts would be minimized by the implementation of best management practices (BMPs). The bridges are considered contributing resources to the proposed BLRI Historic District National Historic Landmark (NHL) nomination, which is currently under development by the NPS. The NPS has determined the project would adversely affect the historic significance of the bridges; therefore, a 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
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29 Sterling, VA 20166-6205

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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.

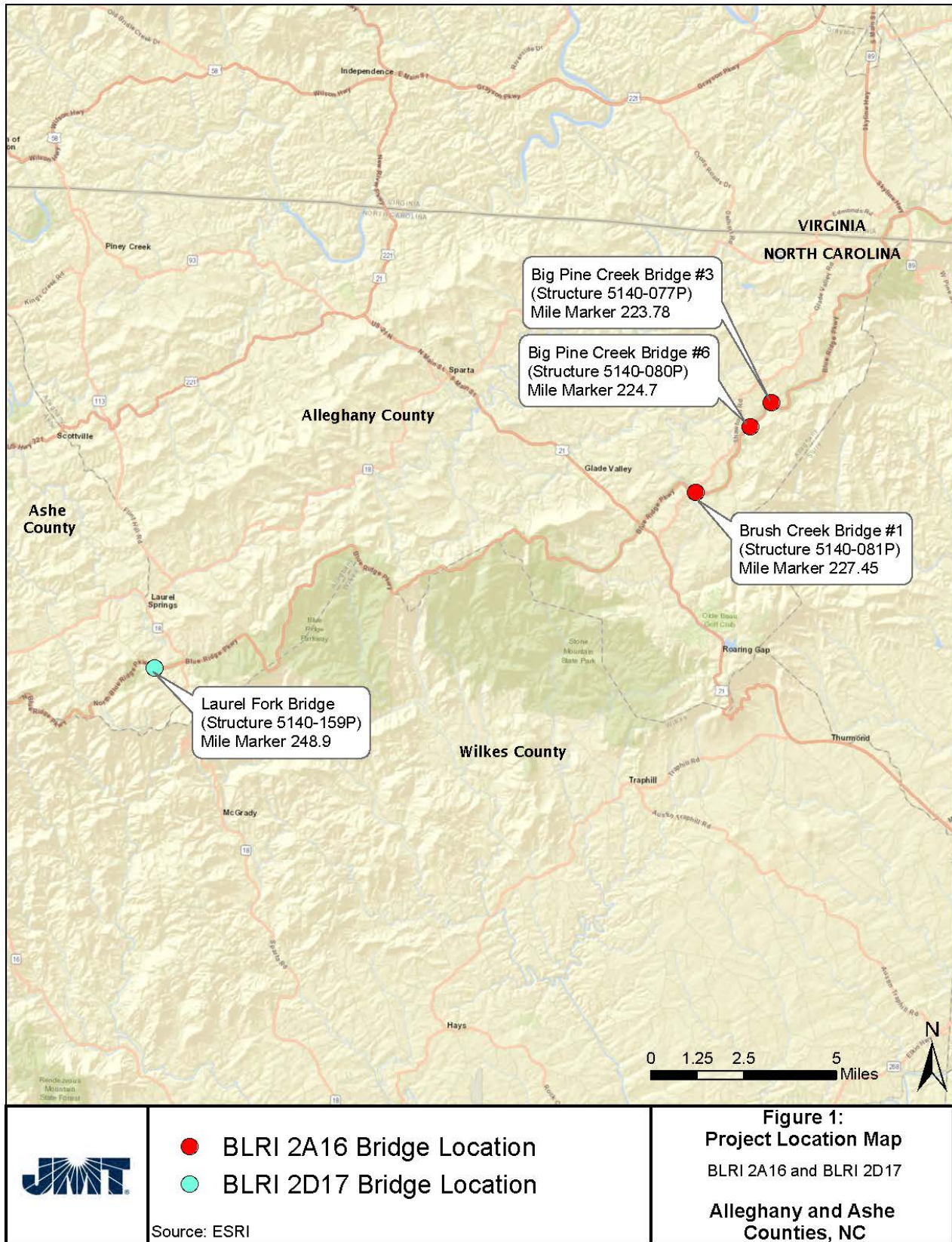
1 Because the BLRI was to be a destination in its own right, both scenic variety and the incorporation of
2 recreational and education areas were prioritized during the design process. Many of the 168 bridges
3 present along the BLRI are designed in a rustic style intended to blend into the landscape. 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.

