# Appendix D – Recreational Resources Draft Study Report

Bad Creek Pumped Storage Project

*Oconee County, South Carolina*

January 4, 2024

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# 1 Project Introduction and Background

Duke Energy Carolinas, LLC (Duke Energy or Licensee) is the owner and operator of the 1,400-megawatt Bad Creek Pumped Storage Project (Project) (FERC Project No. 2740) located in Oconee County, South Carolina, approximately eight miles north of Salem. The Project utilizes the Bad Creek Reservoir as the upper reservoir and Lake Jocassee, which is licensed as part of the Keowee-Toxaway Hydroelectric Project (FERC Project No. 2503), as the lower reservoir.

The existing (original) license for the Project was issued by the Federal Energy Regulatory Commission (FERC or Commission) for a 50-year term, with an effective date of August 1, 1977, and expiration date of July 31, 2027. The license has been subsequently and substantively amended, with the most recent amendment on August 6, 2018 for authorization to upgrade and rehabilitate the four pump-turbines in the powerhouse and increase the Authorized Installed and Maximum Hydraulic capacities for the Project.[1] Duke Energy is pursuing a new license for the Project pursuant to the Commission's Integrated Licensing Process, as described at 18 Code of Federal Regulations (CFR) Part 5.

In accordance with 18 CFR §5.11 of the Commission's regulations, Duke Energy developed a Revised Study Plan (RSP) for the Project and proposed six studies for Project relicensing. The RSP was filed with the Commission and made available to stakeholders on December 5, 2022. FERC issued the Study Plan Determination on January 4, 2023, which included modifications to one of the six proposed studies (Recreational Resources Study).

The Recreational Resources Study is ongoing in support of preparing an application for a new license for the Project in accordance with 18 CFR §5.15, as provided in the RSP. This report includes methods and findings for Task 2 (Foothills Trail Corridor Conditions Assessment) and Task 3 (Whitewater River Cove Existing Recreational Use Evaluation) of the Recreational Resources Study. Task 1 (Foothills Trail Corridor Recreation Use and Needs Study) and Task 4 (Whitewater River Cove Recreational Public Safety Evaluation) of the study will be completed in 2024 and findings will be included in the Updated Study Report.

[1] *Duke Energy Carolinas LLC, 164 FERC ¶ 62,066 (2018)*

# 2 Recreational Resources Study

The Commission identified the following environmental resource issues to be analyzed in the National Environmental Policy Act document for the Project related to recreational, land use, and aesthetic resources. The resource issues address the effects of continued Project operations under the Existing License as well as potential construction and operation of a second powerhouse during the New License term for the Bad Creek II Power Complex (Bad Creek II Complex):

- Effects of proposed project construction, operation, and maintenance on recreational use in the Project boundary, including access to the existing Foothills Trail.
- Use of Project lands for recreation activities, including fly fishing and birdwatching.
- Effects of project construction, operation, and maintenance existing land uses in project-affected area.
- Effects of land management activities within the project boundary on environmental resources.
- Effects of project construction, operation (including the presence of project facilities), and maintenance activities on visual resources.

Resource issues identified by FERC have been and/or will be addressed through a combination of the Recreational Resources Study, Visual Resources Study, and Exhibit E of the license application.

# 3 Study Goals and Objectives

Tasks carried out for the Bad Creek Recreational Resources Study employ standard methodologies that are consistent with the scope and level of effort described in the RSP filed with the Commission on December 5, 2022. Goals and objectives of the Recreational Resources Study were met through four study tasks: (1) a Recreation Use and Needs (RUN) Study for the 43-mile-long portion of the Foothills Trail (or trail) managed by Duke Energy; (2) a Foothills Trail Corridor Conditions Assessment (Conditions Assessment) of the 43-mile-long portion of the Foothills Trail managed by Duke Energy; (3) an Existing Recreational Use Characterization of Whitewater River cove; and (4) a Recreational Public Safety Evaluation of Whitewater River cove.

- The goals of the RUN Study are to assess current recreation use and identify any future recreation needs along the 43-mile-long segment of the Foothills Trail and associated

access areas that are maintained by Duke Energy and referenced in the existing Recreation Plan for the Project.[2] Information collected during the RUN Study will be used to develop an updated Recreation Management Plan, as needed, for the New License term and will support characterization of existing recreational use levels for areas that could be temporarily impacted by the Bad Creek II Complex construction. An updated Recreation Management Plan for the Project will be developed with or following the Final License Application, as needed, to address existing and proposed facilities and arrangements.

- The goal of the Conditions Assessment is to evaluate the current condition of trail surface and corridor included in the 43-mile segment of the Foothills Trail maintained by Duke Energy and identify key areas of future maintenance needs or improvements. Data collected during the RUN Study and Conditions Assessment will be used to estimate the Foothills Trail's hiking and backpacking carrying capacity.
- The goal of the Whitewater River Cove Existing Recreational Use Characterization is to characterize recreation use in Whitewater River cove and inform Duke Energy of the level of boating use disruption that could occur associated with Bad Creek II Complex construction.
- The goal of the Recreational Public Safety Evaluation is to evaluate potential public safety risks, specifically those associated with recreation activities at or near Whitewater River cove, that may be created or exacerbated by the Bad Creek II Complex during the construction and operation phases.

Task 3 of the Recreational Resources Study is complete and the final technical report is included in Attachment 3 as shown in Table 1 below. The draft Task 2 report has undergone Resource Committee review and additional consultation on the draft Trail Conditions Assessment will occur in 2024; the final report will be filed with the Updated Study Report. Work for Task 1 and Task 4 will be completed in 2024; draft reports will be submitted for Resource Committee

[2] Duke Energy filed a copy of the 1980 document, "A Plan for Development and Management of the Foothills Trail and a Supplement to the Bad Creek Pumped Storage Project #2740 Exhibit R," with the Commission on July 25, 2022, in response to additional information requested by FERC staff.

review in 2024 and the final reports will be submitted with the USR. Consultation documentation relevant to the Recreational Resources Study is included as Attachment 5[3].

**Table 1. Recreational Resources Study Attachments**

| Study Report Title | Attachment | Attachment Title |
|---|---|---|
| Appendix D – Recreational Resources Draft Study Report | 1 | Foothills Trail Corridor Recreation Use and Needs Report (*Placeholder - To be submitted with Updated Study Report*) |
| | 2 | Foothills Trail Corridor Conditions Assessment (Draft Report) |
| | 3 | Whitewater River Cove Existing Recreational Use Characterization (Final Report) |
| | 4 | Whitewater River Cove Recreational Public Safety Evaluation (*Placeholder - To be submitted with Updated Study Report*) |
| | 5 | Consultation Documentation |

[3] For Section 6 of the Foothills Trail Corridor Conditions Assessment Draft Report, the reader should defer to Attachment 5 "Consultation Documentation", which includes all correspondence for the Recreational Resources Study since the time of RSP filing.

# Attachment 1

## Foothills Trail Corridor Recreation Use and Needs Study

*[Report to be submitted with USR]*

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# Attachment 2

## Foothills Trail Corridor Conditions Assessment

## Draft Report

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# DRAFT Foothills Trail Corridor Conditions Assessment

Bad Creek Pumped Storage Project

FERC No. 2740

Prepared for:
**Duke Energy Carolinas, LLC**

Prepared by:
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November 2023

## TABLE OF CONTENTS



## LIST OF TABLES



## LIST OF FIGURES

## LIST OF APPENDICES

# 1.0 INTRODUCTION

On February 23, 2022, Duke Energy Carolinas, LLC (Duke Energy) submitted the Bad Creek Pumped Storage Project (Bad Creek Project or Project; FERC No. 2740) Notice of Intent to Relicense and Pre-Application Document (PAD) to the Federal Energy Regulatory Commission (FERC or Commission). The PAD included an alternative licensing proposal for installation of additional energy storage and generation capacity by constructing a new 1,400-megawatt power complex (Bad Creek II Complex) adjacent to the existing Bad Creek Powerhouse to meet the growing need for energy storage and renewable energy production across Duke Energy's service territories. Duke Energy plans to make a final decision regarding the alternative licensing proposal for the construction of the Bad Creek II Complex prior to the submittal of a Final License Application for the Bad Creek Project.

In Section 7.1.6.3 of the PAD, Duke Energy proposed to conduct a Recreational Resources Study in support of the proposed the Bad Creek II Complex. No study requests related to recreational resources were received during the scoping process; however, formal comments on the PAD and Scoping Document 1 regarding recreational resources were received from Upstate Forever and the Foothills Trail Conservancy. Comment responses were included in Appendix A of the Proposed Study Plan, which was filed with the Commission on August 5, 2022. Stakeholder comments on the Proposed Study Plan were submitted by the Commission, South Carolina Department of Natural Resources (SCDNR), Upstate Forever, and the Foothills Trail Conservancy. Resource issues and stakeholder comments pertinent to the Recreational Resources Study were considered in the development of the Revised Study Plan, which was filed with the Commission on December 5, 2022. Summaries of comments and responses were included in Appendix A and copies of all comments and correspondence were provided in Appendix B of the Revised Study Plan (RSP). The Commission issued its Study Plan Determination on January 4, 2023, and approved the Recreational Resources Study with modifications.

The Recreational Resources Study consists of four main study tasks: (1) a Recreation Use and Needs (RUN) Study for the 43-mile-long portion of the Foothills Trail (or trail) managed by Duke Energy; (2) a Foothills Trail Corridor Conditions Assessment (Conditions Assessment) of the 43-mile-long portion of the Foothills Trail and associated spur trails managed by Duke Energy; (3) an Existing Recreational Use Characterization of Whitewater River cove; and (4) a Recreational Public Safety Evaluation of Whitewater River cove.

This Foothills Trail Corridor Conditions Assessment (Conditions Assessment) focuses on item 2 above, evaluating the current condition of trail surface and corridor included in the 43-mile segment of the Foothills Trail and associated spur trails maintained by Duke Energy and identifying key areas of future maintenance needs or improvements. The data collected during this study will be used during development of protection, mitigation, and enhancement measures for the Project.

## 1.1 Current Operation

The Bad Creek Project is located in Oconee County, South Carolina, approximately eight miles north of Salem, South Carolina. The Bad Creek Reservoir (upper reservoir) was formed when Bad Creek and West Bad Creek were dammed and serves as the Bad Creek Project's upper reservoir. Lake Jocassee (lower reservoir) serves as the Bad Creek Project's lower reservoir and is licensed as part of Duke Energy's Keowee-Toxaway Hydroelectric Project (KT Project; FERC No. 2503).

The 30-year-old Bad Creek Project is one of the most powerful and flexible energy generation and storage assets in Duke Energy's system. Built primarily to store surplus energy from baseload nuclear and fossil-fuel-driven power plants during times of low energy demand, today the Bad Creek Project is used to balance an increasingly complex energy grid. By pumping water from Lake Jocassee up to the Bad Creek Reservoir, the Bad Creek Project is able to provide storage of surplus baseload energy during low demand periods. While the Bad Creek Project is in turbine operation mode, water runs from the upper reservoir down to Lake Jocassee, providing power back to the grid when energy demand is higher or when renewable generation is unavailable.

## 1.2 Proposed Action

The demand for energy and energy storage has been steadily on the rise in the southeastern region of the country. In an effort to meet this growing demand, Duke Energy is proposing an expansion to the Bad Creek Project that will double the generating capacity of the station. The proposed Bad Creek II Complex would utilize the existing upper and lower reservoirs and consist of a new inlet/outlet within the existing upper reservoir, water conveyance system, and underground powerhouse. Additionally, a new inlet/outlet along the shoreline of the Whitewater River arm of Lake Jocassee, or the Whitewater River cove, would be constructed.

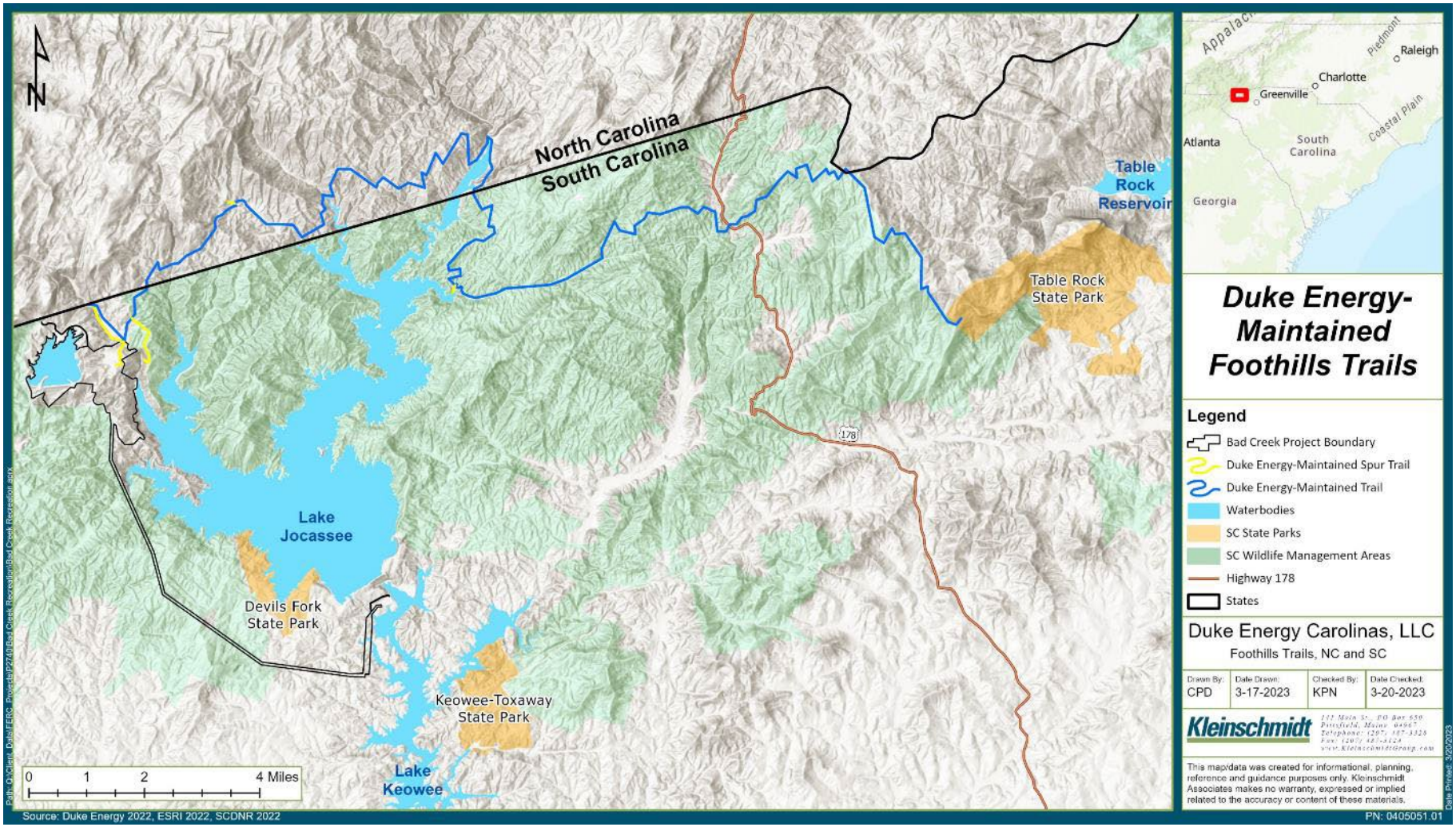
The Bad Creek II Complex underground powerhouse would be arranged and sized similarly to the existing Bad Creek Project powerhouse. In general, most of the features

for the Bad Creek II Complex would be submerged, underground, and/or within lands classified as "project operations," which are not accessible to the general public. The location of the proposed lower reservoir inlet/outlet structure has been chosen to minimize construction-related environmental impacts to the Whitewater River arm of Lake Jocassee. Nevertheless, the Whitewater River cove is anticipated to be closed to the public for approximately five years during construction of the Bad Creek II Complex. Duke Energy will develop more specific schedules and plans for closures as construction plans for the Bad Creek II Complex advance and in consultation with stakeholders.

# 2.0 DESCRIPTION OF STUDY AREA

The geographic scope (i.e., study area) of the Conditions Assessment includes the 43-mile-long segment of the Foothills Trail and five spur trails maintained by Duke Energy. The 43-mile Duke Energy-maintained trail segment begins on the western end of the Foothills Trail at the Duke Energy/U.S. Forest Service property line on the Whitewater River near the Bad Creek Project and extends east to the Duke Energy/Table Rock State Park property line approximately 1,000 feet southwest of the top of Pinnacle Mountain (Figure 2-1). There are five spur trails that connect with the Foothills Trail that are managed and maintained by Duke Energy including Laurel Fork Falls, Hilliard Falls, Lower Whitewater Falls Overlook, Bad Creek, and Coon Branch.

**Figure 2-1 Trail Conditions Assessment Study Area**



# 3.0 METHODOLOGY

One objective for accomplishing study goals was identified in the Recreational Resources Study Plan. The methods for accomplishing this objective are outlined below.

**Objective 1: Evaluate the current condition of trail surface and corridor and identify key areas of future maintenance needs or improvements for the 43-mile segment of the Foothills Trail maintained by Duke Energy**

Duke Energy subcontracted Long Cane Trails to perform a trail conditions assessment involving analyzing sections of trail and determining its maintenance needs[1]. Long Cane Trails divided the 43-mile segment of the Foothills Trail maintained by Duke Energy into six sections using the Foothills Trail Guidebook (Foothills Trail Conservancy 2018) as a reference for location descriptions. All 43 miles of the main trail corridor as well as spur trails were assessed for trail tread, out slope, backslope, drainage, constructed structures (not including engineered bridges) and corridor condition. Trail standards from the Trail Solutions guide (Felton 2004) on building singletrack was used as a base for trail condition analysis. Constructed structures (such as stairs, hand railings, bridges, etc.) were identified and recorded and location tracked geospatially. Structures in need of significant maintenance or replacement were recorded in detail with photo documentation. Similarly, trail condition and corridor features requiring maintenance or repair as well as areas of significant erosion, areas with significant drainage issues (i.e., standing water), or obstructed areas along the trail (i.e., downed trees), and notable occurrences of litter and vandalism were recorded and tracked geospatially.

Long Cane Trails used the following methods to document the current trail conditions and identify key areas of trail surface for future maintenance needs or improvements:

- Populate the Assessment Form (Appendix A); includes trail assessment descriptions defined in Table 3-1.
- Locate issue/structure along the trail and record GPS waypoint.
- Take photos of significant issues/features for documentation.
- Identify type of issue/structure using categories provided in Table 3-1.

[1] Inspections of engineered bridges on the Duke Energy-maintained portion of the Foothills Trail are performed every five years by a licensed Professional Engineer in accordance with the Duke Energy Foothills Trail Maintenance Program.

- Measure issue/structure (i.e., bridges, culverts, eroded sections, washouts, wet areas, and diameters of fallen trees).
- If excessive grade is present (greater than 15 percent slope) in conjunction with erosion, utilize clinometer to measure percent slope.
- Provide additional description/comments about issues/structures identified.

Long Cane Trails added their recommendations/prescriptions to existing trail details already measured and noted in the Foothills Trail Guidebook (Foothills Trails Conservancy 2018).

## Table 3-1 Long Cane Trails' Trail Assessment Descriptions

**Trail Assessment Descriptions:**

| Code | Description |
|---|---|
| B | Bridges, puncheon, bog bridges, turnpikes. ***Note construction material, length/width (feet) and condition of bridge.*** |
| UC | Unimproved Crossing (stream crossing). ***Note if wading or rock steps and any maintenance required (unstable stepping stones). Note the width of the stream at the crossing point.*** |
| C | Culvert – open or closed drain across the trail. ***Note condition of culvert, length/diameter and if sufficient size for situation.*** |
| E | Erosion - look for exposed roots, rocks, or gullies on trail. ***Describe situation (exposed roots, gullies on tread, located on fall line (going straight down a hill regardless of grade) and length of eroded section (if greater than 25 ft, approximate distance).***<br>***If excessive grade (>15% slope) in conjunction with erosion: measure steep slopes with clinometer (if numerous steep rocky slopes, no need to measure each one – note that trail has numerous steep rocky sections)*** |
| EC | Erosion Control Devices – check dams, water bars. ***Note type and condition of structure.*** |
| WO | Washout - section of trail has been mostly/completely washed away. ***Note length/width/depth and any hazards associated with washout. Take photo.*** |
| WA | Wet Area/standing water (larger than 3ft diameter). ***Note length/width. Note any adjacent water feature.*** |
| OB | Obstacle – fallen tree or other obstacle blocking treadway (include broken branches or trees leaning above/across the trail ("widow makers"). ***Note diameter of fallen tree.*** |
| IB | Insufficient Blazing/Marking – if can't see next blaze/marker as you are moving past a blaze/marker or hard to locate next blaze/marker. ***Note if blazes/markers missing or worn off.*** |
| SI | Signage – ***Identify if Trailhead, Directional or Interpretive and if in need of repair. Note type of repair.*** |
| AC | Additional Comment – specific locations that warrant noting such as a scenic vista, unique feature (caves, mines, rock wall) and locations of invasive species. ***Note type of feature and associated details (such as name of invasive species and amount of plants (number, area).*** |

# 4.0 RESULTS

Long Cane Trail identified 89 areas needing maintenance or improvements (i.e., trail issues) along the 43-mile segment of the Foothills Trail and five spur trails maintained by Duke Energy, as listed in Table 4-1[2] and shown in Figure 4-1 through Figure 4-20. Photographs of individual trail issues are also included in Figure 4-1 through Figure 4-20.

[2] The Trail Conditions Assessment included Laurel Fork Falls and Hilliard Falls; however, no issues were identified and therefore are not included in Table 4-1.

## Table 4-1 Foothills Trail Conditions Assessment Findings

| Trail Issue # | Figure # | Date Assessed | Trail Name | Mile Marker | Latitude | Longitude | Assessment Type | Description/Details |
|---|---|---|---|---|---|---|---|---|
| 1 | Figure 4-2 | 2023-09-14 | Bad Creek Access Spur | 0.1 | 35.01273631 | -82.99787808 | Culvert, Open Drain | Concrete culvert needs cleaning. Sediment has gathered and is sitting, not allowing water to run down the drain. |
| 2 | Figure 4-2 | 2023-09-14 | Bad Creek Access Spur | 0.1 | 35.01296829 | -82.99759536 | Wet Area / Standing Water | Gravel needs to be added to the section of the trail to raise it approximately 2 inches. This is a very low area with standing water most of the time. In fact, there is some drainage that seems to be serving a purpose in this area also. |
| 3 | Figure 4-2 | 2023-09-14 | Bad Creek Access Spur | 0.2 | 35.01339791 | -82.9977754 | Wet Area / Standing Water | Low part of the trail, and gravel needs to be brought in. Easily accessible from the parking lot. This trail has had gravel on it in the past. It just needs a topping. |
| 4 | Figure 4-2 | 2023-09-14 | Bad Creek Access Spur | 0.3 | 35.01449413 | -82.99786919 | Erosion Control Devices, Other | Someone is putting barricades on the side of the trail, and these need to be removed. There are several in this section of the trail. These, in fact, hold water on the trail versus letting water off the trail. There should be a series of knicks or grade reversals in this section to divert water. |

| Trail Issue # | Figure # | Date Assessed | Trail Name | Mile Marker | Latitude | Longitude | Assessment Type | Description/Details |
|---|---|---|---|---|---|---|---|---|
| 5 | Figure 4-2 | 2023-09-14 | Bad Creek Access Spur | 0.3 | 35.01413933 | -82.99811383 | Steps | The step is rotten and needs to be replaced. |
| 6 | Figure 4-3 | 2023-09-14 | Bad Creek Access Spur | 0.6 | 35.01723673 | -82.99744404 | Signage, Interpretive | Approximately 100 feet of trail has been rerouted. The user can still see the old relays in the corner as well as the old trail. The new trail is working great! The old trail needs to be closed, and the new trail needs to be blazed in the corner, so users know this is the trail. In this particular area, you have not seen a blaze in a while. Blue color is needed to apply a new blaze |
| 7 | Figure 4-3 | 2023-09-14 | Bad Creek Access Spur | 0.7 | 35.01869053 | -82.99718057 | Obstacle, Fallen Tree | A fallen tree across the trail needs to be removed. |
| 8 | Figure 4-3 | 2023-09-18 | Coon Branch | 0.2 | 35.01956213 | -82.99972003 | Bridge, Bridge | The upper railing needs to be replaced on both sides, and two decking boards need to be replaced. |
| 9 | Figure 4-3 | 2023-09-18 | Coon Branch | 0.2 | 35.01966168 | -82.9999907 | Bridge, Bridge | Two 2x4x12 railings need to be replaced. |
| 10 | Figure 4-3 | 2023-09-18 | Coon Branch | 0.4 | 35.02183009 | -83.00243764 | Bridge, Buncheon | Bog Bridge, two feet wide by four feet long, needs to be installed |

| Trail Issue # | Figure # | Date Assessed | Trail Name | Mile Marker | Latitude | Longitude | Assessment Type | Description/Details |
|---|---|---|---|---|---|---|---|---|
| 11 | Figure 4-3 | 2023-09-18 | Coon Branch | 0.4 | 35.02160249 | -83.00233517 | Erosion, Gullie | A major drain needs to be unclogged. It is overflowing and going down the trail. The solution is to simply open the drain up more and get rid of the sediment that is raising the drain up. |
| 12 | Figure 4-4 | 2023-09-14 | Lower Whitewater Falls Spur | 0.4 | 35.02155442 | -82.99014034 | Washout | Trail needs water diversion in the form of grade dips or knicks. |
| 13 | Figure 4-4 | 2023-09-14 | Lower Whitewater Falls Spur | 0.9 | 35.01623192 | -82.98947331 | Washout | Trail needs some steps and grade dips or water diversion features added. Approximately 20 steps needed. |
| 14 | Figure 4-4 | 2023-09-14 | Lower Whitewater Falls Spur | 1 | 35.01476505 | -82.98918722 | Erosion, Gullie | Trail is using an old roadbed that has a gully on each side and very few drains. all drains are clogged and need to be rerouted. New trail limit is very close to the old just elevated on the banks versus in the middle of the old roadbed. |
| 15 | Figure 4-3 | 2023-09-14 | Foothills Trail | 31.6 | 35.02092083 | -82.99665677 | Washout | The trail needs some grade reversals or knicks. Water has gotten on the trail and does not leave for some time, causing a gully if not fixed. |
| 16 | Figure 4-5 | 2023-09-30 | Foothills Trail | 32.4 | 35.02958049 | -82.99437631 | Steps | Replace three steps |

| Trail Issue # | Figure # | Date Assessed | Trail Name | Mile Marker | Latitude | Longitude | Assessment Type | Description/Details |
|---|---|---|---|---|---|---|---|---|
| 17 | Figure 4-5 | 2023-09-30 | Foothills Trail | 33.3 | 35.03730923 | -82.98769713 | Steps | Replace three steps |
| 18 | Figure 4-5 | 2023-09-30 | Foothills Trail | 33.9 | 35.03812814 | -82.98336354 | Steps | One step needs to be replaced. |
| 19 | Figure 4-5 | 2023-09-30 | Foothills Trail | 34.2 | 35.03822699 | -82.98165951 | Steps | Steps need to be replaced. |
| 20 | Figure 4-6 | 2023-09-30 | Foothills Trail | 35.5 | 35.04768531 | -82.96974848 | Obstacle, Fallen Tree | Tree across trail and needs to be removed. |
| 21 | Figure 4-6 | 2023-09-18 | Foothills Trail | 35.8 | 35.05077596 | -82.96808629 | Steps | Two steps need to be replaced. |
| 22 | Figure 4-7 | 2023-09-30 | Foothills Trail | 37.2 | 35.04848663 | -82.95255533 | Steps | One step is rotten and needs to be replaced. |
| 23 | Figure 4-7 | 2023-09-30 | Foothills Trail | 37.3 | 35.04886479 | -82.95224431 | Obstacle, Other | From mile 36.2 at Hilliard Falls Trail to 37.3 at Bear camp campsite |
| 24 | Figure 4-7 | 2023-09-30 | Foothills Trail | 37.6 | 35.0484997 | -82.94810344 | Obstacle, Fallen Tree | Fallen tree across trail that needs to be cut out. |
| 25 | Figure 4-7 | 2023-09-30 | Foothills Trail | 37.6 | 35.04848623 | -82.94800267 | Obstacle, Fallen Tree | Two trees have fallen and need to be cleared. |
| 26 | Figure 4-7 | 2023-09-30 | Foothills Trail | 38.6 | 35.04622411 | -82.93985485 | Obstacle, Fallen Tree | |
| 27 | Figure 4-7 | 2023-09-30 | Foothills Trail | 38.7 | 35.04687284 | -82.93946234 | Obstacle, Fallen Tree | Brush from the top of a falling tree needs to be removed. |
| 28 | Figure 4-8 | 2023-09-30 | Foothills Trail | 39.4 | 35.05225218 | -82.93751518 | Obstacle, Fallen Tree | Large tree across Trail needs to be removed. |
| 29 | Figure 4-8 | 2023-09-30 | Foothills Trail | 39.5 | 35.05318844 | -82.93657904 | Obstacle, Fallen Tree | A top of a tree is crossing the trail and needs to be cut out. |
| 30 | Figure 4-8 | 2023-09-30 | Foothills Trail | 39.8 | 35.05494625 | -82.93714846 | Erosion, Gullie | At the foot of the bridge there is erosion. Rocks need to be added to armor the 2 x 2′ area that is compromised. |

| Trail Issue # | Figure # | Date Assessed | Trail Name | Mile Marker | Latitude | Longitude | Assessment Type | Description/Details |
|---|---|---|---|---|---|---|---|---|
| 31 | Figure 4-8 | 2023-10-01 | Foothills Trail | 39.9 | 35.05678279 | -82.93638778 | Steps | One step needs to be replaced |
| 32 | Figure 4-8 | 2023-10-01 | Foothills Trail | 40.1 | 35.05636493 | -82.93419022 | Obstacle, Other | Trail needs to be trimmed for 2/10 of a mile from Horse Pasture River Bridge to mile 40.3. |
| 33 | Figure 4-8 | 2023-10-01 | Foothills Trail | 40.2 | 35.05690722 | -82.93502841 | Obstacle, Fallen Tree | Tree removal |
| 34 | Figure 4-9 | 2023-10-01 | Foothills Trail | 40.4 | 35.05892556 | -82.93459743 | Obstacle, Fallen Tree | Tree removal |
| 35 | Figure 4-9 | 2023-10-01 | Foothills Trail | 40.4 | 35.05894665 | -82.93456431 | Obstacle, Fallen Tree | Tree removal |
| 36 | Figure 4-9 | 2023-10-01 | Foothills Trail | 40.5 | 35.05893904 | -82.9342663 | Bridge, Bridge | Trees falling on bridge needs to be repaired. |
| 37 | Figure 4-9 | 2023-10-01 | Foothills Trail | 40.5 | 35.05894956 | -82.93423148 | Obstacle, Fallen Tree | Tree removal |
| 38 | Figure 4-9 | 2023-10-01 | Foothills Trail | 40.8 | 35.06270942 | -82.93295438 | Obstacle, Fallen Tree | Tree needs to be removed. |
| 39 | Figure 4-9 | 2023-10-01 | Foothills Trail | 40.9 | 35.06302301 | -82.93270134 | Washout | 15 feet of trail needs to be re-benched. |
| 40 | Figure 4-10 | 2023-10-01 | Foothills Trail | 42.6 | 35.05953224 | -82.92052046 | Obstacle, Fallen Tree | Fallen tree needs to be removed. |
| 41 | Figure 4-10 | 2023-10-01 | Foothills Trail | 42.6 | 35.05954586 | -82.92038139 | Obstacle, Fallen Tree | Tree removal |
| 42 | Figure 4-11 | 2023-10-01 | Foothills Trail | 44.6 | 35.06174146 | -82.90542222 | Obstacle, Fallen Tree | Fallen tree needs to be cut out. |
| 43 | Figure 4-11 | 2023-10-01 | Foothills Trail | 45.7 | 35.06475517 | -82.90024767 | Obstacle, Fallen Tree | Tree removal |
| 44 | Figure 4-11 | 2023-10-01 | Foothills Trail | 47.9 | 35.06632757 | -82.88963219 | Bridge, Bog Bridges | Bog bridge needs to be installed. |

| Trail Issue # | Figure # | Date Assessed | Trail Name | Mile Marker | Latitude | Longitude | Assessment Type | Description/Details |
|---|---|---|---|---|---|---|---|---|
| 45 | Figure 4-11 | 2023-10-01 | Foothills Trail | 48.3 | 35.07118731 | -82.88726657 | Obstacle, Fallen Tree | Tree needs to be removed from across trail. |
| 46 | Figure 4-12 | 2023-10-01 | Foothills Trail | 48.8 | 35.06624918 | -82.8858863 | Steps | Step replacement |
| 47 | Figure 4-12 | 2023-10-01 | Foothills Trail | 48.9 | 35.06471527 | -82.88571508 | Additional Comment | Bench needs to be replaced. |
| 48 | Figure 4-12 | 2023-10-01 | Foothills Trail | 48.9 | 35.06448911 | -82.88557639 | Bridge, Bog Bridges | Bog bridge needs to be added. |
| 49 | Figure 4-12 | 2023-10-01 | Foothills Trail | 48.9 | 35.06423394 | -82.8852986 | Steps | Two steps need to be replaced. They are missing. One step needs to be repaired. |
| 50 | Figure 4-13 | 2023-10-01 | Foothills Trail | 49.1 | 35.06204989 | -82.88605607 | Steps | One step needs to be replaced. |
| 51 | Figure 4-13 | 2023-10-01 | Foothills Trail | 49.2 | 35.06188881 | -82.88646935 | Obstacle, Fallen Tree | Tree across trail needs to be cut. |
| 52 | Figure 4-13 | 2023-10-01 | Foothills Trail | 49.2 | 35.06188238 | -82.88636861 | Steps | Two steps are missing and need to be replaced. |
| 53 | Figure 4-13 | 2023-10-01 | Foothills Trail | 49.2 | 35.06188773 | -82.88644732 | Steps | One step needs to be replaced. |
| 54 | Figure 4-14 | 2023-10-01 | Foothills Trail | 49.4 | 35.06033756 | -82.88994145 | Steps | One step needs to be replaced. |
| 55 | Figure 4-14 | 2023-10-01 | Foothills Trail | 49.5 | 35.06031437 | -82.88911736 | Steps | One step needs to be replaced. |
| 56 | Figure 4-14 | 2023-10-01 | Foothills Trail | 49.9 | 35.05836929 | -82.89148322 | Obstacle, Fallen Tree | Tree across trail needs to be cut. |
| 57 | Figure 4-15 | 2023-09-17 | Foothills Trail | 53.9 | 35.03336423 | -82.8943042 | Obstacle, Fallen Tree | Tree has fallen across trail and holding back water, causing erosion before the tree fall. |
| 58 | Figure 4-15 | 2023-09-17 | Foothills Trail | 54.2 | 35.03126431 | -82.89076147 | Culvert, Open Drain | Culvert has collapsed and needs replacing |

| Trail Issue # | Figure # | Date Assessed | Trail Name | Mile Marker | Latitude | Longitude | Assessment Type | Description/Details |
|---|---|---|---|---|---|---|---|---|
| 59 | Figure 4-15 | 2023-09-17 | Foothills Trail | 54.2 | 35.03152907 | -82.89171696 | Signage, Directional | Insufficient blazes at this junction of foothills trail and laurel fork campsite. More white blades need to be added. |
| 60 | Figure 4-15 | 2023-09-17 | Foothills Trail | 54.6 | 35.03224254 | -82.886101 | Steps | One step needs to be replaced. |
| 61 | Figure 4-15 | 2023-09-17 | Foothills Trail | 54.8 | 35.03243434 | -82.88302672 | Bridge, Bog Bridges | Needs to be raised and lengthen to 12 feet long. |
| 62 | Figure 4-15 | 2023-09-17 | Foothills Trail | 55.5 | 35.03426627 | -82.8715385 | Bridge, Bog Bridges | 3 feet wide by 20 feet long bog bridge needs to be installed. |
| 63 | Figure 4-15 | 2023-09-17 | Foothills Trail | 55.5 | 35.03426745 | -82.87159877 | Bridge, Bridge | Trail is starting to widen due to water flow on trail being blocked. 12-foot-long by 4-foot-wide bridge needs to be added. |
| 64 | Figure 4-16 | 2023-09-17 | Foothills Trail | 57.1 | 35.04325018 | -82.85098593 | Steps | Two steps are rotten and need to be replaced. |
| 65 | Figure 4-16 | 2023-09-17 | Foothills Trail | 57.3 | 35.04586891 | -82.85120517 | Steps | 4 steps need to be replaced. |
| 66 | Figure 4-16 | 2023-09-17 | Foothills Trail | 57.9 | 35.04966325 | -82.84604181 | Steps | One step needs to be replaced. |
| 67 | Figure 4-16 | 2023-09-17 | Foothills Trail | 61.2 | 35.054138 | -82.8166194 | Steps | One step needs to be replaced. |
| 68 | Figure 4-17 | 2023-07-16 | Foothills Trail | 62 | 35.05087322 | -82.81288696 | Bridge, Bridge | One 2x6x12 bore needs to be replaced. It is rotten. |
| 69 | Figure 4-17 | 2023-07-16 | Foothills Trail | 62 | 35.05092472 | -82.81235406 | Steps | Rotten. Needs to be replaced. |
| 70 | Figure 4-17 | 2023-07-16 | Foothills Trail | 62.1 | 35.05166502 | -82.81183115 | Steps | Needs to be replaced. Rotten. |

| Trail Issue # | Figure # | Date Assessed | Trail Name | Mile Marker | Latitude | Longitude | Assessment Type | Description/Details |
|---|---|---|---|---|---|---|---|---|
| 71 | Figure 4-18 | 2023-07-16 | Foothills Trail | 63.8 | 35.06192592 | -82.79797438 | Steps | |
| 72 | Figure 4-17 | 2023-07-16 | Foothills Trail | 63 | 35.05545323 | -82.80436645 | Obstacle, Fallen Tree | Tree across trail. |
| 73 | Figure 4-18 | 2023-07-16 | Foothills Trail | 64.5 | 35.06428672 | -82.79296011 | Erosion, Gullie | Needs water break. |
| 74 | Figure 4-18 | 2023-07-16 | Foothills Trail | 64.5 | 35.06450762 | -82.79284939 | Erosion, Other | Tread is gone. It needs reestablished. |
| 75 | Figure 4-18 | 2023-07-16 | Foothills Trail | 64.9 | 35.06418329 | -82.78862932 | Erosion, Gullie | Rail on side of trail needs to be removed. It is holding water on the trail. Grade dips need to be installed and steps need to be reinstalled. |
| 76 | Figure 4-18 | 2023-07-16 | Foothills Trail | 66.2 | 35.06514616 | -82.77881549 | Erosion, Gullie | |
| 77 | Figure 4-19 | 2023-10-02 | Foothills Trail | 69.9 | 35.03597162 | -82.75429371 | Erosion, Exposed Roots | Tree has fallen on trail and uprooted 8 feet of trail. 8 feet needs to be re-benched. |
| 78 | Figure 4-19 | 2023-10-02 | Foothills Trail | 70.1 | 35.03574288 | -82.75253624 | Obstacle, Fallen Tree | Tree across trail needs to be cut out. |
| 79 | Figure 4-19 | 2023-10-02 | Foothills Trail | 70.2 | 35.03527295 | -82.75187234 | Obstacle, Fallen Tree | Tree needs to be cut out that is across trail. |
| 80 | Figure 4-19 | 2023-10-02 | Foothills Trail | 70.2 | 35.03507738 | -82.75184794 | Steps | One step needs to be replaced. |
| 81 | Figure 4-19 | 2023-10-02 | Foothills Trail | 70.3 | 35.03407215 | -82.7509606 | Obstacle, Fallen Tree | Tree across trail needs to be cut. |
| 82 | Figure 4-20 | 2023-10-02 | Foothills Trail | 70.8 | 35.02819674 | -82.74681091 | Obstacle, Fallen Tree | Remove tree that's across trail. |

| Trail Issue # | Figure # | Date Assessed | Trail Name | Mile Marker | Latitude | Longitude | Assessment Type | Description/Details |
|---|---|---|---|---|---|---|---|---|
| 83 | Figure 4-20 | 2023-10-02 | Foothills Trail | 70.8 | 35.02814792 | -82.74679256 | Obstacle, Other | Trail is extremely overgrown and needs to be trimmed from mile 70.2 at Pigeon Gap to mile 70.9 at Lighthouse Campsite. |
| 84 | Figure 4-20 | 2023-10-02 | Foothills Trail | 71.3 | 35.028678 | -82.741463 | Obstacle, Fallen Tree | Tree across trail in switchback. Fallen tree crosses trail twice. |
| 85 | Figure 4-20 | 2023-10-02 | Foothills Trail | 71.6 | 35.02797993 | -82.74450542 | Obstacle, Fallen Tree | Three trees across trail need to be cut out. |
| 86 | Figure 4-20 | 2023-10-02 | Foothills Trail | 71.7 | 35.02985095 | -82.74414491 | Obstacle, Fallen Tree | Tree across trail needs to be removed |
| 87 | Figure 4-20 | 2023-10-02 | Foothills Trail | 71.9 | 35.03149829 | -82.74218004 | Obstacle, Fallen Tree | Tree across trail needs to be removed |
| 88 | Figure 4-20 | 2023-10-02 | Foothills Trail | 71.9 | 35.03149667 | -82.74159849 | Obstacle, Fallen Tree | Tree across trail needs to be removed |
| 89 | Figure 4-20 | 2023-10-02 | Foothills Trail | 71.9 | 35.0316208 | -82.74135269 | Obstacle, Other | Corridor needs to be cleared and brushed removed from mile 70.9 at Lighthouse Campsite to 72.1 at Pinnacle Mountain Trail Junction. |

**Figure 4-1 Trail Issues Identified during the Foothills Trail Conditions Assessment**

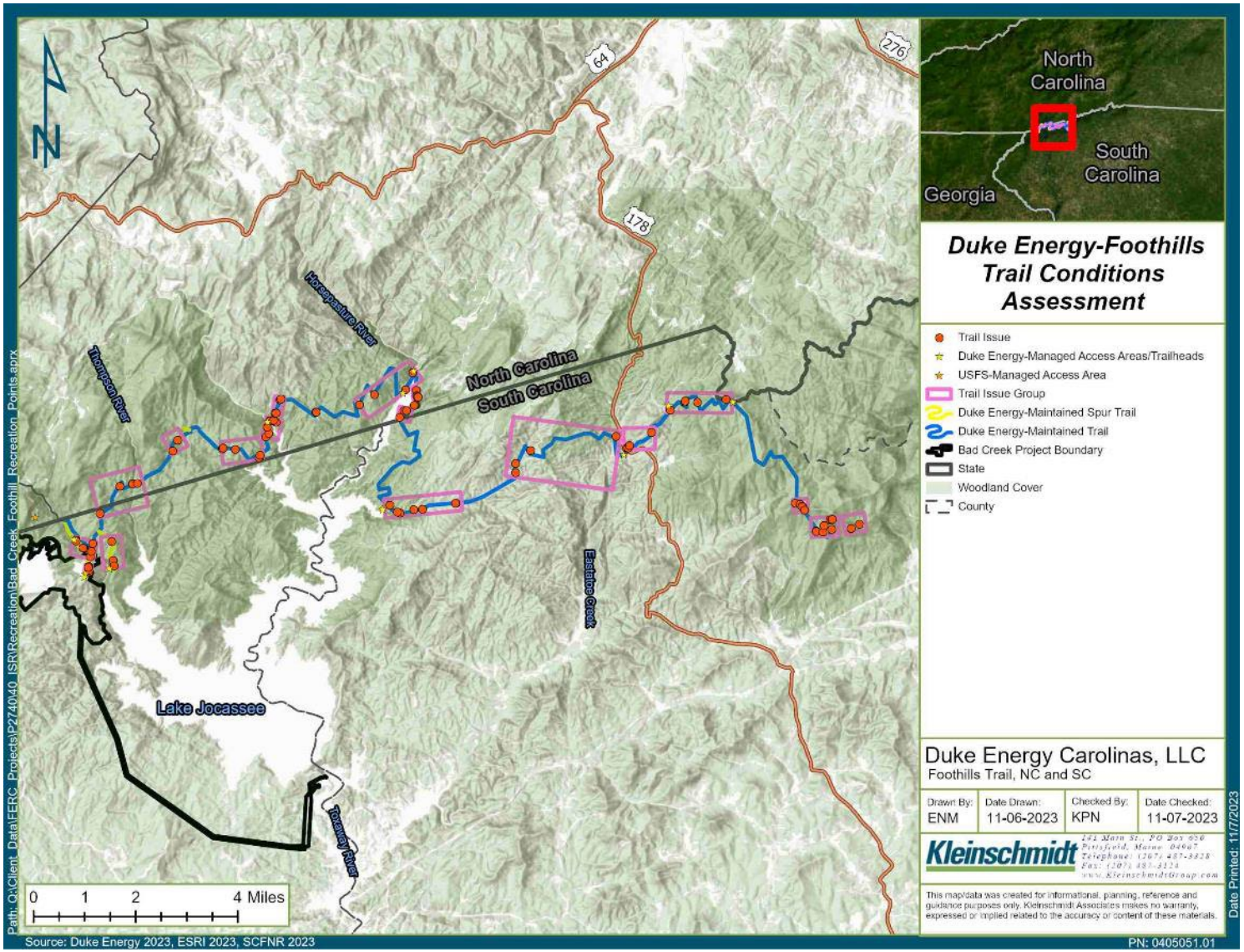


**Figure 4-2 Foothills Trail Conditions Assessment – Figure 1 of 19**

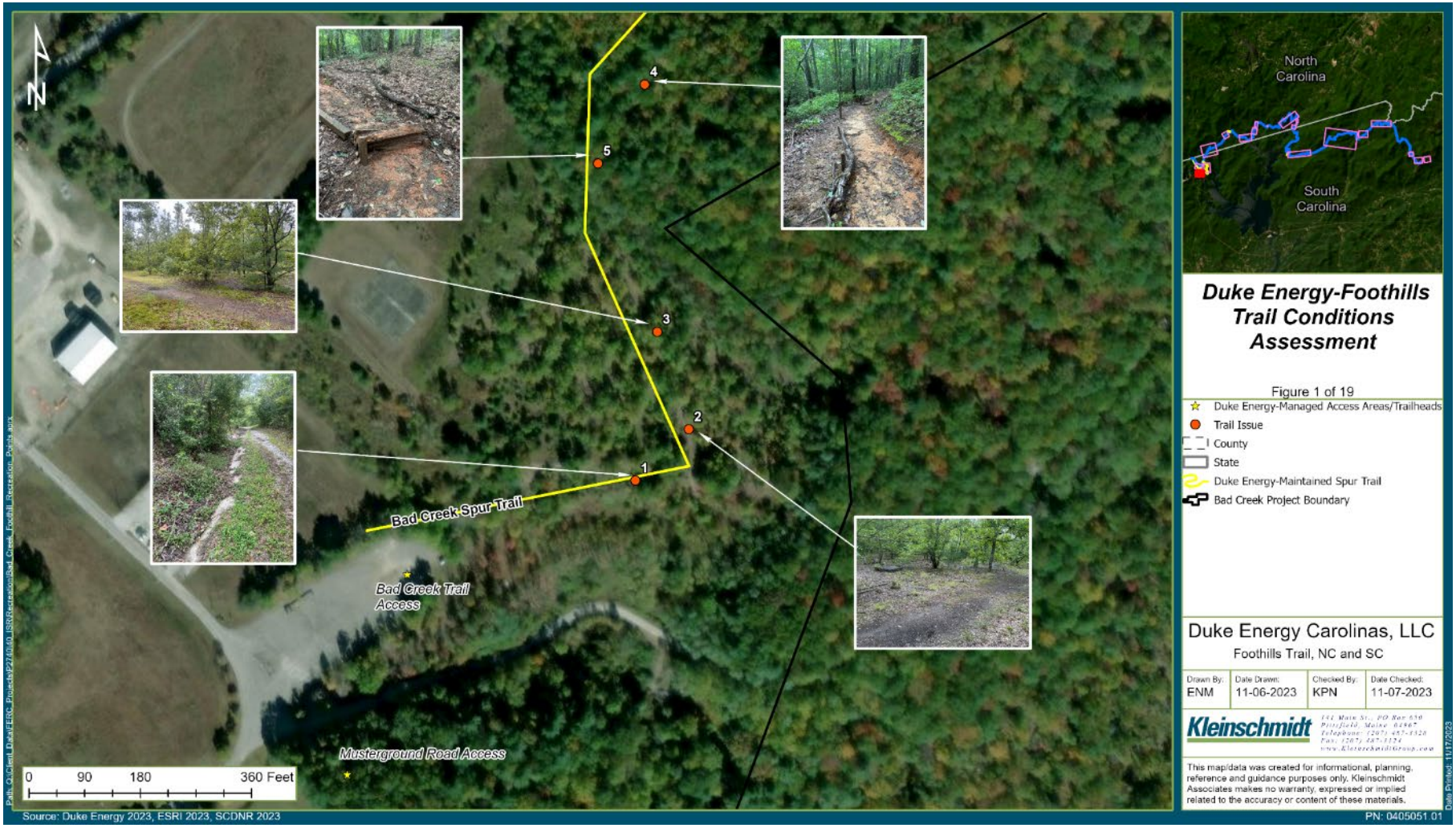
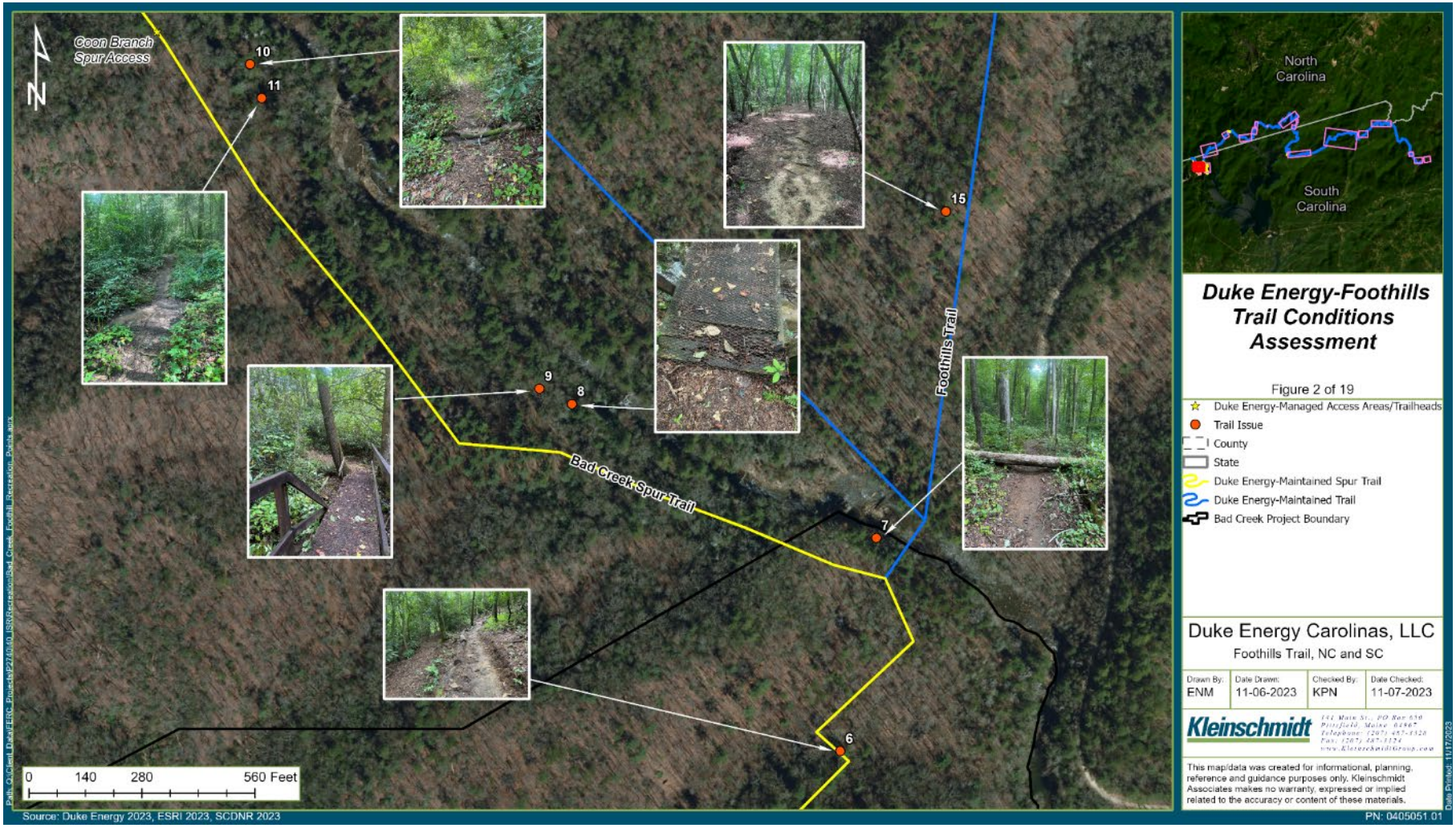