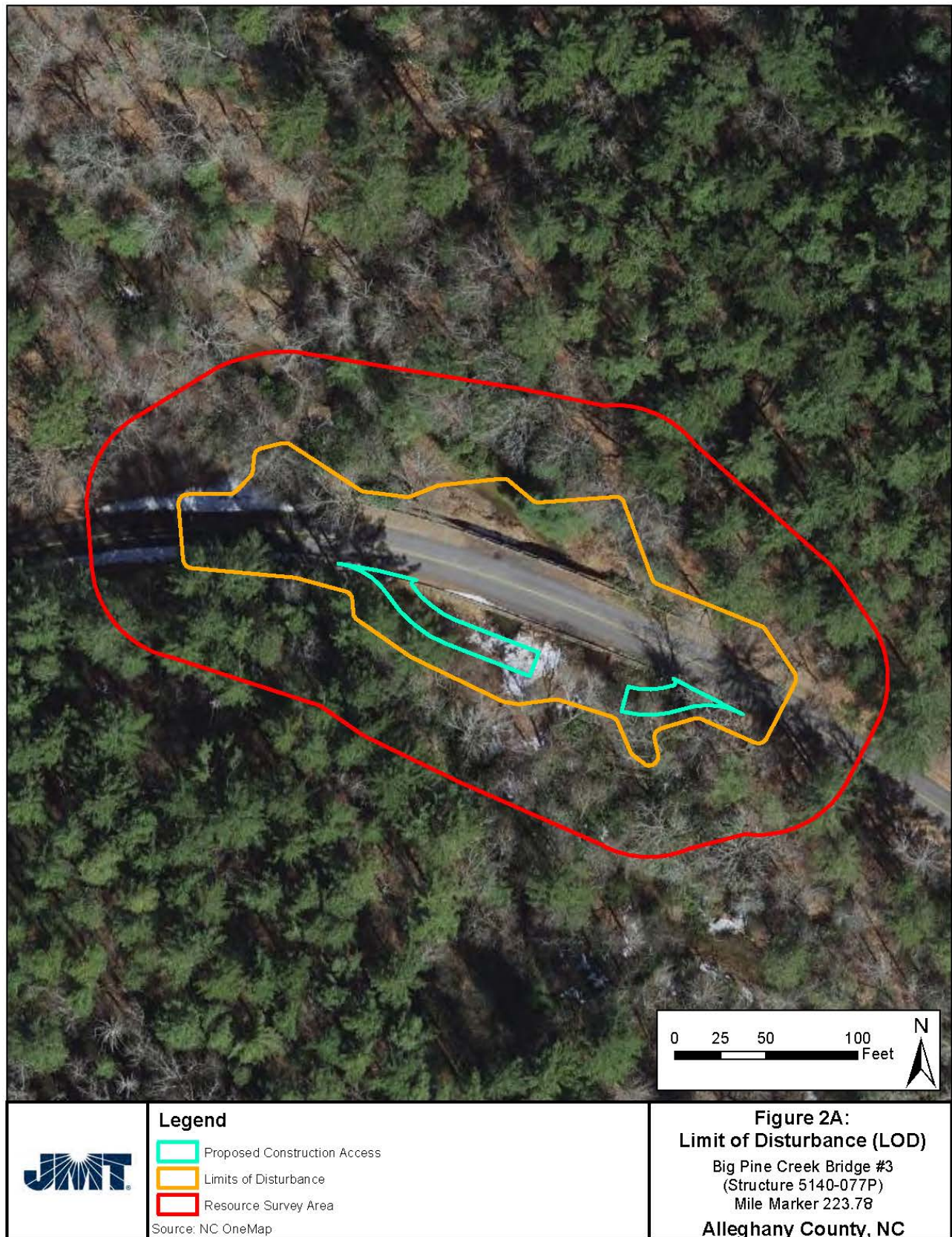
8 FHWA and NPS are proposing to replace/rehabilitate four bridges along the BLRI in Alleghany and Ashe
9 Counties, North Carolina (Figure 1). The four bridges are as follows:

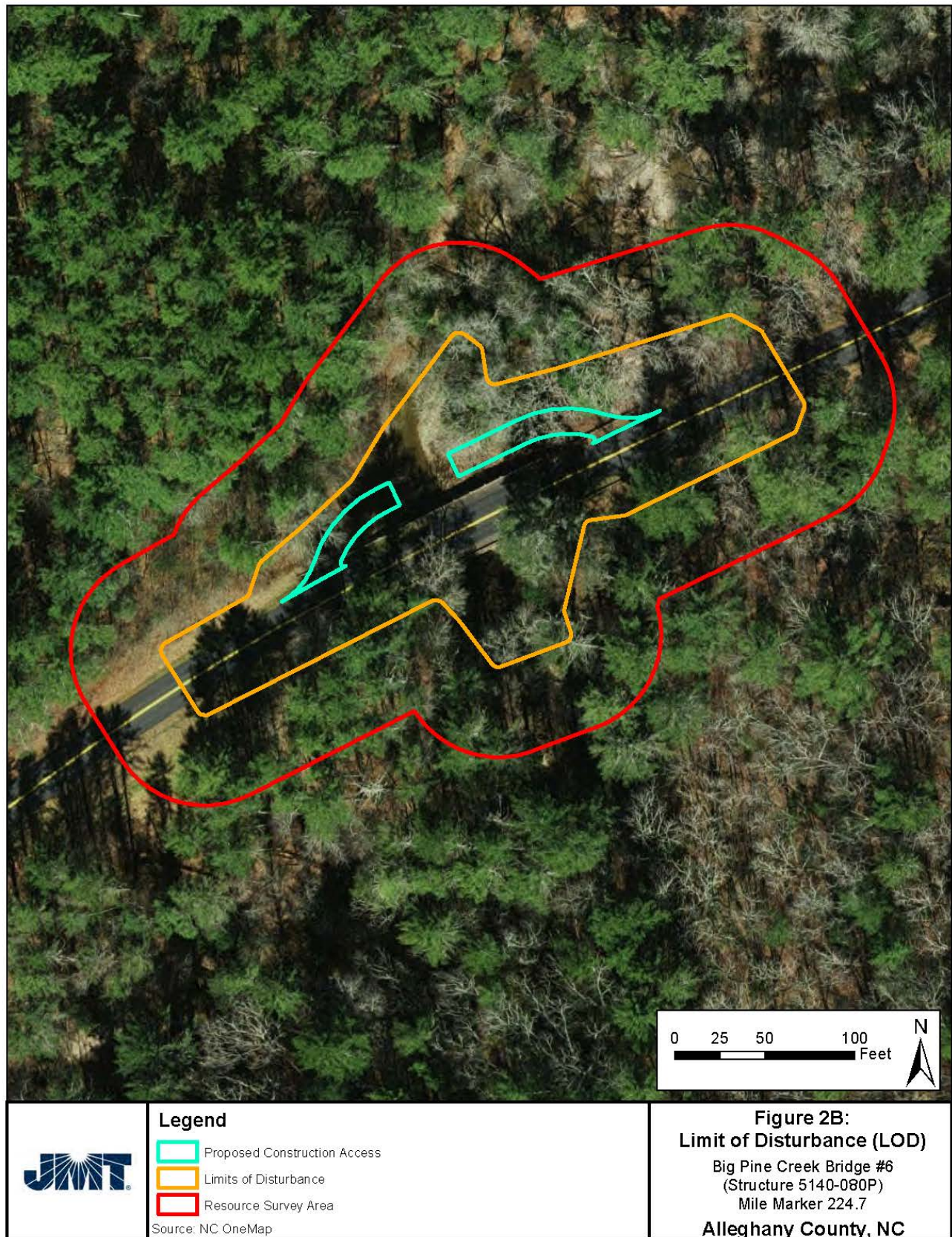
- 10 • BLRI 2A16 (Alleghany County)
 - 11 ○ Big Pine Creek Bridge #3, Structure 5140-077P, Mile Post 223.78
 - 12 ○ Big Pine Creek Bridge #6, Structure 5140-080P, Mile Post 224.7
 - 13 ○ Brush Creek Bridge #1, Structure 5140-081P, Mile Post 227.45
- 14 • BLRI 2D17 (Ashe County)
 - 15 ○ Laurel Fork Bridge,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