**Figure 4-3 Foothills Trail Conditions Assessment – Figure 2 of 19**



## Figure 4-4 Foothills Trail Conditions Assessment – Figure 3 of 19

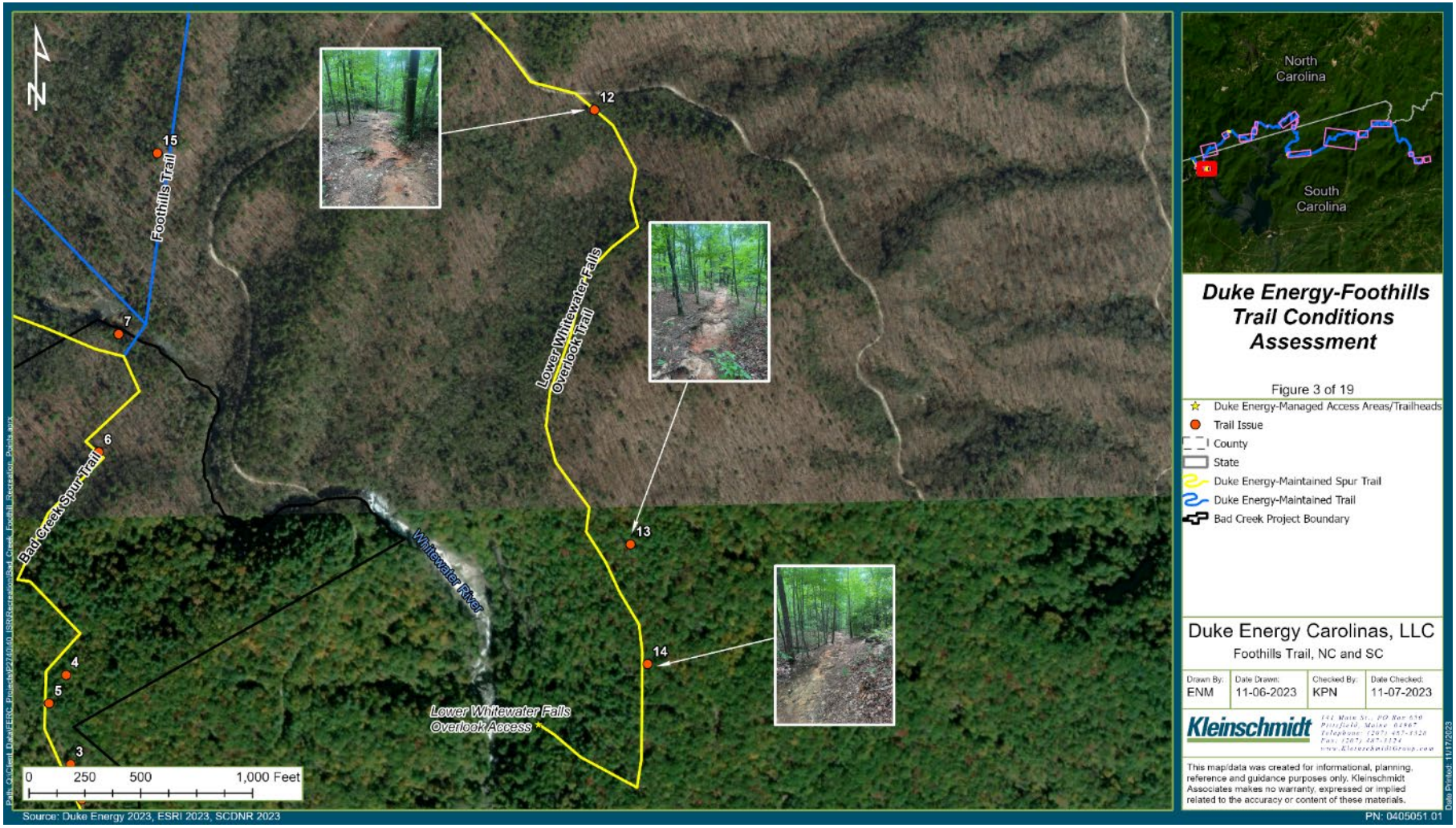


**Figure 4-5 Foothills Trail Conditions Assessment – Figure 4 of 19**

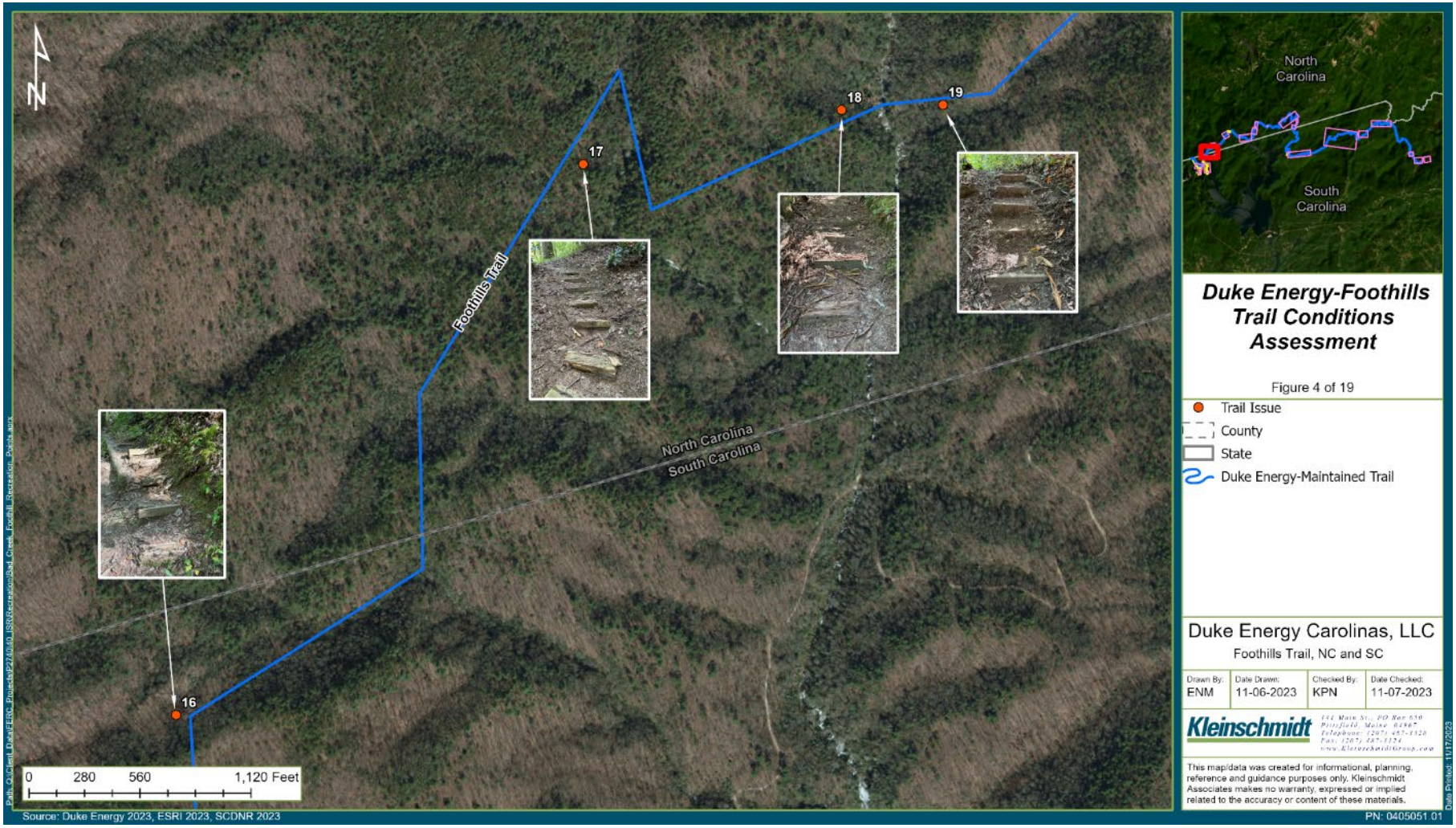
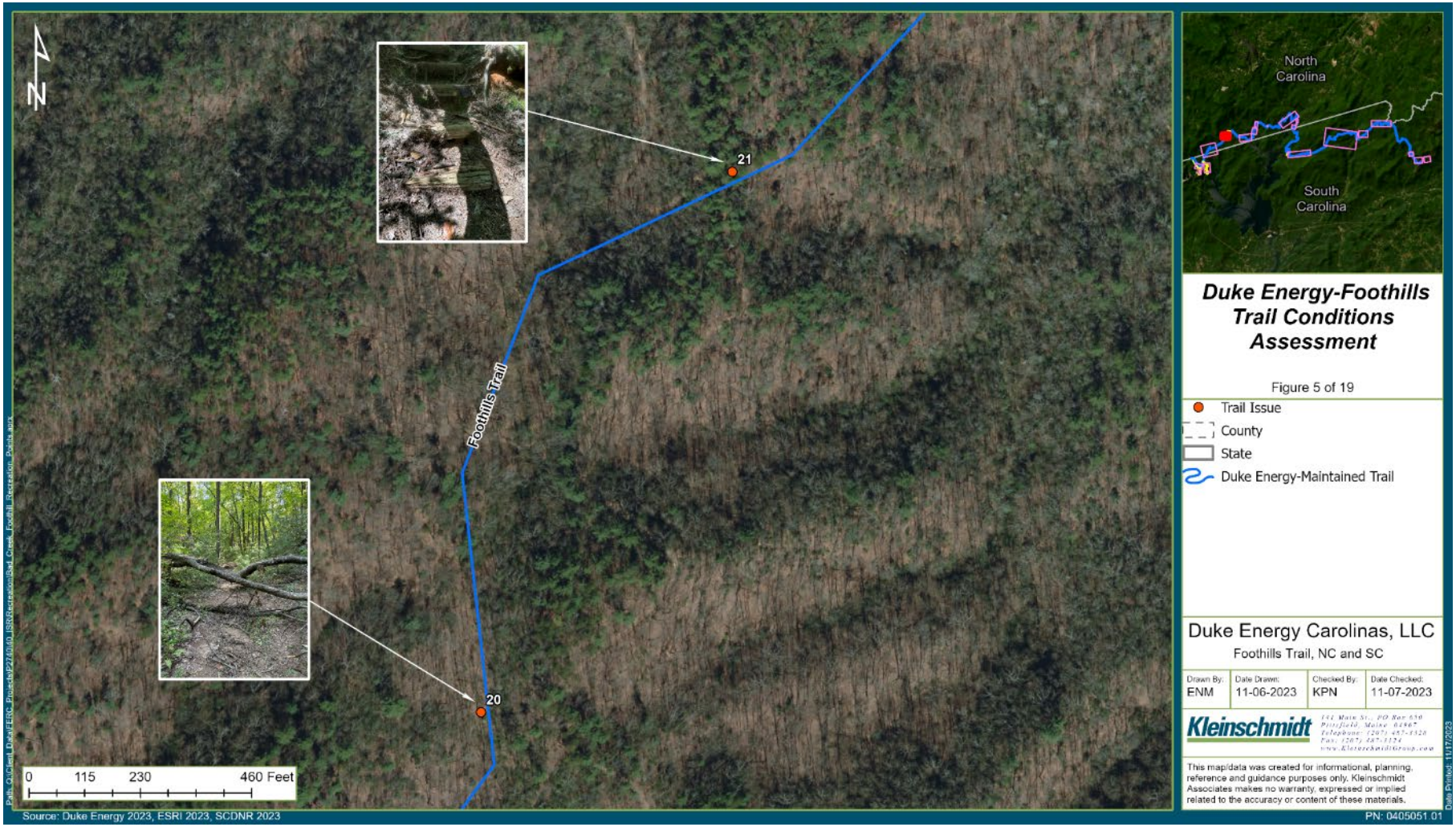


**Figure 4-6 Foothills Trail Conditions Assessment – Figure 5 of 19**



## Figure 4-7 Foothills Trail Conditions Assessment – Figure 6 of 19

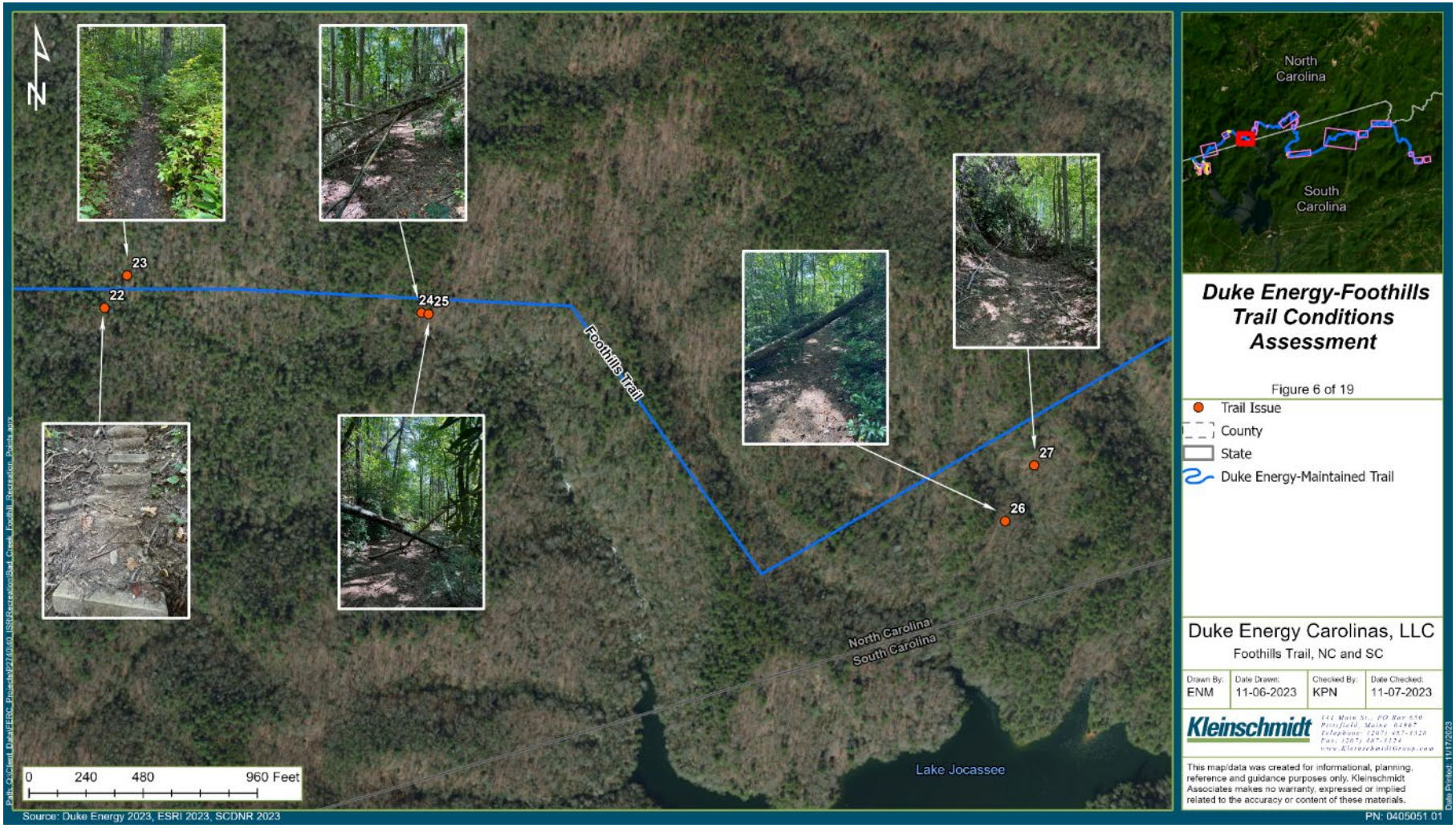


**Figure 4-8 Foothills Trail Conditions Assessment – Figure 7 of 19**

**Figure 4-9 Foothills Trail Conditions Assessment – Figure 8 of 19**

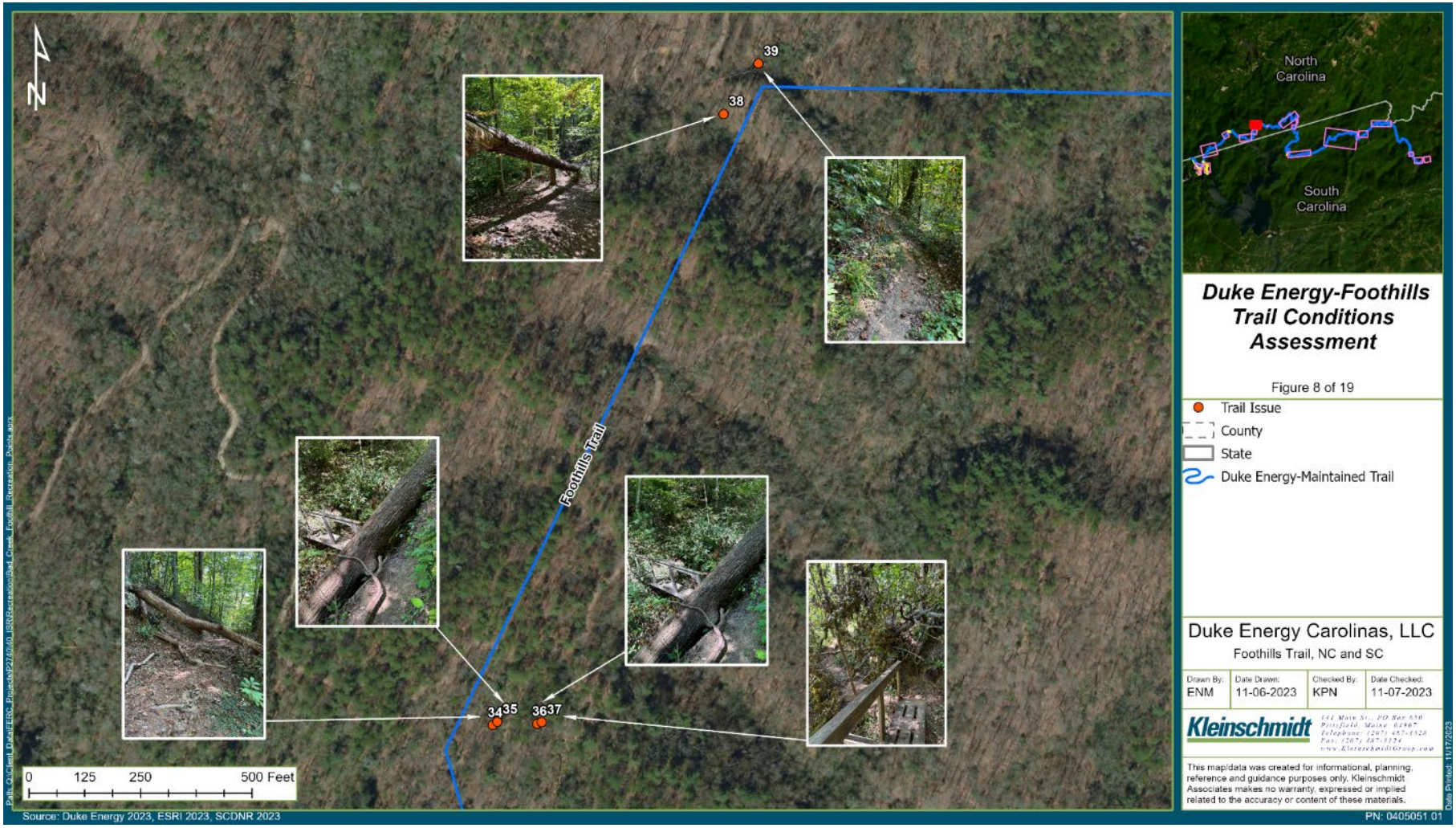


**Figure 4-10 Foothills Trail Conditions Assessment – Figure 9 of 19**

**Figure 4-11 Foothills Trail Conditions Assessment – Figure 10 of 19**

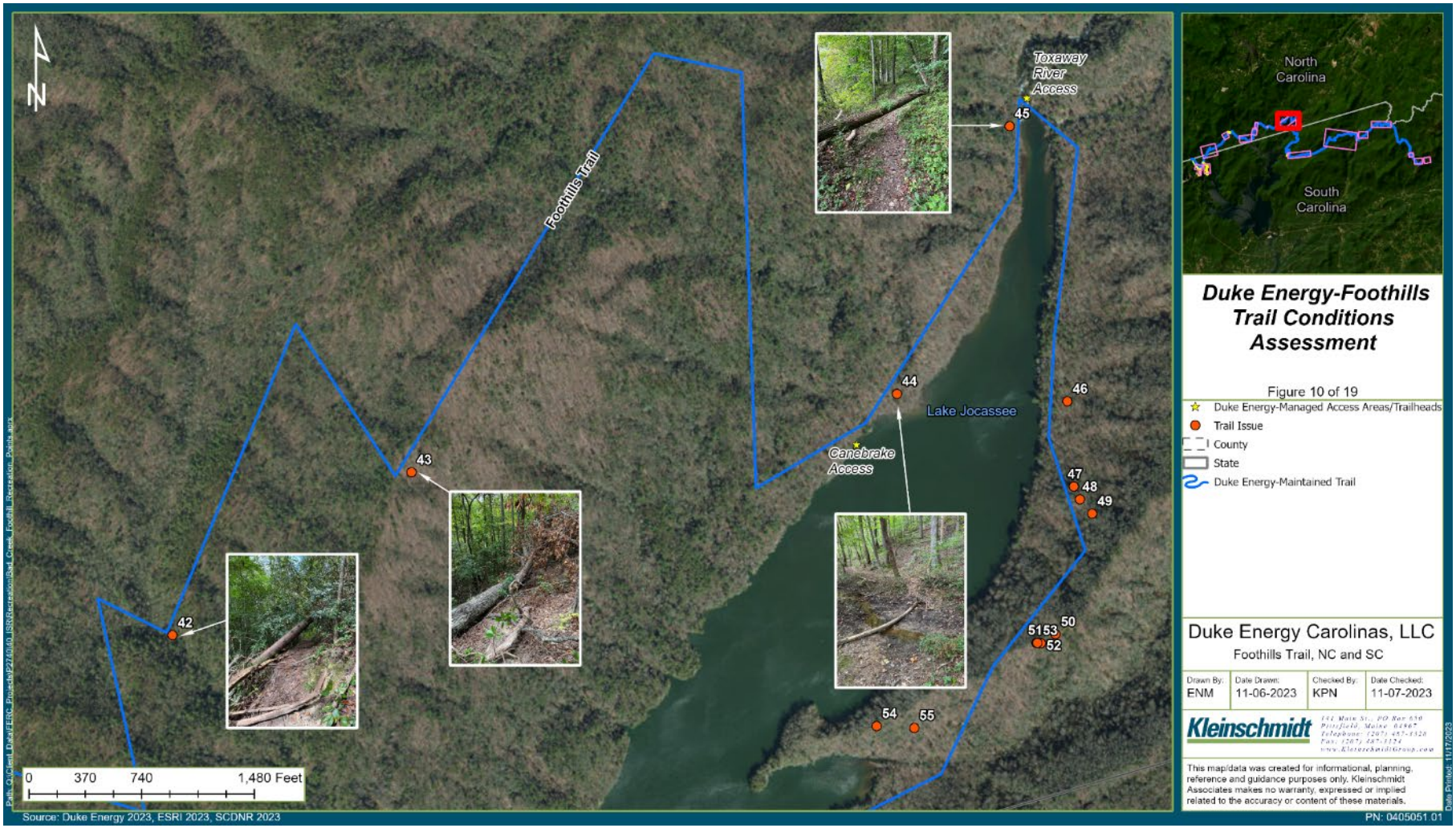


**Figure 4-12 Foothills Trail Conditions Assessment – Figure 11 of 19**

**Figure 4-13 Foothills Trail Conditions Assessment – Figure 12 of 19**

**Figure 4-14 Foothills Trail Conditions Assessment – Figure 13 of 19**

**Figure 4-15 Foothills Trail Conditions Assessment – Figure 14 of 19**

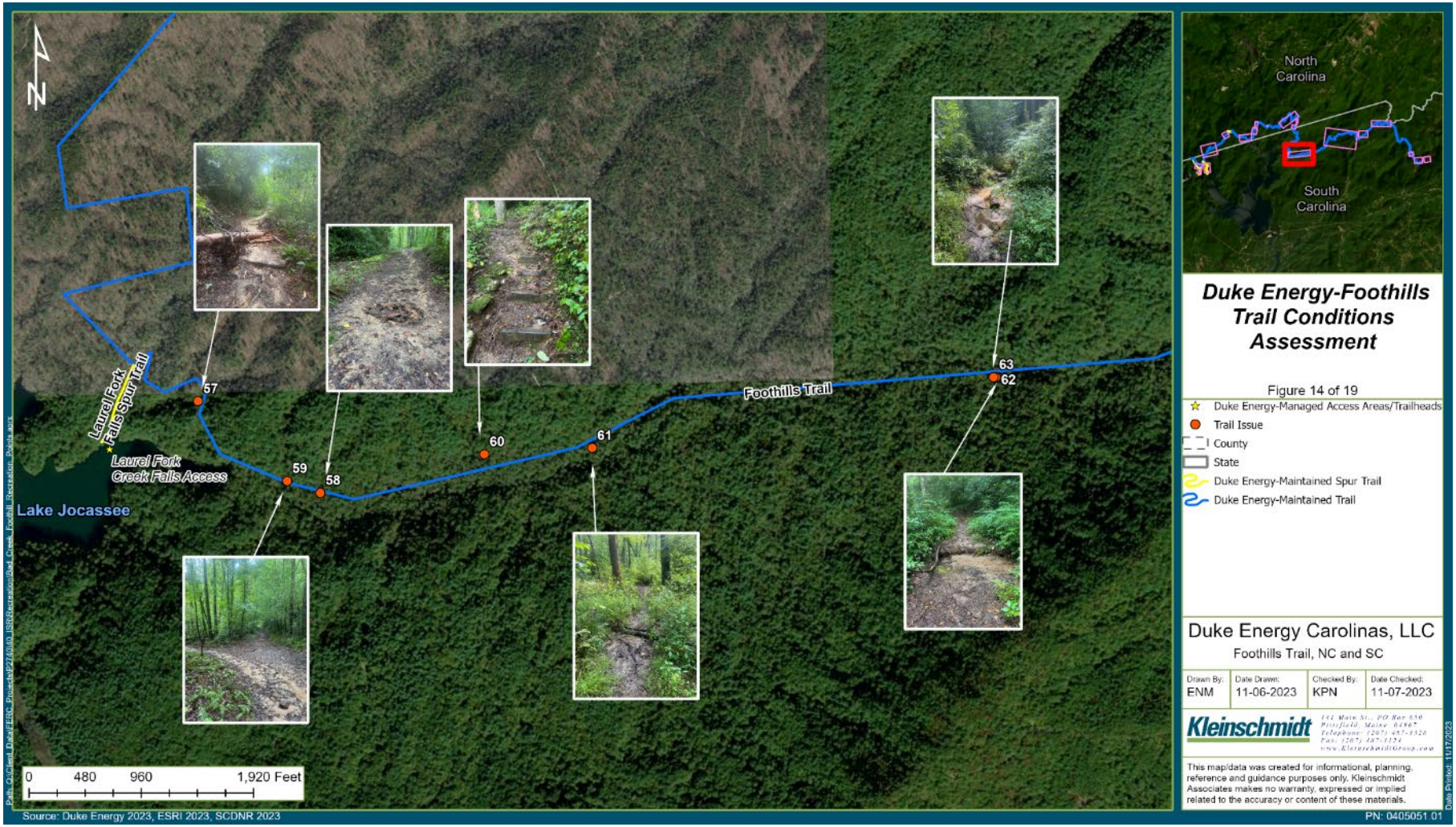


**Figure 4-16 Foothills Trail Conditions Assessment – Figure 15 of 19**

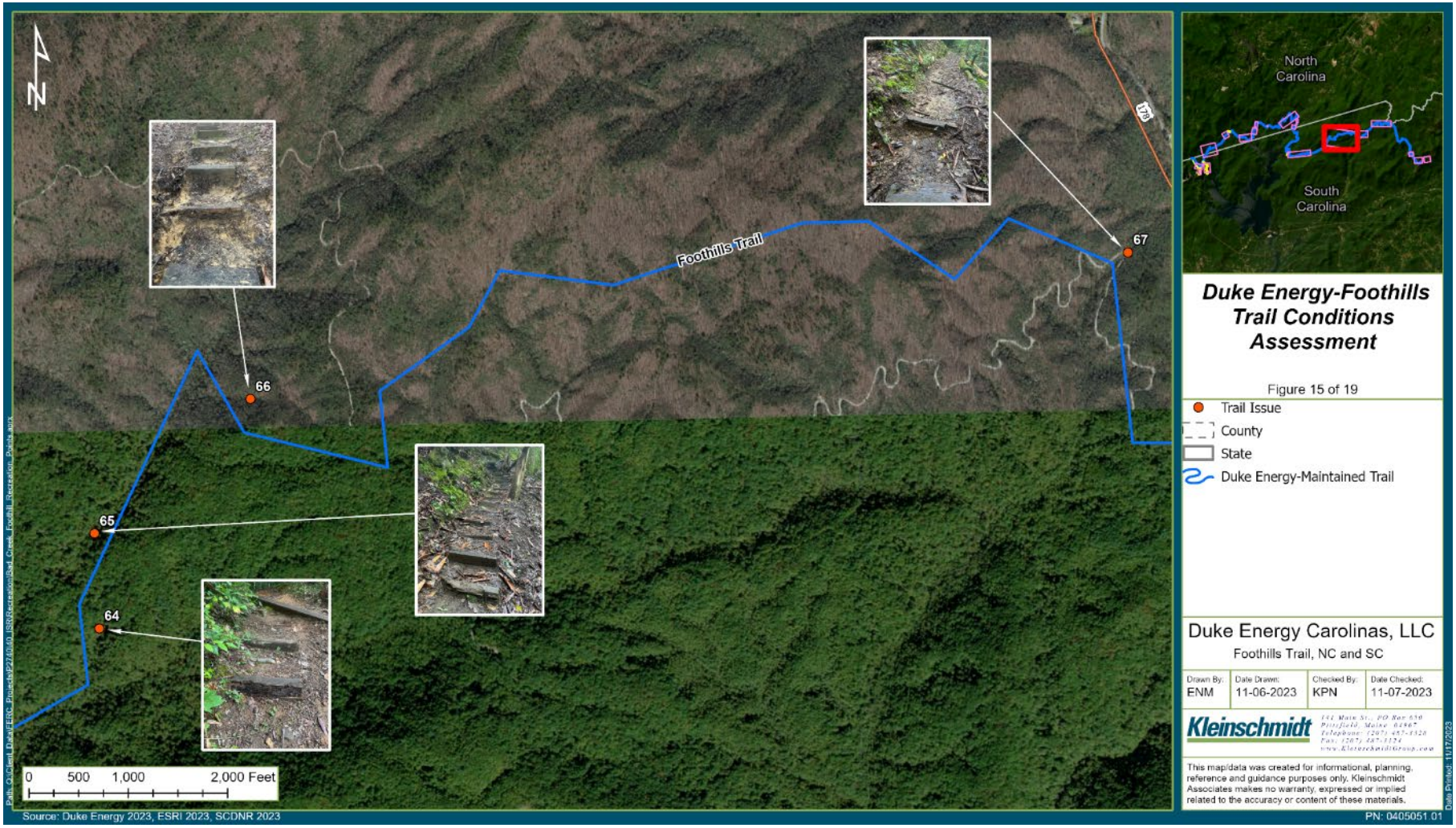


**Figure 4-17 Foothills Trail Conditions Assessment – Figure 16 of 19**

**Figure 4-18 Foothills Trail Conditions Assessment – Figure 17 of 19**

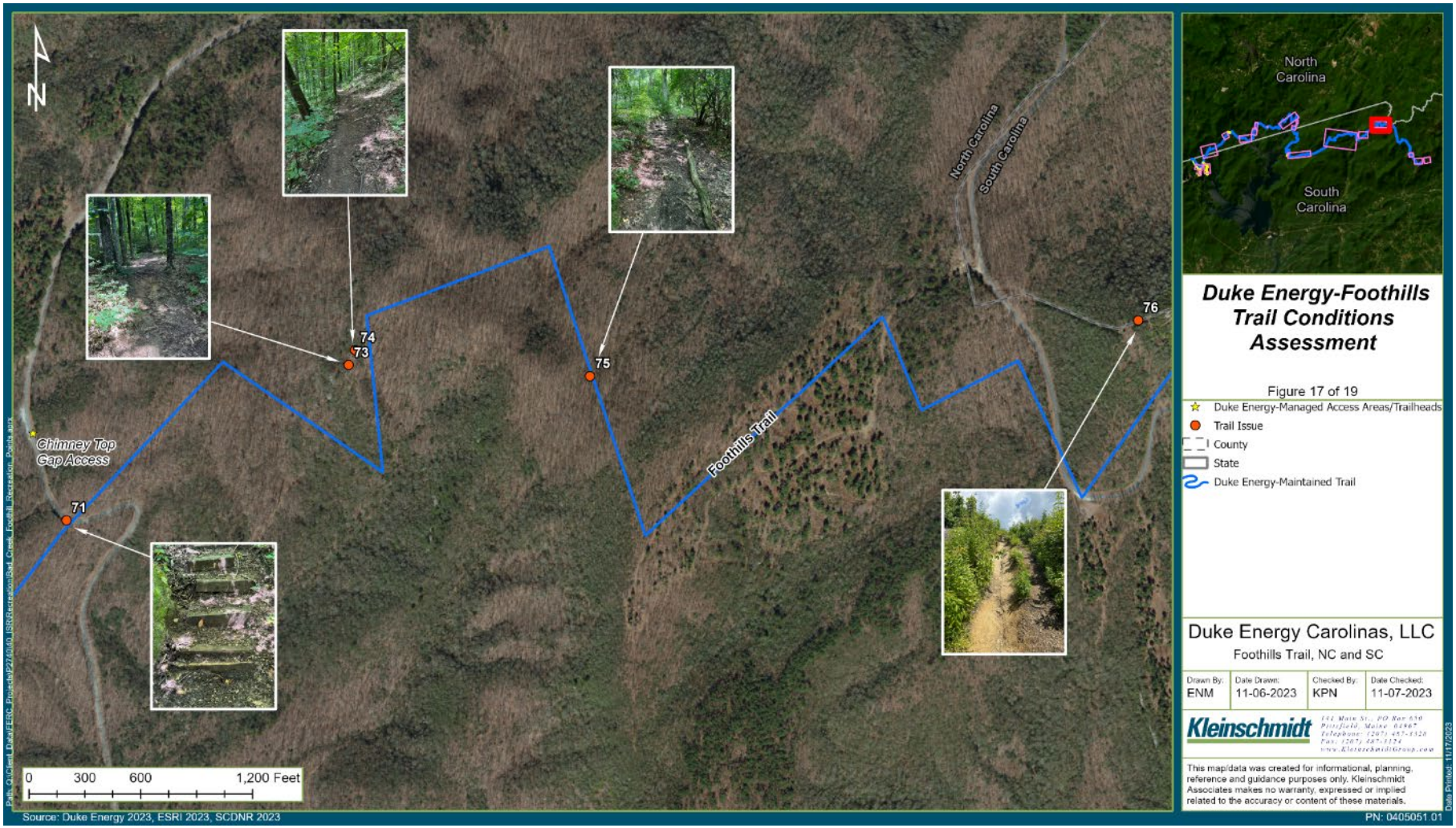


**Figure 4-19 Foothills Trail Conditions Assessment – Figure 18 of 19**

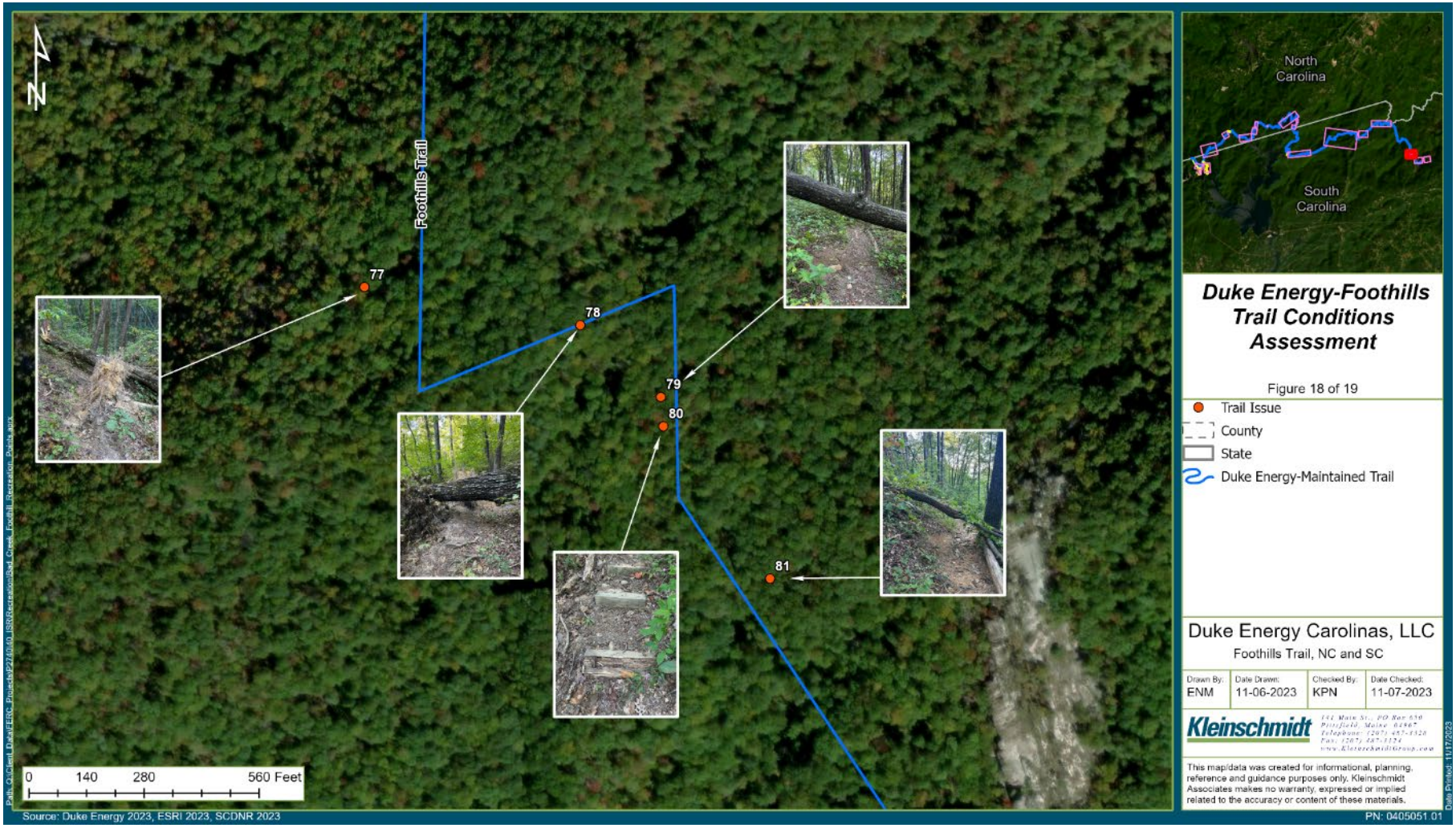
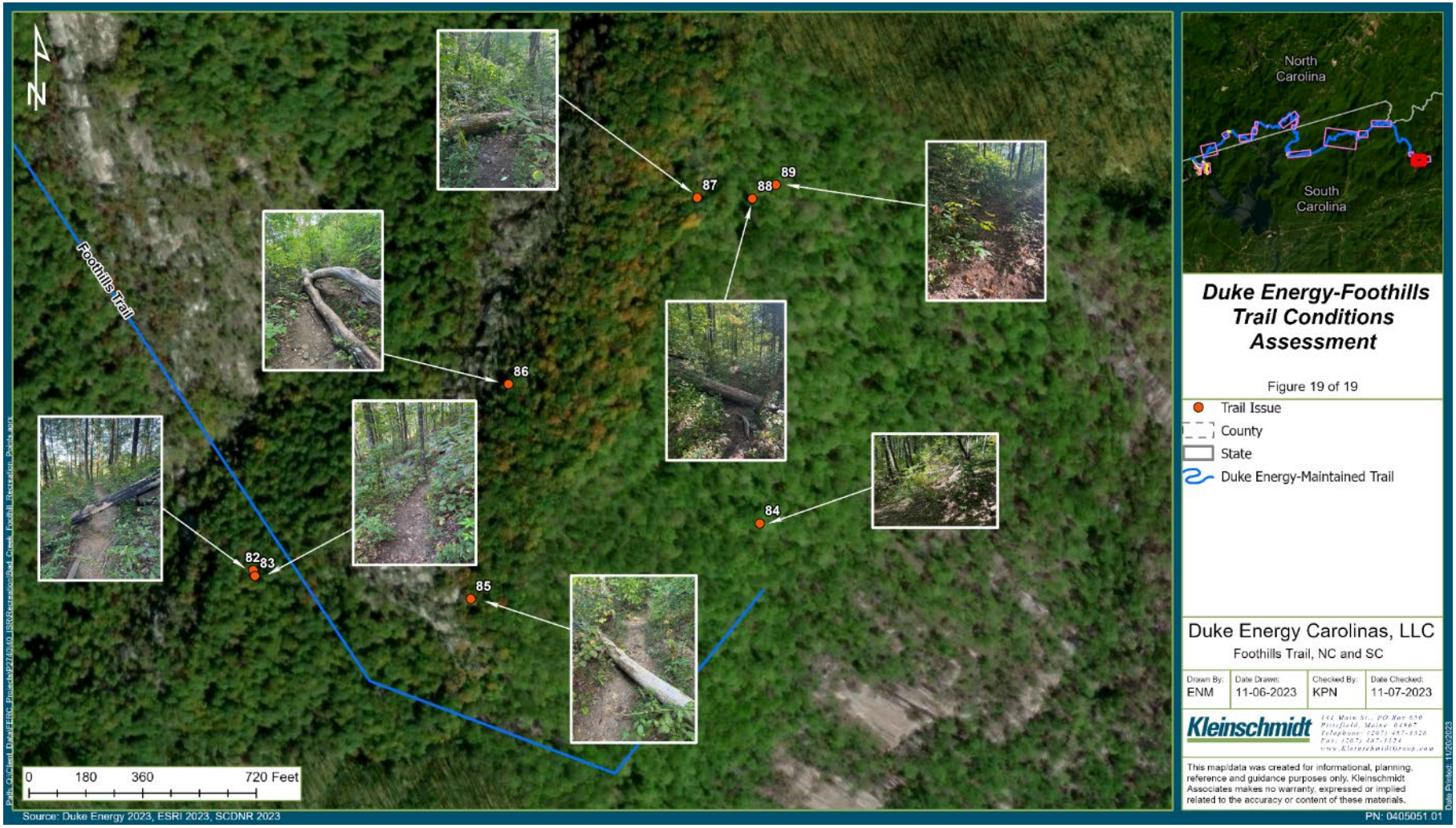


**Figure 4-20 Foothills Trail Conditions Assessment – Figure 19 of 19**



# 5.0 SUMMARY

During the trail Conditions Assessment, Long Cane Trails identified 89 issues within the study area primarily related to trail maintenance and safety. Specifically, 77 issues were identified on the Foothills Trail, seven on the Bad Creek Access Spur, four on Coon Branch, and three on the Lower Whitewater Falls Spur. Issues identified include culvert cleaning, erosion control, steps replacement, signage improvement, bridge maintenance, fallen tree removal, and trail washout repair. Table 5-1 describes the key findings identified by Long Cane Trails for the Foothills Trail and spur trails. The information presented in this Trail Conditions Assessment will be considered by Duke Energy when developing Protection, Mitigation and Enhancement (PME) measures.

**Table 5-1 Key Findings of Foothills Trail Conditions Assessment**

| Trail | Mile | Key Findings |
|---|---|---|
| Bad Creek Access Spur | 0.1-0.7 | • Culvert Maintenance: A culvert with a clogged drain spanning 80 feet requires cleaning to allow proper water flow.<br>• Wet Areas: Low areas on the trail with standing water need gravel addition to raise and level the path, covering 60 feet and 30 feet sections.<br>• Erosion Control: Removal of barricades placed on the side of the trail to address water retention issues.<br>• Steps Replacement: Several steps need replacement due to rot.<br>• Interpretive Signage: Approximately 100 feet of trail has been rerouted, and new blazes are needed to guide hikers. |
| Coon Branch Spur | 0.2 | • Bridge Maintenance: Railing and decking replacement for a bridge, involving handrails and decking boards.<br>• Railing Replacement: Two handrails need replacement. |
| Coon Branch Spur | 0.4 | • Bog Bridge Installation: Installation of a bog bridge measuring 4 feet x 2 feet.<br>• Drain Clearing: Major drain unclogging is required to prevent overflow onto the trail. |
| Foothills Trail | 31.6-72.8 | • Erosion Control: Multiple sections of the Foothills Trail require erosion control measures such as grade reversals, knicks, or drainage improvements.<br>• Steps Replacement: Various steps along the trail need replacement or repair due to damage.<br>• Fallen Trees: Several fallen trees across the trail need removal.<br>• Bog Bridges: Installation of new bog bridges.<br>• Signage: Adding new trail blazes and interpretive signage.<br>• Brush Removal: Clearing overgrown sections of the trail.<br>• Washout Repair: Addressing trail washouts and water diversion.<br>• New Trail Sections: Creating new trail segments to address erosion and trail conditions. |

# 6.0 CONSULTATION RECORD

This report was provided in draft form to the Recreation Resources Committee for review and comment on [date]. Comments were accepted on the draft report through [date]. Consultation is included in Appendix B. Comments were provided by the following entities:

- Commenter – date
- Commenter – date
- Commenter – date

# 7.0 REFERENCES

Felton, V. 2004. Trail Solutions: IMBA's Guide to Building Sweet Singletrack (IMBA (International Mountain Bicycling Association), Ed.). International Mountain Bicycling Association.

Foothills Trail Conservancy, Inc. 2018. Foothills Trail Guidebook: A Comprehensive Guide. Revised Seventh Edition. January 1, 2018.

# APPENDIX A

# ASSESSMENT FORM

# Foothills Trail Assessment

## Bad Creek Access Spur, 12, Bridge ▸ Bridge, 30' L x 5' W x 2' H


**CREATED**

6/17/2023, 12:33:52 PM UTC
by Todd Branham

**UPDATED**

6/19/2023, 4:20:41 PM UTC
by Todd Branham

**STATUS**

Needs Repair

**LOCATION**

35.224860, -82.729978

| | |
|---|---|
| **Date** | June 17, 2023 |
| **Trail Name** | Bad Creek Access Spur |
| **Assessment's Name** | |
| **Mile Marker** | 12 |
| **Assessment Type** | Bridge ▸ Bridge |
| **Measurements** | 30' L x 5' W x 2' H |
| **Description / Details / Comments** | Wooden Bridge with handrails on both sides.<br>Needs new bridge - old one completely gone |

**Photos**

| | |
|---|---|
| **Videos** | |
| **Attachments** | |

# APPENDIX B

# CONSULTATION DOCUMENTATION

# Attachment 3

## Whitewater River Cove Existing Recreational Use Evaluation

## Final Report

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# Whitewater River Cove Existing Recreational Use Evaluation

Bad Creek Pumped Storage Project

FERC No. 2740

Prepared for:

**Duke Energy Carolinas, LLC**

Prepared by:

**Kleinschmidt Associates**

December 2023

Kleinschmidt

## TABLE OF CONTENTS



## LIST OF TABLES



## LIST OF FIGURES

# 1.0 INTRODUCTION

On February 23, 2022, Duke Energy Carolinas, LLC (Duke Energy) submitted the Bad Creek Pumped Storage Project (Bad Creek Project or Project; FERC No. 2740) Notice of Intent to Relicense and Pre-Application Document (PAD) to the Federal Energy Regulatory Commission (FERC or Commission). The PAD included an alternative licensing proposal for installation of additional energy storage and generation capacity by constructing a new 1,400-megawatt power complex (Bad Creek II Complex) adjacent to the existing Bad Creek Powerhouse to meet the growing need for energy storage and renewable energy production across Duke Energy's service territories. Duke Energy plans to make a final decision regarding the alternative licensing proposal for the construction of the Bad Creek II Complex prior to the submittal of a Final License Application for the Bad Creek Project.

In Section 7.1.6.3 of the PAD, Duke Energy proposed to conduct a Recreational Resources Study in support of the proposed the Bad Creek II Complex. No study requests related to recreational resources were received during the scoping process; however, formal comments on the PAD and Scoping Document 1 regarding recreational resources were received from Upstate Forever and the Foothills Trail Conservancy. Comment responses were included in Appendix A of the Proposed Study Plan, which was filed with the Commission on August 5, 2022. Stakeholder comments on the Proposed Study Plan were submitted by the Commission, South Carolina Department of Natural Resources (SCDNR), Upstate Forever, and the Foothills Trail Conservancy. Resource issues and stakeholder comments pertinent to the Recreational Resources Study were considered in the development of the Revised Study Plan, which was filed with the Commission on December 5, 2022. Summaries of comments and responses were included in Appendix A and copies of all comments and correspondence were provided in Appendix B of the Revised Study Plan. Specific to this Whitewater River Cove Existing Recreational Use Evaluation, Duke Energy adopted SCDNR's request to double the number of survey days from 10 days to 20 days. The Commission issued its Study Plan Determination on January 4, 2023, and approved the Recreational Resources Study with modifications.

The Recreational Resources Study consists of four main study tasks: (1) a Recreation Use and Needs (RUN) Study for the 43-mile-long portion of the Foothills Trail (or trail) managed by Duke Energy; (2) a Foothills Trail Corridor Conditions Assessment (Conditions Assessment) of the 43-mile-long portion of the Foothills Trail managed by Duke Energy; (3) an Existing Recreational Use Characterization of Whitewater River cove; and (4) a Recreational Public Safety Evaluation of Whitewater River cove.

This Whitewater River Cove Existing Recreational Use Evaluation characterizes the existing recreational use of Whitewater River cove and informs Duke Energy on the level of boating use disruption that could occur in the cove during the Bad Creek II Complex construction. Results of this evaluation will also be used during the Recreational Public Safety Evaluation of Whitewater River cove (task component 4 of the Recreation Resources Study).

## 1.1 Current Operation

The Bad Creek Project began operation in 1991 after roughly ten years of construction. Located in Oconee County, South Carolina, approximately eight miles north of Salem, South Carolina, the Bad Creek Reservoir was formed when Bad Creek and West Bad Creek were dammed and serves as the Bad Creek Project's upper reservoir. Lake Jocassee serves as the Bad Creek Project's lower reservoir and is licensed as part of Duke Energy's Keowee-Toxaway Hydroelectric Project (KT Project; FERC No. 2503). The structures and features of the Bad Creek Project include the upper reservoir and dams, inlet/outlet structures in the upper and lower reservoirs, a water conveyance system, an underground powerhouse, tailrace tunnels, transmission facilities, and an approximately 9.25-mile-long transmission line corridor extending from the Bad Creek Project to the KT Project's Jocassee switchyard. The entirety of the Bad Creek Powerhouse is built within a large cavern inside a mountain. Similar to other hydroelectric stations, the engineering design of the Bad Creek Project involves the flow of water to produce electricity; however, the roughly 1,200-foot vertical distance between the upper and lower reservoirs makes the Bad Creek Project well-suited to take advantage of gravity to produce larger quantities of electricity for a given flow rate.

The 30-year-old Bad Creek Project is one of the most powerful and flexible energy generation and storage assets in Duke Energy's system. Built primarily to store surplus energy from baseload nuclear and fossil-fuel-driven power plants during times of low energy demand, today the Bad Creek Project is used to balance an increasingly complex energy grid. By pumping water from Lake Jocassee up to the Bad Creek Reservoir, the Bad Creek Project is able to provide storage of surplus baseload energy during low demand periods. While the Bad Creek Project is in turbine operation mode, water flows from the upper reservoir down to Lake Jocassee, providing power back to the grid when energy demand is higher or when renewable generation is unavailable.

## 1.2 Proposed Action

The demand for energy and energy storage has been steadily on the rise in the southeastern region of the country. In an effort to meet this growing demand, Duke Energy is proposing an expansion to the Bad Creek Project that will double the generating capacity of the station. The proposed Bad Creek II Complex would utilize the existing upper and lower reservoirs and consist of a new inlet/outlet within the existing upper reservoir, water conveyance system, and underground powerhouse. Additionally, a new inlet/outlet along the shoreline of the Whitewater River arm of Lake Jocassee would be constructed.

The Bad Creek II Complex underground powerhouse would be arranged and sized similarly to the existing Bad Creek Project powerhouse. In general, most of the features for the Bad Creek II Complex would be submerged, underground, and/or within lands classified as "project operations," which are not accessible to the general public. The location of the proposed lower reservoir inlet/outlet structure has been chosen to minimize construction-related environmental impacts to the Whitewater River arm of Lake Jocassee. Nevertheless, the Whitewater River cove of Lake Jocassee is anticipated to be closed to the public for approximately five to seven years during construction of the Bad Creek II Complex. Duke Energy will develop more specific schedules and plans for closures as construction plans for the Bad Creek II Complex advance and in consultation with stakeholders.

# 2.0 DESCRIPTION OF STUDY AREA

The geographic scope (i.e., study area) of the Whitewater River Cove Recreation Evaluation includes the Whitewater River cove of Lake Jocassee from 35.00.00.40N, 82.59.29.29W to 35.00.04.69N, 82.59.15.57W as shown on Figure 2-1[1].

[1] The project boundary depicted in Figure 2-1 shows the proposed expanded project boundary.

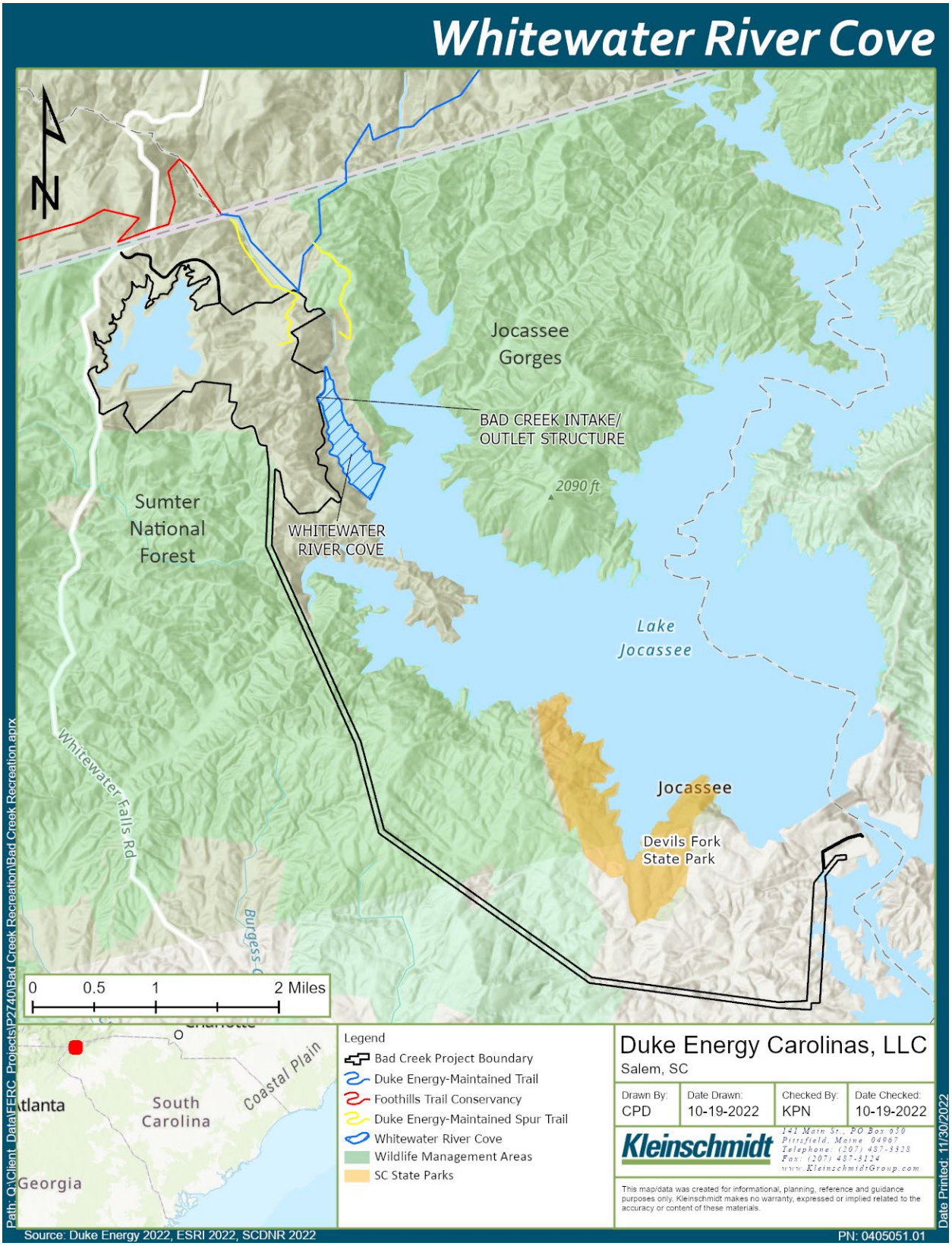


**Figure 2-1 Whitewater River Cove Study Area**

# 3.0 METHODOLOGY

Two objectives for accomplishing study goals were identified as part of the Recreational Resources Study Plan. The methods for accomplishing these objectives are outlined below.

**Objective 1: Establish baseline recreational use within the study area, specifically the level of boating use in Whitewater River cove.**

Duke Energy deployed a drone over the Whitewater River cove of Lake Jocassee to capture aerial images of recreation use to determine the number, type, and location of boats within the study area. Drone flights occurred on 20 individual days scheduled between Memorial Day weekend and Labor Day weekend to evaluate use. Drone flights were conducted on a mix of weekdays, weekends, and holidays and imagery was collected every hour generally between 9:00 AM and 4:00 PM, as weather allowed. Boats within the Whitewater River cove were categorized by the following boat types:

- motorboat
- non-motorized boat (such as canoe or kayak)
- personal watercraft (such as Jet-Ski)
- paddleboard[2]

Aerial imagery was analyzed to estimate the total number of boats present each day, the estimated number of boat types captured each day, and an approximate duration of time the boats spent in Whitewater River cove. In addition, the study area was divided into five distinct zones to further classify the location of boats within Whitewater River cove.

**Objective 2: Quantify recreational impacts of temporary closures of Whitewater River cove during construction related to the Proposed Action**

Data were extrapolated to draw conclusions related to the rate and patterns of recreational use in Whitewater River cove of Lake Jocassee. This comprehensive overview of boating use will be used to quantify the impacts of temporary closures in Whitewater River cove related to the Proposed Action.

[2] No paddleboards were observed during the study.

For the purposes of this evaluation, estimates for nighttime and off-season use determined by the 2012 Keowee-Toxaway RUN Study were applied (Duke Energy 2013). Therefore, it was assumed that nighttime use in the cove was 3 percent of daytime use and off-season use was 3 percent of peak season use. Estimates for nighttime and off-season use were combined with estimates for peak season daytime use to determine an estimate of total use in the Whitewater River Cove for 2023. Data were then escalated based on population projections for 2030 in Oconee County, South Carolina (SCRFA 2019; US Census 2022).

# 4.0 RESULTS

## 4.1 Objective 1

Table 4-1 provides the dates on which the 20 drone flights occurred and the daily high temperature in degrees Fahrenheit (°F) as reported by the Greenville Spartanburg International Airport Station (WU 2023). As noted below, three flights ended early due to weather conditions (July 14, July 15, and August 27). Table 4-2 provides the total number of boats captured in aerial images and total number of each boat type for each survey date.

**Table 4-1 Drone Survey Data**

| Flight/Survey Date | Daily High Temperature (°F) | Notes |
|---|---|---|
| Sunday, May 28, 2023 | 63 | |
| Wednesday, May 31, 2023 | 75 | |
| Friday, June 2, 2023 | 86 | |
| Saturday, June 3, 2023 | 88 | |
| Tuesday, June 13, 2023 | 79 | |
| Saturday, June 24, 2023 | 82 | |
| Wednesday, June 28, 2023 | 89 | |
| Saturday, July 1, 2023 | 93 | |
| Tuesday, July 4, 2023 | 89 | |
| Friday, July 14, 2023 | 92 | Due to lightning, flights ended at 2:30 pm |
| Saturday, July 15, 2023 | 95 | Due to storms, flights ended at 3:00 pm |
| Thursday, July 20, 2023 | 82 | |
| Saturday, July 29, 2023 | 90 | |
| Monday, July 31, 2023 | 89 | |
| Sunday, August 6, 2023 | 92 | |
| Monday, August 7, 2023 | 92 | |
| Wednesday, August 23, 2023 | 86 | |
| Sunday, August 27, 2023 | 94 | Due to weather, flights ended at 2:30 pm |
| Sunday, September 3, 2023 | 87 | |
| Monday, September 4, 2023 | 91 | |

**Table 4-2 Total Number of Boats and Boat Types per Flight**

| Flight/Survey Date | Day Type | Total # of Boats | Total # of Each Boat Type | | | |
|---|---|---|---|---|---|---|
| | | | Kayak | Personal Watercraft | Canoe | Motorboat |
| Sunday, May 28, 2023 | Holiday | 4 | 0 | 2 | 0 | 2 |
| Wednesday, May 31, 2023 | Weekday | 4 | 0 | 0 | 0 | 4 |
| Friday, June 2, 2023 | Weekday | 8 | 4 | 1 | 0 | 3 |
| Saturday, June 3, 2023 | Weekend | 25 | 7 | 0 | 1 | 17 |
| Tuesday, June 13, 2023 | Weekday | 13 | 3 | 0 | 0 | 10 |
| Saturday, June 24, 2023 | Weekend | 34 | 2 | 1 | 0 | 31 |
| Wednesday, June 28, 2023 | Weekday | 20 | 0 | 0 | 1 | 19 |
| Saturday, July 1, 2023 | Weekend | 38 | 2 | 3 | 0 | 33 |
| Tuesday, July 4, 2023 | Holiday | 35 | 1 | 1 | 0 | 33 |
| Friday, July 14, 2023 | Weekday | 15 | 0 | 3 | 0 | 12 |
| Saturday, July 15, 2023 | Weekend | 47 | 0 | 10 | 0 | 37 |
| Thursday, July 20, 2023 | Weekday | 12 | 4 | 0 | 0 | 8 |
| Saturday, July 29, 2023 | Weekend | 41 | 0 | 1 | 1 | 39 |
| Monday, July 31, 2023 | Weekday | 21 | 1 | 0 | 0 | 20 |
| Sunday, August 6, 2023 | Weekend | 14 | 3 | 6 | 0 | 5 |
| Monday, August 7, 2023 | Weekday | 1 | 0 | 0 | 0 | 1 |
| Wednesday, August 23, 2023 | Weekday | 8 | 0 | 1 | 0 | 7 |
| Sunday, August 27, 2023 | Weekend | 22 | 0 | 1 | 0 | 21 |
| Sunday, September 3, 2023 | Holiday | 48 | 0 | 13 | 0 | 35 |
| Monday, September 4, 2023 | Holiday | 30 | 2 | 0 | 0 | 28 |
| **Total** | | **440** | **29** | **43** | **3** | **365** |

During the study period, the majority of boats in Whitewater River cove were motorboats (83 percent), followed by personal watercraft (10 percent), kayaks (7 percent), and canoes (less than 1 percent). The highest use occurred on weekends and holidays, where an average of 32 boats entered the cove per weekend day, and an average of 29 boats entered the cove per holiday day. The highest use occurred in the month of July, where an average of 30 boats entered the cove per day.

Aerial imagery was analyzed to estimate the duration of time boats were in Whitewater River cove by documenting the first time a particular boat appeared in the cove and the last time the same boat was observed in the cove. Approximately 90 percent of boats spent less than one hour in the cove, approximately 9 percent spent between one and two hours in the cove, and approximately 1 percent spent more than two hours in the cove. The cove is known to be a sightseeing attraction due to the waterfalls located at the mouth of the Whitewater River. Data suggest that a majority of visitors spent a minimal amount of time in the cove, likely boating to the waterfall and then leaving shortly thereafter. It can be assumed that boaters who spent more than 1 hour in the cove were likely there for other activities, such as fishing.

To further classify the location of boats within the Whitewater River cove, the study area was divided into five distinct zones (Zone 1, 2, 3, 4, and 5) (Figure 4-1). The majority of boats captured in aerial imagery were located in Zone 5 (49 percent), followed by Zone 3 (20 percent), Zone 4 (17 percent), Zone 1 (9 percent), and Zone 2 (5 percent). The location of each boat captured in aerial imagery was tracked during the survey day and plotted within the cove (Figure 4-2). Aerial images showed that most boats followed the eastern shoreline of the cove and traveled to the mouth of the Whitewater River, in the vicinity of the waterfall.

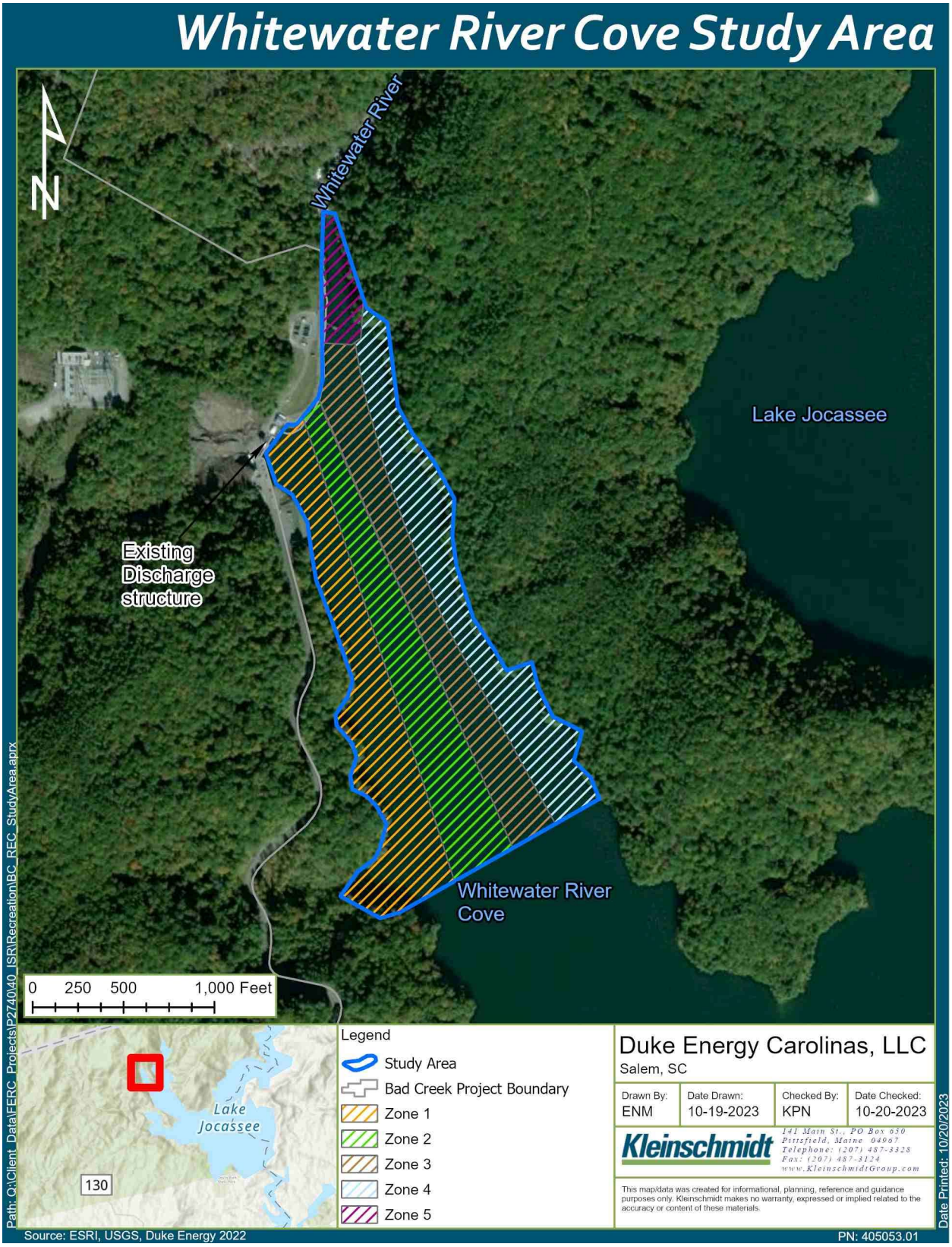


**Figure 4-1 Whitewater River Cove Zones**

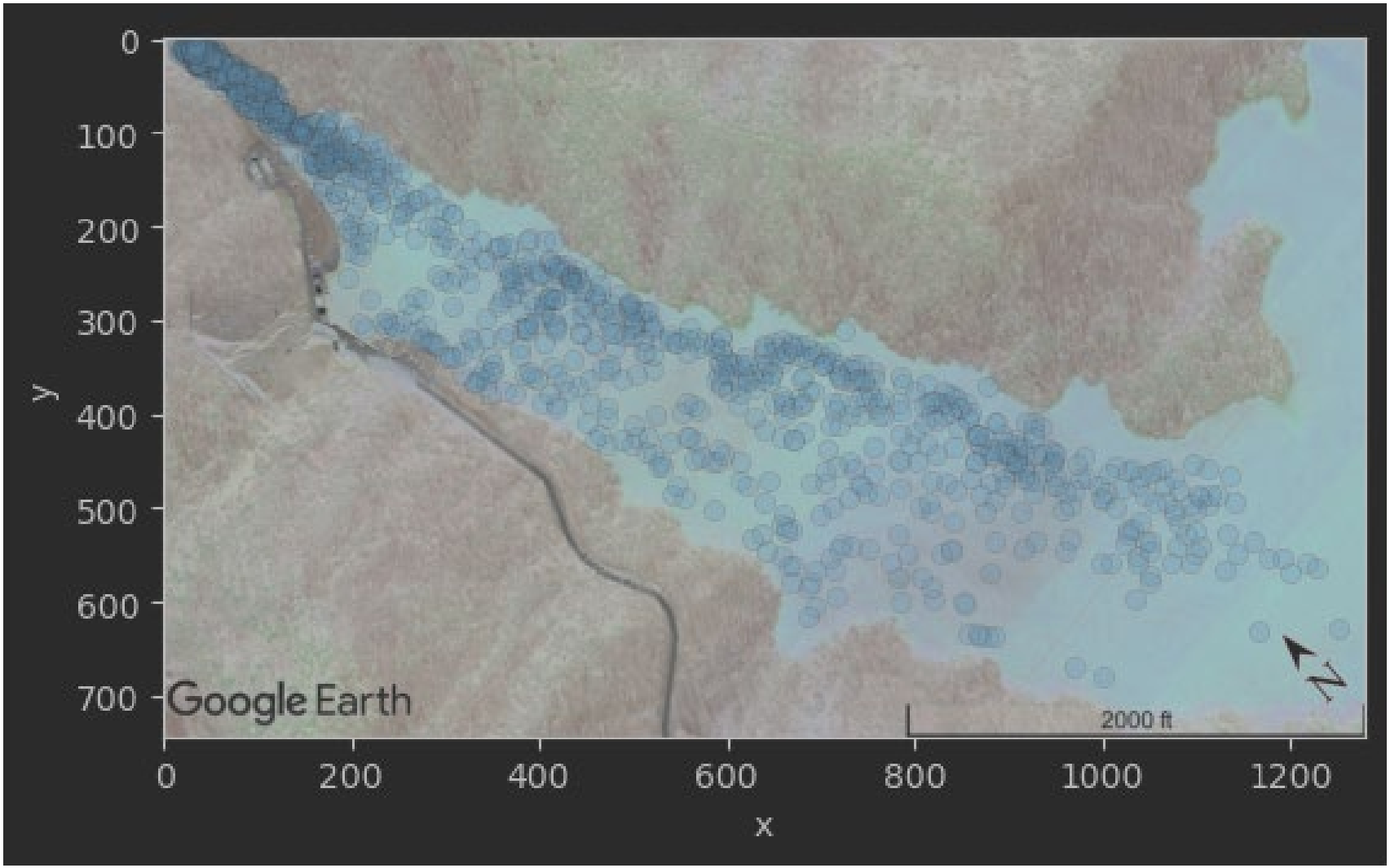


**Figure 4-2 Boating Use within Whitewater River Cove**

## 4.2 Objective 2

Year-round use in the Whitewater River cove was estimated by extrapolating data collected during the 20 survey days in the peak recreation season. Average use per day during the survey months was extrapolated to determine total estimated use for the entire survey period. Approximately 3,647 boats are estimated to have entered the Whitewater River cove between April and October 2023. Assuming off-season use is 3 percent of peak season use, it is estimated that 3,756 boats will enter the Whitewater River cove during 2023.

During construction of the Bad Creek II Complex, the Whitewater River cove would be closed to public use for an estimated five to seven years. Based on population projects in Oconee County (SCRFA 2019; US Census 2022), if construction were to begin in 2030, closure of the cove could displace between approximately 19,895 and 27,852 boats during the construction period. It can be assumed that most of these boats would be motorboats and most displaced visitors would be sightseers.

# 5.0 SUMMARY

The Whitewater River Cove Existing Recreational Use Evaluation found that the Whitewater River cove is primarily visited by recreators in motorboats. While the entire cove is used by boaters, boats tend to follow the eastern shoreline of the cove and congregate in the north end near the waterfall. It is assumed that most visitors to the cove are there to view the waterfall, although fishermen are also common visitors.

Projected annual use in 2030 at Lake Jocassee is estimated to be 343,266 recreation days[3] (Duke Energy 2013). Based on the results of the drone surveys, it is estimated that between 19,895 and 27,852 boats could be displaced from visiting the Whitewater River cove during the Bad Creek II Complex construction period, or nearly 4,000 boats per year. Each year during construction, between 1-2 percent of recreation days could be lost at Lake Jocassee due to closure of the Whitewater River cove.

[3] FERC defines a recreation day as a visit by a person to a project development for recreational purposes during any portion of a 24-hour period.

# 6.0 REFERENCES


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US Census Bureau. 2022. QuickFacts. Population Estimates Oconee County, South Carolina. Online: U.S. Census Bureau QuickFacts: Oconee County, South Carolina. Accessed November 2023.

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# Attachment 4

## Whitewater River Cove Public Recreational Safety Evaluation

*[Report to be submitted with USR]*

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# Attachment 5

Consultation Documentation

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# Meeting Summary

| | |
|---|---|
| Project: | Bad Creek Pumped Storage Project Relicensing |
| Subject: | Bad Creek Recreation Resource Committee Meeting |
| Date: | Tuesday, March 28, 2023 |
| Location: | Wenwood Operations Center, Greenville, SC |

### Attendees

Sue Williams, Advocates for Quality Development
Fletcher Meadema, Applied Trails Research
Jeremy Wimpey, Applied Trails Research
Jennifer Bennett, Duke Energy
Paul Keener, Duke Energy
Alan Stuart, Duke Energy
Andrew Gleason, Foothills Trail Conservancy
Dale Wilde, Friends of Lake Keowee Society
Jen Huff, HDR
Nicole Haibach, Kleinschmidt Associates
Kelly Kirven, Kleinschmidt Associates
Todd Branham, Long Cane Trails
Amy Chastain, SCDNR
Elizabeth Miller, SCDNR
Lynn Quattro, SCDNR
Rowdy Harris, SCDPRT
Andy Douglas, SC Wildlife Federation
Chris Starker, Upstate Forever

## Introduction

Kelly Kirven opened the meeting and announced it would be recorded on Teams. She reviewed the agenda for the meeting and discussed safety. Attendees introduced themselves.

K. Kirven reviewed the Federal Energy Regulatory Commission (FERC) Study Plan Determination. FERC accepted all the study plans filed by Duke Energy, but modified the Recreation Study plan as follows:

- Added a traffic counter at the Laurel Valley Trail Access.
- Changed the Recreation Site Inventory Form to include the number and height of bear cables and latrines.

In addition to the changes, K. Kirven clarified the following:

- FERC recommended Duke Energy modify the study plan to include additional counties during the future recreation use analysis. As stated in the study plan, Duke Energy will include Oconee and Pickens counties, SC and Jackson and Transylvania counties, NC and other counties in SC, NC, and GA that are reported on the recreation user surveys. Since recreation user surveys have not been completed yet, Duke Energy is unable to list what counties will be reported at this time.
- The Foothills Trail Corridor Conditions Assessment will encompass the 43 miles of trail and associated spur trails maintained by Duke Energy which includes 14.8 mi of logging/access roads and 28.2 miles of singletrack trail segments.
- Duke Energy will prepare detailed figures of the trail including labels for spur trails.

- There will be two traffic counters at the Bad Creek Parking Access and Bad Creek Road. One will record employees accessing the facility parking lot so a true count of visitors accessing the parking area can be determined.
- FERC requested additional information about the trail carrying capacity methodology. Today's meeting will include a discussion about the methodology.

## Foothills Trail Corridor Conditions Assessment

Todd Branham with Long Cane Trails introduced himself as the person leading the Foothills Trail Corridor Conditions Assessment effort.

The evaluation will include the 43 miles of trail and associated spur trails maintained by Duke Energy. He will use the Foothills Trail Guidebook (Guide) as a reference for defining trail segments. He will be looking primarily for water damage caused by improper drains, berms that impede drainage, and erosion. Ideally, the trail surface should have a 3-5% outslope such that water flows across the trail. Each issue area will be documented on a Trail Assessment form. Locations will be identified and logged using a GPS system.

Branham stated the trail is typically only two feet wide which helps limit erosion. He will log issues on paper forms as he encounters them. He will also document the findings with photographs. The data captured on the forms will be transferred to a spreadsheet and aggregated for analysis by segment.

Andrew Gleason stated the FarOut app aligns well with the Guidebook; the app works offline.

Elizabeth Miller asked if Branham will note the condition of bridges. Branham stated he will discuss bridges later in the presentation. Jennifer Bennett stated Duke Energy inspects bridges for structural and safety issues every five years. The most recent inspection reports will be attached to the Recreation study report. Those inspections also capture issues like washouts at bridges.

Chris Starker asked if campsites along the trail will be documented. Bennett stated formal campsites will be evaluated as part of the Recreation Use and Needs (RUN) facility assessments, but informal campsites could be documented as part of the Foothills Trail conditions assessment. Gleason stated the Guide includes campsites on the inside back cover. Bennett stated the Recreation RC needs to decide if the study should assess the condition of those listed in the Guide. Starker asked if there are campsites that aren't listed in the Guide. Gleason confirmed there are many dispersed campsites. In an effort to reduce dispersed camping and the impact of it, the Foothills Trail Conservancy (FTC) named some campsites and listed them in the Guide. Alan Stuart asked if the campsites were established on Duke Energy land without Duke Energy approval. Gleason responded those efforts were conducted under previous FTC leadership, but he thinks Allan Boggs might have been involved on the Duke Energy side.

Bennett stated Branham should document the condition and locations of campsites including those listed and not listed in the Guide. This will also be useful to determine if they are located within Duke Energy's easement. Branham stated the Guide list likely helps reduce the number of campsites which is a benefit.

Stuart asked if there will be another survey form for campsites. Branham confirmed he will need to find or develop a form for that. He has spent a long time finding forms that aren't too bulky for fieldwork given he will be hiking in and out daily.

Branham reviewed how the survey will be conducted. He will complete the form, GPS the location, take photos of issues, measure culverts, use a clinometer to determine grades, and record additional comments when/where needed.

Miller asked how culverts are going to be evaluated to help assess aquatic habitat issues. Branham responded his assessment will identify if water goes through or around the culvert, if it was installed correctly, if it's sized for high flow events (i.e., a 400-yr flood). Bennett stated if culverts are identified as being too small, Duke Energy can have engineers evaluate them. Miller requested all stream crossings be documented with photos (upstream and downstream) and then confirm they meet Southeastern Aquatics Resources Partnership (SARP) guidelines for unimpeded passage. Gleason stated there are very few culverts. Branham stated he will document the condition of metal culverts for rust; old ones may need to be replaced. Jeremy Wimpey noted many trail managers are moving to use of plastic double-walled bottomless culverts (arch) which allow for aquatic organism movement.

Dale Wilde asked when the last 5-year inspection occurred. Bennett said it was done in 2021, but it was specific to bridges and didn't evaluate culverts. Amy Chastain said there has been a lot of work on culverts in the Jocassee Gorges. Lynn Quattro stated that so long as the location of culverts is documented, SCDNR can assess the crossing for effects on aquatic species.

Branham stated he's looking forward to being on the trail. He said he will flag identified issues as urgent, high, moderate, or low priority with urgent issues being those that are safety-related. He uses the Tipping Point principle to identify areas that should be repaired before they fail or require new trail segments. Wilde asked if the assessments will be done after storms. Branham stated he hopes to do assessment during rainfall events or at least when it's wet since that is the best time to identify issues.

Stuart noted there are varying levels of recreational knowledge among team members. He asked how study findings will be presented given those differences. Branham stated the study report will document trail design and survey basics in addition to the data. Bennett stated the conditions assessment findings will be summarized in the Recreation Study report, but the entire assessment will be an appendix to the study report.

Kirven stated the trail map has been modified to only show blue lines for the Duke Energy-maintained main trail and yellow lines for spur trails. The remaining portion of the Foothills Trail that is not maintained by Duke Energy was removed from the map for clarity.

Stuart asked when the conditions assessment fieldwork will begin. Branham replied it will begin soon once the forms are finalized. It should not take long to complete once the effort begins. Wilde asked if he will through hike. Branham replied it will be done in sections. Bennett stated there are partner organizations who will be helping with access. Branham stated he has previously hiked approximately 80% of the trail, so understands the challenges. Wilde asked if he will be hiking alone. Branham replied there will probably be a team of three, partly due to safety. He will also use a SPOT, wear snake pants, and take other safety precautions.

## Recreation Use and Needs (RUN) Methodology

Kirven reviewed the locations of traffic (vehicle) and trail counters. She noted traffic counters are being used at areas with parking. Bad Creek Hydro includes two counters; the one at the employee parking lot will be used to distinguish between employees and visitors. She noted Musterground Road just reopened for the season. A counter was added at the Upper Whitewater Falls trail access to evaluate if that lot can accommodate additional use that may be displaced if the Bad Creek Hydro access is closed for Bad Creek II construction. She shared the location of trail counters and noted there are two at Sassafras Mountain because of the loop trail and its connection with the Foothills Trail.

User surveys have begun and are being conducted in 4-hour shifts on 30 days at four locations. Some of the survey locations are boat-in only (no parking areas). QR codes have been posted at all trail access sites and visitors have reported using those codes to participate in the survey. Miller asked why there aren't QR codes at Musterground Road or the Upper Whitewater Falls access point. Kirven replied that Musterground Road visitors are driving by so there's not a good place to post the QR code. Nicole Haibach stated the QR code is posted at the Bad Creek Hydro kiosk, near the Musterground Road entrance. Kirven explained the Upper Whitewater Falls site has a traffic counter to evaluate its capacity for additional visitors if the Bad Creek access point is closed. Wilde asked if the assumption is that hikers won't access the Foothills Trail from there. Kirven stated that's not the case, but neither the access point nor that portion of the Foothills Trail is maintained by Duke Energy, so its condition is not being evaluated.

Miller asked if the form accessed by the QR code allows users to note they are using Musterground Road and Kirven responded no. Miller asked if "Other" can be added to Question 7 to account for people accessing Musterground Road to hunt. Kirven agreed that can be done, but noted the form has been live for a while so it's possible some data might be missing for a couple of weeks. Kirven noted there is a QR code at the Lower Whitewater Falls overlook.

Stuart asked what happens if a respondent states a question is not applicable. Kirven says the survey clerk will leave that section blank.

Gleason said he has seen the traffic and trail counters and they look good. Haibach noted users with mobile coverage can save the QR code and access it when back online. Gleason stated putting trail counters on bridges is good idea since it forces hikers to walk single file. Wilde asked where the counter data is stored. Haibach replied it is stored on the device and downloaded every two weeks. Kirven added that downloading the data every two weeks minimizes data loss if the counter is stolen or tampered with. She hopes trail users will tamper with the trail counters less often than is typical for counters at boat ramps.

Kirven reviewed figures with trail and traffic counters and noted GPS points for each counter have been recorded. Wilde asked if the Project Boundary shown on the figures is correct and Stuart confirmed it is. Kirven noted most of the Foothills Trail is not in the Project Boundary.

Gleason asked where the trail counter is at Table Rock State Park. Haibach replied it is near the beginning of the trail, so it will have a high number of users who are not accessing the Foothills Trail. Gleason offered to drive her to the start of the Foothills Trail at the park to install a trail counter. Bennett said retrieving those data would be a challenge and Gleason agreed. The RC agreed installing the counter at the start of the Foothills Trail and retrieving the data only mid-season and at the end of

the season could be informative. Gleason and Haibach will coordinate installation with a tentative installation date of April 20.

Haibach stated they are not usually doing back-to-back survey days. Kirven noted the team uses a 3-person crew with 30 survey days; 2 people survey visitors during 4-hr shifts with the 3rd person downloading counter data. They are surveying on a mix of weekends and weekdays.

Kirven asked for additional questions regarding methodology, but there were no questions.

## Foothills Trail Carrying Capacity

Jeremy Wimpey introduced himself and Fletcher Meadema as the leads for the Foothills Trail carrying capacity effort.

Wimpey provided background on the carrying capacity methodology which has been developed based on US Forest Service (USFS) and National Park Service (NPS) methodologies. He discussed the Interagency Visitor Use Management Council (IVUMC) and its Visitor Use Management framework. It has four steps:

- Step 1: Build the foundation by reviewing available information and background information.
- Step 2: Define the Visitor Use Management direction. In the case of federal land managers, this would be defined by regulation, but in this situation he will look to Duke Energy for direction.
- Step 3: Identify management strategies. These can include indirect tools like visitor education as well as direct tools like enforcement efforts. Indirect tools are preferable.
- Step 4: Implement, monitor, evaluate, and adjust strategies. This step is reactive to some extent and dependent upon ongoing monitoring.

Carrying capacity is one component of Visitor Use Management. It establishes how much and what types of visitor use can be provided while still delivering the desired visitor experiences. Wimpey stated land managers can't manage just for numbers and strategies should be broader. Carrying capacity has traditionally been based solely on quotas. For example, parking lot spaces and shelter spots can be used to define the carrying capacity. For this effort, he will use the trail conditions assessment and RUN study results like crowding perceptions to understand visitor experiences and desired visitor experiences. He noted hikers often want access to another resource (like water in the case of anglers) or a specific experience like solitude. He will also evaluate where a numeric carrying capacity is appropriate. There might be different zones of the trail where users are seeking different types of experiences. Depending upon these experiences, some zones may support additional or different uses than other zones.

Existing conditions will be compared with historic conditions to discern trends in use over time. For example, the NPS saw big increase park visitation during COVID, but in 2022 many units report visitation levels have returned to 2018 levels. Trail user group trends need to be considered since different tools work well with different user groups. This evaluation will inform messaging and management strategies. For example, trail runner management strategies are different from strategies directed to backpackers.

Carrying capacity is dynamic and changes over time. Without on-going monitoring, Visitor Use Management efforts will fail. Wimpey shared lessons learned from the Pacific Coast Trail (PCT) which uses a permitting (i.e., quota) system. That system is challenged due to the effects of heavy snowpack

and fire closures causing hikers to condense their hiking periods. Resource managers should monitor use to ensure there are not unintended side effects associated with management strategies.

Wilde asked who manages PCT use. Wimpey stated the USFS manages the permit system for PCT while the NPS manages the Appalachian Trail (AT). The PCT uses a lottery system. Wilde asked who enforces the permit requirement. Wimpey replied there are ridge runners on the AT and crest runners on the PCT, but they function mainly to help educate hikers. Wilde asked if he envisions limiting the number of Foothills Trail hikers. Wimpey stated he does not but his discussion was intended to provide an example of some consequences/challenges of a numerical carrying capacity. There are broader strategies to manage carrying capacity.

Kirven noted this methodology is different from most FERC carrying capacity studies which look at usage rates of parking lots, for example. That kind of data will still be captured as part of the RUN effort, but the Foothills Trail carrying capacity will include a broader approach. Wilde noted limited parking spaces don't necessarily stop visitors from using an area like what happens at Fall Creek Access Area. Bennett noted crowded trails don't necessarily stop hikers, but some hikers will go elsewhere. Kirven noted crowding may damage resources. Wilde stated there must be an enforcement effort to manage use. Bennett noted recreational use grows until it no longer provides the desired experience. Stuart stated this effort will distinguish between experience quality and numbers of users. Wilde stated parking space quotas at Fall Creek work only if there's someone there who enforces parking requirements.

Kirven noted RUN study data will document visitors parking outside spaces. Traditionally, FERC might direct a licensee to put in more parking if that is found. However, there might be another strategy for addressing the issue. The Foothills Trail is unique because portions of trail are outside the Project. On-going monitoring can inform Duke Energy if changes are needed. Wilde noted that, based on previous RUN studies, licensees don't design for peak usage times since that would leave facilities underutilized most of the time and Kirven agreed. Wimpey stated many facility providers design for the 75$^{th}$ percentile usage rate, but using a zone approach may allow for different visitor experiences. For example, hardening portions of a trail to provide accessibility but leaving other portions less improved to provide for more solitude might be appropriate. This study will help identify if different strategies would be useful for different zones. Technology including social media can help level set user experience. As an example, a PCT hiker traversed a fire closure area and posted it to social media. However, when the hiker was subsequently ticketed and had their PCT permit revoked, the social media post very quickly informed users of the consequences. Wilde noted enforcement issues at Duke Energy recreational facilities are a challenge because Duke Energy can't issue tickets.

## Whitewater River Cove Recreational Use

Bennett discussed the Whitewater River cove recreational use evaluation is intended to help quantify the potential effects of limiting use of the cove during the construction of Bad Creek II. The falls at the head of the cove attract recreational boaters and there is also angling in the cove.

Boating use will be captured in images collected by unmanned aerial vehicles (UAV), commonly referred to as drones, on twenty randomly selected days between Memorial Day and Labor Day. This will include weekends, weekdays, and holidays. Duke Energy will then use artificial intelligence (AI) technology to evaluate the images to identify the type of boating – personal watercraft, motorized boats, non-

motorized boats, and paddleboards. The study area extends just downstream of the area where the submerged weir would be expanded.

The current plan calls for three flights/day of fieldwork, but the drones can accommodate more flights. Bennett asked the RC for input on increasing the number of flights. Increasing the number of flights per day would not decrease the number of days with flights. Wilde asked how long each flight would take. Bennett doesn't know, but each flight will capture the entire cove.

Andy Douglas asked if there are webcams at the intake/outlet portal that could be used to support this effort. Bennett responded there are no public webcams but there might be security cameras. Douglas said video might help provide a more thorough understanding of what's going on. He then asked how long the cove would be blocked to boaters during construction of Bad Creek II. Bennett stated it would extend for the duration of the construction effort. Wilde asked if Duke Energy had considered using a "critter cam" to document use. Bennett replied Duke Energy evaluated using fixed cameras as well as counters when developing the study plan, but determined that would not be effective due to optic range limitations. Kirven noted this effort will provide a general characterization of the use of the area, not a count. That qualitative assessment is intended to support Duke Energy's efforts to develop mitigation measures for the effects.

Stuart stated this effort dovetails with CFD modeling of velocities. For example, if most boating use is kayaking and modeled velocities are high enough to affect paddling, Duke Energy will evaluate the potential effects and if some sort of protection measures are needed. Duke Energy also needs to know where boats are located within the cove and whether additional signs are needed in specific locations. The AI analysis will generate heat maps to show boating densities.

Douglas noted most boaters don't stay in the cove for long, but some anglers believe the inlet/outfall is where the big fish are. He doesn't think closing the cove during construction is going to be a significant impact. Gleason agreed and stated most boaters look at the falls and then leave.

Wilde asked why a counter is not being used. Bennett explained the range for counters is too small given the width of the cove. UAV images with AI is the best option for documenting use. Wilde is concerned there will be undercounting of use. Kirven noted spot counts have been used to document boating use for RUN studies for many years, the UAV flights are consistent with well-developed boating density study methodology, and the flights meet the study goals.

Stuart noted current signage dissuades some boaters from accessing the cove. Douglas asked if additional notices will be posted informing boaters the cove is closed. Bennett said that will be a component of the construction plan. Stuart added Duke Energy would request assistance from partners in communicating the closure.

Wilde asked if the area is designated as non-swimming. Stuart stated there are warning signs. He's not aware of boating or swimming incidents at the intake/outlet. Wilde asked if boaters can feel when Bad Creek is pumping and Stuart replied they cannot. He added the goal for this effort is to understand the effects of closing the cove to boating during construction only. Duke Energy doesn't intend to permanently close access for viewing the waterfall. Douglas repeated that so long as the closure is publicized, the effects should be manageable. Bennett stated the communications should be similar to the notifications that occurred when a Foothills Trail bridge was closed several years ago.

Miller supported increasing the number of UAV flights per day. The RC agreed as many flights as possible should be captured during each field day.

Bennett stated UAV flights are currently scheduled to begin at 8:00 am. Rowdy Harris stated that may need to be moved to 7:00 am to capture angler use since fishing tournaments usually begin then and anglers immediately head to the Whitewater River cove. Quattro asked if most tournaments are on weekends and Harris confirmed they are. Kirven asked where she can find a list of tournaments. Quattro stated no registration is required for small tournaments, so many just happen. Harris confirmed most tournaments are not registered. The best way to find the schedule is to monitor the "Fishing Jocassee" Facebook page. Quattro stated most tournaments are in the spring and fall so they may fall outside the study season.

Duke Energy will evaluate changing the UAV flight schedule on weekends to start at 7:00 am to capture angler use of the Whitewater River cove. Duke Energy will also determine how many flights per day can occur and will develop a flight schedule that accommodates as many flights as possible.

## Closing

Kirven reviewed the study timeline. She noted Phase 1 of the study began last September and is on-going. Wilde asked if updates will be posted on website. Kirven responded there will be quarterly progress reports filed with FERC, sent to the distribution list, and posted to the SharePoint site.

Bennett informed the team she is changing roles and moving to Asheville, so will be transitioning her responsibilities for this study to Stuart. Paul Keener will be taking the lead on the Whitewater River cove boating study and Kirven will continue her role. Stuart stated Bennett will be missed as well as her expertise and thanked her for her efforts to date.

Kirven asked for remaining questions; there were none. Stuart encouraged attendees to reach out with questions and use the entire RC distribution list if they do so. Kirven reminded attendees to let her know if there are updates needed to the membership roster. Bennett asked RC members who hike the Foothills Trail to contact Stuart if they see issues with trail counters. Photos would be particularly helpful.

The meeting was adjourned.

## Action Items:

- Kleinschmidt will modify the RUN survey question #7 to include an "other" option.
- Duke Energy to install a trail counter at the Foothills Trail at Table Rock State Park. Data will be retrieved mid-study season and at the end of season.
- Duke Energy to capture as many UAV flights per field day as possible instead of the 3 flights/day specified in the study plan.
- Duke Energy to evaluate changing the UAV flight schedule on weekends to start at 7:00 am to capture angler use of the Whitewater River cove.

# Bad Creek Pumped Storage Project No. 2740

## Recreation Resource Committee Meeting

DUKE ENERGY.

BUILDING A SMARTER ENERGY FUTURE®

MARCH 28, 2023

1

## Recreation Resource Committee Meeting Agenda

- Safety Moment
- Introductions
- Discuss FERC's Study Plan Determination Modifications and Recommendations – Duke Energy and Kleinschmidt (Jennifer Bennett and Kelly Kirven)
- Discuss the Foothills Trail Corridor Conditions Assessment Methodology – Long Cane Trails (Todd Branham)
- Discuss the Recreation Use and Needs Study Methodology – Kleinschmidt (Kelly Kirven)
  - Review Traffic and Trail Counter Locations
- Discuss the Foothills Trail Carrying Capacity Assessment Methodology – Applied Trails Research (Jeremy Wimpey and Fletcher Meadema)
- Discuss the Whitewater River Cove Existing Recreational Use Characterization Methodology – Duke Energy and Kleinschmidt (Jennifer Bennett and Kelly Kirven)
  - Review Drone Flight Schedule



2

## Safety Moment – Spring Safety Tips

- Be ready for changing weather
  - Weather can change quickly in the spring (dry to thunderstorms or warm to cold)
- Be aware of insects like ticks and mosquitos
  - Wear appropriate clothing, insect repellent, etc.
- Be aware of the signs of illness that relate to the heat
  - Headaches, dizziness, nausea



3

## FERC Study Plan Determination Modifications and Recommendations

- **The Recreational Resources Study was modified to include the following:**
  - An additional traffic counter was added at the Laurel Valley Trail Access
  - Revisions to the Recreation Site Inventory Form to include the number and height of bear cables and the number of latrines
- **The following are clarifications regarding the Discussion and Staff Recommendations included in the Study Plan Determination:**
  - FERC recommended Duke Energy modify the Recreation Study Plan to include the additional counties that will be used during the future recreation use analysis. As stated in the RSP, Duke Energy will include Oconee and Pickens counties, SC and Jackson and Transylvania counties, NC and any counties in SC, NC, and GA that are reported on the recreation user surveys. Since recreation user surveys have not been completed yet, Duke Energy is unable to list what counties will be reported.
  - FERC recommended Duke Energy include the 14.8 miles of trail that follow logging and access roads in the Conditions Assessment. As stated in the RSP, Duke Energy will include the entire 43 miles of trail, including 28.2 miles of singletrack trail segments and 14.8 miles of trail that follow logging and access roads, in the Conditions Assessment. Although the Trail Solutions guide on building singletrack will be used as a base for trail condition analysis, this will not exclude non-singletrack trail segments from analysis.
  - FERC recommended that the RUN Study include detail boxes and labels for all spur trails within the 43-mile portion of trail to be studied by Duke Energy. Duke Energy will prepare detailed maps of the Duke Energy-maintained, 43-mile portion of the Foothills Trail that identify parcel boundaries, current property owner(s), access locations, spur trails, structures, and facilities/amenities. In addition, as stated in the RSP, two traffic counters will be installed at the Bad Creek Hydro Project Trail Access (i.e., Bad Creek Parking Access Area and Bad Creek Road) and user surveys will be collected at this site.
  - FERC requested additional details on the standards used to define the minimum acceptable values of the indicator variables used to estimate the trail's carrying capacity. Duke Energy will hold a Recreation Resource Committee Meeting on March 28, 2023 to discuss the carrying capacity methodology with Jeremy Wimpey of Applied Trails Research in attendance.



4

## FOOTHILLS TRAIL CORRIDOR CONDITIONS ASSESSMENT

- All 43 miles of the main corridor as well as spur trails will be assessed
  - Split into 6 sections
  - Use Foothills Trail Guidebook as a reference
  - Look for water damage
    - Condition of current drains and water bars
    - Potential locations of new drains
    - Areas of intense erosion
    - Berm issues



5

## FOOTHILLS TRAIL CORRIDOR CONDITIONS ASSESSMENT

**Trail Assessment Descriptions:**

| Code | Description |
|---|---|
| B | Bridges, puncheon, bog bridges, turnpikes. ***Note construction material, length/width (feet) and condition of bridge.*** |
| UC | Unimproved Crossing (stream crossing). ***Note if wading or rock steps and any maintenance required (unstable stepping stones). Note the width of the stream at the crossing*** |
| C | Culvert – open or closed drain across the trail. ***Note condition of culvert sufficient size for situation.*** |
| E | Erosion - look for exposed roots, rocks, or gullies on trail. ***Describe situ on tread, located on fall line (going straight down a hill regardless of g section (if greater than 25 ft, approximate distance). If excessive grade (>15% slope) in conjunction with erosion: measure (if numerous steep rocky slopes, no need to measure each one – note th rocky sections)*** |
| EC | Erosion Control Devices – check dams, water bars. ***Note type and condi*** |
| WO | Washout - section of trail has been mostly/completely washed away. ***No hazards associated with washout. Take photo.*** |
| WA | Wet Area/standing water (larger than 3ft diameter). ***Note length/width. feature.*** |
| OB | Obstacle – fallen tree or other obstacle blocking treadway (include broke above/across the trail ("widow makers"). ***Note diameter of fallen tree.*** |
| IB | Insufficient Blazing/Marking – if can't see next blaze/marker as you are hard to locate next blaze/marker. ***Note if blazes/markers missing or wor*** |
| SI | Signage – ***Identify if Trailhead, Directional or Interpretive and if in ne repair.*** |
| AC | Additional Comment – specific locations that warrant noting such as a s (caves, mines, rock wall) and locations of invasive species. ***Note type of (such as name of invasive species and amount of plants (number, area*** |

**Trail Assessment Forms** Page 1 of ___

Date: _____

Trail Name: _____

**Team leader**:

Name: _____

Phone #: _____

Assessment Team Members:

_____

_____

Average Tread Width (in/ft) _____

End Point (Lat/Long): _____

****Format: Decimal Degrees** **Datum (circle one):** NAD27, 83 or **WGS84** (preferred)

| | |
|---|---|
| (PN) Photo Number | (WO) Washout |
| (B) Bridge | (WA) Wet Area/Standing Water |
| (UC) Unimproved Crossing | (OB) Obstacle – fallen tree |
| (C) Culvert | (IB) Insufficient Blazing |
| (E) Erosion | (SI) Signage (Trailhead, Directional or Interpretive) and repair needed |
| (EC) Erosion Control Devices | (AC) Add. Comments (vista/unique feature, invasive species) |
| Measure: Bridges, Culverts, Eroded sections (excessive grade), Washouts, Wet Areas, and diameter of fallen trees | |

| Way Point # | Lat | Long | PN | Code | Measure in feet or grade (% slope) | Description/ Details/ Comments (as appropriate) |
|---|---|---|---|---|---|---|
| (Start Point) | | | | | | |
| | | | | | | |
| | | | | | | |

6

## Foothills Trail Corridor Conditions Assessment

1. Fill out Assessment Form
2. Locate issues/structure along trail and take a waypoint
3. Take photos of significant issues/features
4. Identify type of issue/structure using categories provided
5. Measure: bridges, culverts, eroded sections, washouts, wet areas, and diameter of fallen trees
6. If excessive grade (>15% slope) in conjunction with erosion, utilize clinometer for % slope
7. Provide additional description/comments about issues/structures.



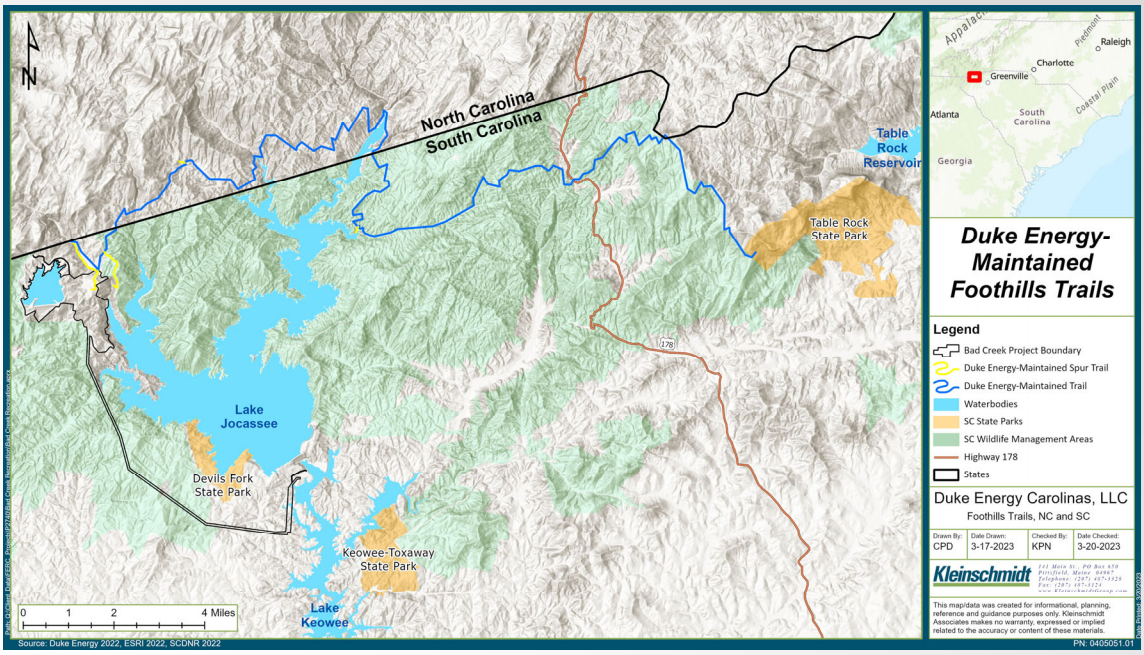
7

## Foothills Trail Corridor Conditions Assessment

- Trail Triage
  - General Priority Levels
    - URGENT: User safety is threatened
    - High: Severe erosion or resource damage established
    - Moderate: Significant erosion or resource damage has begun
    - Low: Signs of trouble, not much damage currently
- "Tipping Point" Principle
  - Prioritize trails that can be repaired **before** they're too far gone over addressing those that are degraded to the point of requiring major resources, relocation, funding, etc.
  - Once trails reach the "tipping point", they have degraded to where the amount of time, materials and labor for rehabilitation may not be available.
    - Salvaging these trails that are degrading but not at the tipping point yet is the best use of resources



8





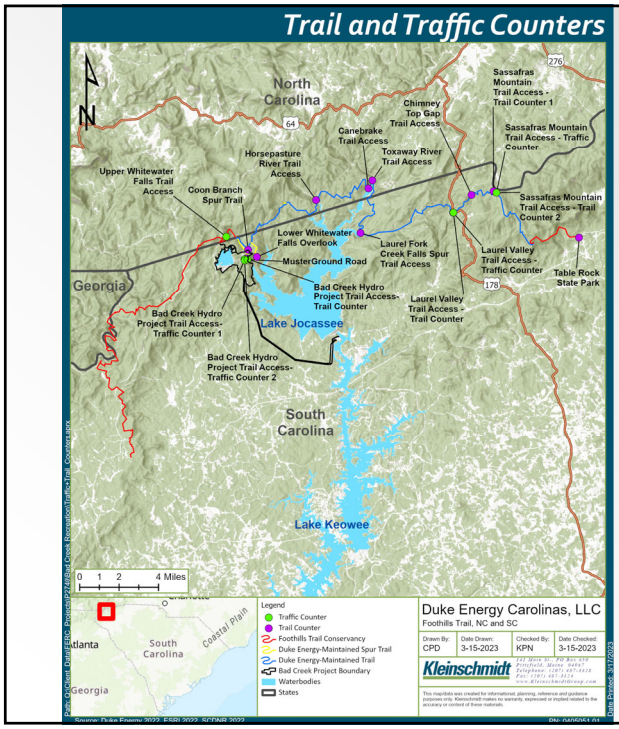

9

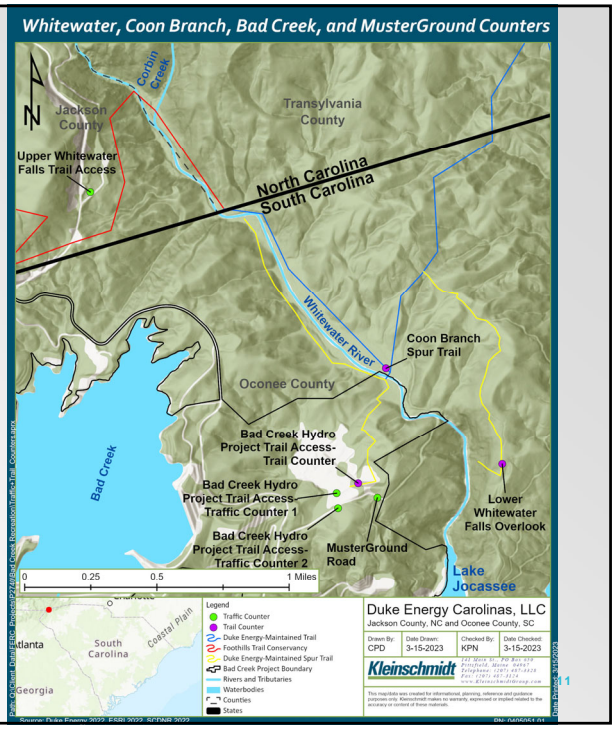
## Recreation Use and Needs Study

| | Data Collection Methods | | | | |
|---|---|---|---|---|---|
| **Access Area** | Recreation Site Inventory | Traffic Counter | Trail Counter | In-Person User Surveys | User Surveys Accessed Via QR Code |
| **Table Rock State Park** | | | * | | |
| **Sassafras Mountain Trail Access** | * | * | * | | * |
| **Chimney Top Gap Trail Access** | * | | * | | * |
| **Laurel Valley Trail Access** | * | * | * | * | * |
| **Laurel Fork Creek Falls Spur Trail Access** | * | | * | | * |
| **Toxaway River Trail Access** | * | | * | * | * |
| **Canebrake Trail Access** | * | | * | | * |
| **Horsepasture River Trail Access** | * | | * | * | * |
| **Lower Whitewater Falls Overlook** | * | | * | | * |
| **Bad Creek Hydro Project Trail Access[c]** | * | * | * | * | * |
| **Coon Branch Spur Trail** | | | * | | * |
| **Musterground Road** | | * | | | |
| **Upper Whitewater Falls Trail Access** | | * | | | |

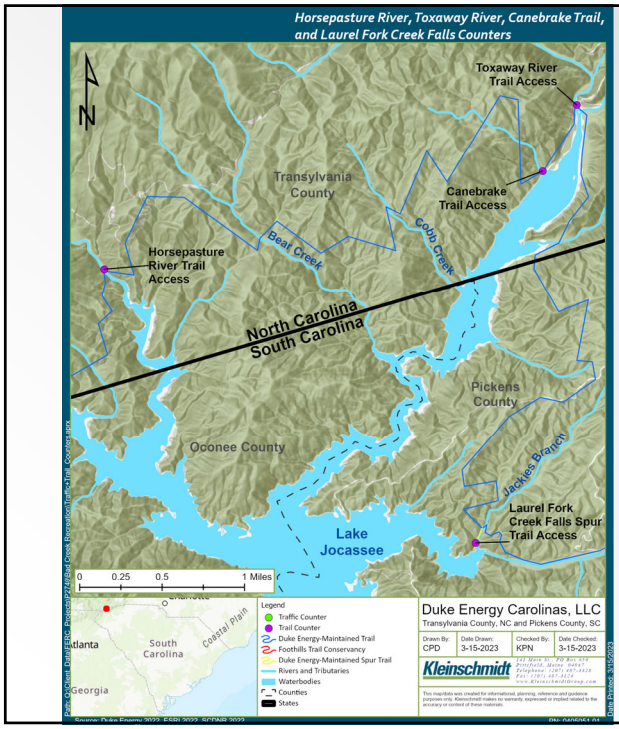


10


Trail and Traffic Counters
North Carolina
Georgia
South Carolina
Lake Jocassee
Lake Keowee
Sassafras Mountain Trail Access - Trail Counter 1
Chimney Top Gap Trail Access
Canebrake Trail Access
Sassafras Mountain Trail Access - Traffic Counter
Horsepasture River Trail Access
Toxaway River Trail Access
Upper Whitewater Falls Trail Access
Coon Branch Spur Trail
Sassafras Mountain Trail Access - Trail Counter 2
Lower Whitewater Falls Overlook
Laurel Fork Creek Falls Spur Trail Access
MusterGround Road
Laurel Valley Trail Access - Traffic Counter
Table Rock State Park
Bad Creek Hydro Project Trail Access- Trail Counter
Laurel Valley Trail Access - Trail Counter
Bad Creek Hydro Project Trail Access- Traffic Counter 1
Bad Creek Hydro Project Trail Access- Traffic Counter 2
0 1 2 4 Miles
Legend
Traffic Counter
Trail Counter
Foothills Trail Conservancy
Duke Energy-Maintained Spur Trail
Duke Energy-Maintained Trail
Bad Creek Project Boundary
Waterbodies
States
Duke Energy Carolinas, LLC
Foothills Trail, NC and SC
Drawn By: CPD
Date Drawn: 3-15-2023
Checked By: KPN
Date Checked: 3-15-2023
Kleinschmidt


Whitewater, Coon Branch, Bad Creek, and MusterGround Counters
Jackson County
Transylvania County
Oconee County
North Carolina
South Carolina
Corbin Creek
Upper Whitewater Falls Trail Access
Whitewater River
Coon Branch Spur Trail
Bad Creek
Bad Creek Hydro Project Trail Access- Trail Counter
Bad Creek Hydro Project Trail Access- Traffic Counter 1
Bad Creek Hydro Project Trail Access- Traffic Counter 2
MusterGround Road
Lower Whitewater Falls Overlook
Lake Jocassee
0 0.25 0.5 1 Miles
Legend
Traffic Counter
Trail Counter
Duke Energy-Maintained Trail
Foothills Trail Conservancy
Duke Energy-Maintained Spur Trail
Bad Creek Project Boundary
Rivers and Tributaries
Waterbodies
Counties
States
Duke Energy Carolinas, LLC
Jackson County, NC and Oconee County, SC
Drawn By: CPD
Date Drawn: 3-15-2023
Checked By: KPN
Date Checked: 3-15-2023
Kleinschmidt

11


Horsepasture River, Toxaway River, Canebrake Trail, and Laurel Fork Creek Falls Counters
Toxaway River Trail Access
Transylvania County
Canebrake Trail Access
Beal Creek
Cobb Creek
Horsepasture River Trail Access
North Carolina
South Carolina
Pickens County
Oconee County
Jackies Branch
Laurel Fork Creek Falls Spur Trail Access
Lake Jocassee
0 0.25 0.5 1 Miles
Legend
Traffic Counter
Trail Counter
Duke Energy-Maintained Trail
Foothills Trail Conservancy
Duke Energy-Maintained Spur Trail
Rivers and Tributaries
Waterbodies
Counties
States
Duke Energy Carolinas, LLC
Transylvania County, NC and Pickens County, SC
Drawn By: CPD
Date Drawn: 3-15-2023
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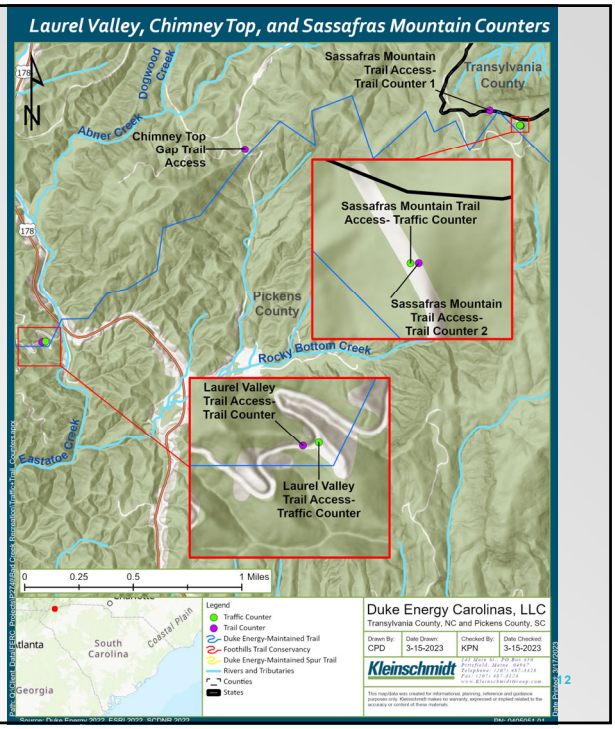
Kleinschmidt


Laurel Valley, Chimney Top, and Sassafras Mountain Counters
Dogwood Creek
Abner Creek
Sassafras Mountain Trail Access- Trail Counter 1
Transylvania County
Chimney Top Gap Trail Access
Sassafras Mountain Trail Access- Traffic Counter
Pickens County
Sassafras Mountain Trail Access- Trail Counter 2
Rocky Bottom Creek
Laurel Valley Trail Access- Trail Counter
Eastatoe Creek
Laurel Valley Trail Access- Traffic Counter
0 0.25 0.5 1 Miles
Legend
Traffic Counter
Trail Counter
Duke Energy-Maintained Trail
Foothills Trail Conservancy
Duke Energy-Maintained Spur Trail
Rivers and Tributaries
Waterbodies
Counties
States
Duke Energy Carolinas, LLC
Transylvania County, NC and Pickens County, SC
Drawn By: CPD
Date Drawn: 3-15-2023
Checked By: KPN
Date Checked: 3-15-2023
Kleinschmidt

12

## Foothills Trail Carrying Capacity Assessment

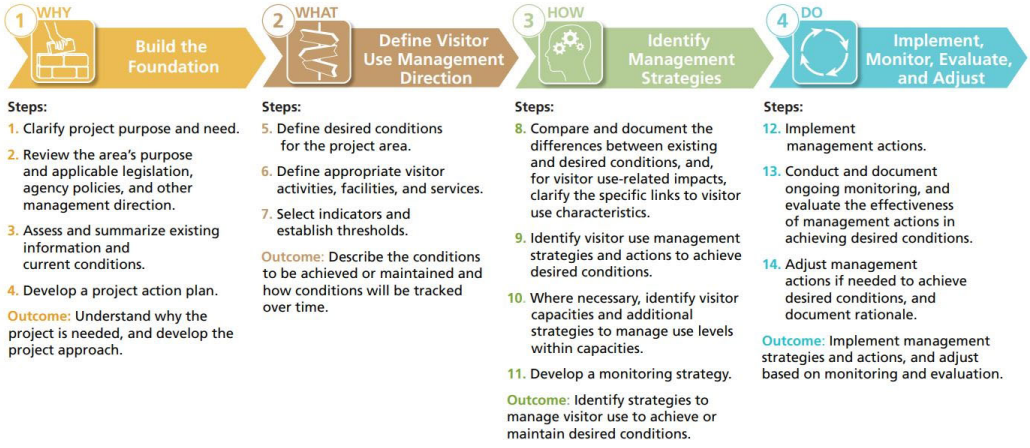
- The Trail Carrying Capacity Assessment will use information collected during the conditions assessment and RUN study to estimate carrying capacity of the trail.