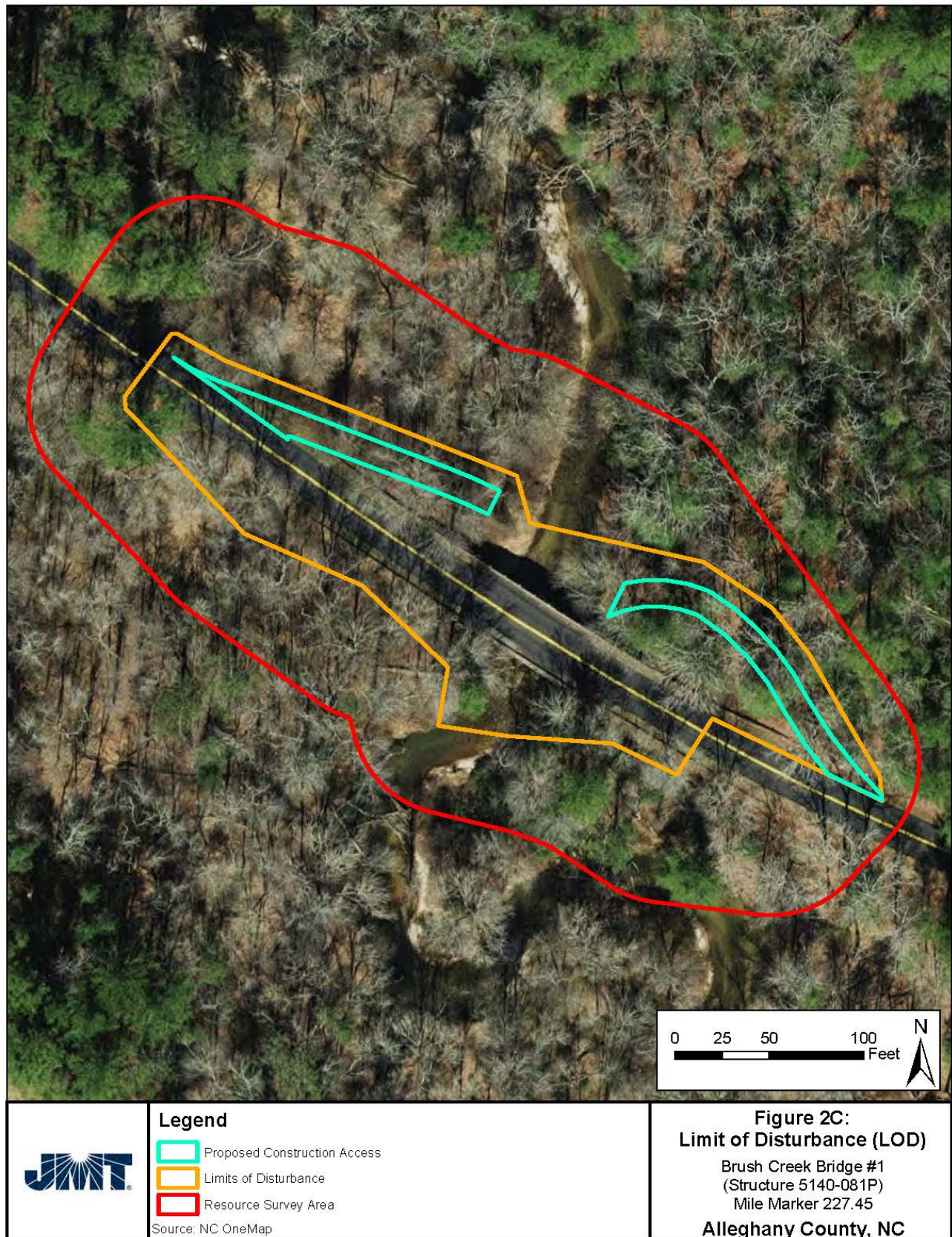
17 The BLRI 2A16 bridges were constructed between 1936 and 1938 in the rustic style typically seen on the
18 other structures of the BLRI, with a cast-in-place concrete deck, abutments, stone and concrete piers,
19 and timber guardrails with concrete posts.

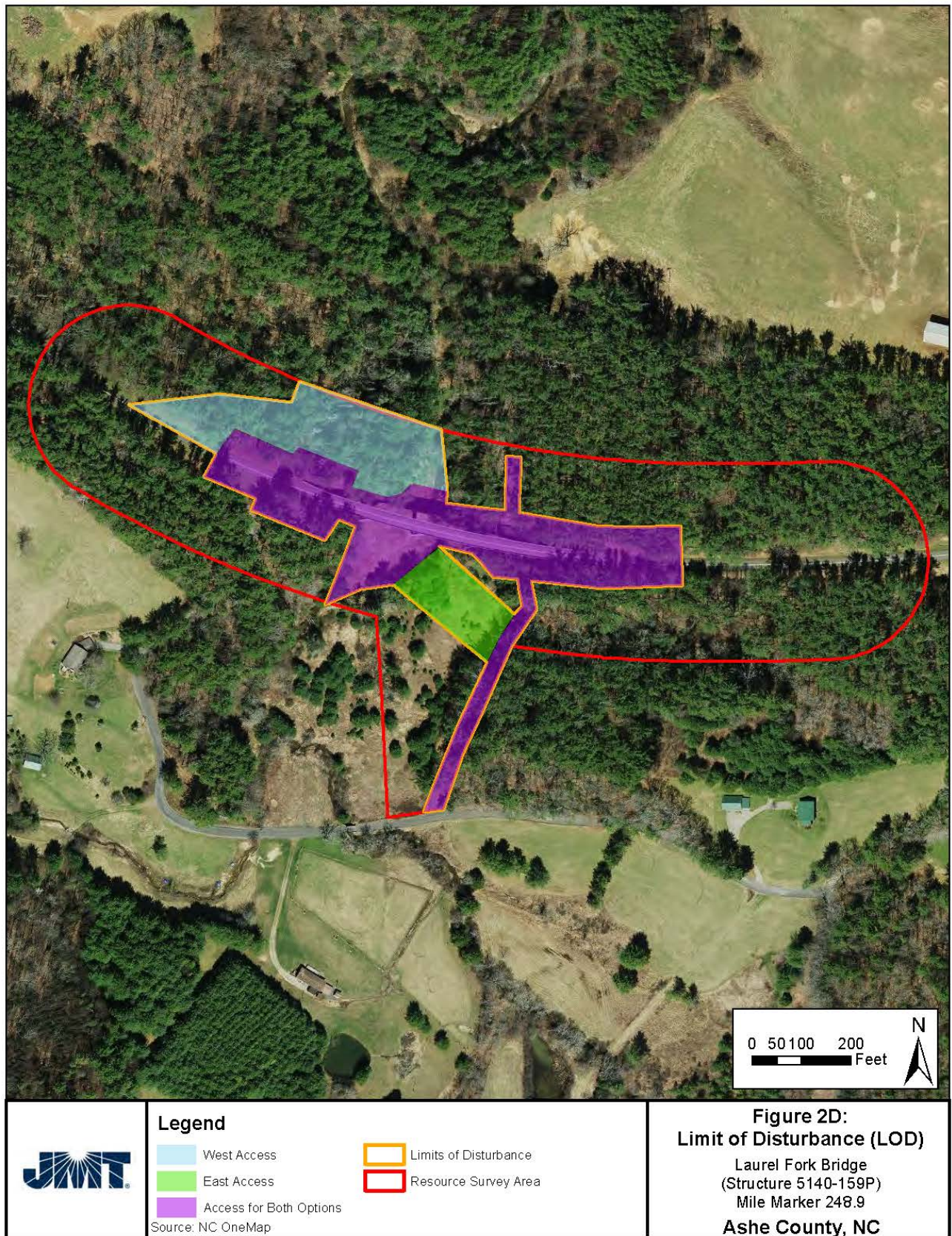
21 The Resource Survey Areas (RSAs) for the 2A16 bridges encompasses all areas approximately within 50
22 feet of the proposed limits of disturbance (LOD) (Figure 2A through 2C). The RSA for the 2D17 bridge
23 is defined as 200 feet from the roadway centerline (Figure 2D). The LODs for the 2A16 bridges
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.