13


14

INTERAGENCY
**VISITOR USE MANAGEMENT**
COUNCIL




15

# Carrying Capacity – IVUMC Definition

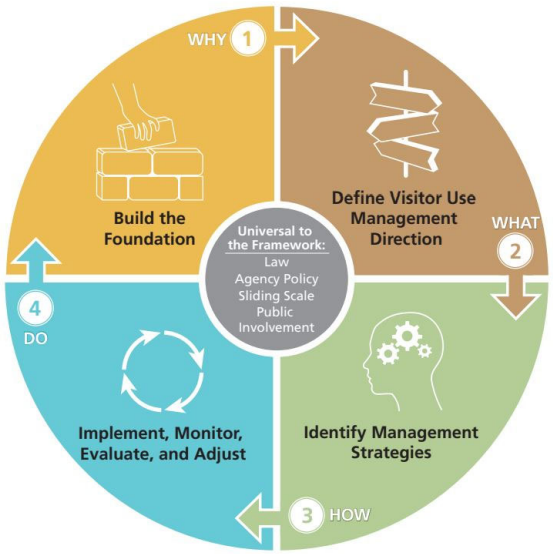
Visitor capacity is a component of visitor use management and is the maximum amounts and types of visitor use that an area can accommodate while achieving and maintaining desired resource conditions and visitor experiences that are consistent with the purposes for which the area was established.

Desired conditions are defined as statements of aspiration that describe resource conditions, visitor experiences and opportunities, and facilities and services that an agency strives to achieve and maintain in a particular area. Desired conditions describe what conditions, outcomes, and opportunities are to be achieved and maintained in the future, not necessarily what exists today. Descriptions of desired conditions paint a picture of what the particular area will look like, feel like, sound like, and function like in the future. Additional guidance on desired conditions is forthcoming.

- Areas are typically managed towards desired conditions through monitoring. Quotas and rationing of use (numbers) are one of many tools that may be leveraged in the process.

16

# IVUMC – Cycle




17

# IVUMC – Carrying Capacities


18

# Bad Creek Rec - Carrying Capacities

## Build the Foundation

Review and synthesis of regs, history, etc
Assessment of facilities & current use conditions
Project action plan (Study plan)

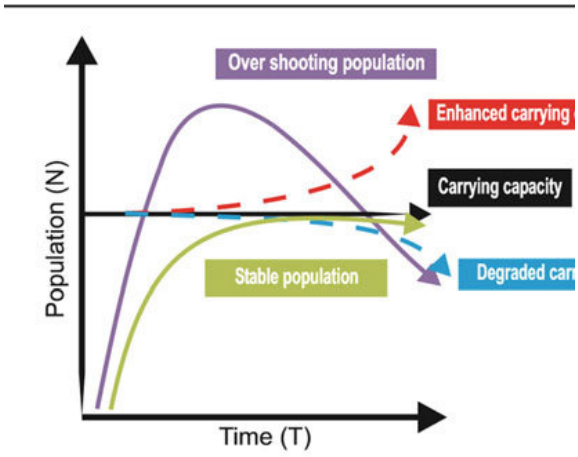
## Define VUM Direction

Define desired future conditions
Define appropriate activities, use and facilities
Develop indicators and thresholds

19

# Bad Creek Rec - Carrying Capacities

- Identify Management Tools
  - Compare-contrast existing and desired conditions
  - Review recommendations from trails assessment
  - Identify management strategies and resources
  - Select and refine strategies for application
  - Define monitoring strategies
- Implement & Adjust
  - Monitor, document, adapt
  - Cyclical → Feeds foundation & strategies

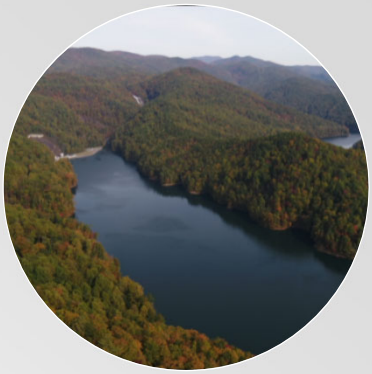



Carrying capacity graph
© CoE ILPWRM IITG

20

## Whitewater River Cove Existing Recreational Use Characterization

- Drone will be deployed over 20 individual days between Memorial Day weekend and Labor Day weekend
- Analyze for the following data per flight time
  - Total number of vessels in the survey area
  - Categorize vessels by:
    - Motorboat
    - Non-motorized boat
    - Personal watercraft
    - Paddleboard
- Discussion: additional flights during study dates





21

## Whitewater River Cove Existing Recreational Use Characterization




22

## Study Schedule – Recreational Resources

| Task | Proposed Timeframe |
|---|---|
| ▪ ***Point of Stakeholder Engagement to Kick-off Recreation Study (discuss traffic/trail counter locations, Trail Carrying Capacity methodology, etc.) (In-person meeting)*** | ***March 2023*** |
| **Study Tasks – Phase 1** | Winter 2022 – Winter 2023 |
| • Task 1: Foothills Trail RUN Study (Data Collection: Inventory, Traffic/Trail Counts, User Surveys) | September 2022 – January 2023, March – November 2023 |
| • Task 2: Foothills Trail Conditions Assessment (Data Collection, Analysis and Draft Report) | January – October 2023 |
| • Task 3: Whitewater River Cove Existing Recreational Use Evaluation (Data Collection, Analysis and Draft Report) | May – October 2023 |
| • ***Point of Stakeholder Engagement: Distribute draft study reports for Tasks 2 and 3 to Recreation & Aesthetics RC for review and obtain feedback (In-person meeting)*** | ***October 2023*** |
| **Study Tasks – Phase 2** | Winter 2023 – Summer 2024 |
| • Begin RMP Development | October 2023 – July 2024 |
| • Task 1: Foothills Trail RUN Study (Analysis and Draft Report) | December 2023 – July 2024 |
| • Task 4: Whitewater River Cove Recreational Public Safety Evaluation (Data Analysis and Draft Report) | Spring 2024 |
| • ***Point of Stakeholder Engagement: Distribute draft study reports for Tasks 1 and 4 to Recreation & Aesthetics RC for review and obtain feedback (In-person meeting)*** | ***July 2024*** |



23

## Action Items

24

**From:** maggie.salazar@hdrinc.com
**Subject:** FW: Recreation Study Progress Report
**Attachments:** Bad Creek Recreation_Progress Report 7-20-23 (002).pdf

**From:** Stuart, Alan Witten <Alan.Stuart@duke-energy.com>
**Sent:** Monday, July 24, 2023 8:49 AM
**To:** Crutchfield Jr., John U <John.Crutchfield@duke-energy.com>; Amy Breedlove <BreedloveA@dnr.sc.gov>; Andrew Gleason <andrewandwilla@hotmail.com>; Andy Douglas <adoug41@att.net>; Chris Starker <cstarker@upstateforever.org>; Dale Wilde <dwilde@keoweefolks.org>; RankinD <RankinD@dnr.sc.gov>; Elizabeth Miller <MillerE@dnr.sc.gov>; Kelly Kirven <Kelly.Kirven@KleinschmidtGroup.com>; Ken Forrester <forresterk@dnr.sc.gov>; quattrol <quattrol@dnr.sc.gov>; Salazar, Maggie <maggie.salazar@hdrinc.com>; amedeemd@dhec.sc.gov; cloningerp@dnr.sc.gov; SelfR <SelfR@dnr.sc.gov>; Rowdy Harris <charris@scprt.com>; suewilliams130@gmail.com; William T. Wood <woodw@dnr.sc.gov>; Willie Simmons <simmonsw@dnr.sc.gov>; Huff, Jen <Jen.Huff@hdrinc.com>; phil.mitchell@gmail.com; Bill Ranson-Retired <bill.ranson@retiree.furman.edu>; Lineberger, Jeff <Jeff.Lineberger@duke-energy.com>; Kulpa, Sarah <sarah.kulpa@hdrinc.com>; Pardue, Ethan <Ethan.Pardue@duke-energy.com>; Tristan Cleveland <tristan@lpda.net>; Keener, Paul <Paul.Keener@duke-energy.com>
**Cc:** Kelly Kirven <Kelly.Kirven@KleinschmidtGroup.com>; Alison Jakupca <Alison.Jakupca@KleinschmidtGroup.com>
**Subject:** Recreation Study Progress Report



Good morning,

In advance of our upcoming Recreation Resources Committee Meeting on Thursday, please find the attached Study Progress Report prepared by Kleinschmidt. Please review the document prior to the meeting and if you have questions, we can address them during the meeting.

See you all on Thursday !

Thank you !
Alan

DUKE ENERGY.
Alan W. Stuart
Senior Project Manager, Water Strategy & Hydro Licensing
Regulated & Renewable Energy
Duke Energy
526 S. Church Street, - EC12Q | Charlotte, NC 28202
Office 980-373-2079 | Cell 803-640-8765

# MEMORANDUM

| | |
|---|---|
| **To:** | Alan Stuart, Duke Energy Carolinas, LLC |
| **From:** | Kelly Kirven, Kleinschmidt Associates |
| **Cc:** | |
| **Date:** | July 20, 2023 **Document No.** *405053.03* |
| **Re:** | Bad Creek Recreation Study Progress Report |

The Recreational Resources Study has four main components: (1) a Recreation Use and Needs (RUN) Study for the 43-mile-long portion of the Foothills Trail (or trail) managed by Duke Energy; (2) a Foothills Trail Corridor Conditions Assessment (Conditions Assessment) of the 43-mile-long portion of the Foothills Trail managed by Duke Energy; (3) an Existing Recreational Use Characterization of Whitewater River Cove; and (4) a Recreational Public Safety Evaluation of Whitewater River Cove. An update on the current status of each study component is provided below.

## Task 1: Foothills Trail Corridor Recreation Use and Needs

*Recreation Site Inventory*

The recreation site inventory was completed as described in the Revised Study Plan (RSP). The inventory was completed at the following sites on May 17, 2023[1]:

- Sassafras Mountain Trail Access
- Chimney Top Gap Trail Access
- Laurel Valley Trail Access
- Lower Whitewater Falls Overlook
- Bad Creek Trail Access
- Coon Branch Spur Trail
- Musterground Road

The recreation site inventory was completed at the following sites on May 28, 2023:

- Laurel Fork Creek Falls Spur Trail Access
- Toxaway River Trail access
- Canebrake Trail Access
- Horsepasture River Trail Access

[1] Although the RSP did not note that a recreation site inventory would occur at Coon Branch Spur Trail and Musterground Road, a recreation inventory was completed at these sites.

*Traffic and Trail Counts*

Traffic and trail counters were installed at access areas in late February/early March 2023. The traffic counter at Musterground Road was installed in mid-September 2022. A list of periods with missing data is provided in Table 1. Due to significant counter malfunctions, data was not collected at Musterground Road over a long period of time in fall 2022. Kleinschmidt will reinstall the traffic counter at Musterground Road by September 15, 2023, to ensure a complete dataset is collected between September 15 and January 15.

**TABLE 1 PERIODS OF MISSING TRAFFIC OR TRAIL COUNTER DATA**

| Site | Data Gap | Explanation |
|---|---|---|
| Bad Creek Trail Counter | March 1-March 9, 2023 | Counter malfunction |
| Canebrake Trail Counter | March 1-March 9, 2023 | Counter malfunction |
| Chimney Top Trail Counter | April 4-May 6, 2023 | Vandalism |
| Coon Branch Trail Counter | March 1-March 18, 2023 | Counter malfunction |
| Fisher Knob Trail Counter | May 6-May 18, 2023 | Vandalism |
| Toxaway Trail Counter | March 1-March 9, 2023 | Counter malfunction |
| Musterground Road Traffic Counter | September 15-October 5, 2022; October 19-November 2, 2023 | Counter malfunctions – counter was replaced with new counter |

*User Surveys*

In-person user surveys began in March 2023 at the Toxaway River Trail Access, the Horsepasture River Trail Access, the Bad Creek Hydro Trail Access, and the Laurel Valley Trail Access. Surveys have been completed at these sites on the dates listed in Table 2. The number of surveys completed through July 5 for each site and via the QR code are listed in Table 3.

**TABLE 2 SURVEYS COMPLETED THROUGH JULY 5, 2023**

| Date | Day Type | Toxaway and Horsepasture | Bad Creek and Laurel Valley |
|---|---|---|---|
| Wednesday, March 8, 2023 | Weekday | Afternoon Survey | Morning Survey |
| Sunday, March 19, 2023 | Weekend | Morning Survey | Afternoon Survey |
| Friday, April 21, 2023 | Weekday | Afternoon Survey | Morning Survey |
| Saturday, April 22, 2023 | Weekend | Morning Survey | Afternoon Survey |
| Friday, May 5, 2023 | Weekday | | Afternoon Survey |
| Saturday, May 6, 2023 | Weekend | Morning Survey | Afternoon Survey |
| Sunday, May 7, 2023 | Weekend | Morning Survey | |

| Date | Day Type | Toxaway and Horsepasture | Bad Creek and Laurel Valley |
|---|---|---|---|
| Sunday, May 28, 2023 | Holiday | | Afternoon Survey |
| Monday, May 29, 2023 | Holiday | Afternoon Survey | Morning Survey |
| Tuesday, May 30, 2023 | Weekday | Morning Survey | |
| Friday, June 2, 2023 | Weekday | | Afternoon Survey |
| Saturday, June 3, 2023 | Weekend | Morning Survey, Afternoon Survey | |
| Sunday, June 4, 2023 | Weekend | | Morning Survey |
| Saturday, June 17, 2023 | Weekend | | Afternoon Survey |
| Sunday, June 18, 2023 | Weekend | Morning Survey, Afternoon Survey | |
| Monday, June 19, 2023 | Weekday | | Morning Survey |
| Monday, July 3, 2023 | Holiday | | Afternoon Survey |
| Tuesday, July 4, 2023 | Holiday | Morning Survey, Afternoon Survey | |
| Wednesday, July 5, 2023 | Weekday | | Morning Survey |

**TABLE 3 NUMBER OF SURVEYS COMPLETED BY RECREATION SITE AND QR CODE THROUGH JULY 5, 2023**

| Site Name | # Surveys Completed |
|---|---|
| Bad Creek Hydro Trail Access | 44 |
| Horsepasture River Trail Access | 13 |
| Laurel Valley Trail Access | 31 |
| Toxaway River Trail Access | 26 |
| QR Code | 41 |
| Total | 155 |

*Trail Carrying Capacity*

Applied Trails Research is planning to visit the Foothills Trail the week after Thanksgiving to gather on-site information for their assessment.

**Task 2: Foothills Trail Corridor Conditions Assessment**

Todd Branham (Long Cane Trails) will be using the Fulcrum app for data collection during the trail conditions assessment. Todd has duplicated the Foothills Trail Conservancy Google interactive map for internal use. This map will be used for visual presentation of the data collected. Todd began hiking the 43 miles of trail in late June and is collecting information using the Fulcrum app.

**Task 3: Whitewater River Cove Existing Recreational Use Evaluation**

The Whitewater River Cove Existing Recreational Use Evaluation is underway. Table 4 includes the dates on which drone flights have occurred, the number of images collected, the approximate high temperature during the flights, and additional notes. Additional information on the timings of flights and number of boats observed will be included in the report.

**TABLE 4 DRONE FLIGHT SUMMARY AT WHITEWATER RIVER COVE**

| Date | # of Images Collected | ~ High Temp (ºF) | Notes |
|---|---|---|---|
| 28-May | 49 | 63 ºF | |
| 31-May | 40 | 75 ºF | |
| 2-Jun | 93 | 86 ºF | |
| 3-Jun | 69 | 88 ºF | |
| 13-Jun | 49 | 79 ºF | |
| 24-Jun | 105 | 82 ºF | |
| 28-Jun | 80 | 89 ºF | |
| 1-Jul | 102 | 93 ºF | |
| 4-Jul | 105 | 89 ºF | |
| 14-Jul | 74 | 92 ºF | Due to lightning, flights ended at 2:30 |
| 15-Jul | 83 | 95 ºF | Due to storms, flights ended at 3:00 |

**Task 4: Whitewater River Cove Recreational Public Safety Evaluation**

Not started.

# Meeting Summary

| | |
|---|---|
| Project: | Bad Creek Pumped Storage Project Relicensing |
| Subject: | Bad Creek Visual and Recreational Resources Committee Meeting |
| Date: | July 27, 2023 |
| Location: | Duke Energy Operations Center, Greenville, SC |

### Attendees (in-person)

John Crutchfield, Duke Energy
Alan Stuart, Duke Energy
Jeff Lineberger, Duke
Ethan Pardue, Duke Energy
Paul Keener, Duke Energy
Sue Williams, Advocates for Quality Development
Mike Abney, Duke Energy
Andrew Gleason, Foothills Trail Conservancy
Kelly Kirven, Kleinschmidt Assoc.
Alison Jakupka, Kleinschmidt Assoc.
Rowdy Harris, SC Department of Parks, Recreation and Tourism
Elizabeth Miller, SCDNR
Amy Chastain, SCDNR
William Wood, SCDNR
Dan Rankin, SCDNR
Erika Hollis, Upstate Forever
Chris Starker, Upstate Forever
Sarah Kulpa, HDR
Joe Dvorak, HDR
Jen Huff, HDR
Kerry McCarney-Castle, HDR
Eric Mularski, HDR

### Attendees (virtual)

Tristan Cleveland, LPDA

## Introduction

John Crutchfield welcomed participants in the room and online to the Bad Creek Relicensing Visual and Recreational Resources Committee meeting, briefly summarized the meeting agenda, provided a safety moment on heat-related issues, introduced the relicensing studies and study leads, and noted the meeting is being recorded. J. Crutchfield summarized the status of the relicensing efforts (ILP schedule) and showed the existing Project Boundary; he then handed the presentation over to Jen Huff to provide an update on the Visual Resources Study.

## Visual Resources Study Update

### Task 2 – Scene Area Analysis

J. Huff briefly summarized the tasks for the Visual Resources Study and introduced Duke Energy's subconsultant, Tristan Cleveland with LPDA. T. Cleveland provided a description of the seen area analysis, reviewed the objectives and methods used, and walked through slides showing different structures/features associated with Bad Creek II that would be visible from surrounding areas up to approximately 4 miles. For the new transmission line corridor, it was assumed the expanded corridor would parallel the existing line. The composite constructed project elements figure shows areas with views of multiple structures.

Chris Starker asked for clarification on adding the new transmission line, if the towers were proposed to be 130 feet tall, and if a new set of towers would be constructed adjacent to the existing towers. Sarah Kulpa indicated tower position and design are based on conservative measures based on available information. T. Cleveland indicated the existing corridor is 200 ft wide; the new one would result in widening the right-of-way from 200 ft to 380 ft.

Alan Stuart indicated many meeting attendees do not yet know of the proposed access road. J. Huff provided an overview of the purpose of the access road and A. Stuart stated it would be a temporary road to provide access to the Fishers Knob community and for first responder access to the station and community, further noting the road would be shut down and revegetated following project construction.

Rowdy Harris asked if the access road will be wide enough to get boat trailers through since residents of Fisher Knob leave boat trailers at the park. If the access road will be any narrower, it might cause more residents to leave their trailers at the park. A. Stuart indicated Duke Energy is still designing the road (no details available at this time).

William Wood asked if the current road would be blocked during construction. A. Stuart confirmed the current road would be restricted to Duke Energy use.

Andrew Gleason asked for confirmation that first responders/emergency vehicles would be able to traverse the access road/bridges. A. Stuart agreed that the road/bridges would support emergency vehicles of all types.

## Task 4 – Key Views Selection

J. Huff described the objectives of Task 4 of the Visual Resources Study. As set forth in the approved study plan, the Resource Committee (RC) is to choose up to four Key Views that encompass a variety of potential scenic and visual impacts for the proposed project. Photos from the Key Views will be taken in leaf-off conditions (November). The goal for the meeting is to choose 6 potential Key Views today. Once the photos are available, the RC will meet again and narrow it down to 4 Key Views to use for the remaining tasks. J. Huff described the initial 11 potential key views that were identified based on the seen area analysis.

A Stuart indicated the locations of the key viewpoints will be determined by the stakeholders, not Duke Energy. J. Huff agreed and proposed the RC use a consensus process (i.e., everyone can live with the decision) to select the six views. Participants agreed. She then opened up the floor to the group to start the elimination process based on the 11 initial/proposed sites. The group decided to remove views 1A, 1B, 3 (from the water), 6, and 8.

A Gleason indicated there is a spot or two along a portion of the Foothills Trail immediately northwest of the Bad Creek Reservoir where the existing project is visible, however, he doesn't recommend adding any viewpoints and noted people like to look down at the reservoir from the trail.

Sue Williams asked about location of the Fisher Knob view and noted residents are likely used to the view of the inlet/outlet structure; leaf conditions are irrelevant.

Kelly Kirven asked about the handout that was provided and the closest feature in the viewshed. T. Cleveland indicated that just because it is listed as the closest view, it may not be the most prominent view, therefore, it is useful to look at individual viewshed maps (or composite map) to view all elements.

J. Huff noted that even though the consensus is to remove view 3 (looking upstream into Whitewater River cove), we would still include existing simulation of inlet/outlet portal (with leaf on) in report.

In November, six photos will be captured and a virtual meeting will be held (December) and at that time, the group will work together to narrow it down to four viewpoints for visualizations and simulations; Duke Energy will then carry out Tasks 7-9 based on the Visual Analysis with the report ready in 3rd quarter 2024.

A Stuart asked J. Huff where lighting effects come into play. J. Huff indicated the plan is still being developed but will likely involve the use of drones to capture baseline lighting (at the Project) and then will assess what is likely to be developed due to the addition of Bad Creek II. A. Stuart asked if it would be part of the report and J. Huff confirmed.

C. Starker agreed that lighting at nighttime is a concern and asked if there would be an update between now and November. J. Huff agreed to provide an update with one of the Recreational Resources updates.

## Recreational Study

K. Kirven provided an update for the Recreational Resources Study and overall tasks and objectives and the status of each task.

### Task 1 Update

The Foothills Trail (FHT) Corridor recreation site inventory was completed at seven sites on May 17, 2023, and on May 28, 2023, at four other sites. Two additional sites not specified in the RSP were included in the inventory (Coon Branch spur trail and Musterground Road). Traffic and trail counters were installed at Musterground Road in September 2022 and at access areas in May 2023. Due to issues with the counter at Musterground Road, Kleinschmidt will re-install the counter in September 2023. A few other counters did not function as intended over short periods of time, but Kleinschmidt will be able to extrapolate data from the larger survey.

In-person surveys began in March 2023;155 were completed as of early July.

### Task 2 Update

FHT Corridor Conditions Assessment: Todd Branham (Long Cane Trails) began the assessment in June. He is using the Fulcrum app and is hiking the 43-mile portion of the trail in sections.

### Task 3 Update

Whitewater River Cove Existing Recreational Use Evaluation: This work is underway. Drone flights will occur 20 days over the season though Labor Day with hourly flights between 8am and 4pm on the hour.

### Task 4 Update

Has not started.

C. Starker asked about the survey response rate. K. Kirven stated the response rate is close to 100% because surveys are in person as opposed to sending them out and waiting for the survey to come back. A Stuart asked if Kleinschmidt is tracking the number of people who are asked to participate in the survey but decline; K. Kirven confirmed.

A. Gleason asked about trail counters being vandalized. K. Kirven indicated the one at Fisher Knob community has been stolen twice and the one at Chimneytop Gap on the trail has been stolen once (along with the post).

## Action Items

- HDR/Duke Energy will post meeting notes, the recording, and presentation to SharePoint site.
- HDR/Duke Energy to revise key views based on input received today.
- HDR/Duke Energy to provide an update on the lighting evaluation in a future Recreation Study progress report.

# Bad Creek Pumped Storage Project No. 2740

## Recreation & Visual Resources Resource Committee Meeting

DUKE ENERGY.
BUILDING A SMARTER ENERGY FUTURE®

JULY 27, 2023

1

## Meeting Agenda

- Welcome and Meeting Purpose
- Safety Moment
- Introductions and FERC ILP Schedule
- Visual Resources Study
  - Task 2: Seen Area Analysis
  - Task 4: Key Views Selection
- Recreational Resources Study

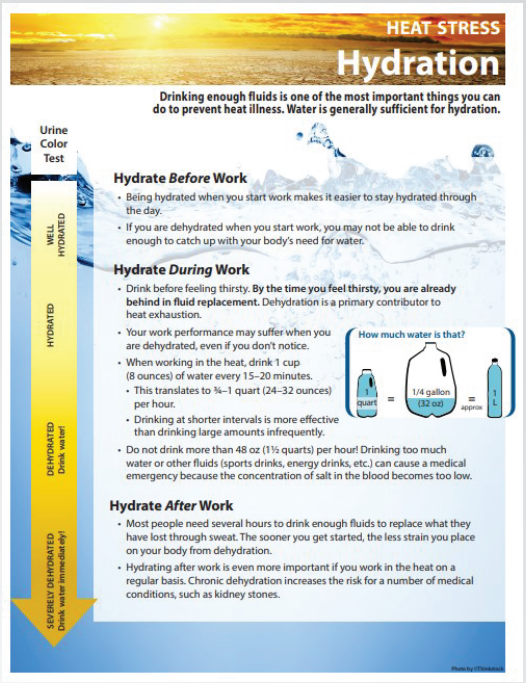


2

## Safety Moment – Heat Safety & Hydration

More than 700 Americans die from heat-related causes annually!

Steps to prevent heat stress
- Limit exposure (start early!)
- Pace yourself
- Loose, lightweight, light-colored clothing
- **Proper hydration**




Source: https://www.cdc.gov/nceh/features/extremeheat/index.html



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## FERC ILP Schedule

| Activity | Responsible Parties | Timeframe | Estimated Filing Date or Deadline |
|---|---|---|---|
| File Notice of Intent (NOI) and Pre-application Document (PAD) (18 CFR §5.5(d)) | Licensee | Within 5 years to 5.5 years prior to license expiration | Feb 23, 2022 |
| Initial Tribal Consultation Meeting (18 CFR §5.7) | FERC | No later than 30 days following filing of NOI/PAD | Mar 25, 2022 |
| Issue Notice of NOI/PAD and Scoping Document 1 (SD1) (18 CFR §5.8(a)) | FERC | Within 60 days following filing of NOI/PAD | Apr 24, 2022 |
| Conduct Scoping Meetings and site visit (18 CFR §5.8(b)(viii)) | FERC | Within 30 days following Notice of NOI/PAD and SD1 | May 16-17, 2022 |
| Comments on PAD, SD1, and Study Requests (18 CFR §5.9(a)) | Licensee Stakeholders | Within 60 days following Notice of NOI/PAD and SD1 | June 23, 2022 |
| Issue Scoping Document 2 (SD2) (18 CFR §5.10) | FERC | Within 45 days following deadline for filing comments on PAD/SD1 | Aug 7, 2022 |
| File Proposed Study Plan (PSP) (18 CFR §5.11) | Licensee | Within 45 days following deadline for filing comments on PAD/SD1 | Aug 7, 2022 |
| PSP Meeting (18 CFR §5.11(e)) | Licensee | Within 30 days following filing of PSP | Sept 7, 2022 |
| Comments on PSP (18 CFR §5.12) | Stakeholders | Within 90 days following filing of PSP | Nov 5, 2022 |
| File Revised Study Plan (RSP) (18 CFR §5.13(a)) | Licensee | Within 30 days following deadline for comments on PSP | Dec 5, 2022 |
| Comments on RSP (18 CFR §5.13(b)) | Stakeholders | Within 15 days following filing of RSP | Dec 20, 2022 |
| Issue Study Plan Determination (18 CFR §5.13(c)) | FERC | Within 30 days following filing of RSP | Jan 4, 2023 |
| Conduct First Season of Studies (18 CFR §5.15) | Licensee | - | Spring-Fall 2023 |
| File Study Progress Reports (18 CFR §5.15(b)) | Licensee | Quarterly | Spring 2023 -Fall 2024 |
| File Initial Study Report (ISR) (18 CFR §5.15(c)) | Licensee | Pursuant to the Commission-approved study plan or no later than 1 year after Commission approval of the study plan, whichever comes first | Jan 4, 2024 |



4

## Recreation & Visual Resources Resource Committee

- Resource Committee Lead: Alan Stuart
- Lead Technical Manager: John Crutchfield
- Recreation Resources Study Lead: Kelly Kirven, Kleinschmidt Associates
- Visual Resources Study Lead: Jen Huff, HDR
- Visual Resources Landscape Architect: Tristan Cleveland, LPDA Associates



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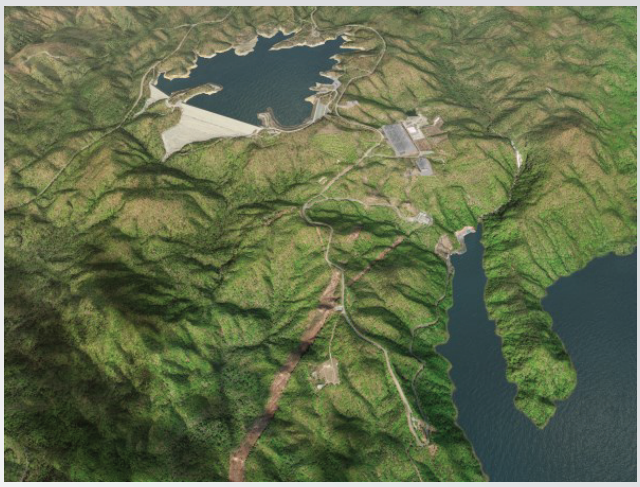
## Visual Resources Study



### Task Refresher

- Task 1 – Existing Landscape Description
- **Task 2 – Seen Area Analysis**
- Task 3 – Field Investigation
- **Task 4 – Key Views Selection**
- Task 5 - Existing Visual Quality Assessment
- Task 6 – Visual Analysis
- Task 7 – Visual Management Consistency Review
- Task 8 – Mitigation Assessment
- Task 9 – Conceptual Design of Bad Creek II Complex



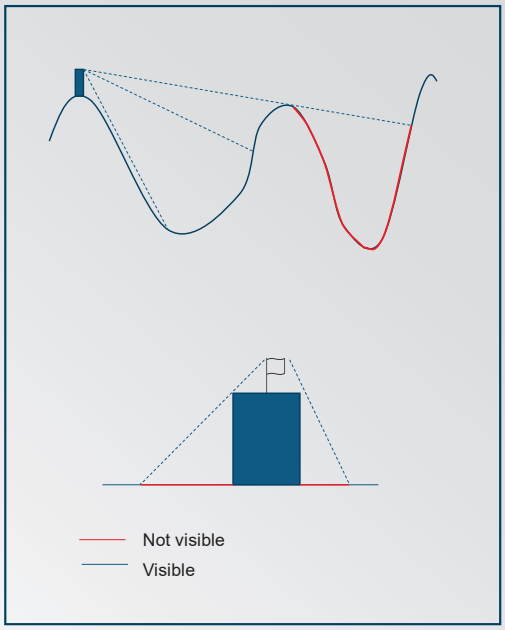
6

# Task 2 - Seen Area Analysis

**Objective: Identify areas from which Bad Creek II would be visible**

**Methodology:**

- Geographic Information System (GIS): ESRI ArcGIS Pro Viewshed Analysis Spatial Analyst Tool
- USGS Digital Elevation Model (DEM)
- Conservative analysis
  - Bare earth basis (trees, structures)
  - Atmospheric effects (clouds, humidity, fog)
  - Revegetation of spoils area
  - Structure design



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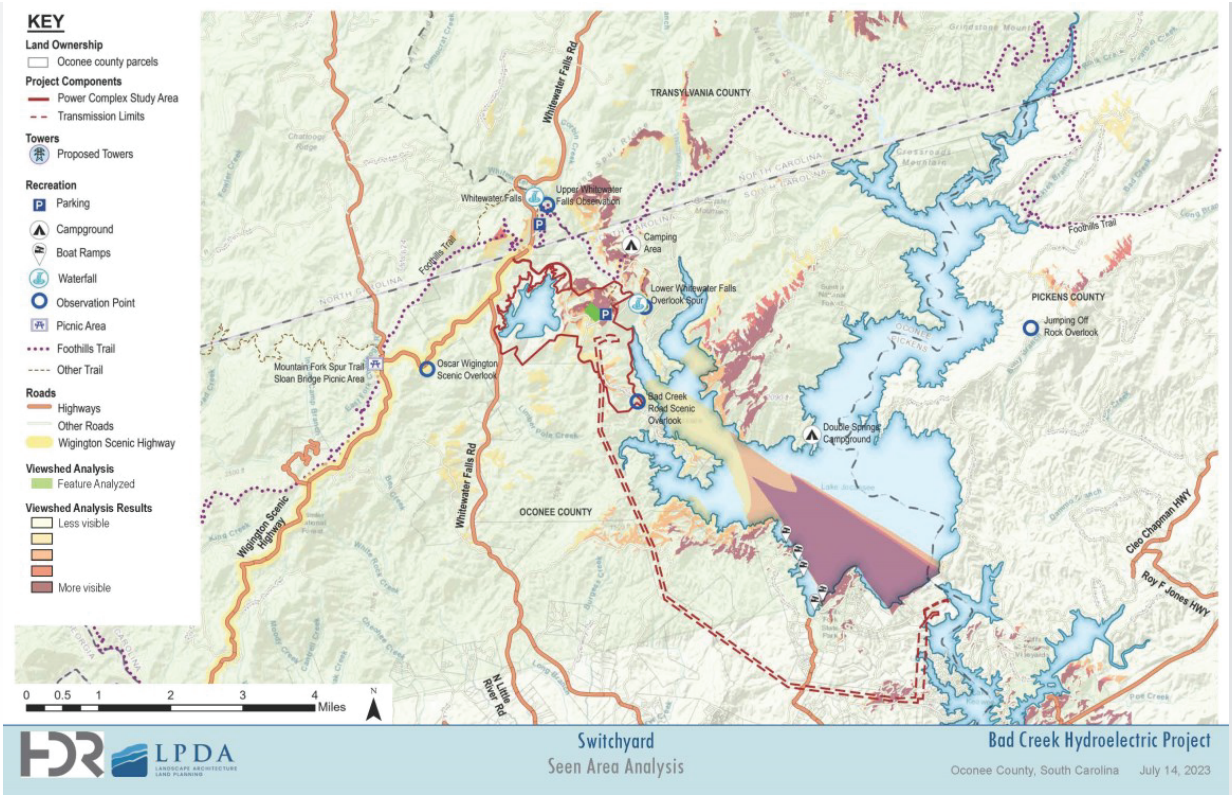




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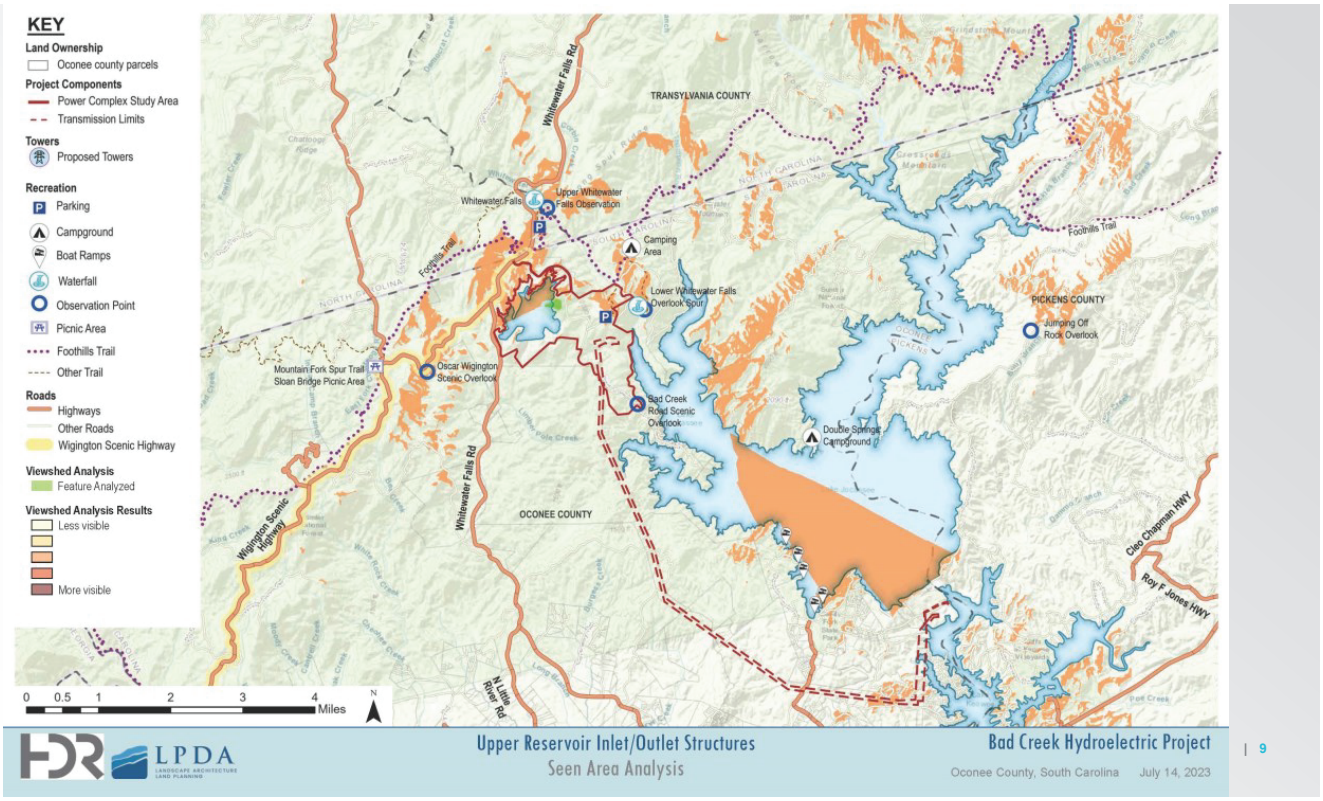
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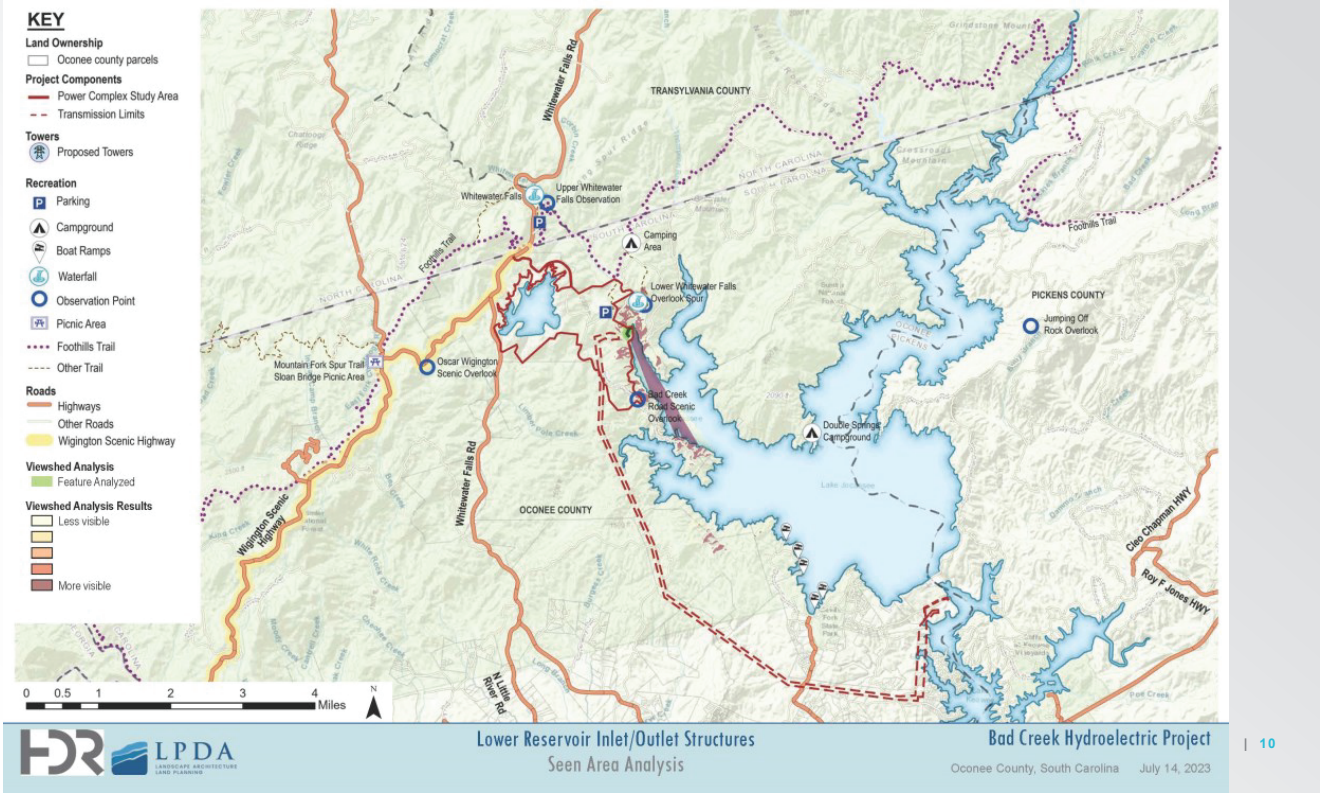
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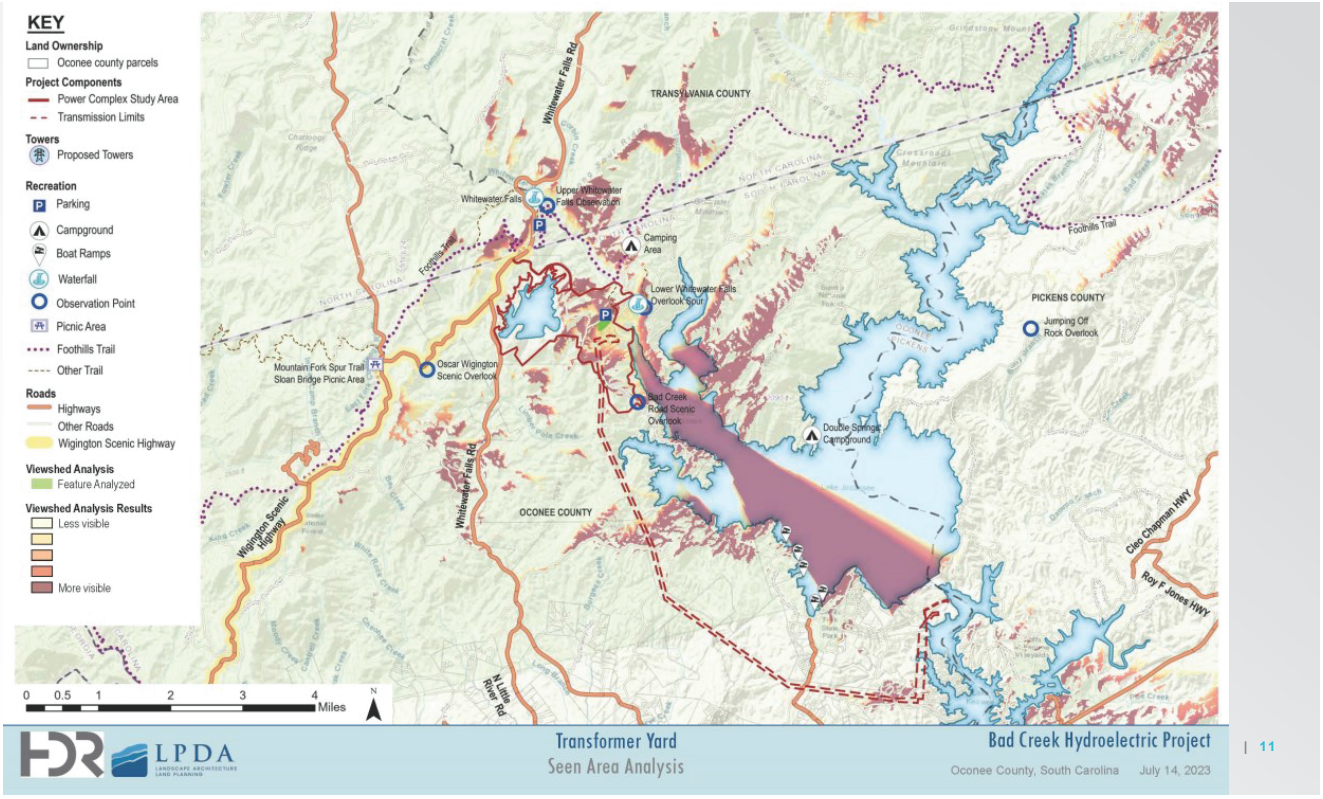
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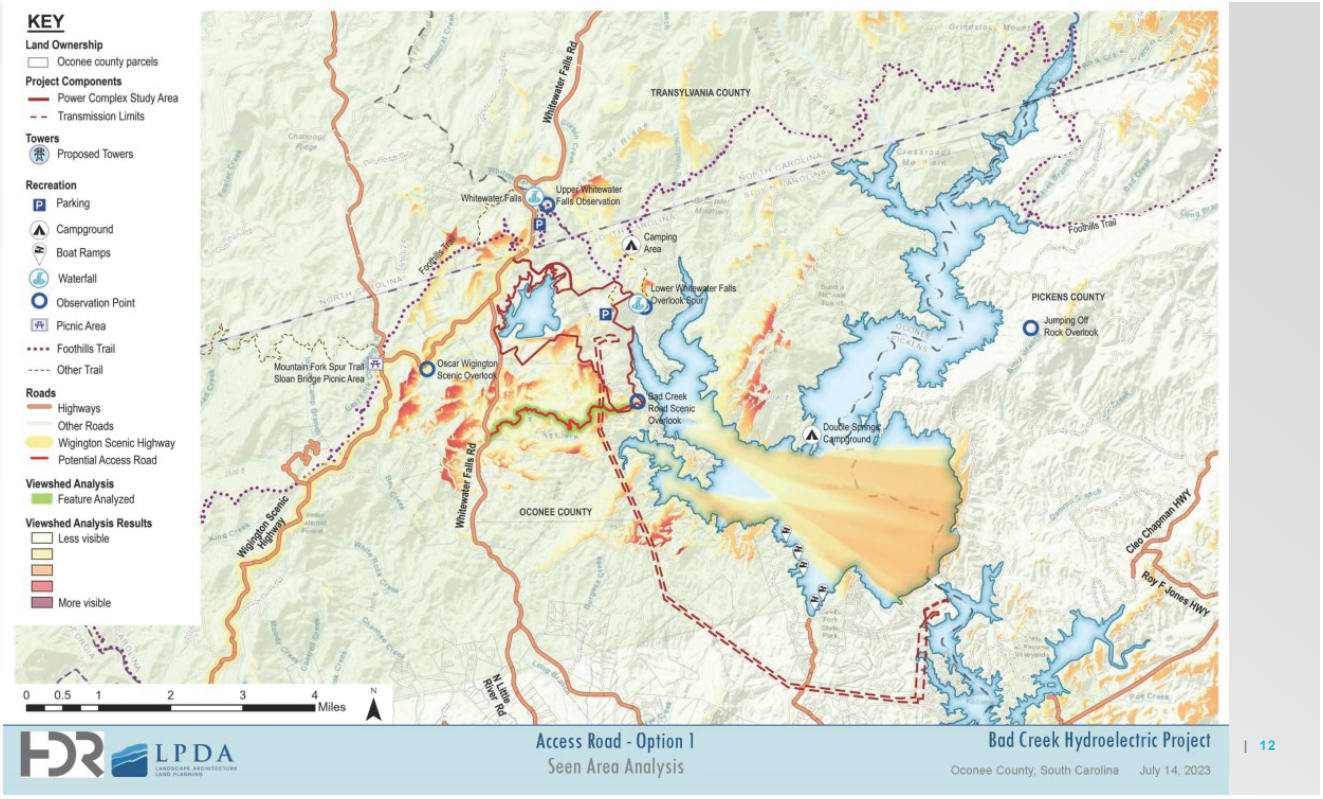
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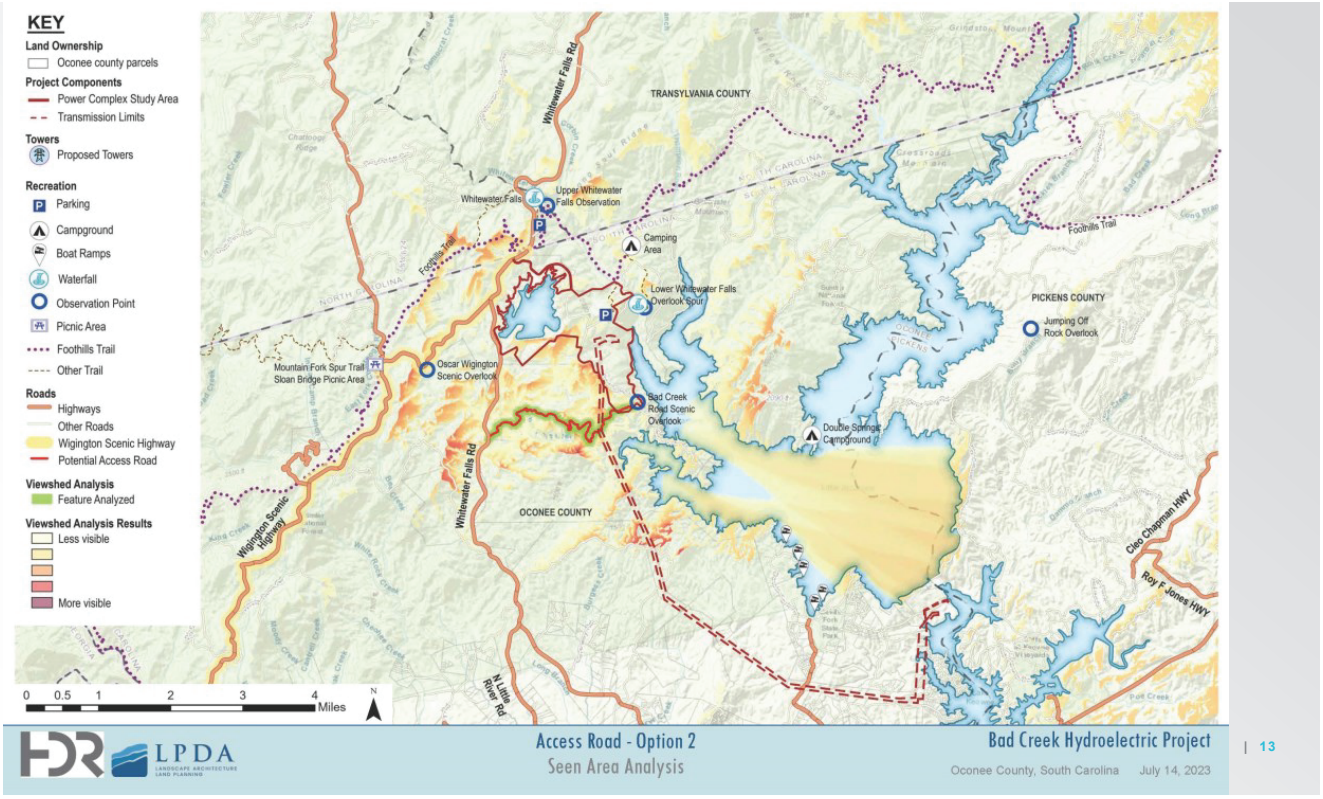
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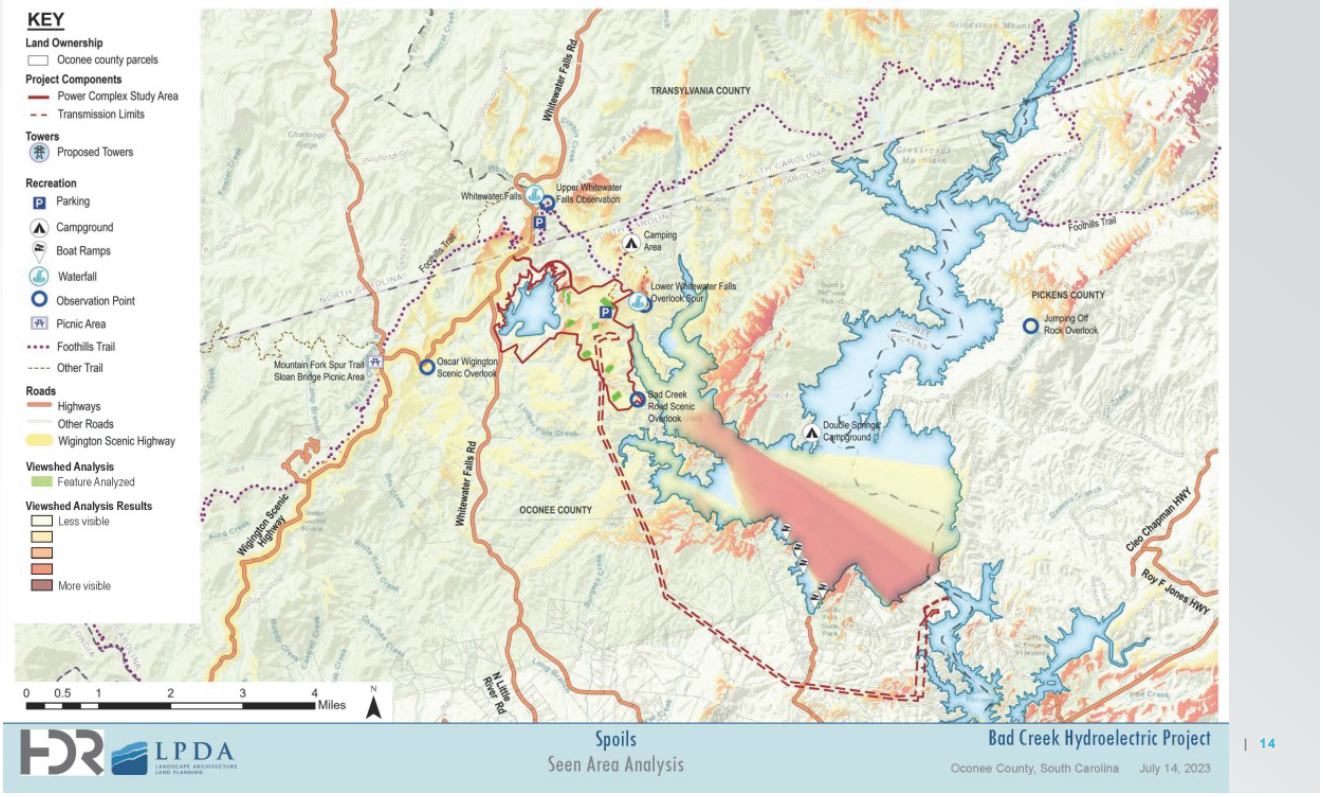
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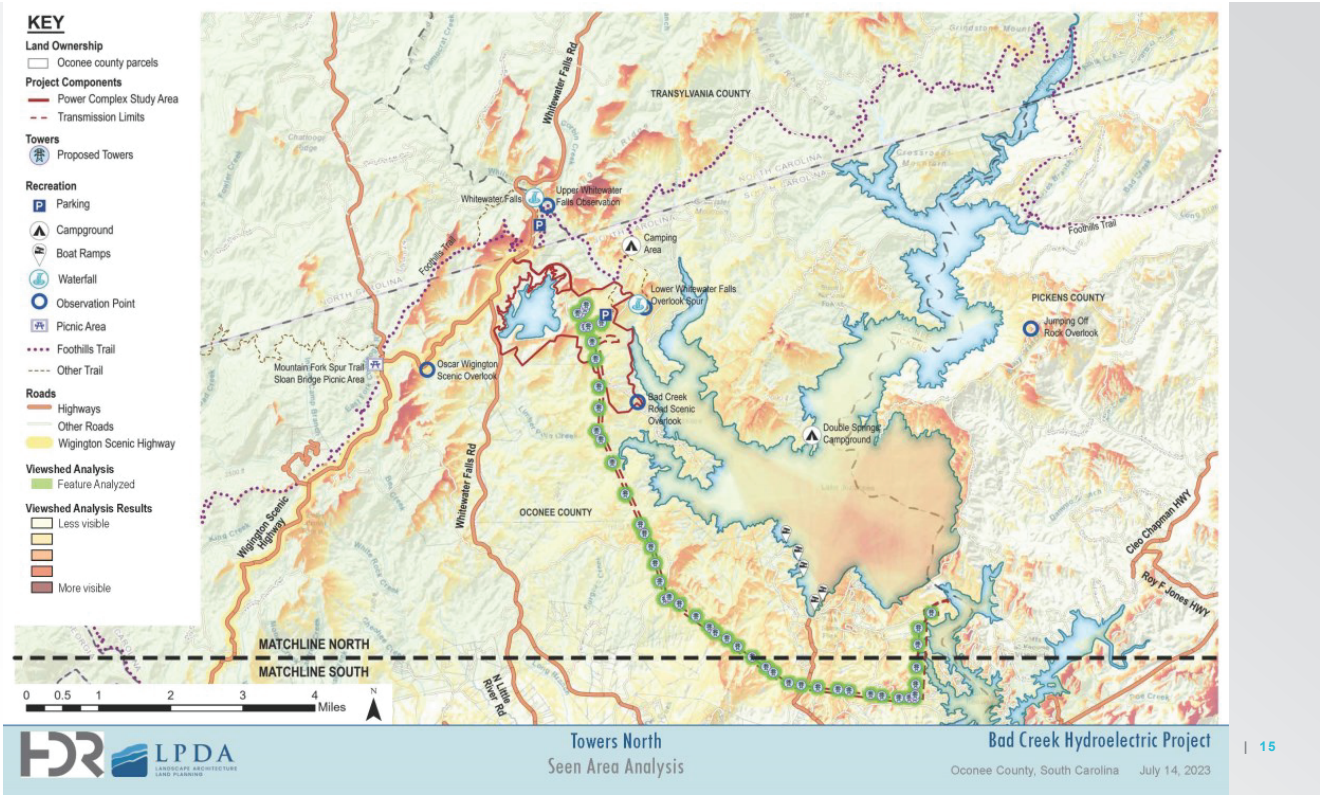
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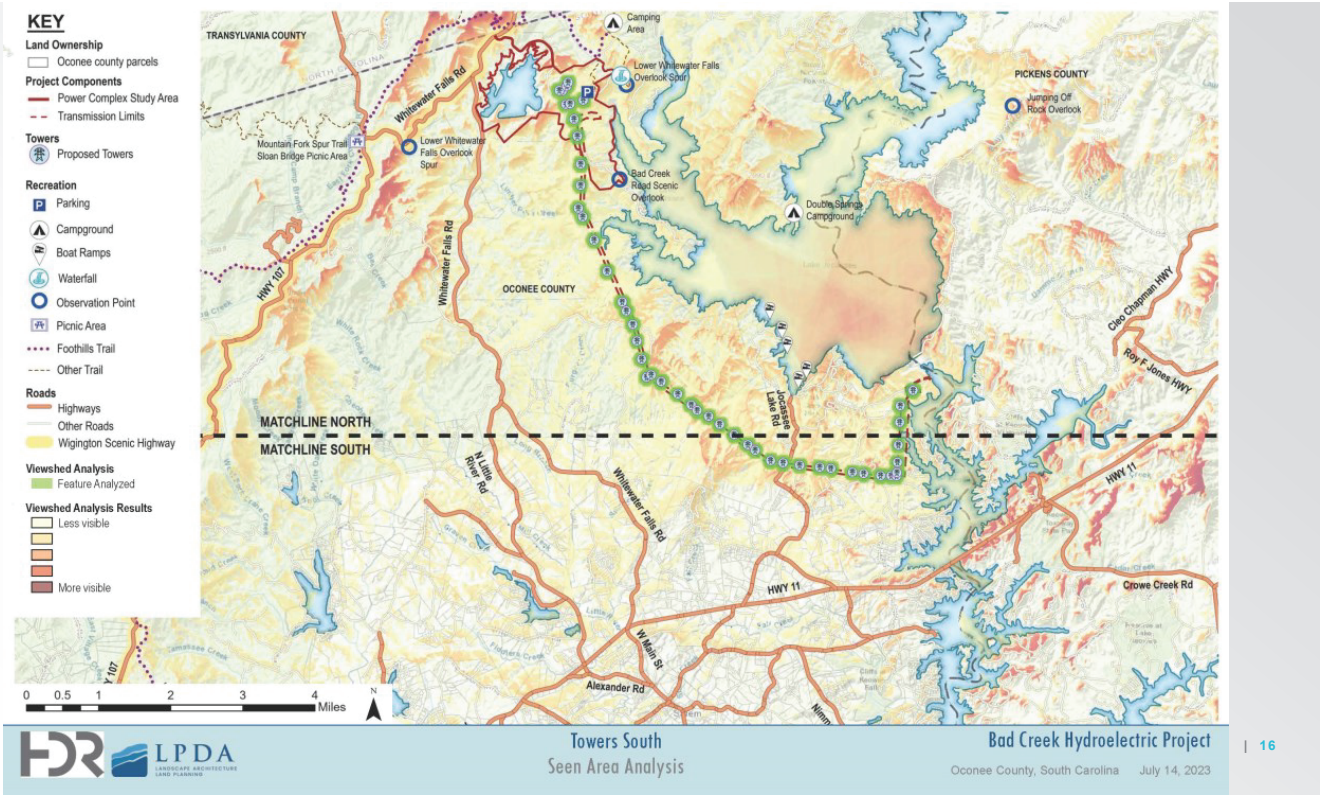
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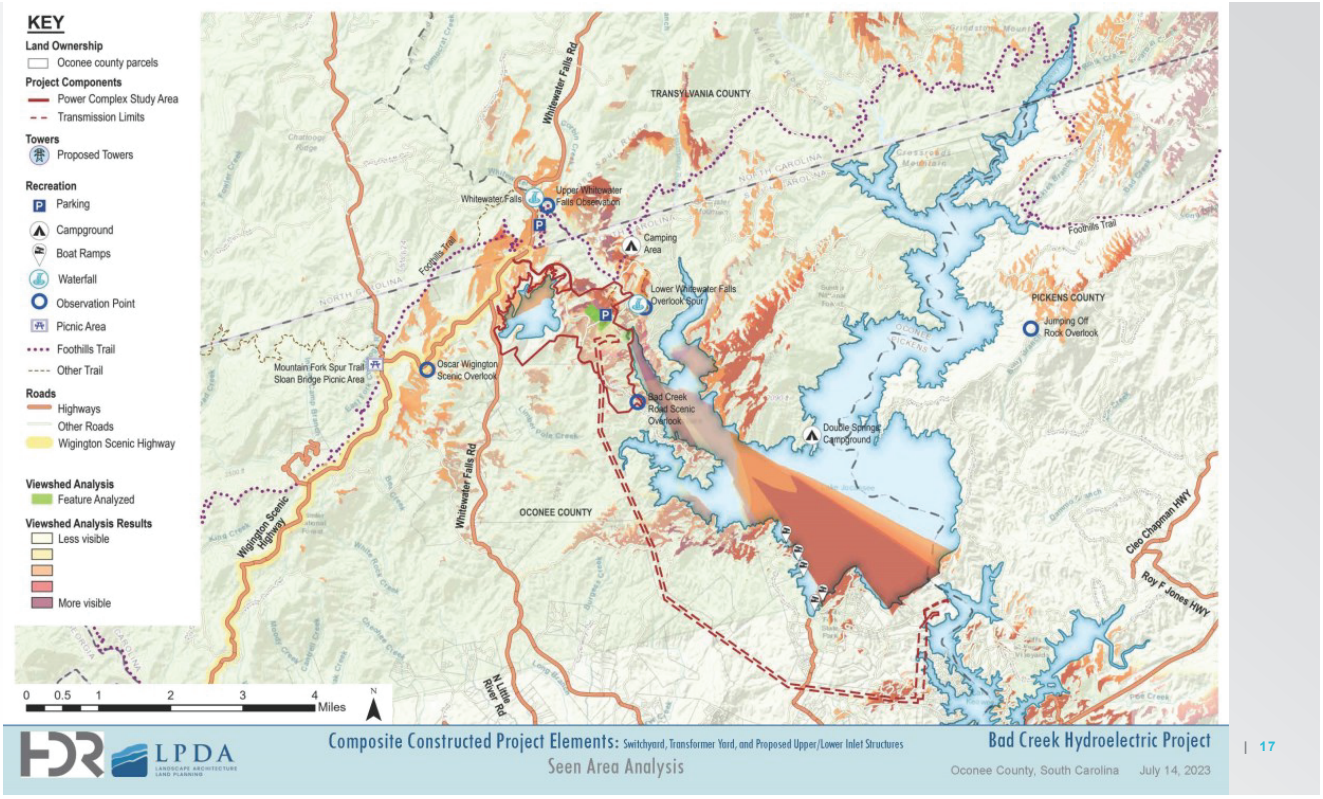
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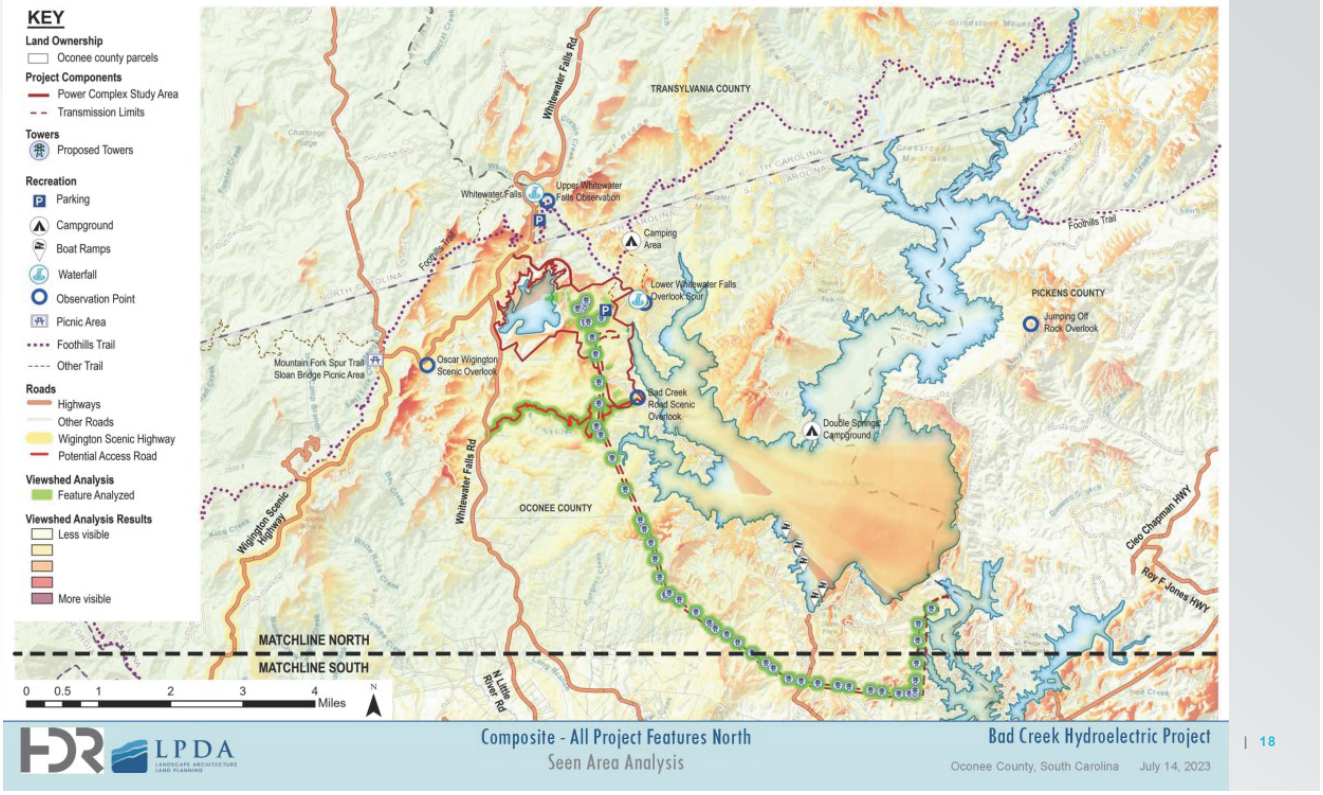
Other Roads
Wigington Scenic Highway
Viewshed Analysis
Feature Analyzed
Viewshed Analysis Results
Less visible
More visible
TRANSYLVANIA COUNTY
OCONEE COUNTY
PICKENS COUNTY
Whitewater Falls Rd
Whitewater Falls
Upper Whitewater Falls Observation
Camping Area
Lower Whitewater Falls Overlook Spur
Jumping Off Rock Overlook
Mountain Fork Spur Trail Sloan Bridge Picnic Area
Oscar Wigington Scenic Overlook
Bad Creek Road Scenic Overlook
Double Springs Campground
Foothills Trail
Wigington Scenic Highway
N. Little River Rd
Cleo Chapman HWY
Roy F. Jones HWY
0 0.5 1 2 3 4 Miles
N
Composite Constructed Project Elements: Switchyard, Transformer Yard, and Proposed Upper/Lower Inlet Structures
Seen Area Analysis
Bad Creek Hydroelectric Project
Oconee County, South Carolina July 14, 2023
17