NEED FOR THE ACTION

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

Background

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



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

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



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

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



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

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

- 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,

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

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

Scoping

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

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

ISSUES AND IMPACT TOPICS

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

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

Issues and Impact Topics Retained for Further Analysis

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

Vegetation

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

Hydrology and Water Quality

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

Wetlands

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

Historic Structures

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

Visitor Use

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

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

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

Issues and Impact Topics Dismissed from Further Analysis

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

Soils

Any soil disturbance, grading, and digging would be kept to a minimum. Only clean fill would be used if needed. No contaminated soils were identified on site at any of the RSAs. Farmland soils of statewide and local importance, regulated under the Farmland Protection Policy Act, were identified within the RSAs for Big Pine Creek Bridge #3, Brush Creek Bridge #1, and the Laurel Fork Bridge; however, the project 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.

Ethnographic Resources

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

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

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

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

Air Quality

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

Soundscapes

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

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

Floodplains

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

Visual Resources

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

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

Socioeconomics

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

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

Night Skies Initiative

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

CHAPTER 2 – DESCRIPTION OF ALTERNATIVES AND MITIGATION

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

ALTERNATIVE 1: NO ACTION

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

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

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

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

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

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

- Big Pine Creek Bridge #3 – RSA approximately 1.9 acres; LOD approximately 0.6 acres
- Big Pine Creek Bridge #6 – RSA approximately 2.1 acres; LOD approximately 0.8 acres
- Brush Creek Bridge #1 – RSA approximately 2.3 acres; LOD approximately 0.8 acres

BLRI Project 2D17: Laurel Fork Bridge

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

Proposed construction activities for each bridge is as follows:

- Big Pine Creek Bridge #3, Structure 5140-077P
 - 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.
 - Both existing bridge piers would be removed, and a new pier would be constructed in the middle of the bridge. Stone from piers designated for replacement would be salvaged and used as stone facing for the new pier to the extent practicable.
 - 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.
- 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.

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

Staging and Construction Access

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

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

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

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

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

Mitigation Measures

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

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

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

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

ALTERNATIVES CONSIDERED BUT DISMISSED

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

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

- 1) Full replacement on new alignment
- 2) Full replacement on existing alignment

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

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

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

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

The three bridge replacement alignment alternatives included:

- Maintain existing alignment
- New alignment north of existing bridge
- New alignment south of existing bridge

The three bridge types considered included:

- Concrete segmental bridge
- Steel plate girder bridge
- Concrete bulb-tee bridge

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

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

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

CHAPTER 3 – AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

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

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

CUMULATIVE IMPACTS

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

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

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

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

VEGETATION

Affected Environment

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

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

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

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

State Rank:

S3 = Rare or uncommon in North Carolina

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

S5 = Demonstrable secure in the state

Global Rank:

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

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.

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

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

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

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

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

Identified vegetation included both native and introduced trees, shrubs, vines, and herbaceous species. The non-native plants species that are considered a threat to native plant communities of the BLRI include, Chinese privet (*Ligustrum sinense*), Chinese lespedeza (*Lespedeza cuneata*), Japanese stiltgrass (*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.

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

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

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

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

Conclusion

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

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

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

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

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

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

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

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

HYDROLOGY AND WATER QUALITY

Affected Environment

The RSAs are located within the New River Basin, which is thought to be one of the oldest rivers in the world. In 1998 it was named an American Heritage River by former President Clinton. The lower South 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).

Environmental Consequences

No Action Alternative

Direct and Indirect Impacts

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

Conclusion

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

Proposed Action Alternative

Direct and Indirect Impacts

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

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

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

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

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

WETLANDS

Affected Environment

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

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

Tables 4 through 7 include a summary of the results at each RSA. Detailed information regarding the delineation can be found in *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* (JMT, 2018).

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

HUC Watershed	Wetland Name	Cowardin 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

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

HUC Watershed	Wetland Name	Cowardin 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

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

HUC Watershed	Wetland Name	Cowardin 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

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

HUC Watershed	Wetland Name	Cowardin 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

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

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

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

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

Table 8: Summary of Potential Impacts to WOUS and Wetlands

Feature Name	Approximate Temporary Impact (Linear Feet/Acre)	Approximate Permanent Impact (Linear Feet/Acre)
Big Pine Creek Bridge #3		
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
Total Wetland	0.024 AC	None
Total Stream	175 LF / 0.1 AC	15 LF / 0.001 AC
Big Pine Creek Bridge #6		
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
Total Wetland	0.03 AC	0.01 AC
Total Stream	245 LF / 0.18 AC	None

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
Total Wetland	0.00001 AC	None
Total Stream	150 LF / 0.17 AC	185 LF / 0.04 AC
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	--
Total Wetland	0.011 AC	--
Total Stream	325 LF / 0.11 AC	--

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 acre 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 an 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.

RARE, THREATENED, ENDANGERED, AND SPECIAL STATUS SPECIES

Affected Environment

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

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

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

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

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

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

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

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

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

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

- Big Pine Creek Bridge #3
 - Big brown bat (*Eptesicus fuscus*)
 - Hoary bat (*Lasiurus cinereus*)
 - Tri-colored bat (*Perimyotis subflavus*)
- Big Pine Creek Bridge #6
 - Eastern red bat (*Lasiurus borealis*)
 - Hoary bat
 - Silver-haired bat (*Lasionycteris noctivagans*)
- Brush Creek Bridge #1
 - Eastern red bat
 - Hoary bat
 - Silver-haired bat
- Laurel Fork Bridge
 - Big brown bat
 - Eastern red bat
 - Little brown bat (*Myotis lucifugus*)
 - Rafinesque's big-eared bat (*Corynorhinus rafinesquii*)
 - 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

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

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
Big Pine Creek Bridge #3 (Alleghany County)					
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
Big Pine Creek Bridge #6 (Alleghany County)					
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
Brush Creek Bridge #1 (Alleghany County)					
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
Laurel Fork Bridge (Ashe County)					
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

Source: NCNHP, 2018

SR-P (Significantly Rare-Peripheral)

W1 – Rare, but relatively secure

W6 - Regionally Rare

W7 – Poorly known in North Carolina

S1 – Critically imperiled in North Carolina because of extreme rarity or because of some factor making it especially vulnerable to extirpation from the state.

S2 – Imperiled in North Carolina because of rarity or because of some factor making it very vulnerable to extirpation from the state.

S3 – Rare or uncommon in North Carolina

S4 – Apparently secure in the state

S_? – Rank uncertain.

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

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

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

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

Environmental Consequences

No Action Alternative

Direct and Indirect Impacts

The No Action Alternative would have no impact on rare, threatened, endangered, and special status species 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 rare, threatened, endangered, and special species under the No Action Alternative, because there would be no construction.

Proposed Action Alternative

Direct and Indirect Impacts

The NPS follows *Management Policies* (NPS, 2006b) for the management of threatened and endangered plants and animals. Coordination with USFWS is required. A BA was prepared and submitted to the

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

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

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

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

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

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

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

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

Conclusion

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

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

CULTURAL RESOURCES

HISTORIC STRUCTURES

Affected Environment

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

Environmental Consequences

No Action Alternative

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

Conclusion

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

Proposed Action Alternative

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

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

- Big Pine Creek Bridge #3 (Latitude/Longitude: 36.497001; -80.96449)
 - Cast-in-place concrete decks, stone abutments, and stone and/or concrete piers, timber guardrails with concrete posts, constructed from 1936-1938
- Big Pine Creek Bridge #6 (Latitude/Longitude: 36.487429; -80.974755)
 - Cast-in-place concrete decks, stone abutments, and stone and/or concrete piers, timber guardrails with concrete posts, constructed from 1936-1938
- Brush Creek Bridge #1 (Latitude/Longitude 36.461241; -81.000474)
 - Cast-in-place concrete decks, stone abutments, and stone and/or concrete piers, timber guardrails with concrete posts, constructed from 1936-1938
- Laurel Fork Bridge (also known as the Laurel Fork Viaduct) (Latitude/Longitude 36.387934, -81.259914)
 - 5-span, two-girder steel bridge with cast-in-place concrete deck, constructed in 1939

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

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

Conclusion

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

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

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

VISITOR USE

Affected Environment

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

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

The BLRI is unique in that there are no entrance stations, no fees, and the roadway itself is the main park experience. Recreational trips make up the majority of trips along the BLRI. With no entrance fees, the 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).