17


KEY
Land Ownership
Oconee county parcels
Project Components
Power Complex Study Area
Transmission Limits
Towers
Proposed Towers
Recreation
Parking
Campground
Boat Ramps
Waterfall
Observation Point
Picnic Area
Foothills Trail
Other Trail
Roads
Highways
Other Roads
Wigington Scenic Highway
Potential Access Road
Viewshed Analysis
Feature Analyzed
Viewshed Analysis Results
Less visible
More visible
TRANSYLVANIA COUNTY
OCONEE COUNTY
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Whitewater Falls Rd
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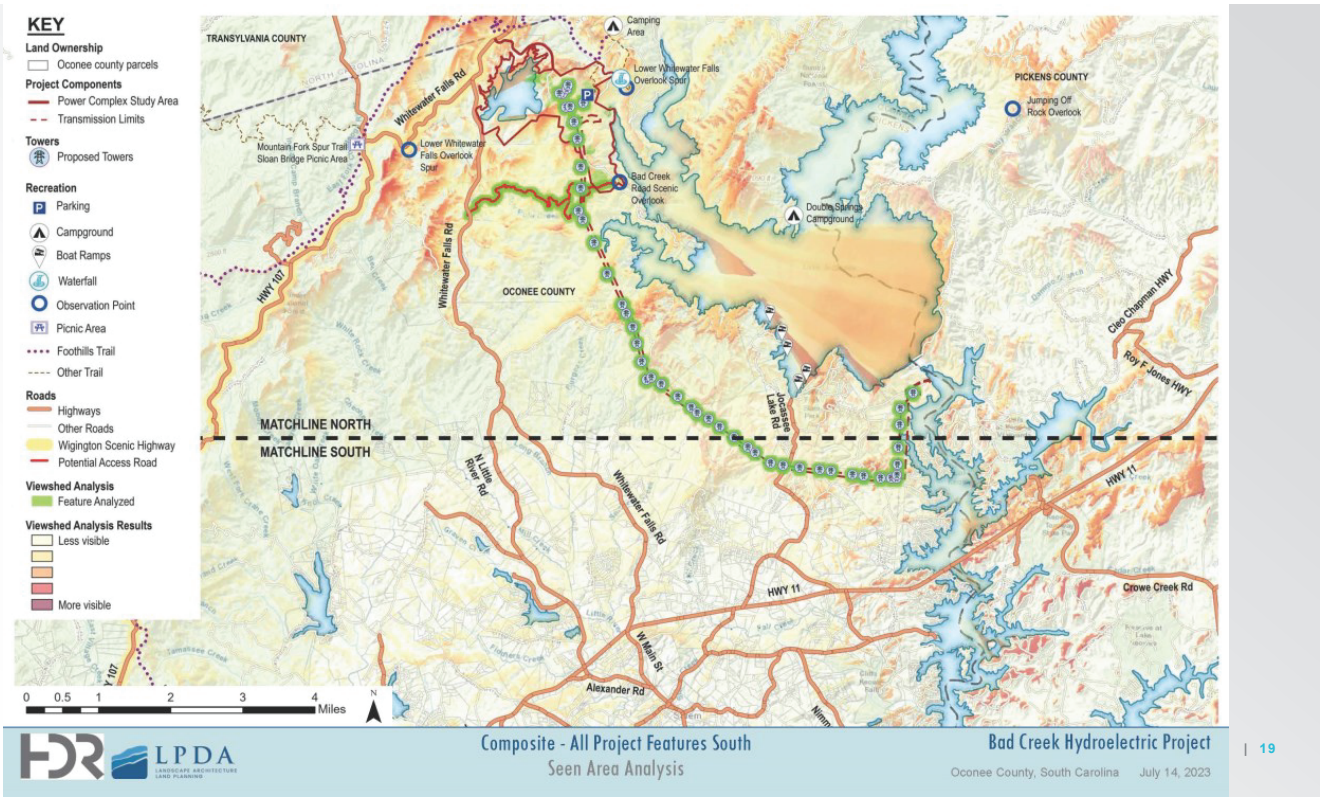
Double Springs Campground
Foothills Trail
Wigington Scenic Highway
N. Little River Rd
Cleo Chapman HWY
Roy F. Jones HWY
MATCHLINE NORTH
MATCHLINE SOUTH
0 0.5 1 2 3 4 Miles
N
Composite - All Project Features North
Seen Area Analysis
Bad Creek Hydroelectric Project
Oconee County, South Carolina July 14, 2023
18

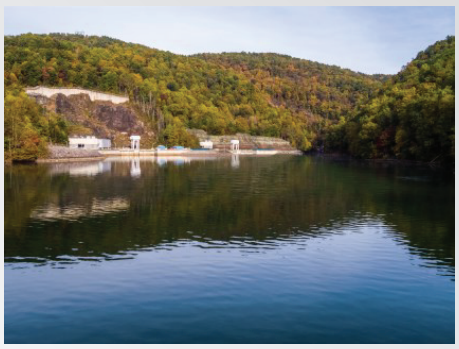
18




19

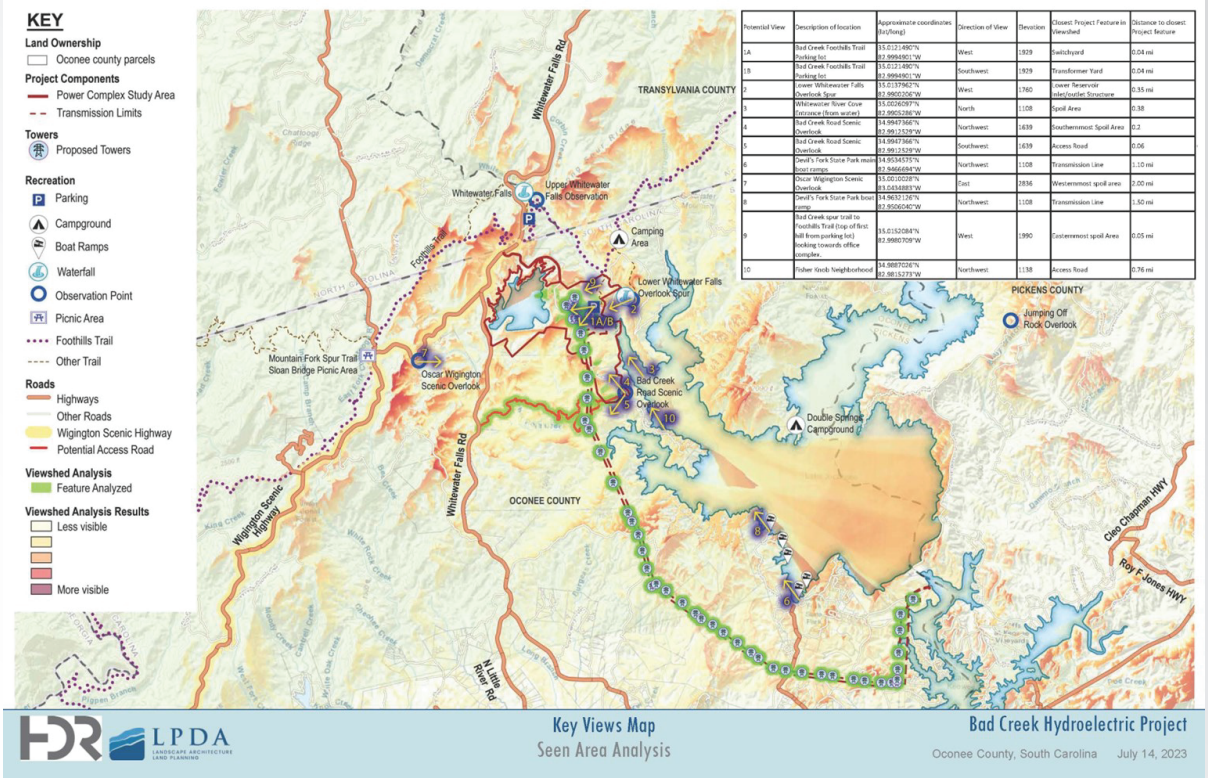
## Task 4 – Key Views Selection

"The objective will be to identify a set of Key Views (**up to four**) that adequately covers the range of visibility and potential scenic and visual impacts for the Project. Considerations that will be used in selecting specific Key Views **include viewing distance, to ensure adequate representation of potential foreground, middleground, and background views of the Project features; viewing direction; and the types of viewer groups** (typically including residents, recreational users and motorists) that might experience views of the Project facilities."





20




| Potential View | Description of location | Approximate coordinates (lat/long) | Direction of View | Elevation | Closest Project Feature in Viewshed | Distance to closest Project feature |
|---|---|---|---|---|---|---|
| 1A | Bad Creek Foothills Trail Parking lot | 35.0121490°N 82.9994901°W | West | 1929 | Switchyard | 0.04 mi |
| 1B | Bad Creek Foothills Trail Parking lot | 35.0121490°N 82.9994901°W | Southwest | 1929 | Transformer Yard | 0.04 mi |
| 2 | Lower Whitewater Falls Overlook Spur | 35.0137962°N 82.9900206°W | West | 1760 | Lower Reservoir Inlet/outlet Structure | 0.35 mi |
| 3 | Whitewater River Cove Entrance (from water) | 35.0026097°N 82.9905286°W | North | 1108 | Spoil Area | 0.38 |
| 4 | Bad Creek Road Scenic Overlook | 34.9947366°N 82.9912529°W | Northwest | 1639 | Southernmost Spoil Area | 0.2 |
| 5 | Bad Creek Road Scenic Overlook | 34.9947366°N 82.9912529°W | Southwest | 1639 | Access Road | 0.06 |
| 6 | Devil's Fork State Park main boat ramps | 34.9534575°N 82.9466694°W | Northwest | 1108 | Transmission Line | 1.10 mi |
| 7 | Oscar Wigington Scenic Overlook | 35.0010028°N 83.0434883°W | East | 2836 | Westernmost spoil area | 2.00 mi |
| 8 | Devil's Fork State Park boat ramp | 34.9632126°N 82.9506040°W | Northwest | 1108 | Transmission Line | 1.50 mi |
| 9 | Bad Creek spur trail to Foothills Trail (top of first hill from parking lot) looking towards office complex. | 35.0152084°N 82.9980709°W | West | 1990 | Easternmost spoil Area | 0.05 mi |
| 10 | Fisher Knob Neighborhood | 34.9887026°N 82.9815273°W | Northwest | 1138 | Access Road | 0.76 mi |

21

## Potential Key Views

| Potential View | Description of location | Approximate coordinates (lat/long) | Direction of View | Elevation | Closest Project Feature in Viewshed | Distance to closest Project feature (mi) |
|---|---|---|---|---|---|---|
| 1A | Bad Creek Foothills Trail Parking lot | 35.0121490°N 82.9994901°W | West | 1929 | Switchyard | 0.04 |
| 1B | Bad Creek Foothills Trail Parking lot | 35.0121490°N 82.9994901°W | Southwest | 1929 | Transformer Yard | 0.04 |
| 2 | Lower Whitewater Falls Overlook Spur | 35.0137962°N 82.9900206°W | West | 1760 | Lower Reservoir Inlet/outlet Structure | 0.35 |
| 3 | Whitewater River Cove Entrance (from water) | 35.0026097°N 82.9905286°W | North | 1108 | Spoil Area | 0.38 |
| 4 | Bad Creek Road Scenic Overlook | 34.9947366°N 82.9912529°W | Northwest | 1639 | Southernmost Spoil Area | 0.20 |
| 5 | Bad Creek Road Scenic Overlook | 34.9947366°N 82.9912529°W | Southwest | 1639 | Access Road | 0.06 |
| 6 | Devil's Fork State Park main boat ramps | 34.9534575°N 82.9466694°W | Northwest | 1108 | Transmission Line | 1.10 |
| 7 | Oscar Wigington Scenic Overlook | 35.0010028°N 83.0434883°W | East | 2836 | Westernmost spoil area | 2.00 |
| 8 | Devil's Fork State Park boat ramp | 34.9632126°N 82.9506040°W | Northwest | 1108 | Transmission Line | 1.50 |
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| 10 | Fisher Knob Neighborhood | 34.9887026°N 82.9815273°W | Northwest | 1138 | Access Road | 0.76 |



22

## Key Views: Next Steps

- Task 3 – Field Investigation (November)
  - Capture views
  - Finalize Key Views (virtual meeting)
- Task 5 – Existing Visual Quality Assessment
- Task 6 – Visual Analysis
  - Develop visualizations
- Task 7 – Visual Management Consistency Review
- Task 8 – Mitigation Assessment
- Task 9 – Conceptual Design of Bad Creek II Complex
- Task 10 – Report (3rd quarter, 2024)



23

## Recreation Resources Study



24

## Recreation Resources Study - Task 1: Foothills Trail Corridor Recreation Use and Needs

*Recreation Site Inventory*

The inventory was completed at the following sites on May 17, 2023:

- Sassafras Mountain Trail Access
- Chimney Top Gap Trail Access
- Laurel Valley Trail Access
- Lower Whitewater Falls Overlook
- Bad Creek Trail Access
- Coon Branch Spur Trail
- Musterground Road

The inventory was completed at the following sites on May 28, 2023:

- Laurel Fork Creek Falls Spur Trail Access
- Toxaway River Trail access
- Canebrake Trail Access
- Horsepasture River Trail Access



25

## Recreation Resources Study - Task 1: Foothills Trail Corridor Recreation Use and Needs

*Traffic and Trail Counts*

- Traffic and trail counters were installed at access areas in late February/early March 2023. The traffic counter at Musterground Road was installed in mid-September 2022.
  - Due to significant counter malfunctions, data was not collected at Musterground Road over a long period of time in fall 2022. Kleinschmidt will reinstall the traffic counter at Musterground Road by September 15, 2023, to ensure a complete dataset is collected between September 15 and January 15.



26

## Recreation Resources Study - Task 1: Foothills Trail Corridor Recreation Use and Needs

*User Surveys*

- In-person user surveys began in March 2023 at the Toxaway River Trail Access, the Horsepasture River Trail Access, the Bad Creek Hydro Trail Access, and the Laurel Valley Trail Access.

**Number of surveys completed by recreation site and using the QR code through July 5, 2023**

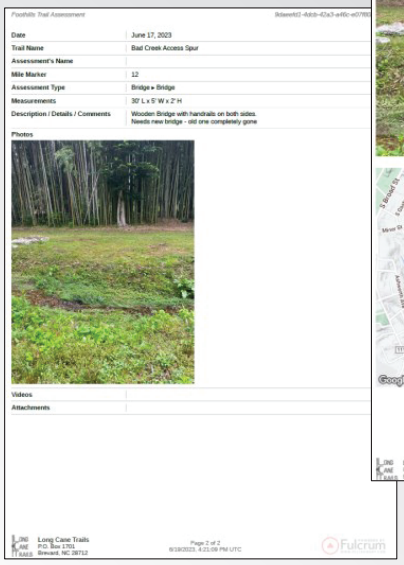
| Site Name | # Surveys Completed |
|---|---|
| Bad Creek Hydro Trail Access | 44 |
| Horsepasture River Trail Access | 13 |
| Laurel Valley Trail Access | 31 |
| Toxaway River Trail Access | 26 |
| QR Code | 41 |
| Total | 155 |

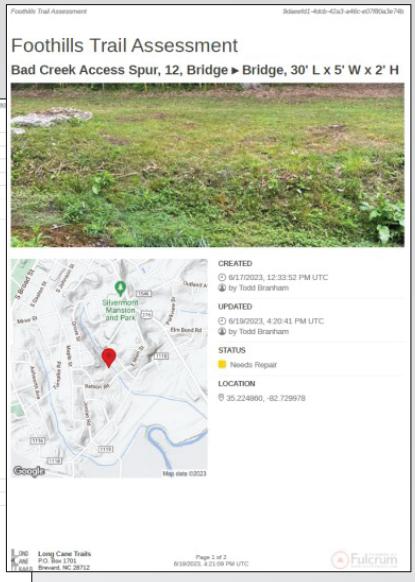


27

## Recreation Resources Study - Task 2: Foothills Trail Corridor Conditions Assessment

- Todd Branham (Long Cane Trails) began hiking the 43 miles of trail in late June and is collecting information using the Fulcrum app.






28

## Recreation Resources Study - Task 3: Whitewater Cove Existing Recreational Use Evaluation

**Drone Flight Summary at Whitewater River Cove**

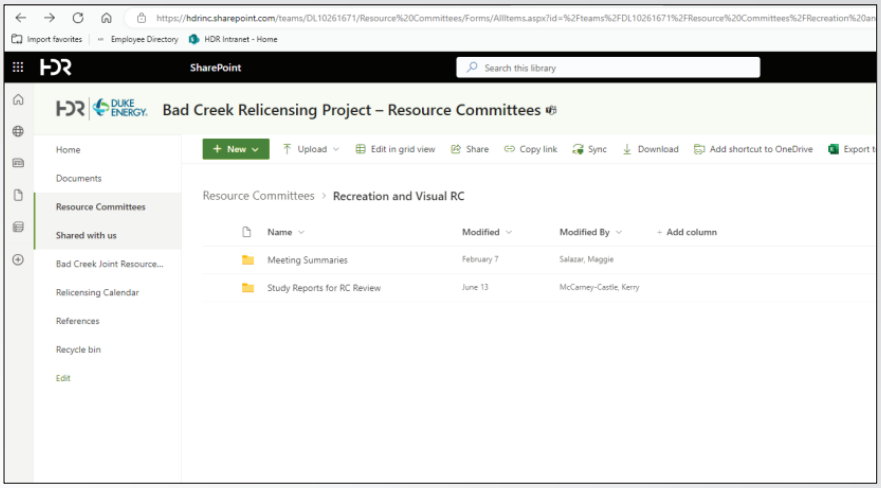
| Date | # of Images Collected | ~ High Temp (°F) | Notes |
|---|---|---|---|
| 28-May | 49 | 63 °F | |
| 31-May | 40 | 75 °F | |
| 2-Jun | 93 | 86 °F | |
| 3-Jun | 69 | 88 °F | |
| 13-Jun | 49 | 79 °F | |
| 24-Jun | 105 | 82 °F | |
| 28-Jun | 80 | 89 °F | |
| 1-Jul | 102 | 93 °F | |
| 4-Jul | 105 | 89 °F | |
| 14-Jul | 74 | 92 °F | Due to lightning, flights ended at 2:30 |
| 15-Jul | 83 | 95 °F | Due to storms, flights ended at 3:00 |



29

## Closing Remarks

- Action item review
- Meeting summary






30


31

| | |
|---|---|
| **From:** | Crutchfield Jr., John U |
| **To:** | Amy Breedlove; Andrew Gleason; Andy Douglas; Chris Starker; Dale Wilde; RankinD; Elizabeth Miller; Kelly Kirven; Ken Forrester; quattrol; Salazar, Maggie; Amedee, Morgan D.; cloningerp@dnr.sc.gov; SelfR; Rowdy Harris; Stuart, Alan Witten; suewilliams130@gmail.com; William T. Wood; Willie Simmons; Huff, Jen; phil.mitchell@gmail.com; Bill Ranson-Retired |
| **Cc:** | Kulpa, Sarah; McCarney-Castle, Kerry; Lineberger, Jeff |
| **Subject:** | Bad Creek Relicensing - ILP Study Plans and Reports Schedule Update |
| **Date:** | Tuesday, October 31, 2023 12:04:36 PM |
| **Importance:** | High |



Dear Bad Creek Relicensing Recreational Resources Committee:

I hope this email finds you well and that you have been able to get out and enjoy the fantastic weather we are having this fall. It is hard to believe it is nearly November, and as we all know the days start slipping by quickly as the years wraps up.

Duke Energy and our consultants have been working diligently to complete the first year ILP studies and advance the study reports. I wanted to take this opportunity to provide you with a preview of Resource Committee (RC) reviews that will be requested over the next month and the upcoming FERC ILP process milestones.

1. **Initial Study Report (ISR)** – We expect to file the ISR on or just before the FERC ILP deadline of January 4, 2024.

2. **ISR Meeting** – The ISR meeting is to be held within 15 days of the ISR filing. Duke Energy is coordinating availability with FERC staff, and we are presently planning to conduct the ISR Meeting at the Duke Energy Wenwood Operations Center (Greenville, SC) on Wednesday, January 17th. Please note this meeting date is subject to change depending on FERC staff availability and if it shifts to another date in January, we will let you know so you can plan accordingly. Your attendance at this meeting is greatly appreciated and encouraged, but a Teams meeting will be made available for participants who are unable to travel.

3. **Recreational Resources Study Reports**

   a. **Task 1** study report "Foothills Trail Corridor Recreation Use and Needs Report".
      i. We presently expect to include a status update in the ISR and distribute the draft report to the RC in 2024.
   b. **Task 2** study report "Foothills Trail Corridor Conditions Assessment".
      i. Draft report will be submitted to the RC for a 30-day review by November 13th.
   c. **Task 3** study report "Whitewater River cove Existing Recreational Use.
      i. Draft report will be submitted to the RC for a 30-day review by November

13th.

d. **Task 4** study report "Whitewater River Cove Recreational Public Safety Evaluation".
    i. The draft report will be distributed to the RC in 2024.

If you have any questions at all about any of the activities described above or the process in general, please do not hesitate to reach out to me or Alan Stuart directly.

Thank you for your continued participation in this process, and on behalf of Duke Energy, we look forward to a productive quarter and advancing the Bad Creek Project relicensing in collaboration with this group and other stakeholders.

Regards,

***John Crutchfield***
Project Manager II
Water Strategy, Hydro Licensing & Lake Services
Regulated & Renewable Energy
Duke Energy
525 South Tryon Street, DEP-35B | Charlotte, NC 28202
Office 980-373-2288| Cell 919-757-1095

| | |
|---|---|
| **From:** | Crutchfield Jr., John U |
| **To:** | Amy Breedlove; Andrew Gleason; Andy Douglas; Chris Starker; Dale Wilde; RankinD; Elizabeth Miller; Kelly Kirven; Ken Forrester; quattrol; Salazar, Maggie; Amedee, Morgan D.; cloningerp@dnr.sc.gov; SelfR; Rowdy Harris; Stuart, Alan Witten; suewilliams130@gmail.com; William T. Wood; Willie Simmons; Huff, Jen; phil.mitchell@gmail.com; Bill Ranson-Retired |
| **Cc:** | Kulpa, Sarah; McCarney-Castle, Kerry |
| **Subject:** | Bad Creek Relicensing - Foothills Trail Corridor Conditions Assessment and Whitewater River Cove Recreation Use Evaluation Draft Reports (READY FOR REVIEW) |
| **Date:** | Monday, November 13, 2023 4:42:28 PM |
| **Attachments:** | image001.png<br>image002.png |
| **Importance:** | High |



Dear Bad Creek Relicensing Recreational Resources Committee:

Duke Energy is pleased to distribute two reports for your review:

1. *Foothills Trail Corridor Conditions Assessment Report.* This draft report includes methods and results of the Foothills Trail corridor conditions assessment (Task 2) and is available on the Bad Creek Relicensing SharePoint site at the following link: Task 2 - Trail Conditions Assessment Draft Report.

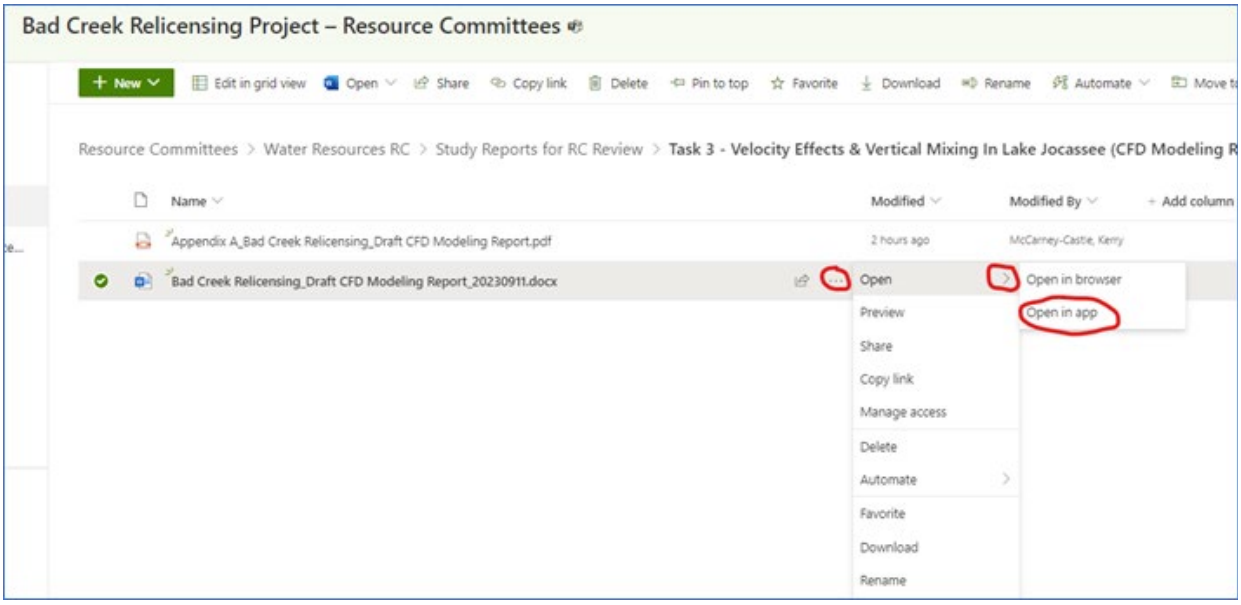
2. *Whitewater River Cove Recreational Use Evaluation*. This draft report includes methods and results from the recreational use evaluation in Whitewater River cove (Task 3) and is available on the Bad Creek Relicensing SharePoint site at the following link: Task 3 - Whitewater River Cove Recreational Use Evaluation Draft Report.

Duke Energy is requesting a 30-day review period, therefore, please submit all comments by **December 11th**. A confirmation email is kindly requested upon review completion (email me at John.Crutchfield@duke-energy.com).

**Important – Please Read!**

- As discussed in the kick-off meeting (July 2022), Duke Energy would like to make relicensing deliverables available on a shared platform (i.e., SharePoint) so all stakeholders can access, review, and comment; therefore, we request all comments be made in the SharePoint Word document using tracked changes. This will eliminate version control issues and result in a consolidated document for comment response.
- We strongly recommend opening the document in Word; otherwise the formatting will look distorted. The simplest way to do this is to click on the three dots to the right of the document (example shown below), choose "Open", then choose "Open in app". This will open the document in Word and you'll have the functionality you are accustomed to. Your changes will be saved automatically as you review. Please feel free to reach out to @McCarney-Castle, Kerry for SharePoint assistance.

  (Note: If you are new to SharePoint, a very brief tutorial with screenshots is available on the home page of the Resource Committees tab called **"**Editing a Document in SharePoint". This is the same tutorial that was presented during the kick-off meeting. [*The tutorial provides an alternative way to open the document in Word – either technique works!])*




If you have any questions, please contact Alan Stuart or me.

Regards,

***John Crutchfield***
Project Manager II
Water Strategy, Hydro Licensing & Lake Services
Regulated & Renewable Energy
Duke Energy
525 South Tryon Street, DEP-35B | Charlotte, NC 28202
Office 980-373-2288| Cell 919-757-1095

**From:** Crutchfield Jr., John U
**To:** Kelly Kirven; Kulpa, Sarah; McCarney-Castle, Kerry
**Cc:** Stuart, Alan Witten
**Subject:** FW: [EXTERNAL] Draft reports review
**Date:** Tuesday, November 14, 2023 9:36:50 AM

---



FYI, for consultation record.

John

-----Original Message-----
From: Sue Williams <suewilliams130@gmail.com>
Sent: Tuesday, November 14, 2023 9:30 AM
To: Crutchfield Jr., John U <John.Crutchfield@duke-energy.com>
Subject: [EXTERNAL] Draft reports review



I have reviewed the two draft reports submitted to the Recreation Resources Committee. AQD has no comments to add.

Sue Williams
Six Mile, SC

| | |
|---|---|
| **From:** | Crutchfield Jr., John U |
| **To:** | Amy Breedlove; Andrew Gleason; Andy Douglas; Chris Starker; Dale Wilde; RankinD; Elizabeth Miller; Kelly Kirven; Ken Forrester; quattrol; Salazar, Maggie; Amedee, Morgan D.; cloningerp@dnr.sc.gov; SelfR; Rowdy Harris; Stuart, Alan Witten; suewilliams130@gmail.com; William T. Wood; Willie Simmons; Huff, Jen; phil.mitchell@gmail.com; Bill Ranson-Retired |
| **Cc:** | Kulpa, Sarah; McCarney-Castle, Kerry |
| **Subject:** | RE: Bad Creek Relicensing - Foothills Trail Corridor Conditions Assessment and Whitewater River Cove Recreation Use Evaluation Draft Reports (READY FOR REVIEW) PLEASE NOTE UPDATE |
| **Date:** | Thursday, November 16, 2023 10:04:34 AM |
| **Attachments:** | image002.png<br>image003.png |
| **Importance:** | High |



Dear Bad Creek Relicensing Recreational Resources Committee:

Duke Energy has become aware of an issue with the draft Foothills Trail Corridor Conditions Assessment Report. There is a discrepancy in the report table and figures not matching up.

Please note we will temporarily suspend access to the draft report until the issue is resolved. We will notify the Resource Committee when the corrected draft report will be available for review on the link provided below.

We apologize for this discrepancy and thank you for your patience in getting this resolved.

Regards,

John Crutchfield

---

**From:** Crutchfield Jr., John U
**Sent:** Monday, November 13, 2023 4:42 PM
**To:** Amy Breedlove <BreedloveA@dnr.sc.gov>; Andrew Gleason <andrewandwilla@hotmail.com>; Andy Douglas <adoug41@att.net>; Chris Starker <cstarker@upstateforever.org>; Dale Wilde <dwilde@keoweefolks.org>; Dan Rankin <RankinD@dnr.sc.gov>; Elizabeth Miller <MillerE@dnr.sc.gov>; Kelly Kirven <Kelly.Kirven@KleinschmidtGroup.com>; Ken Forrester <forresterk@dnr.sc.gov>; Lynn Quattro <quattrol@dnr.sc.gov>; Maggie Salazar <maggie.salazar@hdrinc.com>; Morgan Amedee <amedeemd@dhec.sc.gov>; Pat Cloninger <cloningerp@dnr.sc.gov>; Ross Self <SelfR@dnr.sc.gov>; Rowdy Harris <charris@scprt.com>; Stuart, Alan Witten <Alan.Stuart@duke-energy.com>; Sue Williams <suewilliams130@gmail.com>; William Wood <woodw@dnr.sc.gov>; Willie Simmons <simmonsw@dnr.sc.gov>; 'Huff, Jen' <Jen.Huff@hdrinc.com>; 'phil.mitchell@gmail.com' <phil.mitchell@gmail.com>; Bill Ranson <bill.ranson@retiree.furman.edu>
**Cc:** Sarah Kulpa <sarah.kulpa@hdrinc.com>; Kerry McCarney-Castle <kerry.mccarney-castle@hdrinc.com>
**Subject:** Bad Creek Relicensing - Foothills Trail Corridor Conditions Assessment and Whitewater River Cove Recreation Use Evaluation Draft Reports (READY FOR REVIEW)
**Importance:** High

Dear Bad Creek Relicensing Recreational Resources Committee:

Duke Energy is pleased to distribute two reports for your review:

1. *Foothills Trail Corridor Conditions Assessment Report.* This draft report includes methods and results of the Foothills Trail corridor conditions assessment (Task 2) and is available on the Bad Creek Relicensing

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Duke Energy is requesting a 30-day review period, therefore, please submit all comments by **December 11th**. A confirmation email is kindly requested upon review completion (email me at John.Crutchfield@duke-energy.com).

**Important – Please Read!**

- As discussed in the kick-off meeting (July 2022), Duke Energy would like to make relicensing deliverables available on a shared platform (i.e., SharePoint) so all stakeholders can access, review, and comment; therefore, we request all comments be made in the SharePoint Word document using tracked changes. This will eliminate version control issues and result in a consolidated document for comment response.
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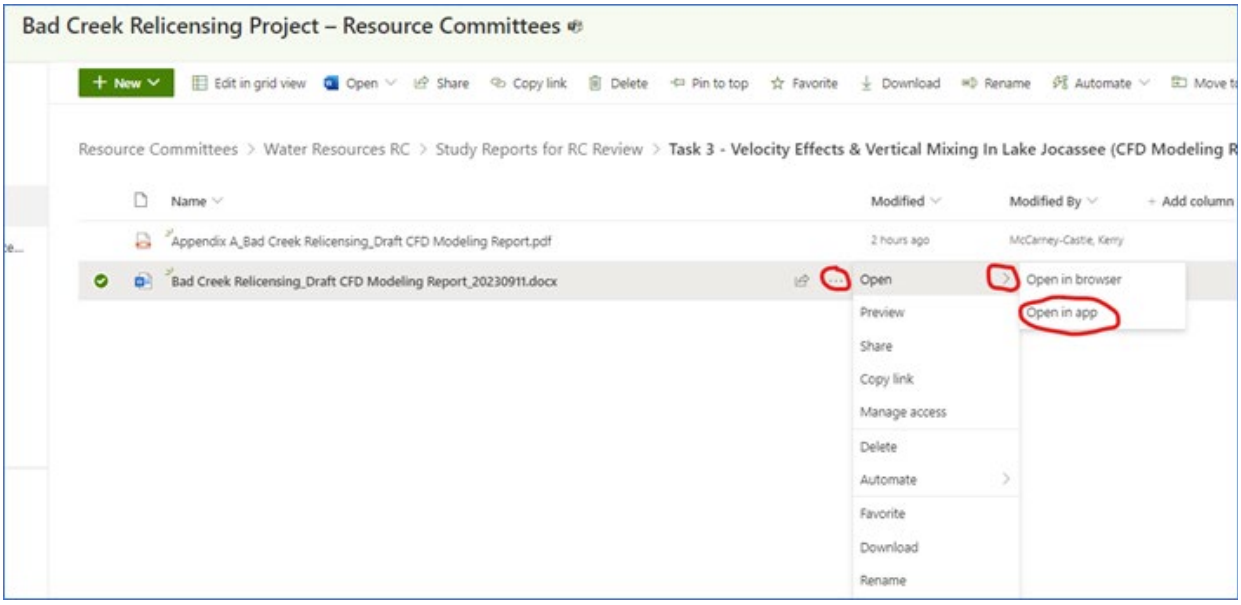
  (Note: If you are new to SharePoint, a very brief tutorial with screenshots is available on the home page of the Resource Committees tab called **"**Editing a Document in SharePoint". This is the same tutorial that was presented during the kick-off meeting. [*The tutorial provides an alternative way to open the document in Word – either technique works!])*




If you have any questions, please contact Alan Stuart or me.

Regards,

***John Crutchfield***
Project Manager II

Water Strategy, Hydro Licensing & Lake Services
Regulated & Renewable Energy
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525 South Tryon Street, DEP-35B | Charlotte, NC 28202
Office 980-373-2288| Cell 919-757-1095

| | |
|---|---|
| **From:** | Crutchfield Jr., John U |
| **To:** | Amy Breedlove; Andrew Gleason; Andy Douglas; Chris Starker; Dale Wilde; RankinD; Elizabeth Miller; Kelly Kirven; Ken Forrester; quattrol; Salazar, Maggie; Amedee, Morgan D.; Pat Cloninger; SelfR; Rowdy Harris; Stuart, Alan Witten; suewilliams130@gmail.com; William T. Wood; Willie Simmons; Huff, Jen; phil.mitchell@gmail.com; Bill Ranson-Retired |
| **Cc:** | Kulpa, Sarah; McCarney-Castle, Kerry |
| **Subject:** | RE: Bad Creek Relicensing - Foothills Trail Corridor Conditions Assessment and Whitewater River Cove Recreation Use Evaluation Draft Reports (READY FOR REVIEW - REVISED) |
| **Date:** | Tuesday, November 21, 2023 2:36:43 PM |
| **Attachments:** | image001.png<br>image002.png |
| **Importance:** | High |



Dear Bad Creek Relicensing Recreation Resources Committee:

The noted discrepancy in the draft Foothills Trail Corridor Conditions Assessment Report tables and figures has been resolved, and the revised report has been re-posted to the SharePoint site for your review (link provided below).

Task 2 - Trail Conditions Assessment Draft Report

Duke Energy is extending the review period for Resource Committee members to provide comments on the draft report until **Monday, December 18** to compensate for the missed review days while the draft report was corrected.

If you have any questions, please contact Alan Stuart or me.

Regards,

John Crutchfield

---

**From:** Crutchfield Jr., John U
**Sent:** Thursday, November 16, 2023 10:04 AM
**To:** Amy Breedlove <BreedloveA@dnr.sc.gov>; Andrew Gleason <andrewandwilla@hotmail.com>; Andy Douglas <adoug41@att.net>; Chris Starker <cstarker@upstateforever.org>; Dale Wilde <dwilde@keoweefolks.org>; Dan Rankin <RankinD@dnr.sc.gov>; Elizabeth Miller <MillerE@dnr.sc.gov>; Kelly Kirven <Kelly.Kirven@KleinschmidtGroup.com>; Ken Forrester <forresterk@dnr.sc.gov>; Lynn Quattro <quattrol@dnr.sc.gov>; Maggie Salazar <maggie.salazar@hdrinc.com>; Morgan Amedee <amedeemd@dhec.sc.gov>; Pat Cloninger <cloningerp@dnr.sc.gov>; Ross Self <SelfR@dnr.sc.gov>; Rowdy Harris <charris@scprt.com>; Stuart, Alan Witten <Alan.Stuart@duke-energy.com>; Sue Williams <suewilliams130@gmail.com>; William Wood <woodw@dnr.sc.gov>; Willie Simmons <simmonsw@dnr.sc.gov>; Huff, Jen <Jen.Huff@hdrinc.com>; phil.mitchell@gmail.com; Bill Ranson <bill.ranson@retiree.furman.edu>
**Cc:** Sarah Kulpa <sarah.kulpa@hdrinc.com>; Kerry McCarney-Castle <kerry.mccarney-castle@hdrinc.com>
**Subject:** RE: Bad Creek Relicensing - Foothills Trail Corridor Conditions Assessment and Whitewater River Cove Recreation Use Evaluation Draft Reports (READY FOR REVIEW) PLEASE NOTE UPDATE
**Importance:** High

Dear Bad Creek Relicensing Recreational Resources Committee:

Duke Energy has become aware of an issue with the draft Foothills Trail Corridor Conditions Assessment Report. There is a discrepancy in the report table and figures not matching up.

Please note we will temporarily suspend access to the draft report until the issue is resolved. We will notify the Resource Committee when the corrected draft report will be available for review on the link provided below.

We apologize for this discrepancy and thank you for your patience in getting this resolved.

Regards,

John Crutchfield

---

**From:** Crutchfield Jr., John U
**Sent:** Monday, November 13, 2023 4:42 PM
**To:** Amy Breedlove <BreedloveA@dnr.sc.gov>; Andrew Gleason <andrewandwilla@hotmail.com>; Andy Douglas <adoug41@att.net>; Chris Starker <cstarker@upstateforever.org>; Dale Wilde <dwilde@keoweefolks.org>; Dan Rankin <RankinD@dnr.sc.gov>; Elizabeth Miller <MillerE@dnr.sc.gov>; Kelly Kirven <Kelly.Kirven@KleinschmidtGroup.com>; Ken Forrester <forresterk@dnr.sc.gov>; Lynn Quattro <quattrol@dnr.sc.gov>; Maggie Salazar <maggie.salazar@hdrinc.com>; Morgan Amedee <amedeemd@dhec.sc.gov>; Pat Cloninger <cloningerp@dnr.sc.gov>; Ross Self <SelfR@dnr.sc.gov>; Rowdy Harris <charris@scprt.com>; Stuart, Alan Witten <Alan.Stuart@duke-energy.com>; Sue Williams <suewilliams130@gmail.com>; William Wood <woodw@dnr.sc.gov>; Willie Simmons <simmonsw@dnr.sc.gov>; 'Huff, Jen' <Jen.Huff@hdrinc.com>; 'phil.mitchell@gmail.com' <phil.mitchell@gmail.com>; Bill Ranson <bill.ranson@retiree.furman.edu>
**Cc:** Sarah Kulpa <sarah.kulpa@hdrinc.com>; Kerry McCarney-Castle <kerry.mccarney-castle@hdrinc.com>
**Subject:** Bad Creek Relicensing - Foothills Trail Corridor Conditions Assessment and Whitewater River Cove Recreation Use Evaluation Draft Reports (READY FOR REVIEW)
**Importance:** High

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Duke Energy is requesting a 30-day review period, therefore, please submit all comments by **December 11th**. A confirmation email is kindly requested upon review completion (email me at John.Crutchfield@duke-energy.com).

**Important – Please Read!**

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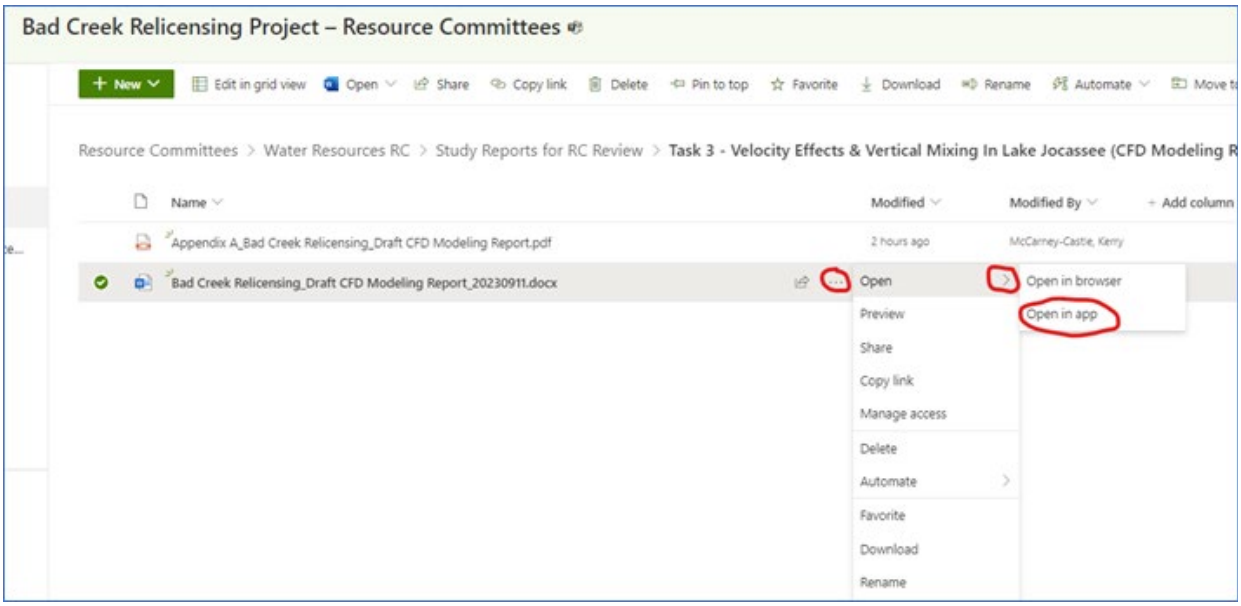


If you have any questions, please contact Alan Stuart or me.

Regards,

***John Crutchfield***
Project Manager II
Water Strategy, Hydro Licensing & Lake Services
Regulated & Renewable Energy
Duke Energy
525 South Tryon Street, DEP-35B | Charlotte, NC 28202
Office 980-373-2288| Cell 919-757-1095

**From:** Crutchfield Jr., John U
**To:** Stuart, Alan Witten; Kelly Kirven; Kulpa, Sarah; McCarney-Castle, Kerry
**Subject:** Fwd: [EXTERNAL] Revised Foothills Trail Conditions Report
**Date:** Friday, November 24, 2023 1:06:32 PM

---



FYI.

Get Outlook for iOS

---

**From:** Sue Williams <suewilliams130@gmail.com>
**Sent:** Friday, November 24, 2023 12:48 PM
**To:** Crutchfield Jr., John U <John.Crutchfield@duke-energy.com>
**Subject:** [EXTERNAL] Revised Foothills Trail Conditions Report



John,

I have read the revised report and AQD has no comments to add.

Sue Williams
Six Mile, SC

| | |
|---|---|
| **From:** | Sue Williams |
| **To:** | Crutchfield Jr., John U |
| **Cc:** | Amy Breedlove; Andrew Gleason; Andy Douglas; Chris Starker; Dale Wilde; RankinD; Elizabeth Miller; Kelly Kirven; Ken Forrester; quattrol; Salazar, Maggie; Amedee, Morgan D.; Pat Cloninger; SelfR; Rowdy Harris; Stuart, Alan Witten; William T. Wood; Willie Simmons; Huff, Jen; phil.mitchell@gmail.com; Bill Ranson-Retired; Kulpa, Sarah; McCarney-Castle, Kerry |
| **Subject:** | Re: Bad Creek Relicensing - Foothills Trail Corridor Conditions Assessment and Whitewater River Cove Recreation Use Evaluation Draft Reports (READY FOR REVIEW) |
| **Date:** | Monday, December 4, 2023 11:12:47 AM |



AQD has no comments on the Whitewater River Cove Use Evaluation Draft report.

Sue Williams
Six Mile, SC

> On Dec 4, 2023, at 06:24, Crutchfield Jr., John U <John.Crutchfield@duke-energy.com> wrote:
>
> Dear Bad Creek Relicensing Recreational Resources Committee:
>
> Just a reminder that comments on the Whitewater River Cove Recreation Use Evaluation Draft are due **December 11th**.
>
> Thanks,
>
> John
>
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> **Sent:** Monday, November 13, 2023 4:42 PM
> **To:** Amy Breedlove <BreedloveA@dnr.sc.gov>; Andrew Gleason <andrewandwilla@hotmail.com>; Andy Douglas <adoug41@att.net>; Chris Starker <cstarker@upstateforever.org>; Dale Wilde <dwilde@keoweefolks.org>; Dan Rankin <RankinD@dnr.sc.gov>; Elizabeth Miller <MillerE@dnr.sc.gov>; Kelly Kirven <Kelly.Kirven@KleinschmidtGroup.com>; Ken Forrester <forresterk@dnr.sc.gov>; Lynn Quattro <quattrol@dnr.sc.gov>; Maggie Salazar <maggie.salazar@hdrinc.com>; Morgan Amedee <amedeemd@dhec.sc.gov>; Pat Cloninger <cloningerp@dnr.sc.gov>; Ross Self <SelfR@dnr.sc.gov>; Rowdy Harris <charris@scprt.com>; Stuart, Alan Witten <Alan.Stuart@duke-energy.com>; Sue Williams <suewilliams130@gmail.com>; William Wood <woodw@dnr.sc.gov>; Willie Simmons <simmonsw@dnr.sc.gov>; 'Huff, Jen' <Jen.Huff@hdrinc.com>; 'phil.mitchell@gmail.com' <phil.mitchell@gmail.com>; Bill Ranson <bill.ranson@retiree.furman.edu>

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<image003.png>

If you have any questions, please contact Alan Stuart or me.

Regards,

***John Crutchfield***
Project Manager II
Water Strategy, Hydro Licensing & Lake Services
Regulated & Renewable Energy
Duke Energy
525 South Tryon Street, DEP-35B | Charlotte, NC 28202
Office 980-373-2288| Cell 919-757-1095

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|---|---|
| **From:** | Andy Douglas |
| **To:** | Crutchfield Jr., John U; suewilliams130@gmail.com |
| **Cc:** | Amy Breedlove; Andrew Gleason; Chris Starker; Dale Wilde; RankinD; Elizabeth Miller; Kelly Kirven; Ken Forrester; quattrol; Salazar, Maggie; Amedee, Morgan D.; Pat Cloninger; SelfR; Rowdy Harris; Stuart, Alan Witten; William T. Wood; Willie Simmons; Huff, Jen; phil.mitchell@gmail.com; Bill Ranson-Retired; Kulpa, Sarah; McCarney-Castle, Kerry |
| **Subject:** | Re: Bad Creek Relicensing - Foothills Trail Corridor Conditions Assessment and Whitewater River Cove Recreation Use Evaluation Draft Reports (READY FOR REVIEW) |
| **Date:** | Monday, December 4, 2023 11:55:58 PM |



John, I was asked by a stakeholder if we had determined the impact of any potential seismic activity (non earthquake type disturbances such as blasting for the new turbine project). I can't recall any discussion about that. If there has been, please direct me to it.

Their concern was impact on birds, aquatic critters, mammals, etc. They were especially worried about how this may be especially disruptive during the critical springtime mating and nesting season.
Thank you.....

Andy Douglas

On Monday, December 4, 2023, 04:57:04 PM EST, Sue Williams <suewilliams130@gmail.com> wrote:

AQD has no comments on the Whitewater River Cove Use Evaluation Draft report.

Sue Williams
Six Mile, SC

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**To:** Amy Breedlove <BreedloveA@dnr.sc.gov>; Andrew Gleason <andrewandwilla@hotmail.com>; Andy Douglas <adoug41@att.net>; Chris Starker <cstarker@upstateforever.org>; Dale Wilde <dwilde@keoweefolks.org>; Dan Rankin <RankinD@dnr.sc.gov>; Elizabeth Miller <MillerE@dnr.sc.gov>; Kelly Kirven <Kelly.Kirven@KleinschmidtGroup.com>; Ken Forrester <forresterk@dnr.sc.gov>; Lynn Quattro <quattrol@dnr.sc.gov>; Maggie Salazar <maggie.salazar@hdrinc.com>; Morgan Amedee <amedeemd@dhec.sc.gov>; Pat Cloninger <cloningerp@dnr.sc.gov>; Ross Self <SelfR@dnr.sc.gov>; Rowdy Harris <charris@scprt.com>; Stuart, Alan Witten <Alan.Stuart@duke-energy.com>; Sue Williams <suewilliams130@gmail.com>; William Wood <woodw@dnr.sc.gov>; Willie Simmons <simmonsw@dnr.sc.gov>; 'Huff, Jen' <Jen.Huff@hdrinc.com>; 'phil.mitchell@gmail.com' <phil.mitchell@gmail.com>; Bill Ranson <bill.ranson@retiree.furman.edu>
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Regards,

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Project Manager II
Water Strategy, Hydro Licensing & Lake Services
Regulated & Renewable Energy
Duke Energy
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Office 980-373-2288| Cell 919-757-1095

# DRAFT Foothills Trail Corridor Conditions Assessment

Bad Creek Pumped Storage Project

FERC No. 2740

Prepared for:
**Duke Energy Carolinas, LLC**

Prepared by:
**Kleinschmidt Associates**

November 2023

Kleinschmidtgroup.com

## TABLE OF CONTENTS



## LIST OF TABLES



## LIST OF FIGURES

## LIST OF APPENDICES

# 1.0 INTRODUCTION

On February 23, 2022, Duke Energy Carolinas, LLC (Duke Energy) submitted the Bad Creek Pumped Storage Project (Bad Creek Project or Project; FERC No. 2740) Notice of Intent to Relicense and Pre-Application Document (PAD) to the Federal Energy Regulatory Commission (FERC or Commission). The PAD included an alternative licensing proposal for installation of additional energy storage and generation capacity by constructing a new 1,400-megawatt power complex (Bad Creek II Complex) adjacent to the existing Bad Creek Powerhouse to meet the growing need for energy storage and renewable energy production across Duke Energy's service territories. Duke Energy plans to make a final decision regarding the alternative licensing proposal for the construction of the Bad Creek II Complex prior to the submittal of a Final License Application for the Bad Creek Project.

In Section 7.1.6.3 of the PAD, Duke Energy proposed to conduct a Recreational Resources Study in support of the proposed the Bad Creek II Complex. No study requests related to recreational resources were received during the scoping process; however, formal comments on the PAD and Scoping Document 1 regarding recreational resources were received from Upstate Forever and the Foothills Trail Conservancy. Comment responses were included in Appendix A of the Proposed Study Plan, which was filed with the Commission on August 5, 2022. Stakeholder comments on the Proposed Study Plan were submitted by the Commission, South Carolina Department of Natural Resources (SCDNR), Upstate Forever, and the Foothills Trail Conservancy. Resource issues and stakeholder comments pertinent to the Recreational Resources Study were considered in the development of the Revised Study Plan, which was filed with the Commission on December 5, 2022. Summaries of comments and responses were included in Appendix A and copies of all comments and correspondence were provided in Appendix B of the Revised Study Plan (RSP). The Commission issued its Study Plan Determination on January 4, 2023, and approved the Recreational Resources Study with modifications.

The Recreational Resources Study consists of four main study tasks: (1) a Recreation Use and Needs (RUN) Study for the 43-mile-long portion of the Foothills Trail (or trail) managed by Duke Energy; (2) a Foothills Trail Corridor Conditions Assessment (Conditions Assessment) of the 43-mile-long portion of the Foothills Trail and associated spur trails managed by Duke Energy; (3) an Existing Recreational Use Characterization of Whitewater River cove; and (4) a Recreational Public Safety Evaluation of Whitewater River cove.

This Foothills Trail Corridor Conditions Assessment (Conditions Assessment) focuses on item 2 above, evaluating the current condition of trail surface and corridor included in the 43-mile segment of the Foothills Trail and associated spur trails maintained by Duke Energy and identifying key areas of future maintenance needs or improvements. The data collected during this study will be used during development of protection, mitigation, and enhancement measures for the Project.

### 1.1 Current Operation

The Bad Creek Project is located in Oconee County, South Carolina, approximately eight miles north of Salem, South Carolina. The Bad Creek Reservoir (upper reservoir) was formed when Bad Creek and West Bad Creek were dammed and serves as the Bad Creek Project's upper reservoir. Lake Jocassee (lower reservoir) serves as the Bad Creek Project's lower reservoir and is licensed as part of Duke Energy's Keowee-Toxaway Hydroelectric Project (KT Project; FERC No. 2503).

The 30-year-old Bad Creek Project is one of the most powerful and flexible energy generation and storage assets in Duke Energy's system. Built primarily to store surplus energy from baseload nuclear and fossil-fuel-driven power plants during times of low energy demand, today the Bad Creek Project is used to balance an increasingly complex energy grid. By pumping water from Lake Jocassee up to the Bad Creek Reservoir, the Bad Creek Project is able to provide storage of surplus baseload energy during low demand periods. While the Bad Creek Project is in turbine operation mode, water runs from the upper reservoir down to Lake Jocassee, providing power back to the grid when energy demand is higher or when renewable generation is unavailable.

### 1.2 Proposed Action

The demand for energy and energy storage has been steadily on the rise in the southeastern region of the country. In an effort to meet this growing demand, Duke Energy is proposing an expansion to the Bad Creek Project that will double the generating capacity of the station. The proposed Bad Creek II Complex would utilize the existing upper and lower reservoirs and consist of a new inlet/outlet within the existing upper reservoir, water conveyance system, and underground powerhouse. Additionally, a new inlet/outlet along the shoreline of the Whitewater River arm of Lake Jocassee, or the Whitewater River cove, would be constructed.

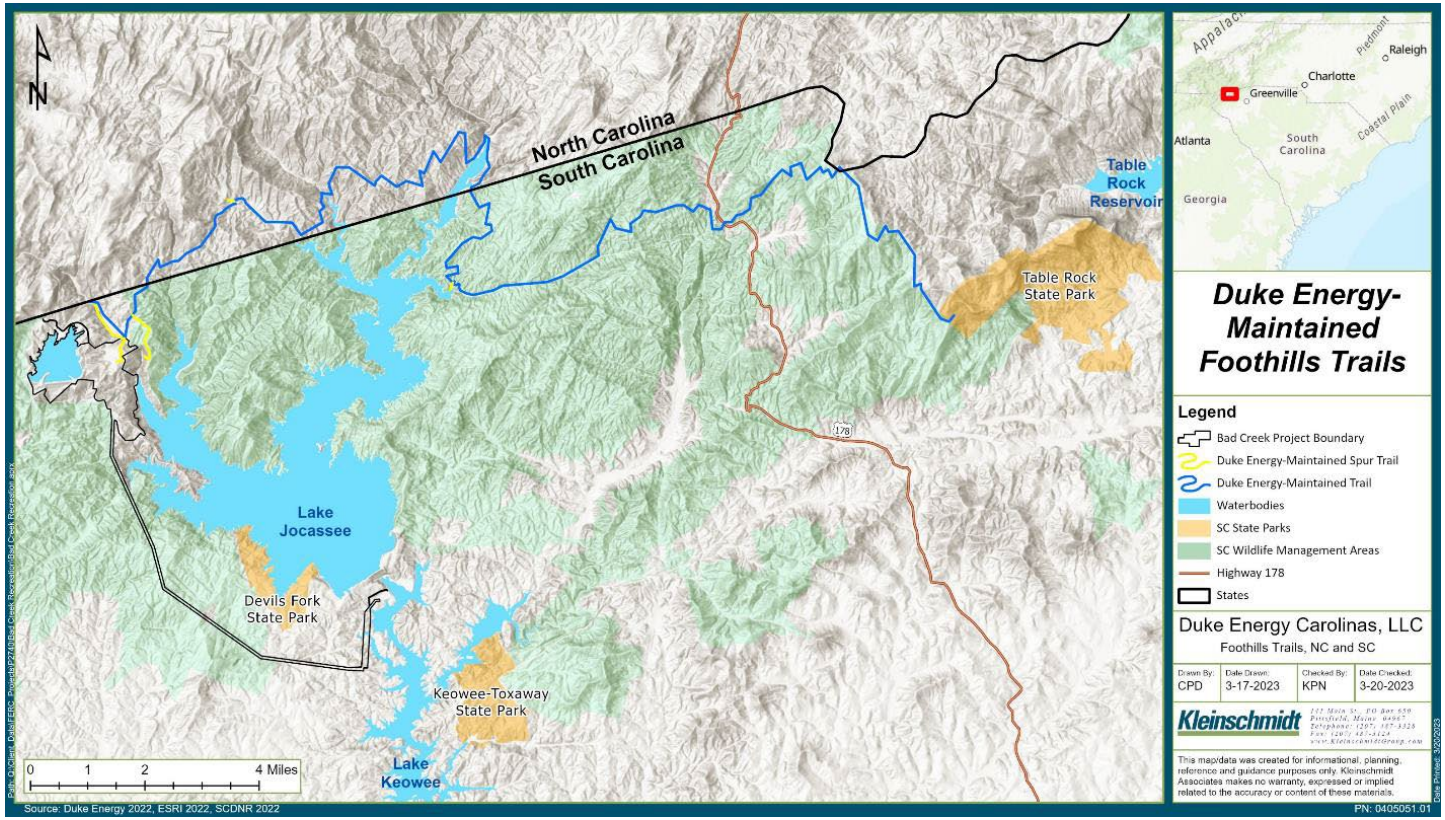
The Bad Creek II Complex underground powerhouse would be arranged and sized similarly to the existing Bad Creek Project powerhouse. In general, most of the features

for the Bad Creek II Complex would be submerged, underground, and/or within lands classified as "project operations," which are not accessible to the general public. The location of the proposed lower reservoir inlet/outlet structure has been chosen to minimize construction-related environmental impacts to the Whitewater River arm of Lake Jocassee. Nevertheless, the Whitewater River cove is anticipated to be closed to the public for approximately five years during construction of the Bad Creek II Complex. Duke Energy will develop more specific schedules and plans for closures as construction plans for the Bad Creek II Complex advance and in consultation with stakeholders.

## 2.0 DESCRIPTION OF STUDY AREA

The geographic scope (i.e., study area) of the Conditions Assessment includes the 43-mile-long segment of the Foothills Trail and five spur trails maintained by Duke Energy. The 43-mile Duke Energy-maintained trail segment begins on the western end of the Foothills Trail at the Duke Energy/U.S. Forest Service property line on the Whitewater River near the Bad Creek Project and extends east to the Duke Energy/Table Rock State Park property line approximately 1,000 feet southwest of the top of Pinnacle Mountain (Figure 2-1). There are five spur trails that connect with the Foothills Trail that are managed and maintained by Duke Energy including Laurel Fork Falls, Hilliard Falls, Lower Whitewater Falls Overlook, Bad Creek, and Coon Branch.

**Figure 2-1 Trail Conditions Assessment Study Area**



## 3.0 METHODOLOGY

One objective for accomplishing study goals was identified in the Recreational Resources Study Plan. The methods for accomplishing this objective are outlined below.

**Objective 1: Evaluate the current condition of trail surface and corridor and identify key areas of future maintenance needs or improvements for the 43-mile segment of the Foothills Trail maintained by Duke Energy**

Duke Energy subcontracted Long Cane Trails to perform a trail conditions assessment involving analyzing sections of trail and determining its maintenance needs[1]. Long Cane Trails divided the 43-mile segment of the Foothills Trail maintained by Duke Energy into six sections using the Foothills Trail Guidebook (Foothills Trail Conservancy 2018) as a reference for location descriptions. All 43 miles of the main trail corridor as well as spur trails were assessed for trail tread, out slope, backslope, drainage, constructed structures (not including engineered bridges) and corridor condition. Trail standards from the Trail Solutions guide (Felton 2004) on building singletrack was used as a base for trail condition analysis. Constructed structures (such as stairs, hand railings, bridges, etc.) were identified and recorded and location tracked geospatially. Structures in need of significant maintenance or replacement were recorded in detail with photo documentation. Similarly, trail condition and corridor features requiring maintenance or repair as well as areas of significant erosion, areas with significant drainage issues (i.e., standing water), or obstructed areas along the trail (i.e., downed trees), and notable occurrences of litter and vandalism were recorded and tracked geospatially.

Long Cane Trails used the following methods to document the current trail conditions and identify key areas of trail surface for future maintenance needs or improvements:

- Populate the Assessment Form (Appendix A); includes trail assessment descriptions defined in Table 3-1.
- Locate issue/structure along the trail and record GPS waypoint.
- Take photos of significant issues/features for documentation.
- Identify type of issue/structure using categories provided in Table 3-1.

[1] Inspections of engineered bridges on the Duke Energy-maintained portion of the Foothills Trail are performed every five years by a licensed Professional Engineer in accordance with the Duke Energy Foothills Trail Maintenance Program.

- Measure issue/structure (i.e., bridges, culverts, eroded sections, washouts, wet areas, and diameters of fallen trees).
- If excessive grade is present (greater than 15 percent slope) in conjunction with erosion, utilize clinometer to measure percent slope.
- Provide additional description/comments about issues/structures identified.

Long Cane Trails added their recommendations/prescriptions to existing trail details already measured and noted in the Foothills Trail Guidebook (Foothills Trails Conservancy 2018).

**Table 3-1 Long Cane Trails' Trail Assessment Descriptions**

**Trail Assessment Descriptions:**

| Code | Description |
|---|---|
| B | Bridges, puncheon, bog bridges, turnpikes. ***Note construction material, length/width (feet) and condition of bridge.*** |
| UC | Unimproved Crossing (stream crossing). ***Note if wading or rock steps and any maintenance required (unstable stepping stones). Note the width of the stream at the crossing point.*** |
| C | Culvert – open or closed drain across the trail. ***Note condition of culvert, length/diameter and if sufficient size for situation.*** |
| E | Erosion - look for exposed roots, rocks, or gullies on trail. ***Describe situation (exposed roots, gullies on tread, located on fall line (going straight down a hill regardless of grade) and length of eroded section (if greater than 25 ft, approximate distance).*** ***If excessive grade (>15% slope) in conjunction with erosion: measure steep slopes with clinometer (if numerous steep rocky slopes, no need to measure each one – note that trail has numerous steep rocky sections)*** |
| EC | Erosion Control Devices – check dams, water bars. ***Note type and condition of structure.*** |
| WO | Washout - section of trail has been mostly/completely washed away. ***Note length/width/depth and any hazards associated with washout. Take photo.*** |
| WA | Wet Area/standing water (larger than 3ft diameter). ***Note length/width. Note any adjacent water feature.*** |
| OB | Obstacle – fallen tree or other obstacle blocking treadway (include broken branches or trees leaning above/across the trail ("widow makers"). ***Note diameter of fallen tree***. |
| IB | Insufficient Blazing/Marking – if can't see next blaze/marker as you are moving past a blaze/marker or hard to locate next blaze/marker. ***Note if blazes/markers missing or worn off.*** |
| SI | Signage – ***Identify if Trailhead, Directional or Interpretive and if in need of repair. Note type of repair.*** |
| AC | Additional Comment – specific locations that warrant noting such as a scenic vista, unique feature (caves, mines, rock wall) and locations of invasive species. ***Note type of feature and associated details (such as name of invasive species and amount of plants (number, area).*** |

## 4.0 RESULTS

Long Cane Trail identified 89 areas needing maintenance or improvements (i.e., trail issues) along the 43-mile segment of the Foothills Trail and five spur trails maintained by Duke Energy, as listed in Table 4-1[2] and shown in Figure 4-1 through Figure 4-20. Photographs of individual trail issues are also included in Figure 4-1 through Figure 4-20.

[2] The Trail Conditions Assessment included Laurel Fork Falls and Hilliard Falls; however, no issues were identified and therefore are not included in Table 4-1.

**Table 4-1 Foothills Trail Conditions Assessment Findings**

| Trail Issue # | Figure # | Date Assessed | Trail Name | Mile Marker | Latitude | Longitude | Assessment Type | Description/Details |
|---|---|---|---|---|---|---|---|---|
| 1 | Figure 4-2 | 2023-09-14 | Bad Creek Access Spur | 0.1 | 35.01273631 | -82.99787808 | Culvert, Open Drain | Concrete culvert needs cleaning. Sediment has gathered and is sitting, not allowing water to run down the drain. |
| 2 | Figure 4-2 | 2023-09-14 | Bad Creek Access Spur | 0.1 | 35.01296829 | -82.99759536 | Wet Area / Standing Water | Gravel needs to be added to the section of the trail to raise it approximately 2 inches. This is a very low area with standing water most of the time. In fact, there is some drainage that seems to be serving a purpose in this area also. |
| 3 | Figure 4-2 | 2023-09-14 | Bad Creek Access Spur | 0.2 | 35.01339791 | -82.9977754 | Wet Area / Standing Water | Low part of the trail, and gravel needs to be brought in. Easily accessible from the parking lot. This trail has had gravel on it in the past. It just needs a topping. |

| Trail Issue # | Figure # | Date Assessed | Trail Name | Mile Marker | Latitude | Longitude | Assessment Type | Description/Details |
|---|---|---|---|---|---|---|---|---|
| 4 | Figure 4-2 | 2023-09-14 | Bad Creek Access Spur | 0.3 | 35.01449413 | -82.99786919 | Erosion Control Devices, Other | Someone is putting barricades on the side of the trail, and these need to be removed. There are several in this section of the trail. These, in fact, hold water on the trail versus letting water off the trail. There should be a series of knicks or grade reversals in this section to divert water. |
| 5 | Figure 4-2 | 2023-09-14 | Bad Creek Access Spur | 0.3 | 35.01413933 | -82.99811383 | Steps | The step is rotten and needs to be replaced. |
| 6 | Figure 4-3 | 2023-09-14 | Bad Creek Access Spur | 0.6 | 35.01723673 | -82.99744404 | Signage, Interpretive | Approximately 100 feet of trail has been rerouted. The user can still see the old relays in the corner as well as the old trail. The new trail is working great! The old trail needs to be closed, and the new trail needs to be blazed in the corner, so users know this is the trail. In this particular area, you have not seen a blaze in a while. Blue color is needed to apply a new blaze |

| Trail Issue # | Figure # | Date Assessed | Trail Name | Mile Marker | Latitude | Longitude | Assessment Type | Description/Details |
|---|---|---|---|---|---|---|---|---|
| 7 | Figure 4-3 | 2023-09-14 | Bad Creek Access Spur | 0.7 | 35.01869053 | -82.99718057 | Obstacle, Fallen Tree | A fallen tree across the trail needs to be removed. |
| 8 | Figure 4-3 | 2023-09-18 | Coon Branch | 0.2 | 35.01956213 | -82.99972003 | Bridge, Bridge | The upper railing needs to be replaced on both sides, and two decking boards need to be replaced. |
| 9 | Figure 4-3 | 2023-09-18 | Coon Branch | 0.2 | 35.01966168 | -82.9999907 | Bridge, Bridge | Two 2x4x12 railings need to be replaced. |
| 10 | Figure 4-3 | 2023-09-18 | Coon Branch | 0.4 | 35.02183009 | -83.00243764 | Bridge, Buncheon | Bog Bridge, two feet wide by four feet long, needs to be installed |
| 11 | Figure 4-3 | 2023-09-18 | Coon Branch | 0.4 | 35.02160249 | -83.00233517 | Erosion, Gullie | A major drain needs to be unclogged. It is overflowing and going down the trail. The solution is to simply open the drain up more and get rid of the sediment that is raising the drain up. |
| 12 | Figure 4-4 | 2023-09-14 | Lower Whitewater Falls Spur | 0.4 | 35.02155442 | -82.99014034 | Washout | Trail needs water diversion in the form of grade dips or knicks. |
| 13 | Figure 4-4 | 2023-09-14 | Lower Whitewater Falls Spur | 0.9 | 35.01623192 | -82.98947331 | Washout | Trail needs some steps and grade dips or water diversion features added. Approximately 20 steps needed. |

| Trail Issue # | Figure # | Date Assessed | Trail Name | Mile Marker | Latitude | Longitude | Assessment Type | Description/Details |
|---|---|---|---|---|---|---|---|---|
| 14 | Figure 4-4 | 2023-09-14 | Lower Whitewater Falls Spur | 1 | 35.01476505 | -82.98918722 | Erosion, Gullie | Trail is using an old roadbed that has a gully on each side and very few drains. all drains are clogged and need to be rerouted. New trail limit is very close to the old just elevated on the banks versus in the middle of the old roadbed. |
| FTC1 | | | Foothills Trail | 30.6 | 35.02712 | -83.00535 | Stairs | These stairs are pulling apart and are now at an unsafe angle. |
| FTC2 | | | Foothills Trail | 30.7 | 35.02612 | -83.0041 | Bridge | Rotten split log bridge with broken handrail. Needs replacing. |
| FTC3 | | 11/22/2023 | Foothills Trail | 31.4 | 35.01909 | -82.99697 | Kiosk | Informational kiosk is water damaged and information is outdated and obsolete. Needs repair and updated information. |
| 15 | Figure 4-3 | 2023-09-14 | Foothills Trail | 31.6 | 35.02092083 | -82.99665677 | Washout | The trail needs some grade reversals or knicks. Water has gotten on the trail and does not leave for some time, causing a gully if not fixed. |
| 16 | Figure 4-5 | 2023-09-30 | Foothills Trail | 32.4 | 35.02958049 | -82.99437631 | Steps | Replace three steps |

| Trail Issue # | Figure # | Date Assessed | Trail Name | Mile Marker | Latitude | Longitude | Assessment Type | Description/Details |
|---|---|---|---|---|---|---|---|---|
| FTC4 | | 11/22/2023 | Foothills Trail | 32.6 | 35.03095 | -82.99234 | Bridge | Rotten split log bridge with broken handrail. Needs replacing. |
| FTC5 | | 11/22/2023 | Foothills Trail | 32.9 | 35.03364 | -82.99093 | Bridge | This bridge need to be widened and a more secure handrail. |
| 17 | Figure 4-5 | 2023-09-30 | Foothills Trail | 33.3 | 35.03730923 | -82.98769713 | Steps | Replace three steps |
| 18 | Figure 4-5 | 2023-09-30 | Foothills Trail | 33.9 | 35.03812814 | -82.98336354 | Steps | One step needs to be replaced. |
| 19 | Figure 4-5 | 2023-09-30 | Foothills Trail | 34.2 | 35.03822699 | -82.98165951 | Steps | Steps need to be replaced. |
| 20 | Figure 4-6 | 2023-09-30 | Foothills Trail | 35.5 | 35.04768531 | -82.96974848 | Obstacle, Fallen Tree | Tree across trail and needs to be removed. |
| FTC6 | | 11/22/2023 | Foothills Trail | 35.6 | 35.0486 | -82.96974 | Bridge | Rotten split log bridge with loose handrail. Needs replacing. |
| FTC7 | | 11/22/2023 | Foothills Trail | 35.7 | 35.04925 | -82.9694 | Bridge | Rotten split log bridge with loose handrail. Needs replacing. |
| 21 | Figure 4-6 | 2023-09-18 | Foothills Trail | 35.8 | 35.05077596 | -82.96808629 | Steps | Two steps need to be replaced. |
| FTC8 | | 11/26/2023 | Foothills Trail | 36.4 | 35.05437 | -82.96269 | Bridge | Rotten split log bridge with loose handrail. Needs replacing. |
| FTC9 | | 11/26/2023 | Foothills Trail | 36.6 | 35.05342 | -82.96065 | Bridge | Rotten split log bridge with missing handrail. Needs replacing. |
| FTC10 | | 11/26/2023 | Foothills Trail | 36.9 | 35.05084 | -82.95669 | Bridge | Narrow 4x4 bridge with no handrail needs to be widened and improved for safety. |

| Trail Issue # | Figure # | Date Assessed | Trail Name | Mile Marker | Latitude | Longitude | Assessment Type | Description/Details |
|---|---|---|---|---|---|---|---|---|
| FTC11 | | 11/26/2023 | Foothills Trail | 37.0 | 35.05032 | -82.95643 | Bridge | Plank bridge with no handrail needs to be improved for safety. |
| 22 | Figure 4-7 | 2023-09-30 | Foothills Trail | 37.2 | 35.04848663 | -82.95255533 | Steps | One step is rotten and needs to be replaced. |
| FTC12 | | 11/26/2023 | Foothills Trail | 37.2 | 35.04914 | -82.95372 | Bridge | Narrow 4x4 bridge with no handrail needs to be widened and improved for safety. |
| 23 | Figure 4-7 | 2023-09-30 | Foothills Trail | 37.3 | 35.04886479 | -82.95224431 | Obstacle, Other | From mile 36.2 at Hilliard Falls Trail to 37.3 at Bear camp campsite We need a clearer definition. A 1.1 mile obstacle? |
| 24 | Figure 4-7 | 2023-09-30 | Foothills Trail | 37.6 | 35.0484997 | -82.94810344 | Obstacle, Fallen Tree | Fallen tree across trail that needs to be cut out. |
| 25 | Figure 4-7 | 2023-09-30 | Foothills Trail | 37.6 | 35.04848623 | -82.94800267 | Obstacle, Fallen Tree | Two trees have fallen and need to be cleared. |
| 26 | Figure 4-7 | 2023-09-30 | Foothills Trail | 38.6 | 35.04622411 | -82.93985485 | Obstacle, Fallen Tree | |
| 27 | Figure 4-7 | 2023-09-30 | Foothills Trail | 38.7 | 35.04687284 | -82.93946234 | Obstacle, Fallen Tree | Brush from the top of a falling tree needs to be removed. |
| 28 | Figure 4-8 | 2023-09-30 | Foothills Trail | 39.4 | 35.05225218 | -82.93751518 | Obstacle, Fallen Tree | Large tree across Trail needs to be removed. |
| 29 | Figure 4-8 | 2023-09-30 | Foothills Trail | 39.5 | 35.05318844 | -82.93657904 | Obstacle, Fallen Tree | A top of a tree is crossing the trail and needs to be cut out. |
| FTC13 | | 11/26/2023 | Foothills Trail | 39.8 | 35.05569 | -82.93749 | Bridge | Old lumber bridge with no handrail. Need to be improved for safety. |

| Trail Issue # | Figure # | Date Assessed | Trail Name | Mile Marker | Latitude | Longitude | Assessment Type | Description/Details |
|---|---|---|---|---|---|---|---|---|
| 30 | Figure 4-8 | 2023-09-30 | Foothills Trail | 39.8 | 35.05494625 | -82.93714846 | Erosion, ~~Gullie~~Gully | At the foot of the bridge there is erosion. Rocks need to be added to armor the 2 x 2' area that is compromised. |
| 31 | Figure 4-8 | 2023-10-01 | Foothills Trail | 39.9 | 35.05678279 | -82.93638778 | Steps | One step needs to be replaced. This part of a very large set of stairs. Every tread board is rotten. |
| 32 | Figure 4-8 | 2023-10-01 | Foothills Trail | 40.1 | 35.05636493 | -82.93419022 | Obstacle, Other | Trail needs to be trimmed for 2/10 of a mile from Horse Pasture River Bridge to mile 40.3. |
| 33 | Figure 4-8 | 2023-10-01 | Foothills Trail | 40.2 | 35.05690722 | -82.93502841 | Obstacle, Fallen Tree | Tree removal |
| 34 | Figure 4-9 | 2023-10-01 | Foothills Trail | 40.4 | 35.05892556 | -82.93459743 | Obstacle, Fallen Tree | Tree removal |
| 35 | Figure 4-9 | 2023-10-01 | Foothills Trail | 40.4 | 35.05894665 | -82.93456431 | Obstacle, Fallen Tree | Tree removal |
| 36 | Figure 4-9 | 2023-10-01 | Foothills Trail | 40.5 | 35.05893904 | -82.9342663 | Bridge, Bridge | Trees falling on bridge needs to be repaired. |
| 37 | Figure 4-9 | 2023-10-01 | Foothills Trail | 40.5 | 35.05894956 | -82.93423148 | Obstacle, Fallen Tree | Tree removal |
| 38 | Figure 4-9 | 2023-10-01 | Foothills Trail | 40.8 | 35.06270942 | -82.93295438 | Obstacle, Fallen Tree | Tree needs to be removed. |
| 39 | Figure 4-9 | 2023-10-01 | Foothills Trail | 40.9 | 35.06302301 | -82.93270134 | Washout | 15 feet of trail needs to be re-benched. |
| FTC14 | | 11/26/2023 | Foothills Trail | 41.0 | 35.06268 | -82.93308 | Bridge | Old log and lumber bridge needs to be rebuilt for safety |

| Trail Issue # | Figure # | Date Assessed | Trail Name | Mile Marker | Latitude | Longitude | Assessment Type | Description/Details |
|---|---|---|---|---|---|---|---|---|
| 40 | Figure 4-10 | 2023-10-01 | Foothills Trail | 42.6 | 35.05953224 | -82.92052046 | Obstacle, Fallen Tree | Fallen tree needs to be removed. |
| 41 | Figure 4-10 | 2023-10-01 | Foothills Trail | 42.6 | 35.05954586 | -82.92038139 | Obstacle, Fallen Tree | Tree removal |
| FTC15 | | 11/24/2023 | Foothills Trail | 44.6 | 35.06195 | -82.90653 | Bridge | Bridge needs to be widened for safety. |
| 42 | Figure 4-11 | 2023-10-01 | Foothills Trail | 44.6 | 35.06174146 | -82.90542222 | Obstacle, Fallen Tree | Fallen tree needs to be cut out. |
| 43 | Figure 4-11 | 2023-10-01 | Foothills Trail | 45.7 | 35.06475517 | -82.90024767 | Obstacle, Fallen Tree | Tree removal |
| 44 | Figure 4-11 | 2023-10-01 | Foothills Trail | 47.9 | 35.06632757 | -82.88963219 | Bridge, Bog Bridges | Bog bridge needs to be installed. |
| 45 | Figure 4-11 | 2023-10-01 | Foothills Trail | 48.3 | 35.07118731 | -82.88726657 | Obstacle, Fallen Tree | Tree needs to be removed from across trail. |
| FTC16 | | 11/18/23 | Foothills Trail | 48.3 | 35.07061 | -82.88732 | Bridge | Bridge needs to be widened and improved for safety. |
| FTC17 | | 11/18/23 | Foothills Trail | 48.3 | 35.07144 | -82.88723 | Bridge | Bridge needs to be widened and improved for safety. |
| 46 | Figure 4-12 | 2023-10-01 | Foothills Trail | 48.8 | 35.06624918 | -82.8858863 | Steps | Step replacement |
| 47 | Figure 4-12 | 2023-10-01 | Foothills Trail | 48.9 | 35.06448 ~~35.06471527~~ | -82.88558 ~~-82.88571508~~ | Additional Comment | Bench needs to be replaced. |
| 48 | Figure 4-12 | 2023-10-01 | Foothills Trail | ~~48.9~~48.8 | 35.0663~~735.06448911~~ | -82.88584~~-82.88557639~~ | Bridge, Bog Bridges | Bog bridge needs to be added. |
| 49 | Figure 4-12 | 2023-10-01 | Foothills Trail | 48.9 | 35.06423394 | -82.8852986 | Steps | Two steps need to be replaced. They are missing.<br>One step needs to be repaired. |

| Trail Issue # | Figure # | Date Assessed | Trail Name | Mile Marker | Latitude | Longitude | Assessment Type | Description/Details |
|---|---|---|---|---|---|---|---|---|
| 50 | Figure 4-13 | 2023-10-01 | Foothills Trail | 49.1 | 35.06204989 | -82.88605607 | Steps | One step needs to be replaced. |
| FTC18 | | 11/18/23 | Foothills Trail | 49.1 | 35.06369 | -82.88494 | Stairs | Stairs have sunk on one side and are very sloped. Needs to be rebuilt for safety. |
| 51 | Figure 4-13 | 2023-10-01 | Foothills Trail | 49.2 | 35.06188881 | -82.88646935 | Obstacle, Fallen Tree | Tree across trail needs to be cut. |
| 52 | Figure 4-13 | 2023-10-01 | Foothills Trail | 49.2 | 35.06188238 | -82.88636861 | Steps | Two steps are missing and need to be replaced. |
| 53 | Figure 4-13 | 2023-10-01 | Foothills Trail | 49.2 | 35.06188773 | -82.88644732 | Steps | One step needs to be replaced. |
| 54 | Figure 4-14 | 2023-10-01 | Foothills Trail | 49.4 | 35.06033756 | -82.88994145 | Steps | One step needs to be replaced. |
| 55 | Figure 4-14 | 2023-10-01 | Foothills Trail | 49.5 | 35.06031437 | -82.88911736 | Steps | One step needs to be replaced. |
| 56 | Figure 4-14 | 2023-10-01 | Foothills Trail | 49.9 | 35.05836929 | -82.89148322 | Obstacle, Fallen Tree | Tree across trail needs to be cut. |
| FTC19 | | 11/18/23 | Foothills Trail | 49.9 | 35.0585 | -82.89075 | Bridge | Rotten split log bridge with missing handrail. Needs replacing. |
| FTC20 | | 11/18/23 | Foothills Trail | 53.7 | 35.03439 | -82.89607 | Kiosk | Informational kiosk is water damaged and information is outdated and obsolete. Needs repair and updated information. |
| 57 | Figure 4-15 | 2023-09-17 | Foothills Trail | 53.9 | 35.03336423 | -82.8943042 | Obstacle, Fallen Tree | Tree has fallen across trail and holding back water, causing erosion before the tree fall. |

| Trail Issue # | Figure # | Date Assessed | Trail Name | Mile Marker | Latitude | Longitude | Assessment Type | Description/Details |
|---|---|---|---|---|---|---|---|---|
| 58 | Figure 4-15 | 2023-09-17 | Foothills Trail | 54.2 | 35.03126431 | -82.89076147 | Culvert, Open Drain | Culvert has collapsed and needs replacing |
| 59 | Figure 4-15 | 2023-09-17 | Foothills Trail | 54.2 | 35.03152907 | -82.89171696 | Signage, Directional | Insufficient blazes at this junction of foothills trail and laurel fork campsite. More white blades need to be added. |
| 60 | Figure 4-15 | 2023-09-17 | Foothills Trail | 54.6 | 35.03224254 | -82.886101 | Steps | One step needs to be replaced. |
| 61 | Figure 4-15 | 2023-09-17 | Foothills Trail | 54.8 | 35.03243434 | -82.88302672 | Bridge, Bog Bridges | Needs to be raised and lengthen to 12 feet long. |
| 62 | Figure 4-15 | 2023-09-17 | Foothills Trail | 55.5 | 35.03426627 | -82.8715385 | Bridge, Bog Bridges | 3 feet wide by 20 feet long bog bridge needs to be installed. |
| 63 | Figure 4-15 | 2023-09-17 | Foothills Trail | 55.5 | 35.03426745 | -82.87159877 | Bridge, Bridge | Trail is starting to widen due to water flow on trail being blocked. 12-foot-long by 4-foot-wide bridge needs to be added. |
| FTC21 | | 11/18/23 | Foothills Trail | 56.3 | 35.03759 | -82.85947 | Bridge | Needs a handrail added for safety. |
| 64 | Figure 4-16 | 2023-09-17 | Foothills Trail | 57.1 | 35.04325018 | -82.85098593 | Steps | Two steps are rotten and need to be replaced. |
| 65 | Figure 4-16 | 2023-09-17 | Foothills Trail | 57.3 | 35.04586891 | -82.85120517 | Steps | 4 steps need to be replaced. |
| FTC22 | | 11/18/23 | Foothills Trail | 57.9 | 35.0496 | -82.84608 | Steps | Handrail is broken down in several places. |
| 66 | Figure 4-16 | 2023-09-17 | Foothills Trail | 57.9 | 35.04966325 | -82.84604181 | Steps | One step needs to be replaced. |

| Trail Issue # | Figure # | Date Assessed | Trail Name | Mile Marker | Latitude | Longitude | Assessment Type | Description/Details |
|---|---|---|---|---|---|---|---|---|
| FTC23 | | 11/18/23 | Foothills Trail | 58.8 | 35.04992 | -82.84119 | Bridge | Handrail need to be replaced, very loose. |
| FTC24 | | 11/18/23 | Foothills Trail | 58.9 | 35.05112 | -82.84013 | Bridge | Bridge needs to be widened and handrail added for safety. |
| 67 | Figure 4-16 | 2023-09-17 | Foothills Trail | 61.2 | 35.054138 | -82.8166194 | Steps | One step needs to be replaced. |
| 68 | Figure 4-17 | 2023-07-16 | Foothills Trail | 62 | 35.05087322 | -82.81288696 | Bridge, Bridge | One 2x6x12 bore needs to be replaced. It is rotten. |
| 69 | Figure 4-17 | 2023-07-16 | Foothills Trail | 62 | 35.05092472 | -82.81235406 | Steps | Rotten. Needs to be replaced. |
| 70 | Figure 4-17 | 2023-07-16 | Foothills Trail | 62.1 | 35.05166502 | -82.81183115 | Steps | Needs to be replaced. Rotten. |
| 71 | Figure 4-18 | 2023-07-16 | Foothills Trail | 63.8 | 35.06192592 | -82.79797438 | Steps | |
| 72 | Figure 4-17 | 2023-07-16 | Foothills Trail | 63 | 35.05545323 | -82.80436645 | Obstacle, Fallen Tree | Tree across trail. |
| 73 | Figure 4-18 | 2023-07-16 | Foothills Trail | 64.5 | 35.06428672 | -82.79296011 | Erosion, Gullie | Needs water break. |
| 74 | Figure 4-18 | 2023-07-16 | Foothills Trail | 64.5 | 35.06450762 | -82.79284939 | Erosion, Other | Tread is gone. It needs reestablished. |
| 75 | Figure 4-18 | 2023-07-16 | Foothills Trail | 64.9 | 35.06418329 | -82.78862932 | Erosion, Gullie | Rail on side of trail needs to be removed. It is holding water on the trail. Grade dips need to be installed and steps need to be reinstalled. |
| 76 | Figure 4-18 | 2023-07-16 | Foothills Trail | 66.2 | 35.06514616 | -82.77881549 | Erosion, Gullie | |
| FTC25 | | 12/3/2023 | Foothills Trail | 69.8 | 35.0386 | -82.75329 | Steps | Handrails are broken down |

| Trail Issue # | Figure # | Date Assessed | Trail Name | Mile Marker | Latitude | Longitude | Assessment Type | Description/Details |
|---|---|---|---|---|---|---|---|---|
| 77 | Figure 4-19 | 2023-10-02 | Foothills Trail | 69.9 | 35.03597162 | -82.75429371 | Erosion, Exposed Roots | Tree has fallen on trail and uprooted 8 feet of trail. 8 feet needs to be re-benched. |
| 78 | Figure 4-19 | 2023-10-02 | Foothills Trail | 70.1 | 35.03574288 | -82.75253624 | Obstacle, Fallen Tree | Tree across trail needs to be cut out. |
| 79 | Figure 4-19 | 2023-10-02 | Foothills Trail | 70.2 | 35.03527295 | -82.75187234 | Obstacle, Fallen Tree | Tree needs to be cut out that is across trail. |
| 80 | Figure 4-19 | 2023-10-02 | Foothills Trail | 70.2 | 35.03507738 | -82.75184794 | Steps | One step needs to be replaced. |
| FTC26 | | 12/3/2023 | Foothills Trail | 70.2 | 35.03601 | -82.75209 | Bridge | Needs handrail added for safety |
| 81 | Figure 4-19 | 2023-10-02 | Foothills Trail | 70.3 | 35.03407215 | -82.7509606 | Obstacle, Fallen Tree | Tree across trail needs to be cut. |
| 82 | Figure 4-20 | 2023-10-02 | Foothills Trail | 70.8 | 35.02819674 | -82.74681091 | Obstacle, Fallen Tree | Remove tree that's across trail. |
| 83 | Figure 4-20 | 2023-10-02 | Foothills Trail | 70.8 | 35.02814792 | -82.74679256 | Obstacle, Other | Trail is extremely overgrown and needs to be trimmed from mile 70.2 at Pigeon Gap to mile 70.9 at Lighthouse Campsite. This section needs to be re-benched in many places, unsafe in many places. |
| 84 | Figure 4-20 | 2023-10-02 | Foothills Trail | 71.3 | 35.028678 | -82.741463 | Obstacle, Fallen Tree | Tree across trail in switchback. Fallen tree crosses trail twice. |
| 85 | Figure 4-20 | 2023-10-02 | Foothills Trail | 71.6 | 35.02797993 | -82.74450542 | Obstacle, Fallen Tree | Three trees across trail need to be cut out. |

| Trail Issue # | Figure # | Date Assessed | Trail Name | Mile Marker | Latitude | Longitude | Assessment Type | Description/Details |
|---|---|---|---|---|---|---|---|---|
| 86 | Figure 4-20 | 2023-10-02 | Foothills Trail | 71.7 | 35.02985095 | -82.74414491 | Obstacle, Fallen Tree | Tree across trail needs to be removed |
| 87 | Figure 4-20 | 2023-10-02 | Foothills Trail | 71.9 | 35.03149829 | -82.74218004 | Obstacle, Fallen Tree | Tree across trail needs to be removed |
| 88 | Figure 4-20 | 2023-10-02 | Foothills Trail | 71.9 | 35.03149667 | -82.74159849 | Obstacle, Fallen Tree | Tree across trail needs to be removed |
| 89 | Figure 4-20 | 2023-10-02 | Foothills Trail | 71.9 | 35.0316208 | -82.74135269 | Obstacle, Other | Corridor needs to be cleared and brushed removed from mile 70.9 at Lighthouse Campsite to 72.1 at Pinnacle Mountain Trail Junction. |
| FTC27 | | 11/26/23 | Hilliard Falls Spur | 0.1 | 35.05396 | -82.96539 | Bridge | Split log bridge is rotten and falling in, needs to be replaced |
| FTC28 | | 11/26/23 | Hilliard Falls Spur | 0.05 | 35.05389 | -82.96468 | Erosion | Trail needs to be re-benched and re-established |
| FTC29 | | 11/23/23 | Laurel Fork Falls Access Spur | 0.1 | 35.03349 | -82.89647 | Bridge | Bridge has broken stringer and missing handrail. Needs to be replaced. |
| FTC30 | | 11/23/23 | Laurel Fork Falls Access Spur | 0.2 | 35.03238 | -82.89707 | Signage | Temporary signage needs to be replaced with standard signage for access points. |