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

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

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

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

Environmental Consequences

No Action Alternative

Direct and Indirect Impacts

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

Conclusion

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

Proposed Action Alternative

Direct and Indirect Impacts

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

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

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

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

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

Conclusion

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

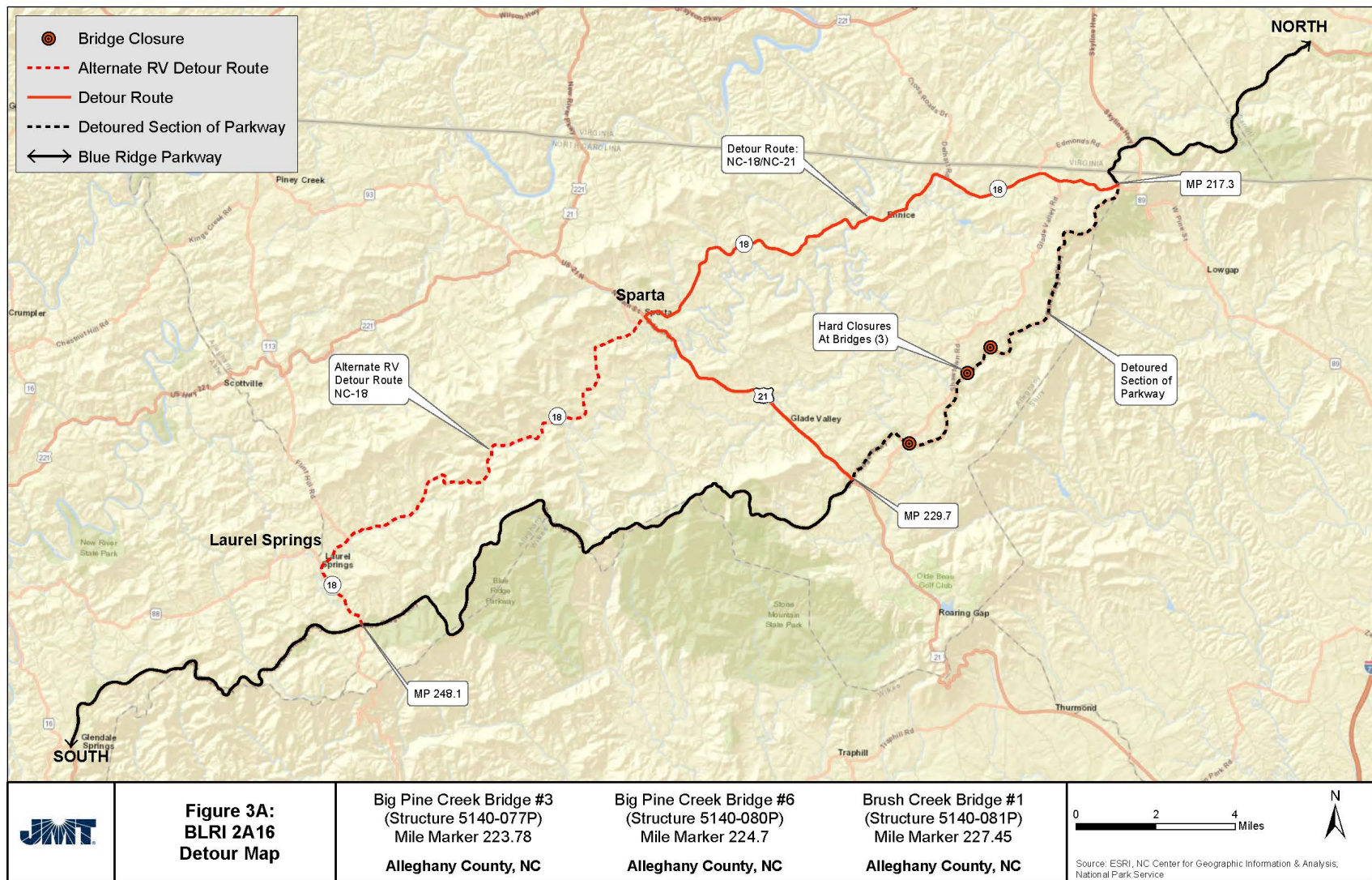
There would also be temporary adverse impacts to park concession operations and park campgrounds utilized by visitors. The Bluffs Coffee Shop and the Raccoon Holler Camp and Recreation Vehicle Park was identified within the limits of the BLRI that will be closed during construction. The Bluffs Coffee

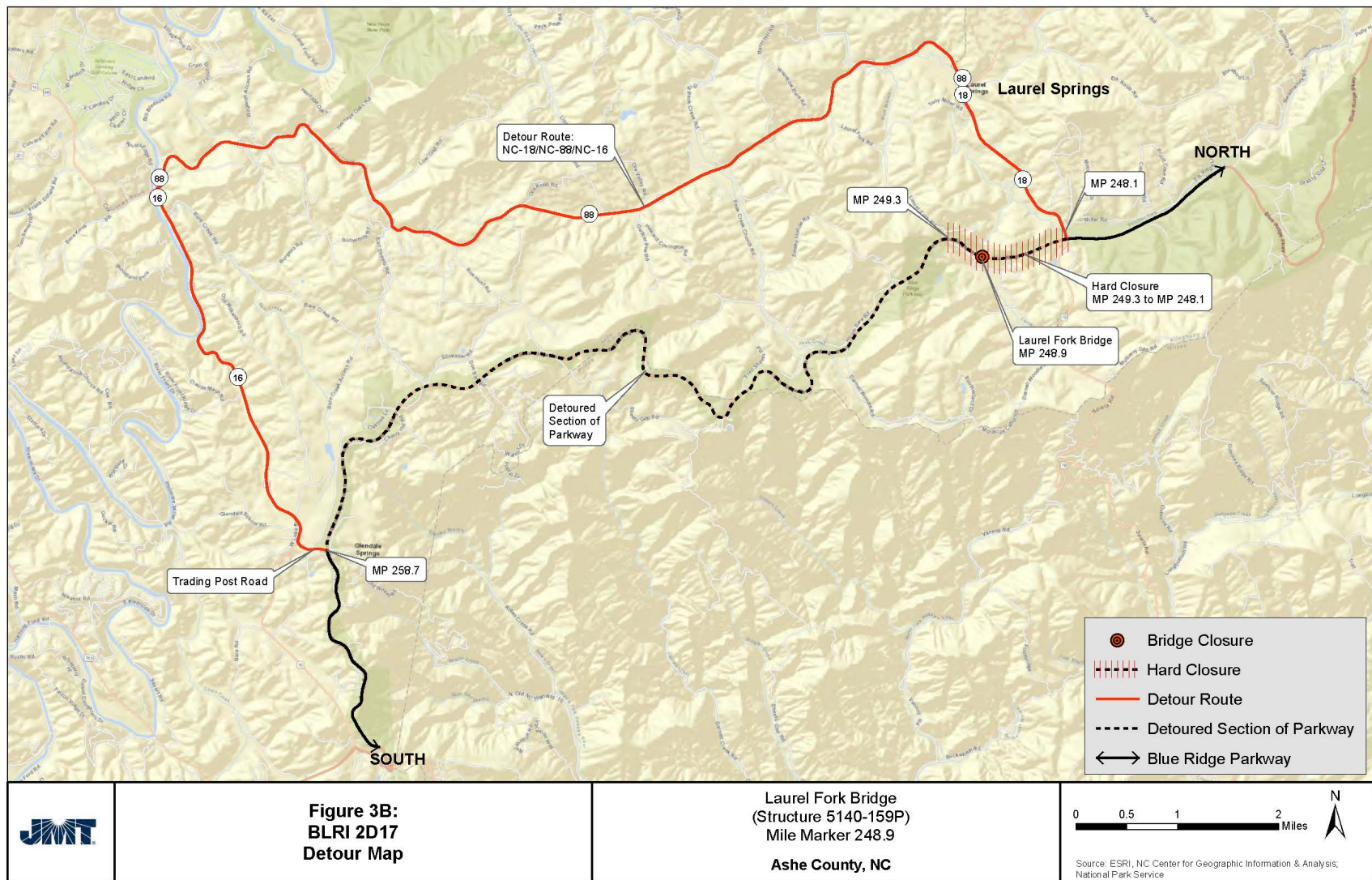
1 Shop is an historic structure within the Doughton Park recreation area that housed a restaurant and store
2 for many years. In 2010 the concession that ran the coffee shop and store closed the businesses. The
3 facility sat idle and fell into disrepair. Now, thanks to several important community partnerships, 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.





CHAPTER 4: PUBLIC INVOLVEMENT AND COORDINATION

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

PUBLIC INVOLVEMENT

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

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

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

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

AGENCY AND ENVIRONMENTAL PERMIT COORDINATION

Agency Coordination

Appendix B contains copies of written correspondence with the federal and state agencies, and local 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

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

Permits

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

Clean Water Act Section 404 Permit

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

401 Water Quality Certification

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

Erosion & Sediment Control Permit (E&SC)

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

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APPENDIX A – APPLICABLE EXECUTIVE ORDERS, REGULATIONS, & POLICIES

Resource	Relevant Laws and Regulations
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