**Figure 4-1 Trail Issues Identified during the Foothills Trail Conditions Assessment**

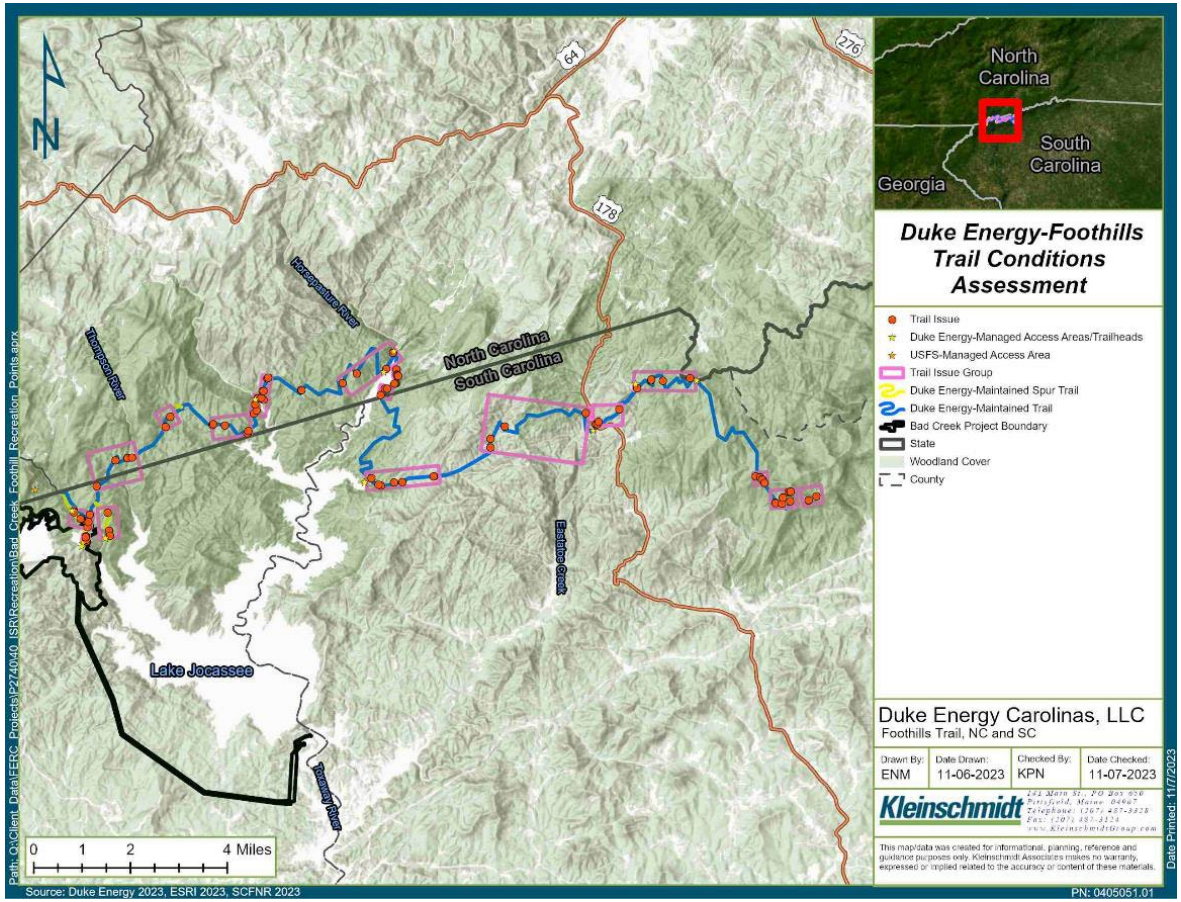


**Figure 4-2 Foothills Trail Conditions Assessment – Figure 1 of 19**

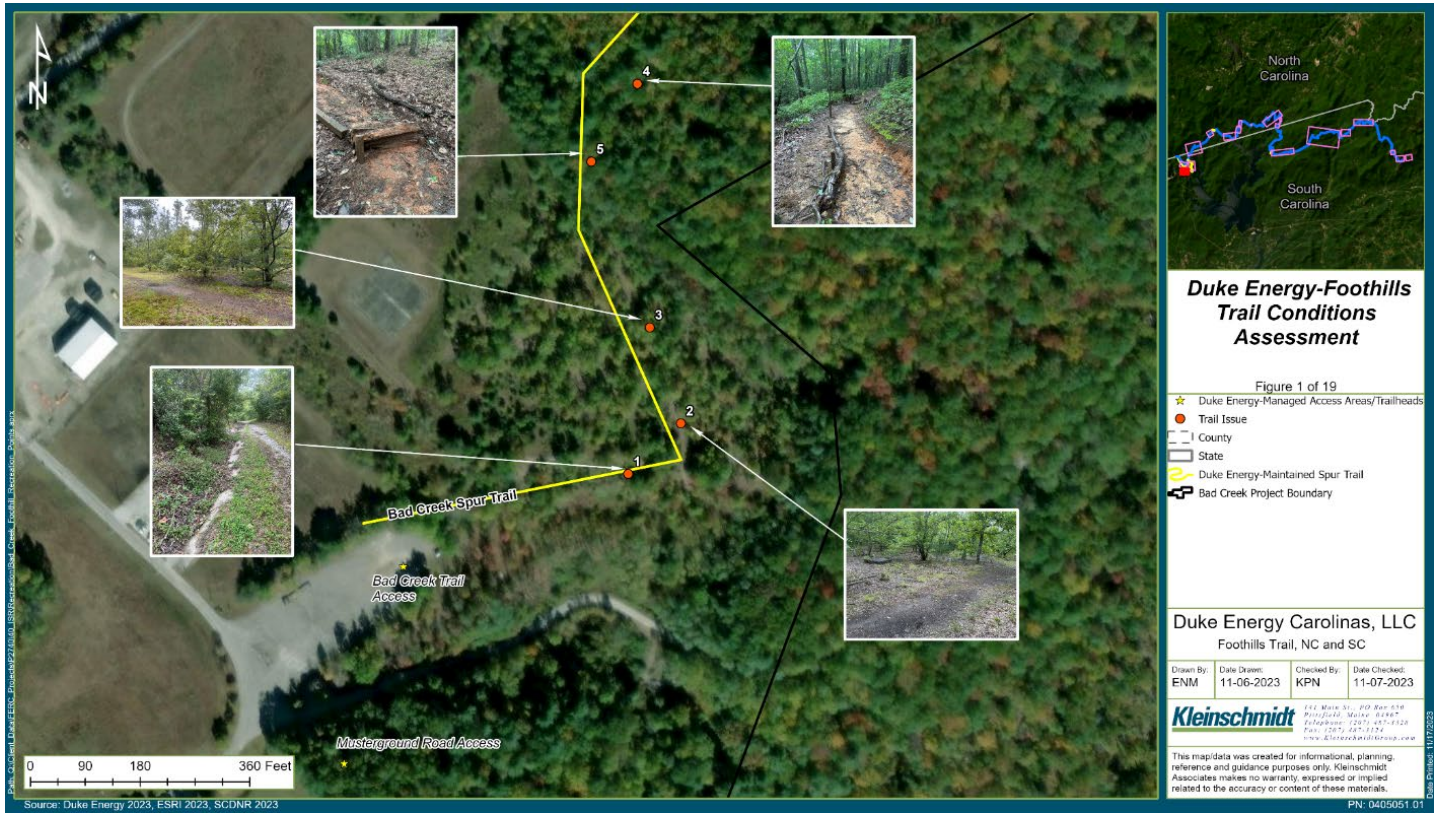


**Figure 4-3 Foothills Trail Conditions Assessment – Figure 2 of 19**

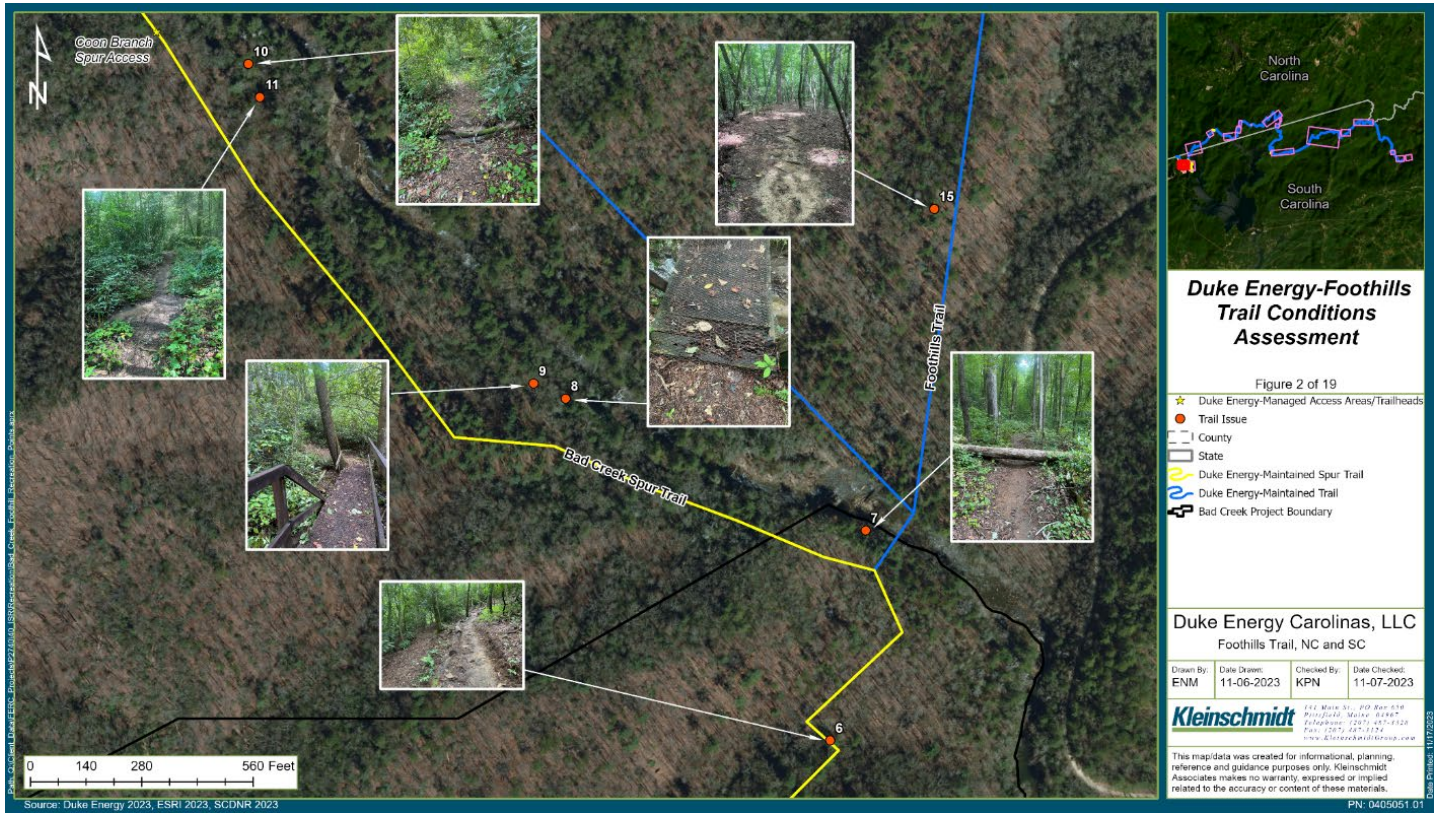


**Figure 4-4 Foothills Trail Conditions Assessment – Figure 3 of 19**

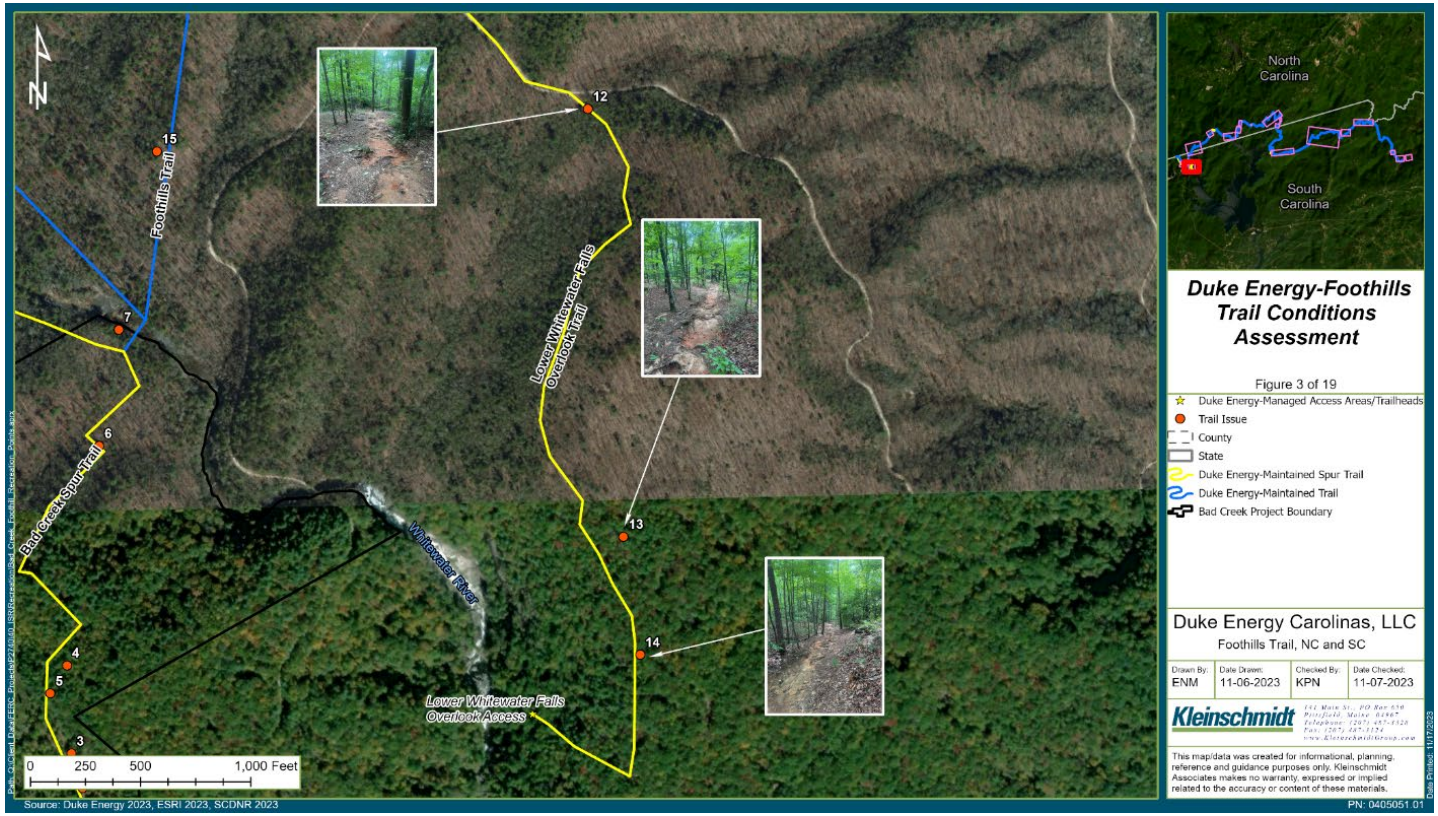


**Figure 4-5 Foothills Trail Conditions Assessment – Figure 4 of 19**

**Figure 4-6 Foothills Trail Conditions Assessment – Figure 5 of 19**

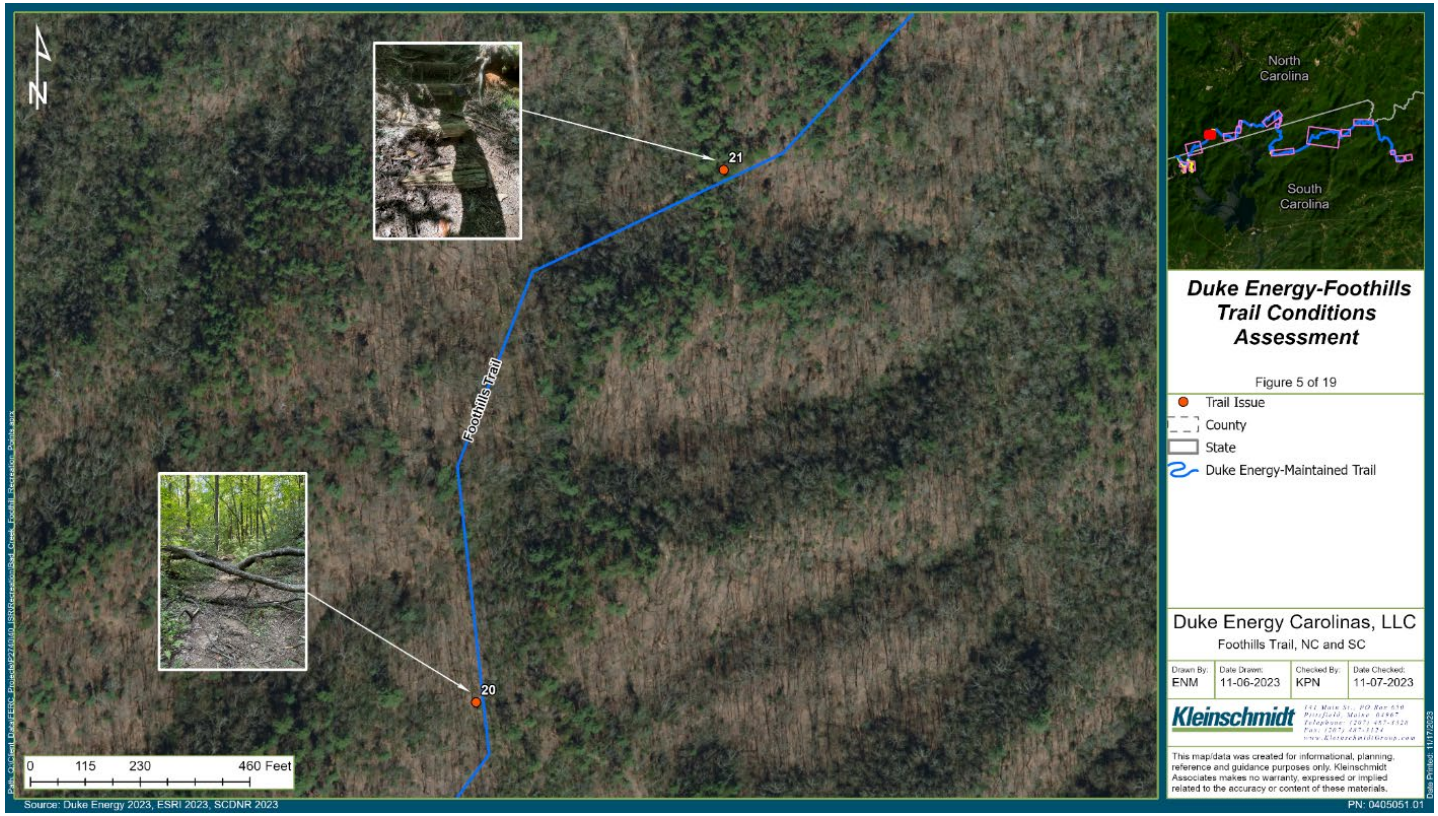


**Figure 4-7 Foothills Trail Conditions Assessment – Figure 6 of 19**

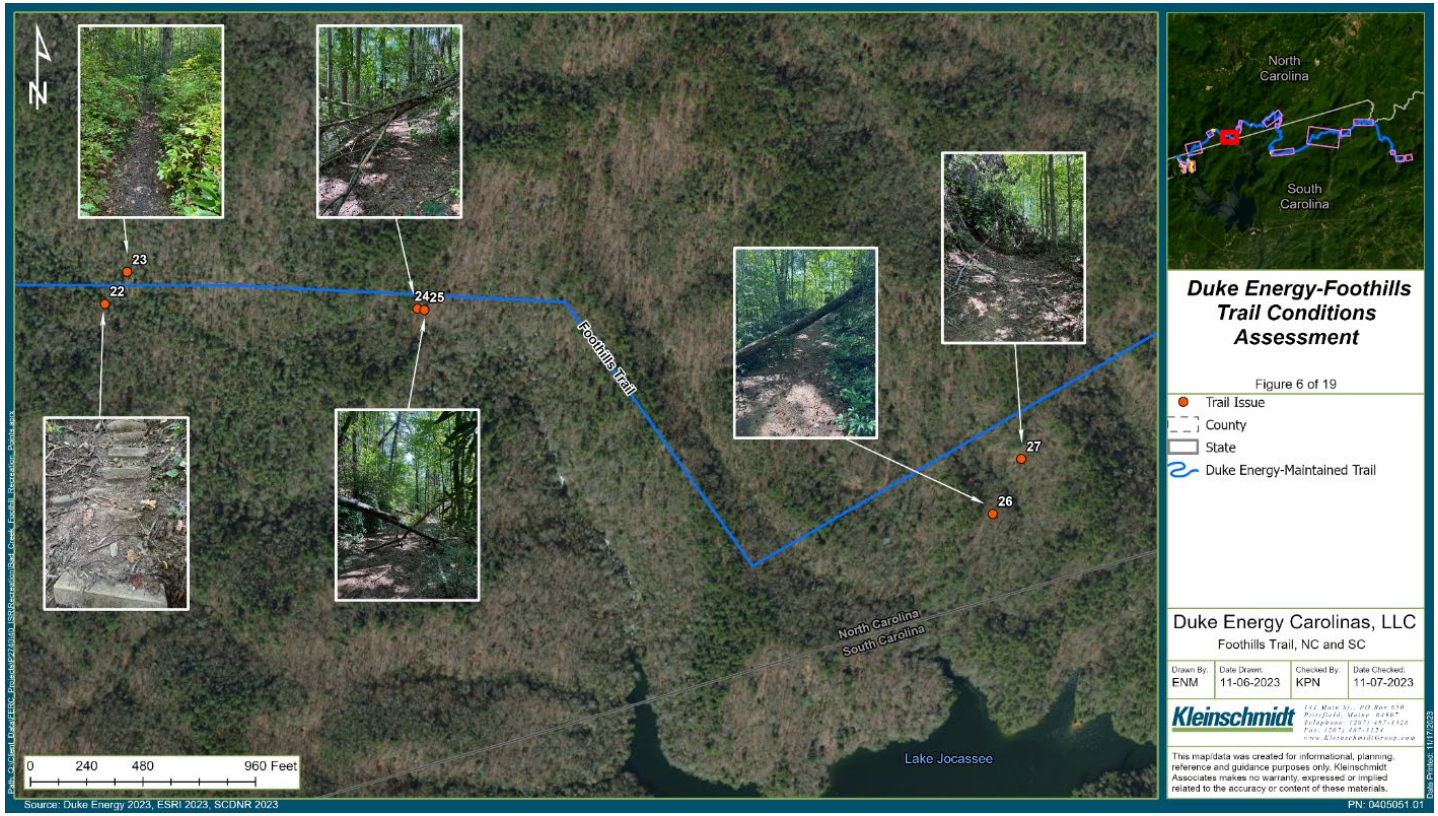


**Figure 4-8 Foothills Trail Conditions Assessment – Figure 7 of 19**

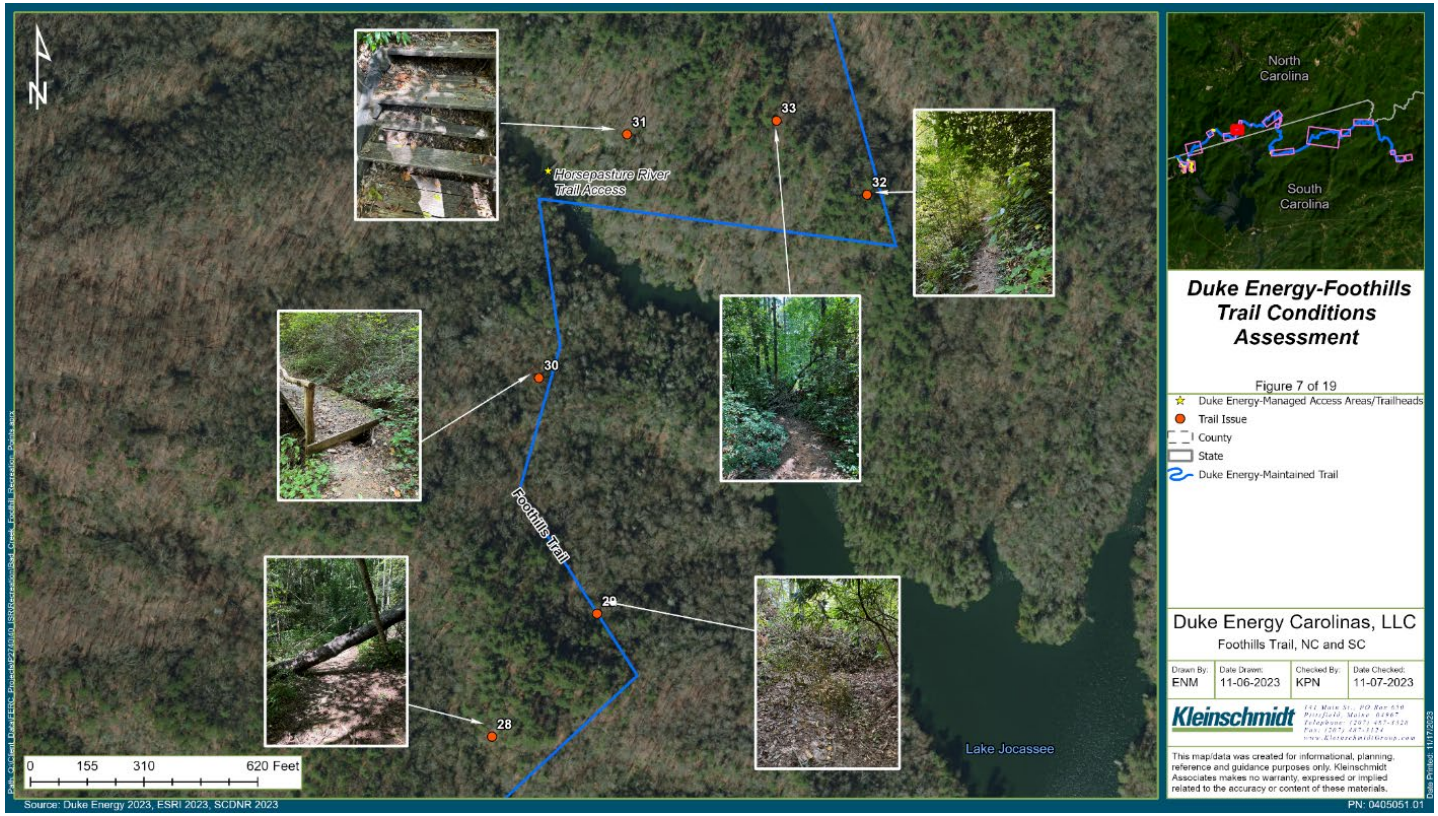


**Figure 4-9 Foothills Trail Conditions Assessment – Figure 8 of 19**

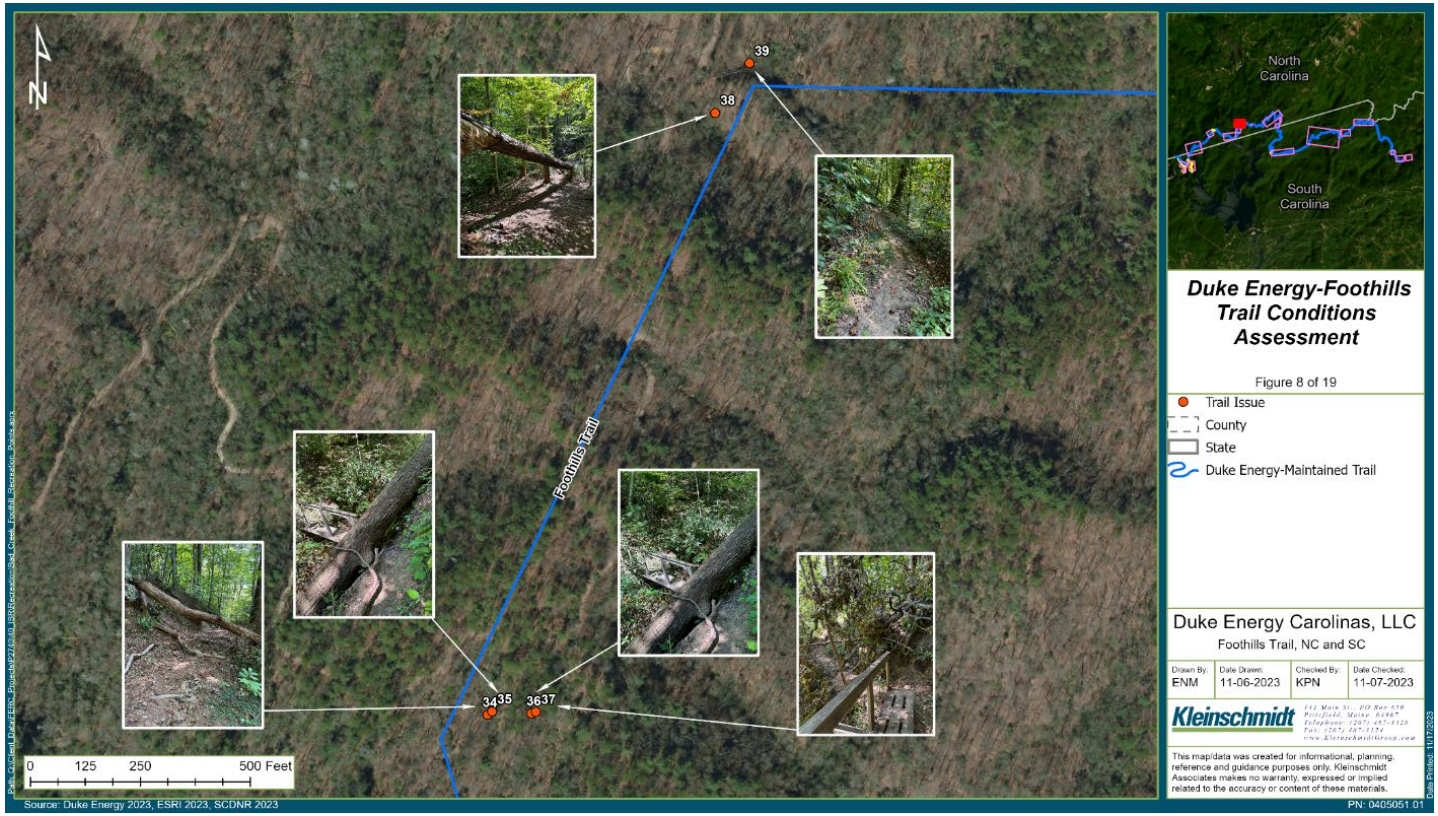


**Figure 4-10 Foothills Trail Conditions Assessment – Figure 9 of 19**

**Figure 4-11 Foothills Trail Conditions Assessment – Figure 10 of 19**

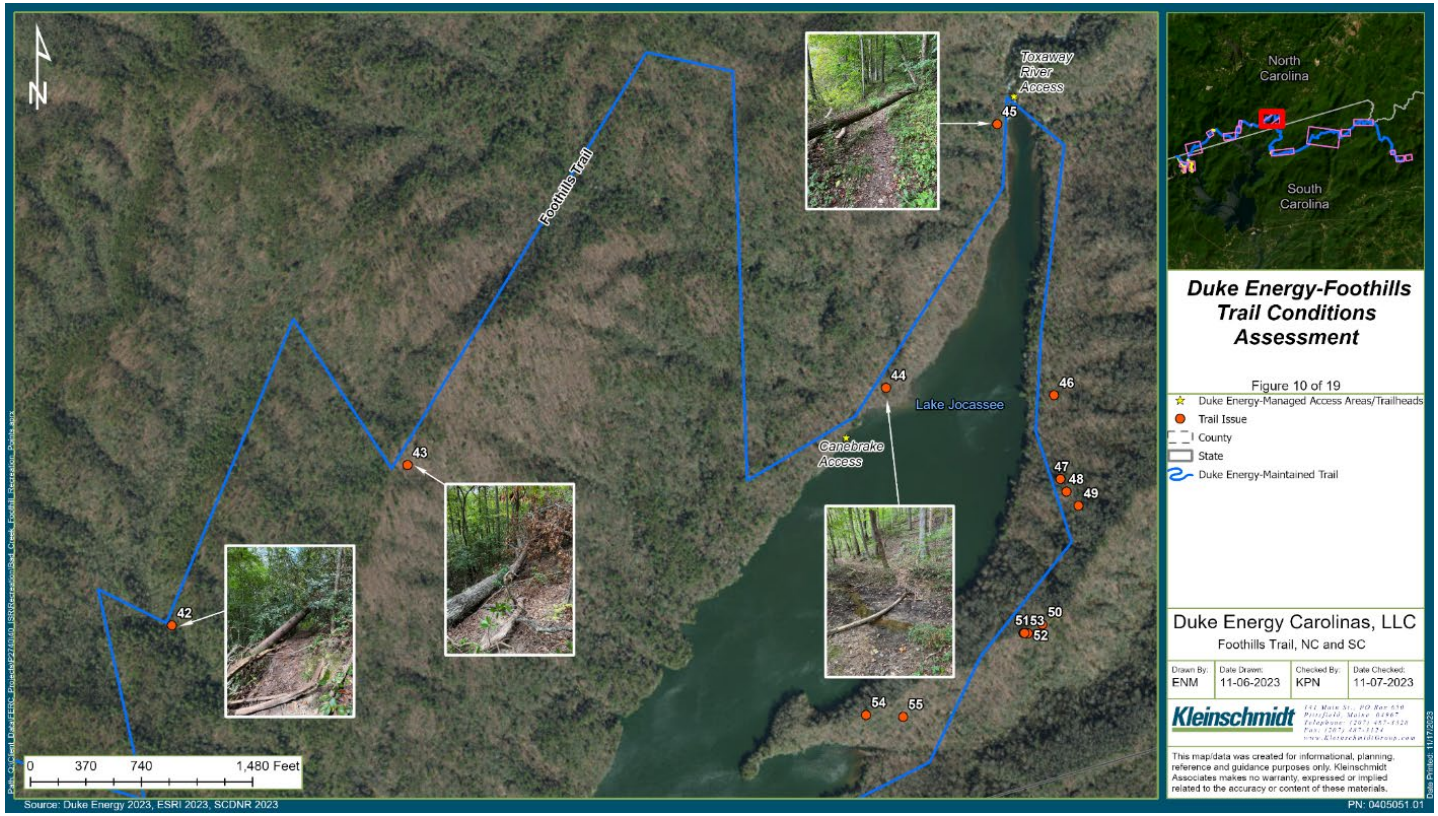
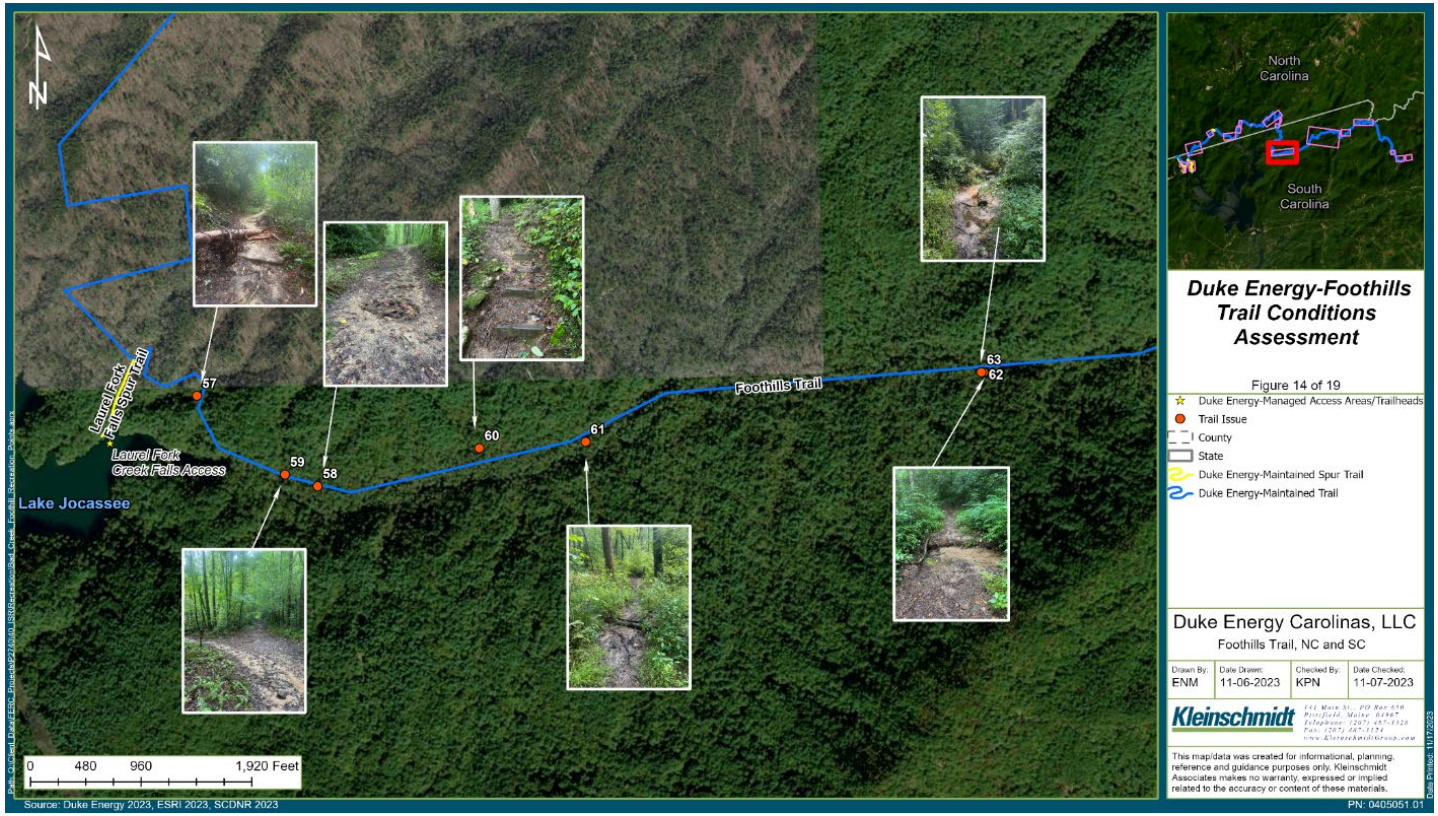


**Figure 4-12 Foothills Trail Conditions Assessment – Figure 11 of 19**

**Figure 4-13 Foothills Trail Conditions Assessment – Figure 12 of 19**

**Figure 4-14 Foothills Trail Conditions Assessment – Figure 13 of 19**

**Figure 4-15 Foothills Trail Conditions Assessment – Figure 14 of 19**



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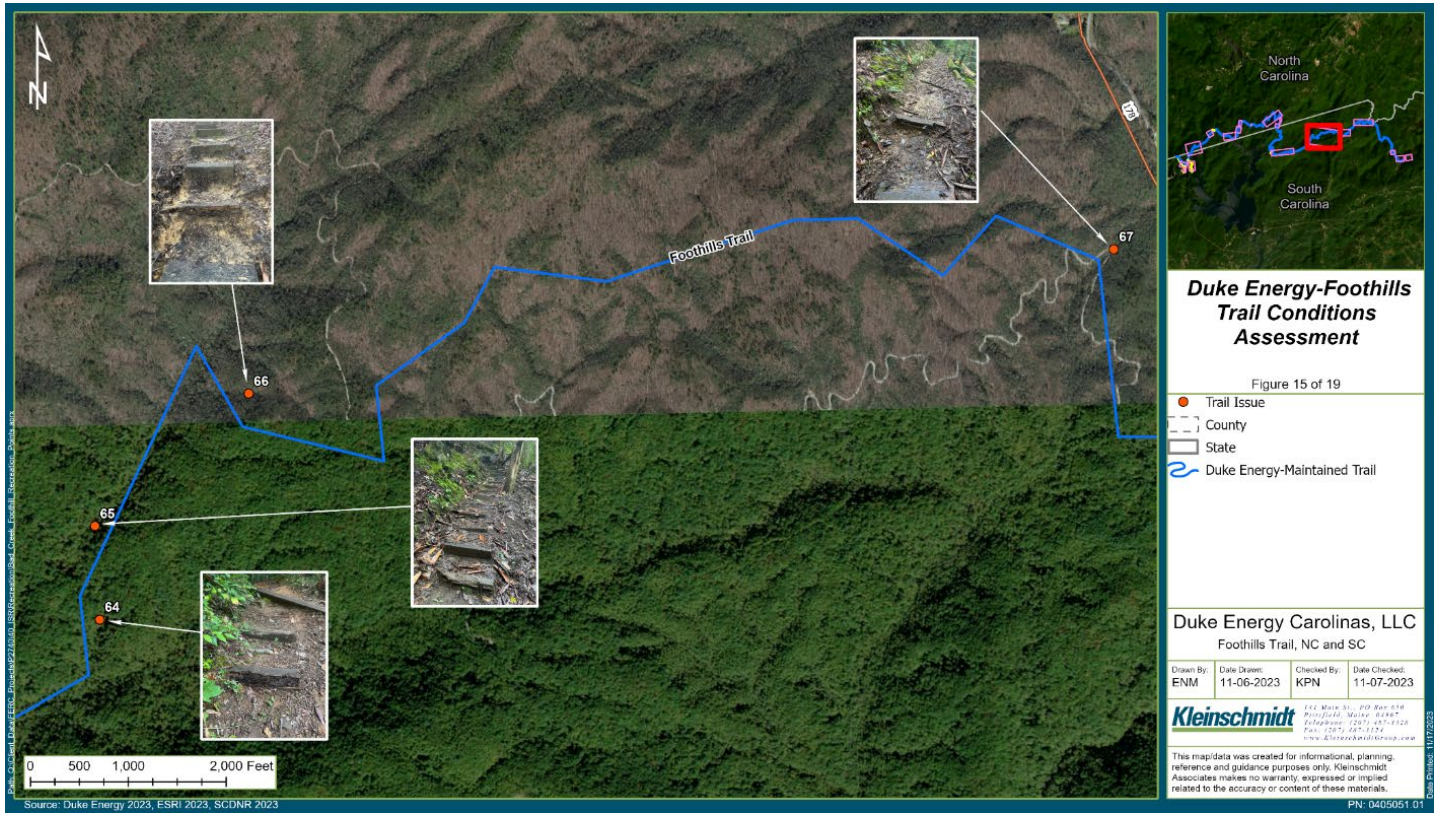
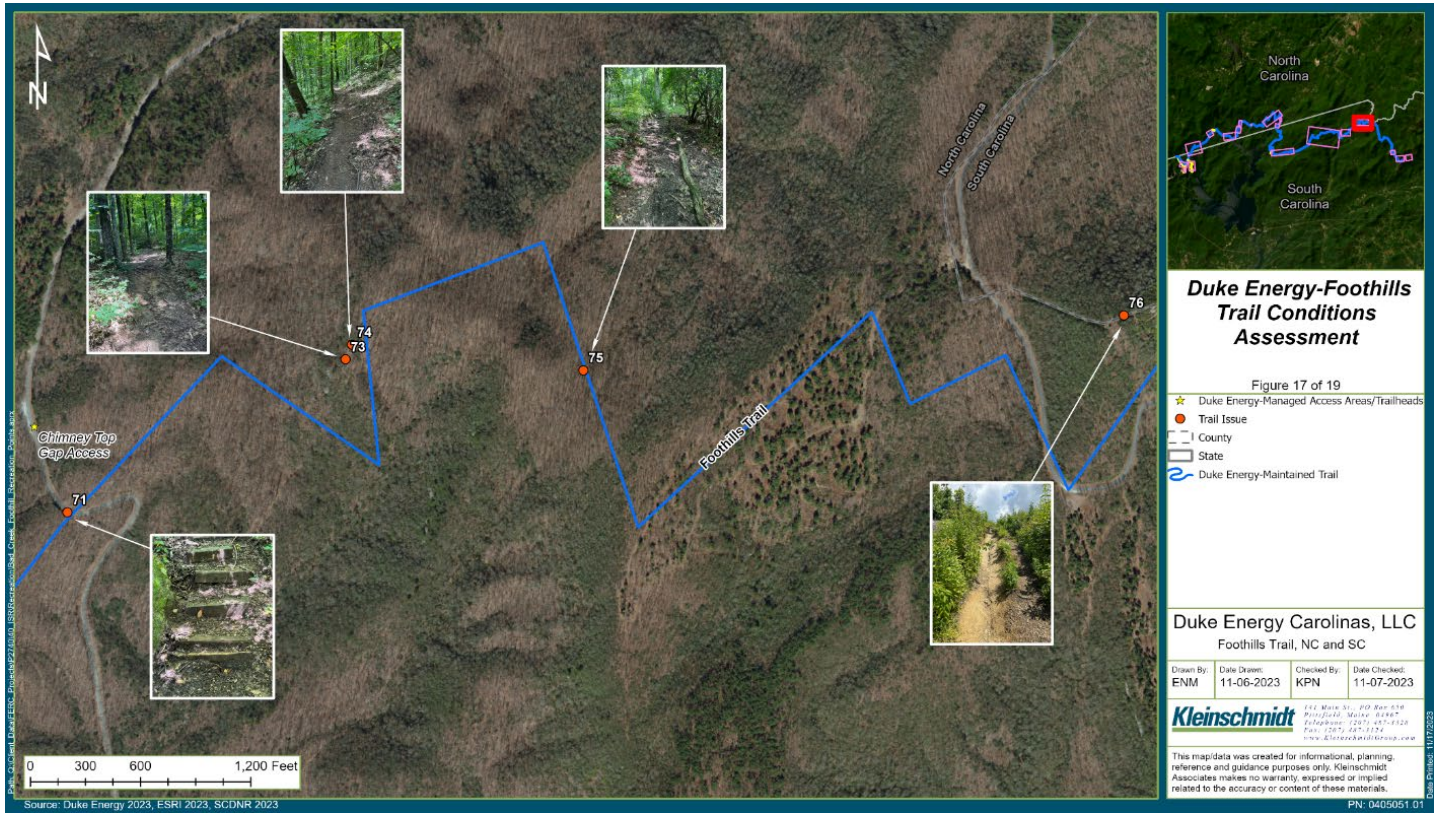


**Figure 4-17 Foothills Trail Conditions Assessment – Figure 16 of 19**

**Figure 4-18 Foothills Trail Conditions Assessment – Figure 17 of 19**



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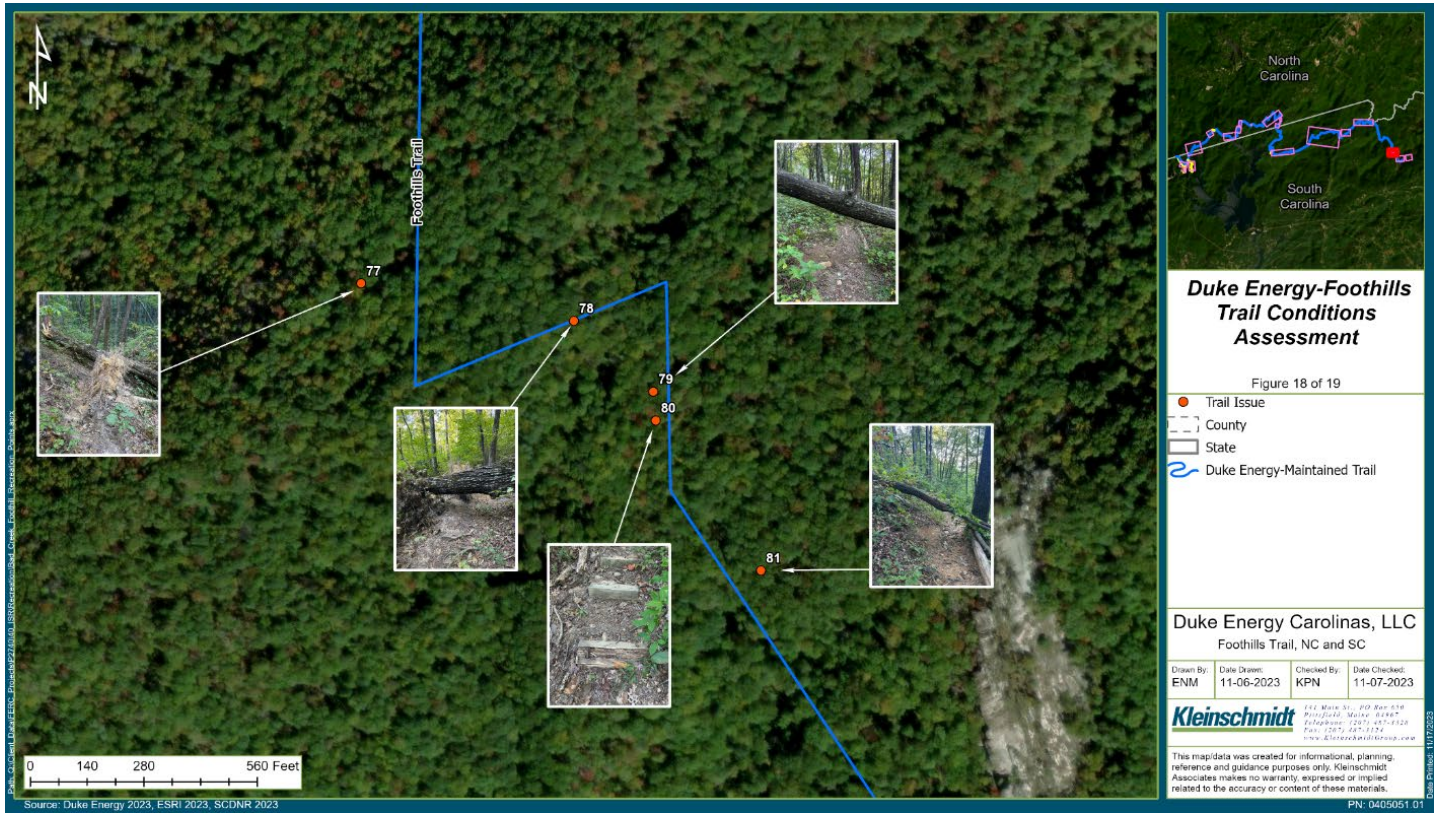
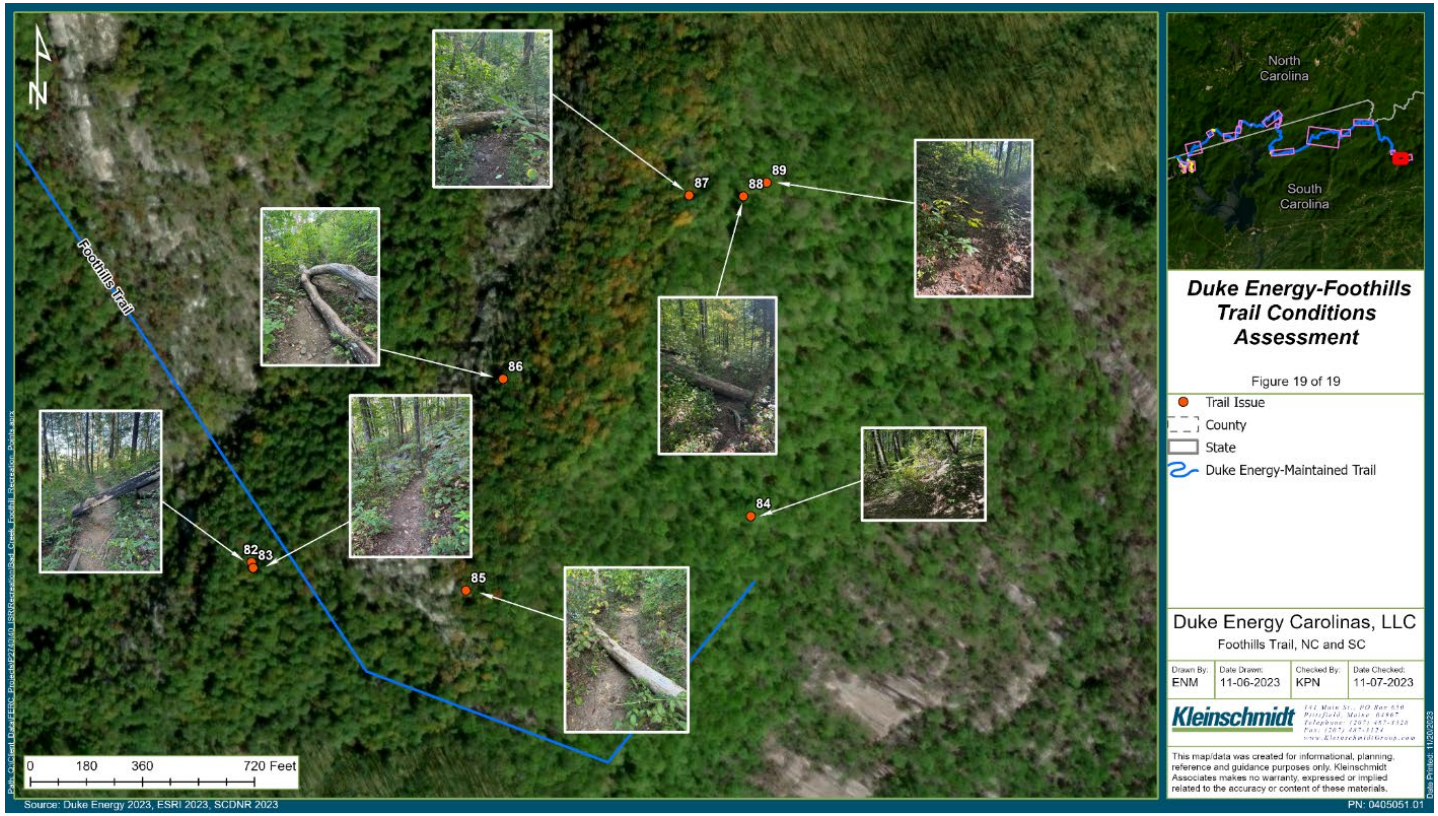


**Figure 4-20 Foothills Trail Conditions Assessment – Figure 19 of 19**



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## 5.0 SUMMARY

During the trail Conditions Assessment, Long Cane Trails identified 89 issues within the study area primarily related to trail maintenance and safety. Specifically, 77 issues were identified on the Foothills Trail, seven on the Bad Creek Access Spur, four on Coon Branch, and three on the Lower Whitewater Falls Spur. Issues identified include culvert cleaning, erosion control, steps replacement, signage improvement, bridge maintenance, fallen tree removal, and trail washout repair. Table 5-1 describes the key findings identified by Long Cane Trails for the Foothills Trail and spur trails. The information presented in this Trail Conditions Assessment will be considered by Duke Energy when developing Protection, Mitigation and Enhancement (PME) measures.

**Table 5-1 Key Findings of Foothills Trail Conditions Assessment**

| Trail | Mile | Key Findings |
|---|---|---|
| Bad Creek Access Spur | 0.1-0.7 | • Culvert Maintenance: A culvert with a clogged drain spanning 80 feet requires cleaning to allow proper water flow.<br>• Wet Areas: Low areas on the trail with standing water need gravel addition to raise and level the path, covering 60 feet and 30 feet sections.<br>• Erosion Control: Removal of barricades placed on the side of the trail to address water retention issues.<br>• Steps Replacement: Several steps need replacement due to rot.<br>• Interpretive Signage: Approximately 100 feet of trail has been rerouted, and new blazes are needed to guide hikers. |
| Coon Branch Spur | 0.2 | • Bridge Maintenance: Railing and decking replacement for a bridge, involving handrails and decking boards.<br>• Railing Replacement: Two handrails need replacement. |
| Coon Branch Spur | 0.4 | • Bog Bridge Installation: Installation of a bog bridge measuring 4 feet x 2 feet.<br>• Drain Clearing: Major drain unclogging is required to prevent overflow onto the trail. |
| Foothills Trail | 31.6-72.8 | • Erosion Control: Multiple sections of the Foothills Trail require erosion control measures such as grade reversals, knicks, or drainage improvements.<br>• Steps Replacement: Various steps along the trail need replacement or repair due to damage.<br>• Fallen Trees: Several fallen trees across the trail need removal.<br>• Bog Bridges: Installation of new bog bridges.<br>• Signage: Adding new trail blazes and interpretive signage.<br>• Brush Removal: Clearing overgrown sections of the trail.<br>• Washout Repair: Addressing trail washouts and water diversion.<br>• New Trail Sections: Creating new trail segments to address erosion and trail conditions. |

## 6.0 CONSULTATION RECORD

This report was provided in draft form to the Recreation Resources Committee for review and comment on [date]. Comments were accepted on the draft report through [date]. Consultation is included in Appendix B. Comments were provided by the following entities:

- ~~Commenter~~ Foothills Trail Conservancy – ~~date~~11/28/2023
- Commenter – date
- Commenter – date

## 7.0 REFERENCES

Felton, V. 2004. Trail Solutions: IMBA's Guide to Building Sweet Singletrack (IMBA (International Mountain Bicycling Association), Ed.). International Mountain Bicycling Association.

Foothills Trail Conservancy, Inc. 2018. Foothills Trail Guidebook: A Comprehensive Guide. Revised Seventh Edition. January 1, 2018.

# APPENDIX A

# ASSESSMENT FORM

# APPENDIX B

# CONSULTATION DOCUMENTATION

| | |
|---|---|
| **From:** | Andrew Gleason |
| **To:** | Crutchfield Jr., John U; Amy Breedlove; Andy Douglas; Chris Starker; Dale Wilde; Dan Rankin; Elizabeth Miller; Kelly Kirven; Ken Forrester; quattrol; Salazar, Maggie; Amedee, Morgan D.; Pat Cloninger; SelfR; Rowdy Harris; Stuart, Alan Witten; suewilliams130@gmail.com; William T. Wood; Willie Simmons; Huff, Jen; phil.mitchell@gmail.com; Bill Ranson-Retired |
| **Cc:** | Kulpa, Sarah; McCarney-Castle, Kerry; glenn@hilliardgrp.com |
| **Subject:** | Re: Bad Creek Relicensing - Foothills Trail Corridor Conditions Assessment and Whitewater River Cove Recreation Use Evaluation Draft Reports (READY FOR REVIEW - REVISED) |
| **Date:** | Thursday, December 14, 2023 10:25:42 AM |
| **Attachments:** | image001.png<br>image002.png |



The FTC has submitted our comments and edits to the Conditions Assessment. I was not able to save comments directly to the document in the SharePoint drive, so I uploaded a copy that has our comments and edits. Here is the link to document FTC Updated Foothills Trail Conditions Assessment Study_20231120_Draft for RC Review.docx
We also included photographs of each item near the end of the document.

Andrew Gleason
Foothills Trail Conservancy Chairman
864-546-1589
andrewandwilla@hotmail.com

Foothills Trail

---

**From:** Crutchfield Jr., John U <John.Crutchfield@duke-energy.com>
**Sent:** Tuesday, November 21, 2023 2:36 PM
**To:** Amy Breedlove <BreedloveA@dnr.sc.gov>; Andrew Gleason <andrewandwilla@hotmail.com>; Andy Douglas <adoug41@att.net>; Chris Starker <cstarker@upstateforever.org>; Dale Wilde <dwilde@keoweefolks.org>; Dan Rankin <RankinD@dnr.sc.gov>; Elizabeth Miller <MillerE@dnr.sc.gov>; Kelly Kirven <Kelly.Kirven@KleinschmidtGroup.com>; Ken Forrester <forresterk@dnr.sc.gov>; Lynn Quattro <quattrol@dnr.sc.gov>; Maggie Salazar <maggie.salazar@hdrinc.com>; Morgan Amedee <amedeemd@dhec.sc.gov>; Pat Cloninger <cloningerp@dnr.sc.gov>; Ross Self <SelfR@dnr.sc.gov>; Rowdy Harris <charris@scprt.com>; Stuart, Alan Witten <Alan.Stuart@duke-energy.com>; Sue Williams <suewilliams130@gmail.com>; William Wood <woodw@dnr.sc.gov>; Willie Simmons <simmonsw@dnr.sc.gov>; Huff, Jen <Jen.Huff@hdrinc.com>; phil.mitchell@gmail.com <phil.mitchell@gmail.com>; Bill Ranson <bill.ranson@retiree.furman.edu>
**Cc:** Sarah Kulpa <sarah.kulpa@hdrinc.com>; Kerry McCarney-Castle <kerry.mccarney-castle@hdrinc.com>
**Subject:** RE: Bad Creek Relicensing - Foothills Trail Corridor Conditions Assessment and Whitewater River Cove Recreation Use Evaluation Draft Reports (READY FOR REVIEW - REVISED)

Dear Bad Creek Relicensing Recreation Resources Committee:

The noted discrepancy in the draft Foothills Trail Corridor Conditions Assessment Report tables and figures has been resolved, and the revised report has been re-posted to the SharePoint site for your review (link provided below).

Task 2 - Trail Conditions Assessment Draft Report

Duke Energy is extending the review period for Resource Committee members to provide comments on the draft report until **Monday, December 18** to compensate for the missed review days while the draft report was corrected.

If you have any questions, please contact Alan Stuart or me.

Regards,

John Crutchfield

---

**From:** Crutchfield Jr., John U
**Sent:** Thursday, November 16, 2023 10:04 AM
**To:** Amy Breedlove <BreedloveA@dnr.sc.gov>; Andrew Gleason <andrewandwilla@hotmail.com>; Andy Douglas <adoug41@att.net>; Chris Starker <cstarker@upstateforever.org>; Dale Wilde <dwilde@keoweefolks.org>; Dan Rankin <RankinD@dnr.sc.gov>; Elizabeth Miller <MillerE@dnr.sc.gov>; Kelly Kirven <Kelly.Kirven@KleinschmidtGroup.com>; Ken Forrester <forresterk@dnr.sc.gov>; Lynn Quattro <quattrol@dnr.sc.gov>; Maggie Salazar <maggie.salazar@hdrinc.com>; Morgan Amedee <amedeemd@dhec.sc.gov>; Pat Cloninger <cloningerp@dnr.sc.gov>; Ross Self <SelfR@dnr.sc.gov>; Rowdy Harris <charris@scprt.com>; Stuart, Alan Witten <Alan.Stuart@duke-energy.com>; Sue Williams <suewilliams130@gmail.com>; William Wood <woodw@dnr.sc.gov>; Willie Simmons <simmonsw@dnr.sc.gov>; Huff, Jen <Jen.Huff@hdrinc.com>; phil.mitchell@gmail.com; Bill Ranson <bill.ranson@retiree.furman.edu>
**Cc:** Sarah Kulpa <sarah.kulpa@hdrinc.com>; Kerry McCarney-Castle <kerry.mccarney-castle@hdrinc.com>
**Subject:** RE: Bad Creek Relicensing - Foothills Trail Corridor Conditions Assessment and Whitewater River Cove Recreation Use Evaluation Draft Reports (READY FOR REVIEW) PLEASE NOTE UPDATE
**Importance:** High

Dear Bad Creek Relicensing Recreational Resources Committee:

Duke Energy has become aware of an issue with the draft Foothills Trail Corridor Conditions Assessment Report. There is a discrepancy in the report table and figures not matching up.

Please note we will temporarily suspend access to the draft report until the issue is resolved. We will notify the Resource Committee when the corrected draft report will be available for review on the link provided below.

We apologize for this discrepancy and thank you for your patience in getting this resolved.

Regards,

John Crutchfield

---

**From:** Crutchfield Jr., John U
**Sent:** Monday, November 13, 2023 4:42 PM
**To:** Amy Breedlove <BreedloveA@dnr.sc.gov>; Andrew Gleason <andrewandwilla@hotmail.com>; Andy Douglas <adoug41@att.net>; Chris Starker <cstarker@upstateforever.org>; Dale Wilde <dwilde@keoweefolks.org>; Dan Rankin <RankinD@dnr.sc.gov>; Elizabeth Miller <MillerE@dnr.sc.gov>; Kelly Kirven <Kelly.Kirven@KleinschmidtGroup.com>; Ken Forrester <forresterk@dnr.sc.gov>; Lynn Quattro

<quattrol@dnr.sc.gov>; Maggie Salazar <maggie.salazar@hdrinc.com>; Morgan Amedee <amedeemd@dhec.sc.gov>; Pat Cloninger <cloningerp@dnr.sc.gov>; Ross Self <SelfR@dnr.sc.gov>; Rowdy Harris <charris@scprt.com>; Stuart, Alan Witten <Alan.Stuart@duke-energy.com>; Sue Williams <suewilliams130@gmail.com>; William Wood <woodw@dnr.sc.gov>; Willie Simmons <simmonsw@dnr.sc.gov>; 'Huff, Jen' <Jen.Huff@hdrinc.com>; 'phil.mitchell@gmail.com' <phil.mitchell@gmail.com>; Bill Ranson <bill.ranson@retiree.furman.edu>
**Cc:** Sarah Kulpa <sarah.kulpa@hdrinc.com>; Kerry McCarney-Castle <kerry.mccarney-castle@hdrinc.com>
**Subject:** Bad Creek Relicensing - Foothills Trail Corridor Conditions Assessment and Whitewater River Cove Recreation Use Evaluation Draft Reports (READY FOR REVIEW)
**Importance:** High

Dear Bad Creek Relicensing Recreational Resources Committee:

Duke Energy is pleased to distribute two reports for your review:

1. *Foothills Trail Corridor Conditions Assessment Report.* This draft report includes methods and results of the Foothills Trail corridor conditions assessment (Task 2) and is available on the Bad Creek Relicensing SharePoint site at the following link: Task 2 - Trail Conditions Assessment Draft Report.

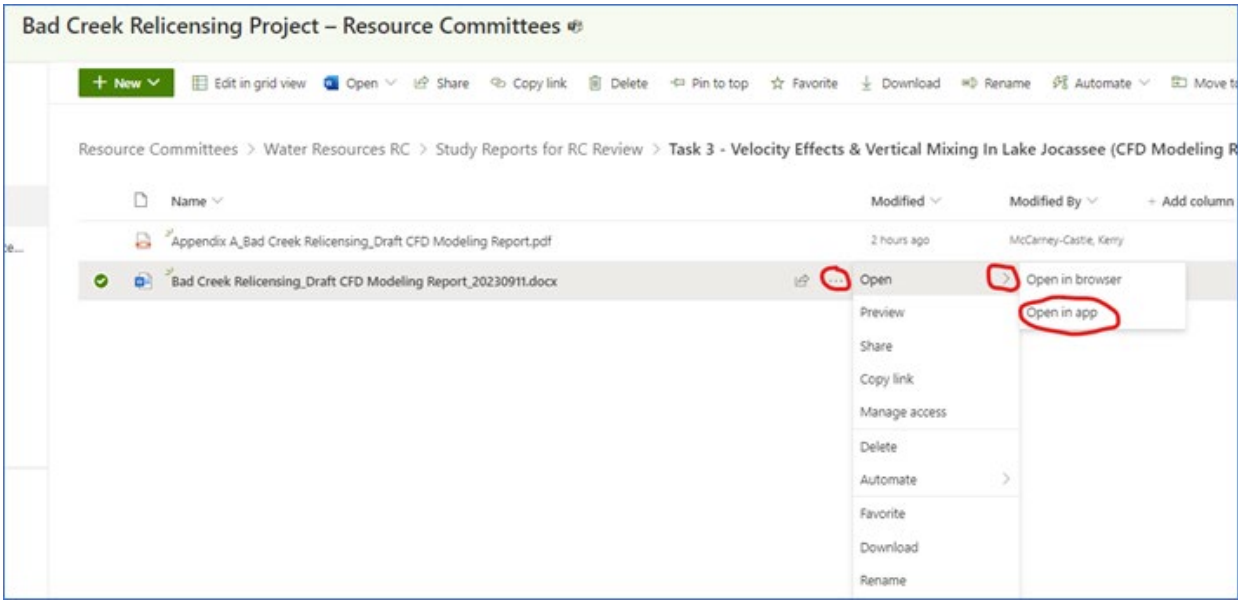
2. *Whitewater River Cove Recreational Use Evaluation*. This draft report includes methods and results from the recreational use evaluation in Whitewater River cove (Task 3) and is available on the Bad Creek Relicensing SharePoint site at the following link: Task 3 - Whitewater River Cove Recreational Use Evaluation Draft Report.

Duke Energy is requesting a 30-day review period, therefore, please submit all comments by **December 11th**. A confirmation email is kindly requested upon review completion (email me at John.Crutchfield@duke-energy.com).

**Important – Please Read!**

- As discussed in the kick-off meeting (July 2022), Duke Energy would like to make relicensing deliverables available on a shared platform (i.e., SharePoint) so all stakeholders can access, review, and comment; therefore, we request all comments be made in the SharePoint Word document using tracked changes. This will eliminate version control issues and result in a consolidated document for comment response.
- We strongly recommend opening the document in Word; otherwise the formatting will look distorted. The simplest way to do this is to click on the three dots to the right of the document (example shown below), choose "Open", then choose "Open in app". This will open the document in Word and you'll have the functionality you are accustomed to. Your changes will be saved automatically as you review. Please feel free to reach out to @McCarney-Castle, Kerry for SharePoint assistance.

  (Note: If you are new to SharePoint, a very brief tutorial with screenshots is available on the home page of the Resource Committees tab called **"**Editing a Document in SharePoint". This is the same tutorial that was presented during the kick-off meeting. [*The tutorial provides an alternative way to open the document in Word – either technique works!])*




If you have any questions, please contact Alan Stuart or me.

Regards,

***John Crutchfield***
Project Manager II
Water Strategy, Hydro Licensing & Lake Services
Regulated & Renewable Energy
Duke Energy
525 South Tryon Street, DEP-35B | Charlotte, NC 28202
Office 980-373-2288| Cell 919-757-1095

# DRAFT Foothills Trail Corridor Conditions Assessment

Bad Creek Pumped Storage Project

FERC No. 2740

Prepared for:
**Duke Energy Carolinas, LLC**

Prepared by:
**Kleinschmidt Associates**

November 2023

Kleinschmidtgroup.com

## TABLE OF CONTENTS



## LIST OF TABLES



## LIST OF FIGURES

## LIST OF APPENDICES

# 1.0 INTRODUCTION

On February 23, 2022, Duke Energy Carolinas, LLC (Duke Energy) submitted the Bad Creek Pumped Storage Project (Bad Creek Project or Project; FERC No. 2740) Notice of Intent to Relicense and Pre-Application Document (PAD) to the Federal Energy Regulatory Commission (FERC or Commission). The PAD included an alternative licensing proposal for installation of additional energy storage and generation capacity by constructing a new 1,400-megawatt power complex (Bad Creek II Complex) adjacent to the existing Bad Creek Powerhouse to meet the growing need for energy storage and renewable energy production across Duke Energy's service territories. Duke Energy plans to make a final decision regarding the alternative licensing proposal for the construction of the Bad Creek II Complex prior to the submittal of a Final License Application for the Bad Creek Project.

In Section 7.1.6.3 of the PAD, Duke Energy proposed to conduct a Recreational Resources Study in support of the proposed the Bad Creek II Complex. No study requests related to recreational resources were received during the scoping process; however, formal comments on the PAD and Scoping Document 1 regarding recreational resources were received from Upstate Forever and the Foothills Trail Conservancy. Comment responses were included in Appendix A of the Proposed Study Plan, which was filed with the Commission on August 5, 2022. Stakeholder comments on the Proposed Study Plan were submitted by the Commission, South Carolina Department of Natural Resources (SCDNR), Upstate Forever, and the Foothills Trail Conservancy. Resource issues and stakeholder comments pertinent to the Recreational Resources Study were considered in the development of the Revised Study Plan, which was filed with the Commission on December 5, 2022. Summaries of comments and responses were included in Appendix A and copies of all comments and correspondence were provided in Appendix B of the Revised Study Plan (RSP). The Commission issued its Study Plan Determination on January 4, 2023, and approved the Recreational Resources Study with modifications.

The Recreational Resources Study consists of four main study tasks: (1) a Recreation Use and Needs (RUN) Study for the 43-mile-long portion of the Foothills Trail (or trail) managed by Duke Energy; (2) a Foothills Trail Corridor Conditions Assessment (Conditions Assessment) of the 43-mile-long portion of the Foothills Trail and associated spur trails managed by Duke Energy; (3) an Existing Recreational Use Characterization of Whitewater River cove; and (4) a Recreational Public Safety Evaluation of Whitewater River cove.

This Foothills Trail Corridor Conditions Assessment (Conditions Assessment) focuses on item 2 above, evaluating the current condition of trail surface and corridor included in the 43-mile segment of the Foothills Trail and associated spur trails maintained by Duke Energy and identifying key areas of future maintenance needs or improvements. The data collected during this study will be used during development of protection, mitigation, and enhancement measures for the Project.

### 1.1 Current Operation

The Bad Creek Project is located in Oconee County, South Carolina, approximately eight miles north of Salem, South Carolina. The Bad Creek Reservoir (upper reservoir) was formed when Bad Creek and West Bad Creek were dammed and serves as the Bad Creek Project's upper reservoir. Lake Jocassee (lower reservoir) serves as the Bad Creek Project's lower reservoir and is licensed as part of Duke Energy's Keowee-Toxaway Hydroelectric Project (KT Project; FERC No. 2503).

The 30-year-old Bad Creek Project is one of the most powerful and flexible energy generation and storage assets in Duke Energy's system. Built primarily to store surplus energy from baseload nuclear and fossil-fuel-driven power plants during times of low energy demand, today the Bad Creek Project is used to balance an increasingly complex energy grid. By pumping water from Lake Jocassee up to the Bad Creek Reservoir, the Bad Creek Project is able to provide storage of surplus baseload energy during low demand periods. While the Bad Creek Project is in turbine operation mode, water runs from the upper reservoir down to Lake Jocassee, providing power back to the grid when energy demand is higher or when renewable generation is unavailable.

### 1.2 Proposed Action

The demand for energy and energy storage has been steadily on the rise in the southeastern region of the country. In an effort to meet this growing demand, Duke Energy is proposing an expansion to the Bad Creek Project that will double the generating capacity of the station. The proposed Bad Creek II Complex would utilize the existing upper and lower reservoirs and consist of a new inlet/outlet within the existing upper reservoir, water conveyance system, and underground powerhouse. Additionally, a new inlet/outlet along the shoreline of the Whitewater River arm of Lake Jocassee, or the Whitewater River cove, would be constructed.

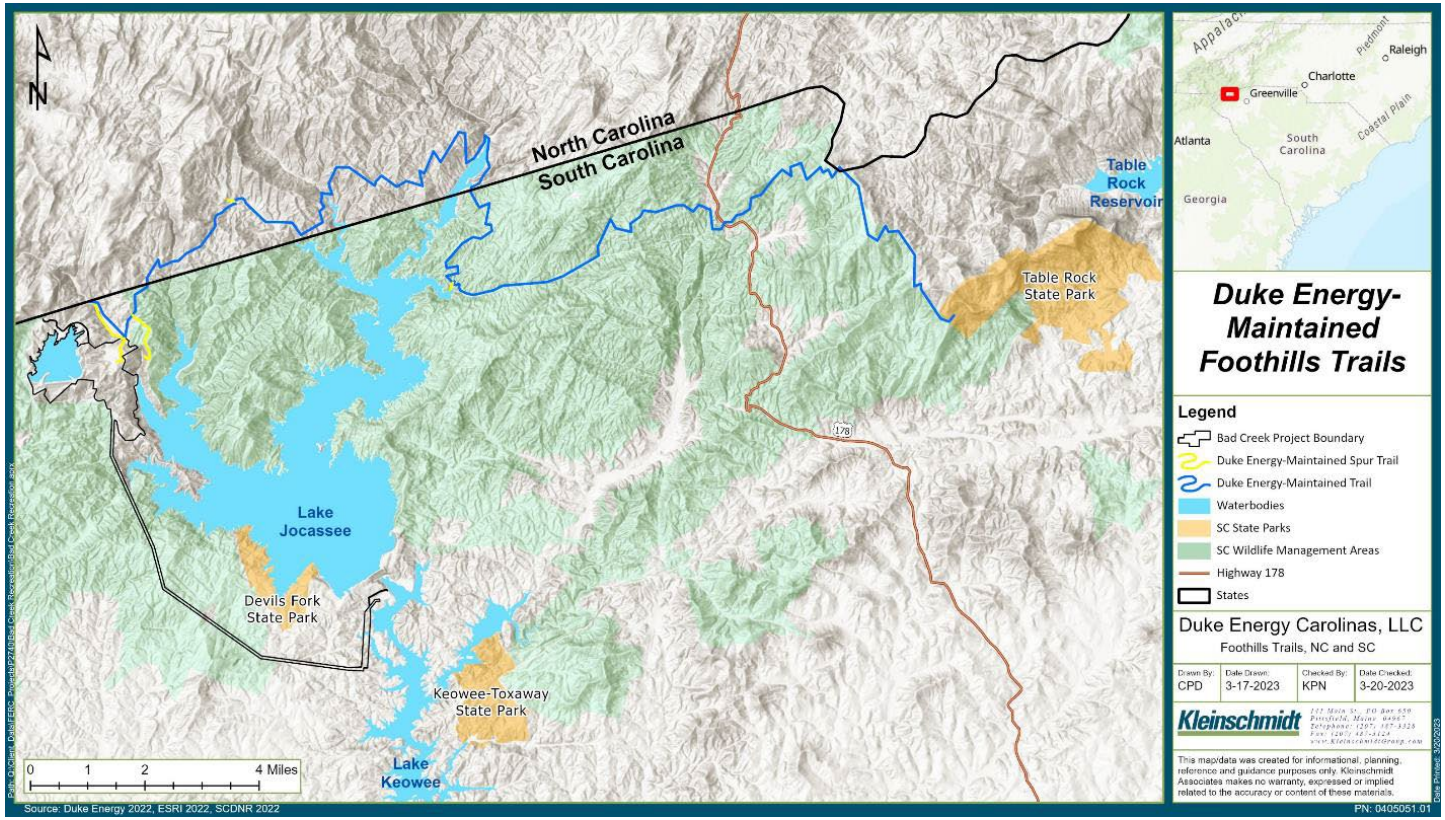
The Bad Creek II Complex underground powerhouse would be arranged and sized similarly to the existing Bad Creek Project powerhouse. In general, most of the features

for the Bad Creek II Complex would be submerged, underground, and/or within lands classified as "project operations," which are not accessible to the general public. The location of the proposed lower reservoir inlet/outlet structure has been chosen to minimize construction-related environmental impacts to the Whitewater River arm of Lake Jocassee. Nevertheless, the Whitewater River cove is anticipated to be closed to the public for approximately five years during construction of the Bad Creek II Complex. Duke Energy will develop more specific schedules and plans for closures as construction plans for the Bad Creek II Complex advance and in consultation with stakeholders.

## 2.0 DESCRIPTION OF STUDY AREA

The geographic scope (i.e., study area) of the Conditions Assessment includes the 43-mile-long segment of the Foothills Trail and five spur trails maintained by Duke Energy. The 43-mile Duke Energy-maintained trail segment begins on the western end of the Foothills Trail at the Duke Energy/U.S. Forest Service property line on the Whitewater River near the Bad Creek Project and extends east to the Duke Energy/Table Rock State Park property line approximately 1,000 feet southwest of the top of Pinnacle Mountain (Figure 2-1). There are five spur trails that connect with the Foothills Trail that are managed and maintained by Duke Energy including Laurel Fork Falls, Hilliard Falls, Lower Whitewater Falls Overlook, Bad Creek, and Coon Branch.

**Figure 2-1 Trail Conditions Assessment Study Area**



## 3.0 METHODOLOGY

One objective for accomplishing study goals was identified in the Recreational Resources Study Plan. The methods for accomplishing this objective are outlined below.

**Objective 1: Evaluate the current condition of trail surface and corridor and identify key areas of future maintenance needs or improvements for the 43-mile segment of the Foothills Trail maintained by Duke Energy**

Duke Energy subcontracted Long Cane Trails to perform a trail conditions assessment involving analyzing sections of trail and determining its maintenance needs[1]. Long Cane Trails divided the 43-mile segment of the Foothills Trail maintained by Duke Energy into six sections using the Foothills Trail Guidebook (Foothills Trail Conservancy 2018) as a reference for location descriptions. All 43 miles of the main trail corridor as well as spur trails were assessed for trail tread, out slope, backslope, drainage, constructed structures (not including engineered bridges) and corridor condition. Trail standards from the Trail Solutions guide (Felton 2004) on building singletrack was used as a base for trail condition analysis. Constructed structures (such as stairs, hand railings, bridges, etc.) were identified and recorded and location tracked geospatially. Structures in need of significant maintenance or replacement were recorded in detail with photo documentation. Similarly, trail condition and corridor features requiring maintenance or repair as well as areas of significant erosion, areas with significant drainage issues (i.e., standing water), or obstructed areas along the trail (i.e., downed trees), and notable occurrences of litter and vandalism were recorded and tracked geospatially.

Long Cane Trails used the following methods to document the current trail conditions and identify key areas of trail surface for future maintenance needs or improvements:

- Populate the Assessment Form (Appendix A); includes trail assessment descriptions defined in Table 3-1.
- Locate issue/structure along the trail and record GPS waypoint.
- Take photos of significant issues/features for documentation.
- Identify type of issue/structure using categories provided in Table 3-1.

[1] Inspections of engineered bridges on the Duke Energy-maintained portion of the Foothills Trail are performed every five years by a licensed Professional Engineer in accordance with the Duke Energy Foothills Trail Maintenance Program.

- Measure issue/structure (i.e., bridges, culverts, eroded sections, washouts, wet areas, and diameters of fallen trees).
- If excessive grade is present (greater than 15 percent slope) in conjunction with erosion, utilize clinometer to measure percent slope.
- Provide additional description/comments about issues/structures identified.

Long Cane Trails added their recommendations/prescriptions to existing trail details already measured and noted in the Foothills Trail Guidebook (Foothills Trails Conservancy 2018).

**Table 3-1 Long Cane Trails' Trail Assessment Descriptions**

**Trail Assessment Descriptions:**

| Code | Description |
|---|---|
| B | Bridges, puncheon, bog bridges, turnpikes. ***Note construction material, length/width (feet) and condition of bridge.*** |
| UC | Unimproved Crossing (stream crossing). ***Note if wading or rock steps and any maintenance required (unstable stepping stones). Note the width of the stream at the crossing point.*** |
| C | Culvert – open or closed drain across the trail. ***Note condition of culvert, length/diameter and if sufficient size for situation.*** |
| E | Erosion - look for exposed roots, rocks, or gullies on trail. ***Describe situation (exposed roots, gullies on tread, located on fall line (going straight down a hill regardless of grade) and length of eroded section (if greater than 25 ft, approximate distance).*** ***If excessive grade (>15% slope) in conjunction with erosion: measure steep slopes with clinometer (if numerous steep rocky slopes, no need to measure each one – note that trail has numerous steep rocky sections)*** |
| EC | Erosion Control Devices – check dams, water bars. ***Note type and condition of structure.*** |
| WO | Washout - section of trail has been mostly/completely washed away. ***Note length/width/depth and any hazards associated with washout. Take photo.*** |
| WA | Wet Area/standing water (larger than 3ft diameter). ***Note length/width. Note any adjacent water feature.*** |
| OB | Obstacle – fallen tree or other obstacle blocking treadway (include broken branches or trees leaning above/across the trail ("widow makers"). ***Note diameter of fallen tree***. |
| IB | Insufficient Blazing/Marking – if can't see next blaze/marker as you are moving past a blaze/marker or hard to locate next blaze/marker. ***Note if blazes/markers missing or worn off.*** |
| SI | Signage – ***Identify if Trailhead, Directional or Interpretive and if in need of repair. Note type of repair.*** |
| AC | Additional Comment – specific locations that warrant noting such as a scenic vista, unique feature (caves, mines, rock wall) and locations of invasive species. ***Note type of feature and associated details (such as name of invasive species and amount of plants (number, area).*** |

## 4.0 RESULTS

Long Cane Trail identified 89 areas needing maintenance or improvements (i.e., trail issues) along the 43-mile segment of the Foothills Trail and five spur trails maintained by Duke Energy, as listed in Table 4-1[2] and shown in Figure 4-1 through Figure 4-20. Photographs of individual trail issues are also included in Figure 4-1 through Figure 4-20.

[2] The Trail Conditions Assessment included Laurel Fork Falls and Hilliard Falls; however, no issues were identified and therefore are not included in Table 4-1.

**Table 4-1 Foothills Trail Conditions Assessment Findings**

| Trail Issue # | Figure # | Date Assessed | Trail Name | Mile Marker | Latitude | Longitude | Assessment Type | Description/Details |
|---|---|---|---|---|---|---|---|---|
| 1 | Figure 4-2 | 2023-09-14 | Bad Creek Access Spur | 0.1 | 35.01273631 | -82.99787808 | Culvert, Open Drain | Concrete culvert needs cleaning. Sediment has gathered and is sitting, not allowing water to run down the drain. |
| 2 | Figure 4-2 | 2023-09-14 | Bad Creek Access Spur | 0.1 | 35.01296829 | -82.99759536 | Wet Area / Standing Water | Gravel needs to be added to the section of the trail to raise it approximately 2 inches. This is a very low area with standing water most of the time. In fact, there is some drainage that seems to be serving a purpose in this area also. |
| 3 | Figure 4-2 | 2023-09-14 | Bad Creek Access Spur | 0.2 | 35.01339791 | -82.9977754 | Wet Area / Standing Water | Low part of the trail, and gravel needs to be brought in. Easily accessible from the parking lot. This trail has had gravel on it in the past. It just needs a topping. |
| 4 | Figure 4-2 | 2023-09-14 | Bad Creek Access Spur | 0.3 | 35.01449413 | -82.99786919 | Erosion Control Devices, Other | Someone is putting barricades on the side of the trail, and these need to be removed. There are several in this section of the trail. These, in fact, hold water on the trail versus letting water off the trail. There should be a series of knicks or grade reversals in this section to divert water. |

**Commented [EM1]:** The SCDNR notes that the clogged culverts may need to be assessed for the their need of expansion or conversion to a bridge in order to prevent future issues.

| Trail Issue # | Figure # | Date Assessed | Trail Name | Mile Marker | Latitude | Longitude | Assessment Type | Description/Details |
|---|---|---|---|---|---|---|---|---|
| 5 | Figure 4-2 | 2023-09-14 | Bad Creek Access Spur | 0.3 | 35.01413933 | -82.99811383 | Steps | The step is rotten and needs to be replaced. |
| 6 | Figure 4-3 | 2023-09-14 | Bad Creek Access Spur | 0.6 | 35.01723673 | -82.99744404 | Signage, Interpretive | Approximately 100 feet of trail has been rerouted. The user can still see the old relays in the corner as well as the old trail. The new trail is working great! The old trail needs to be closed, and the new trail needs to be blazed in the corner, so users know this is the trail. In this particular area, you have not seen a blaze in a while. Blue color is needed to apply a new blaze |
| 7 | Figure 4-3 | 2023-09-14 | Bad Creek Access Spur | 0.7 | 35.01869053 | -82.99718057 | Obstacle, Fallen Tree | A fallen tree across the trail needs to be removed. |
| 8 | Figure 4-3 | 2023-09-18 | Coon Branch | 0.2 | 35.01956213 | -82.99972003 | Bridge, Bridge | The upper railing needs to be replaced on both sides, and two decking boards need to be replaced. |
| 9 | Figure 4-3 | 2023-09-18 | Coon Branch | 0.2 | 35.01966168 | -82.9999907 | Bridge, Bridge | Two 2x4x12 railings need to be replaced. |
| 10 | Figure 4-3 | 2023-09-18 | Coon Branch | 0.4 | 35.02183009 | -83.00243764 | Bridge, Buncheon | Bog Bridge, two feet wide by four feet long, needs to be installed |

| Trail Issue # | Figure # | Date Assessed | Trail Name | Mile Marker | Latitude | Longitude | Assessment Type | Description/Details |
|---|---|---|---|---|---|---|---|---|
| 11 | Figure 4-3 | 2023-09-18 | Coon Branch | 0.4 | 35.02160249 | -83.00233517 | Erosion, Gullie | A major drain needs to be unclogged. It is overflowing and going down the trail. The solution is to simply open the drain up more and get rid of the sediment that is raising the drain up. |
| 12 | Figure 4-4 | 2023-09-14 | Lower Whitewater Falls Spur | 0.4 | 35.02155442 | -82.99014034 | Washout | Trail needs water diversion in the form of grade dips or knicks. |
| 13 | Figure 4-4 | 2023-09-14 | Lower Whitewater Falls Spur | 0.9 | 35.01623192 | -82.98947331 | Washout | Trail needs some steps and grade dips or water diversion features added. Approximately 20 steps needed. |
| 14 | Figure 4-4 | 2023-09-14 | Lower Whitewater Falls Spur | 1 | 35.01476505 | -82.98918722 | Erosion, Gullie | Trail is using an old roadbed that has a gully on each side and very few drains. all drains are clogged and need to be rerouted. New trail limit is very close to the old just elevated on the banks versus in the middle of the old roadbed. |
| 15 | Figure 4-3 | 2023-09-14 | Foothills Trail | 31.6 | 35.02092083 | -82.99665677 | Washout | The trail needs some grade reversals or knicks. Water has gotten on the trail and does not leave for some time, causing a gully if not fixed. |
| 16 | Figure 4-5 | 2023-09-30 | Foothills Trail | 32.4 | 35.02958049 | -82.99437631 | Steps | Replace three steps |

| Trail Issue # | Figure # | Date Assessed | Trail Name | Mile Marker | Latitude | Longitude | Assessment Type | Description/Details |
|---|---|---|---|---|---|---|---|---|
| 17 | Figure 4-5 | 2023-09-30 | Foothills Trail | 33.3 | 35.03730923 | -82.98769713 | Steps | Replace three steps |
| 18 | Figure 4-5 | 2023-09-30 | Foothills Trail | 33.9 | 35.03812814 | -82.98336354 | Steps | One step needs to be replaced. |
| 19 | Figure 4-5 | 2023-09-30 | Foothills Trail | 34.2 | 35.03822699 | -82.98165951 | Steps | Steps need to be replaced. |
| 20 | Figure 4-6 | 2023-09-30 | Foothills Trail | 35.5 | 35.04768531 | -82.96974848 | Obstacle, Fallen Tree | Tree across trail and needs to be removed. |
| 21 | Figure 4-6 | 2023-09-18 | Foothills Trail | 35.8 | 35.05077596 | -82.96808629 | Steps | Two steps need to be replaced. |
| 22 | Figure 4-7 | 2023-09-30 | Foothills Trail | 37.2 | 35.04848663 | -82.95255533 | Steps | One step is rotten and needs to be replaced. |
| 23 | Figure 4-7 | 2023-09-30 | Foothills Trail | 37.3 | 35.04886479 | -82.95224431 | Obstacle, Other | From mile 36.2 at Hilliard Falls Trail to 37.3 at Bear camp campsite |
| 24 | Figure 4-7 | 2023-09-30 | Foothills Trail | 37.6 | 35.0484997 | -82.94810344 | Obstacle, Fallen Tree | Fallen tree across trail that needs to be cut out. |
| 25 | Figure 4-7 | 2023-09-30 | Foothills Trail | 37.6 | 35.04848623 | -82.94800267 | Obstacle, Fallen Tree | Two trees have fallen and need to be cleared. |
| 26 | Figure 4-7 | 2023-09-30 | Foothills Trail | 38.6 | 35.04622411 | -82.93985485 | Obstacle, Fallen Tree | |
| 27 | Figure 4-7 | 2023-09-30 | Foothills Trail | 38.7 | 35.04687284 | -82.93946234 | Obstacle, Fallen Tree | Brush from the top of a falling tree needs to be removed. |
| 28 | Figure 4-8 | 2023-09-30 | Foothills Trail | 39.4 | 35.05225218 | -82.93751518 | Obstacle, Fallen Tree | Large tree across Trail needs to be removed. |
| 29 | Figure 4-8 | 2023-09-30 | Foothills Trail | 39.5 | 35.05318844 | -82.93657904 | Obstacle, Fallen Tree | A top of a tree is crossing the trail and needs to be cut out. |
| 30 | Figure 4-8 | 2023-09-30 | Foothills Trail | 39.8 | 35.05494625 | -82.93714846 | Erosion, Gullie | At the foot of the bridge there is erosion. Rocks need to be added to armor the 2 x 2' area that is compromised. |

| Trail Issue # | Figure # | Date Assessed | Trail Name | Mile Marker | Latitude | Longitude | Assessment Type | Description/Details |
|---|---|---|---|---|---|---|---|---|
| 31 | Figure 4-8 | 2023-10-01 | Foothills Trail | 39.9 | 35.05678279 | -82.93638778 | Steps | One step needs to be replaced |
| 32 | Figure 4-8 | 2023-10-01 | Foothills Trail | 40.1 | 35.05636493 | -82.93419022 | Obstacle, Other | Trail needs to be trimmed for 2/10 of a mile from Horse Pasture River Bridge to mile 40.3. |
| 33 | Figure 4-8 | 2023-10-01 | Foothills Trail | 40.2 | 35.05690722 | -82.93502841 | Obstacle, Fallen Tree | Tree removal |
| 34 | Figure 4-9 | 2023-10-01 | Foothills Trail | 40.4 | 35.05892556 | -82.93459743 | Obstacle, Fallen Tree | Tree removal |
| 35 | Figure 4-9 | 2023-10-01 | Foothills Trail | 40.4 | 35.05894665 | -82.93456431 | Obstacle, Fallen Tree | Tree removal |
| 36 | Figure 4-9 | 2023-10-01 | Foothills Trail | 40.5 | 35.05893904 | -82.9342663 | Bridge, Bridge | Trees falling on bridge needs to be repaired. |
| 37 | Figure 4-9 | 2023-10-01 | Foothills Trail | 40.5 | 35.05894956 | -82.93423148 | Obstacle, Fallen Tree | Tree removal |
| 38 | Figure 4-9 | 2023-10-01 | Foothills Trail | 40.8 | 35.06270942 | -82.93295438 | Obstacle, Fallen Tree | Tree needs to be removed. |
| 39 | Figure 4-9 | 2023-10-01 | Foothills Trail | 40.9 | 35.06302301 | -82.93270134 | Washout | 15 feet of trail needs to be re-benched. |
| 40 | Figure 4-10 | 2023-10-01 | Foothills Trail | 42.6 | 35.05953224 | -82.92052046 | Obstacle, Fallen Tree | Fallen tree needs to be removed. |
| 41 | Figure 4-10 | 2023-10-01 | Foothills Trail | 42.6 | 35.05954586 | -82.92038139 | Obstacle, Fallen Tree | Tree removal |
| 42 | Figure 4-11 | 2023-10-01 | Foothills Trail | 44.6 | 35.06174146 | -82.90542222 | Obstacle, Fallen Tree | Fallen tree needs to be cut out. |
| 43 | Figure 4-11 | 2023-10-01 | Foothills Trail | 45.7 | 35.06475517 | -82.90024767 | Obstacle, Fallen Tree | Tree removal |
| 44 | Figure 4-11 | 2023-10-01 | Foothills Trail | 47.9 | 35.06632757 | -82.88963219 | Bridge, Bog Bridges | Bog bridge needs to be installed. |

| Trail Issue # | Figure # | Date Assessed | Trail Name | Mile Marker | Latitude | Longitude | Assessment Type | Description/Details |
|---|---|---|---|---|---|---|---|---|
| 45 | Figure 4-11 | 2023-10-01 | Foothills Trail | 48.3 | 35.07118731 | -82.88726657 | Obstacle, Fallen Tree | Tree needs to be removed from across trail. |
| 46 | Figure 4-12 | 2023-10-01 | Foothills Trail | 48.8 | 35.06624918 | -82.8858863 | Steps | Step replacement |
| 47 | Figure 4-12 | 2023-10-01 | Foothills Trail | 48.9 | 35.06471527 | -82.88571508 | Additional Comment | Bench needs to be replaced. |
| 48 | Figure 4-12 | 2023-10-01 | Foothills Trail | 48.9 | 35.06448911 | -82.88557639 | Bridge, Bog Bridges | Bog bridge needs to be added. |
| 49 | Figure 4-12 | 2023-10-01 | Foothills Trail | 48.9 | 35.06423394 | -82.8852986 | Steps | Two steps need to be replaced. They are missing. One step needs to be repaired. |
| 50 | Figure 4-13 | 2023-10-01 | Foothills Trail | 49.1 | 35.06204989 | -82.88605607 | Steps | One step needs to be replaced. |
| 51 | Figure 4-13 | 2023-10-01 | Foothills Trail | 49.2 | 35.06188881 | -82.88646935 | Obstacle, Fallen Tree | Tree across trail needs to be cut. |
| 52 | Figure 4-13 | 2023-10-01 | Foothills Trail | 49.2 | 35.06188238 | -82.88636861 | Steps | Two steps are missing and need to be replaced. |
| 53 | Figure 4-13 | 2023-10-01 | Foothills Trail | 49.2 | 35.06188773 | -82.88644732 | Steps | One step needs to be replaced. |
| 54 | Figure 4-14 | 2023-10-01 | Foothills Trail | 49.4 | 35.06033756 | -82.88994145 | Steps | One step needs to be replaced. |
| 55 | Figure 4-14 | 2023-10-01 | Foothills Trail | 49.5 | 35.06031437 | -82.88911736 | Steps | One step needs to be replaced. |
| 56 | Figure 4-14 | 2023-10-01 | Foothills Trail | 49.9 | 35.05836929 | -82.89148322 | Obstacle, Fallen Tree | Tree across trail needs to be cut. |
| 57 | Figure 4-15 | 2023-09-17 | Foothills Trail | 53.9 | 35.03336423 | -82.8943042 | Obstacle, Fallen Tree | Tree has fallen across trail and holding back water, causing erosion before the tree fall. |
| 58 | Figure 4-15 | 2023-09-17 | Foothills Trail | 54.2 | 35.03126431 | -82.89076147 | Culvert, Open Drain | Culvert has collapsed and needs replacing |

| Trail Issue # | Figure # | Date Assessed | Trail Name | Mile Marker | Latitude | Longitude | Assessment Type | Description/Details |
|---|---|---|---|---|---|---|---|---|
| 59 | Figure 4-15 | 2023-09-17 | Foothills Trail | 54.2 | 35.03152907 | -82.89171696 | Signage, Directional | Insufficient blazes at this junction of foothills trail and laurel fork campsite. More white blades need to be added. |
| 60 | Figure 4-15 | 2023-09-17 | Foothills Trail | 54.6 | 35.03224254 | -82.886101 | Steps | One step needs to be replaced. |
| 61 | Figure 4-15 | 2023-09-17 | Foothills Trail | 54.8 | 35.03243434 | -82.88302672 | Bridge, Bog Bridges | Needs to be raised and lengthen to 12 feet long. |
| 62 | Figure 4-15 | 2023-09-17 | Foothills Trail | 55.5 | 35.03426627 | -82.8715385 | Bridge, Bog Bridges | 3 feet wide by 20 feet long bog bridge needs to be installed. |
| 63 | Figure 4-15 | 2023-09-17 | Foothills Trail | 55.5 | 35.03426745 | -82.87159877 | Bridge, Bridge | Trail is starting to widen due to water flow on trail being blocked. 12-foot-long by 4-foot-wide bridge needs to be added. |
| 64 | Figure 4-16 | 2023-09-17 | Foothills Trail | 57.1 | 35.04325018 | -82.85098593 | Steps | Two steps are rotten and need to be replaced. |
| 65 | Figure 4-16 | 2023-09-17 | Foothills Trail | 57.3 | 35.04586891 | -82.85120517 | Steps | 4 steps need to be replaced. |
| 66 | Figure 4-16 | 2023-09-17 | Foothills Trail | 57.9 | 35.04966325 | -82.84604181 | Steps | One step needs to be replaced. |
| 67 | Figure 4-16 | 2023-09-17 | Foothills Trail | 61.2 | 35.054138 | -82.8166194 | Steps | One step needs to be replaced. |
| 68 | Figure 4-17 | 2023-07-16 | Foothills Trail | 62 | 35.05087322 | -82.81288696 | Bridge, Bridge | One 2x6x12 bore needs to be replaced. It is rotten. |
| 69 | Figure 4-17 | 2023-07-16 | Foothills Trail | 62 | 35.05092472 | -82.81235406 | Steps | Rotten. Needs to be replaced. |
| 70 | Figure 4-17 | 2023-07-16 | Foothills Trail | 62.1 | 35.05166502 | -82.81183115 | Steps | Needs to be replaced. Rotten. |

| Trail Issue # | Figure # | Date Assessed | Trail Name | Mile Marker | Latitude | Longitude | Assessment Type | Description/Details |
|---|---|---|---|---|---|---|---|---|
| 71 | Figure 4-18 | 2023-07-16 | Foothills Trail | 63.8 | 35.06192592 | -82.79797438 | Steps | |
| 72 | Figure 4-17 | 2023-07-16 | Foothills Trail | 63 | 35.05545323 | -82.80436645 | Obstacle, Fallen Tree | Tree across trail. |
| 73 | Figure 4-18 | 2023-07-16 | Foothills Trail | 64.5 | 35.06428672 | -82.79296011 | Erosion, Gullie | Needs water break. |
| 74 | Figure 4-18 | 2023-07-16 | Foothills Trail | 64.5 | 35.06450762 | -82.79284939 | Erosion, Other | Tread is gone. It needs reestablished. |
| 75 | Figure 4-18 | 2023-07-16 | Foothills Trail | 64.9 | 35.06418329 | -82.78862932 | Erosion, Gullie | Rail on side of trail needs to be removed. It is holding water on the trail. Grade dips need to be installed and steps need to be reinstalled. |
| 76 | Figure 4-18 | 2023-07-16 | Foothills Trail | 66.2 | 35.06514616 | -82.77881549 | Erosion, Gullie | |
| 77 | Figure 4-19 | 2023-10-02 | Foothills Trail | 69.9 | 35.03597162 | -82.75429371 | Erosion, Exposed Roots | Tree has fallen on trail and uprooted 8 feet of trail. 8 feet needs to be re-benched. |
| 78 | Figure 4-19 | 2023-10-02 | Foothills Trail | 70.1 | 35.03574288 | -82.75253624 | Obstacle, Fallen Tree | Tree across trail needs to be cut out. |
| 79 | Figure 4-19 | 2023-10-02 | Foothills Trail | 70.2 | 35.03527295 | -82.75187234 | Obstacle, Fallen Tree | Tree needs to be cut out that is across trail. |
| 80 | Figure 4-19 | 2023-10-02 | Foothills Trail | 70.2 | 35.03507738 | -82.75184794 | Steps | One step needs to be replaced. |
| 81 | Figure 4-19 | 2023-10-02 | Foothills Trail | 70.3 | 35.03407215 | -82.7509606 | Obstacle, Fallen Tree | Tree across trail needs to be cut. |
| 82 | Figure 4-20 | 2023-10-02 | Foothills Trail | 70.8 | 35.02819674 | -82.74681091 | Obstacle, Fallen Tree | Remove tree that's across trail. |

| Trail Issue # | Figure # | Date Assessed | Trail Name | Mile Marker | Latitude | Longitude | Assessment Type | Description/Details |
|---|---|---|---|---|---|---|---|---|
| 83 | Figure 4-20 | 2023-10-02 | Foothills Trail | 70.8 | 35.02814792 | -82.74679256 | Obstacle, Other | Trail is extremely overgrown and needs to be trimmed from mile 70.2 at Pigeon Gap to mile 70.9 at Lighthouse Campsite. |
| 84 | Figure 4-20 | 2023-10-02 | Foothills Trail | 71.3 | 35.028678 | -82.741463 | Obstacle, Fallen Tree | Tree across trail in switchback. Fallen tree crosses trail twice. |
| 85 | Figure 4-20 | 2023-10-02 | Foothills Trail | 71.6 | 35.02797993 | -82.74450542 | Obstacle, Fallen Tree | Three trees across trail need to be cut out. |
| 86 | Figure 4-20 | 2023-10-02 | Foothills Trail | 71.7 | 35.02985095 | -82.74414491 | Obstacle, Fallen Tree | Tree across trail needs to be removed |
| 87 | Figure 4-20 | 2023-10-02 | Foothills Trail | 71.9 | 35.03149829 | -82.74218004 | Obstacle, Fallen Tree | Tree across trail needs to be removed |
| 88 | Figure 4-20 | 2023-10-02 | Foothills Trail | 71.9 | 35.03149667 | -82.74159849 | Obstacle, Fallen Tree | Tree across trail needs to be removed |
| 89 | Figure 4-20 | 2023-10-02 | Foothills Trail | 71.9 | 35.0316208 | -82.74135269 | Obstacle, Other | Corridor needs to be cleared and brushed removed from mile 70.9 at Lighthouse Campsite to 72.1 at Pinnacle Mountain Trail Junction. |

**Figure 4-1 Trail Issues Identified during the Foothills Trail Conditions Assessment**

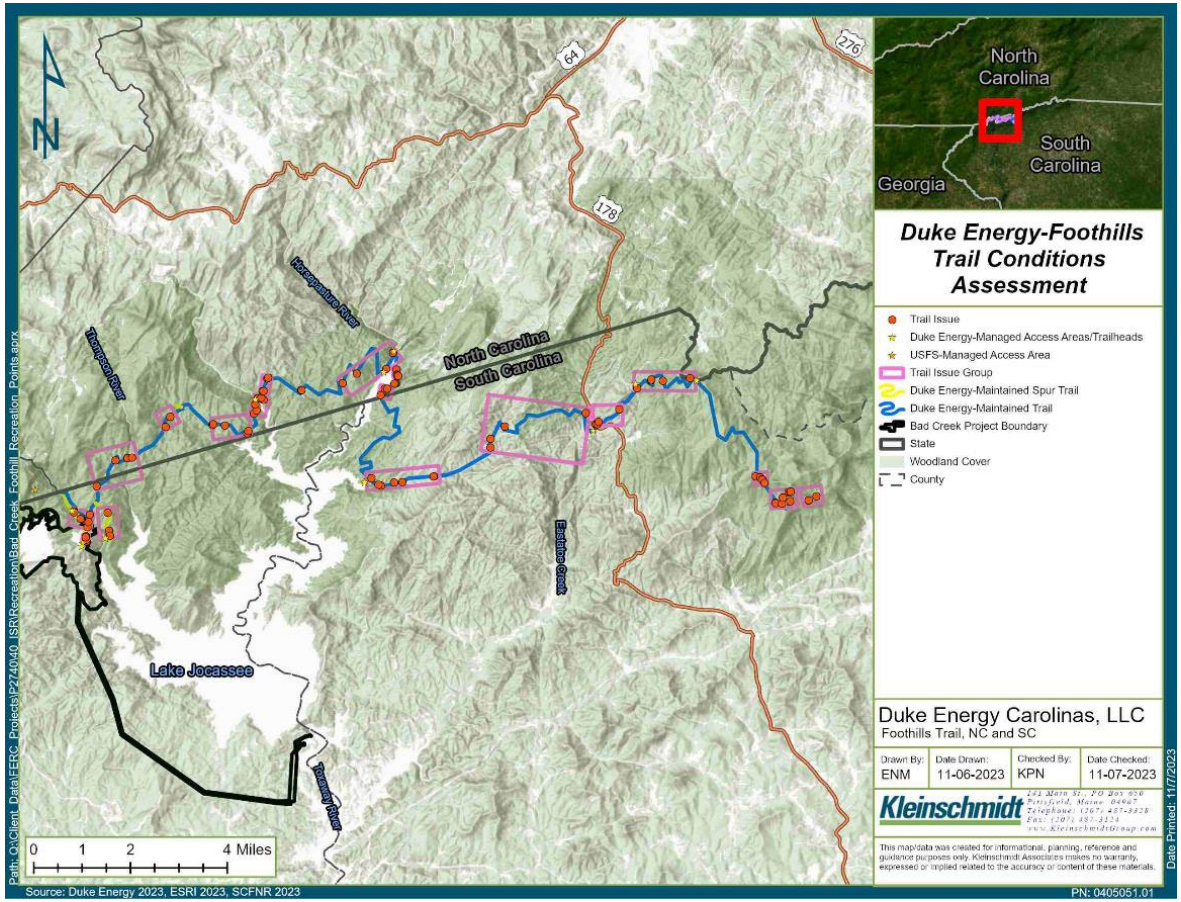
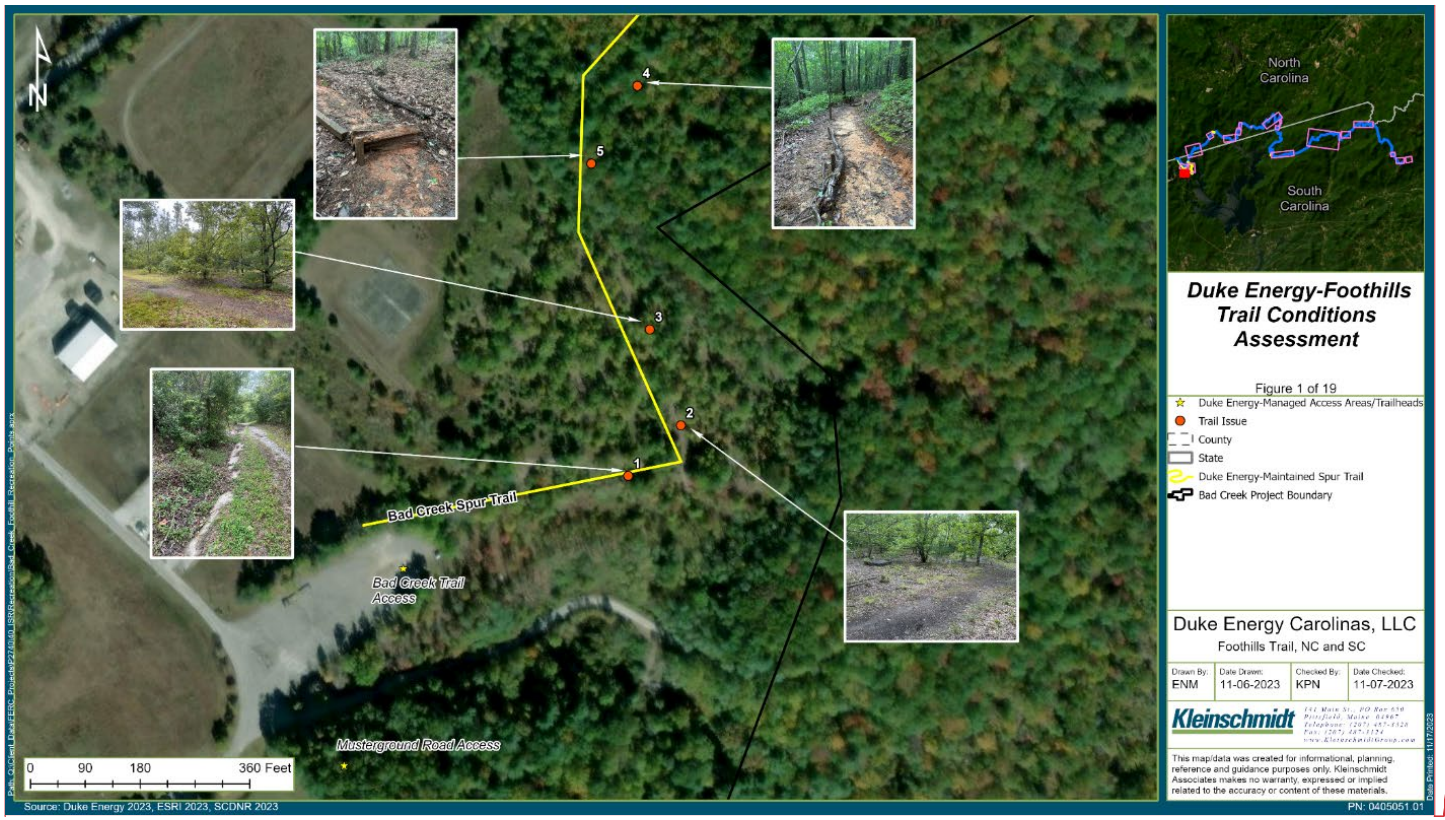
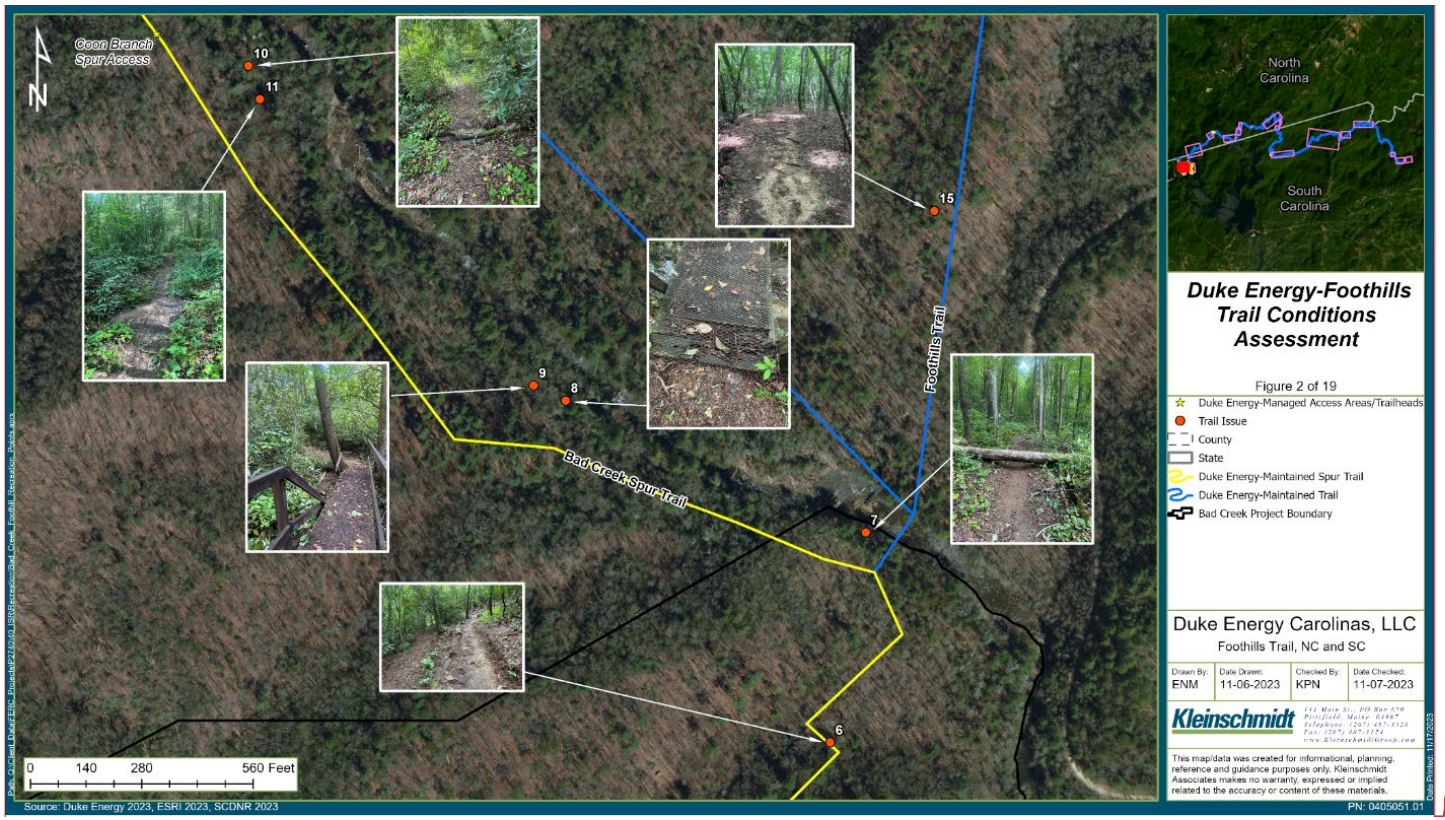


**Figure 4-2 Foothills Trail Conditions Assessment – Figure 1 of 19**




**Commented [EM2]:** Photo of Trail Issue #1 does not show the clogged culvert or downstream effects.

**Figure 4-3 Foothills Trail Conditions Assessment – Figure 2 of 19**




**Commented [EM3]:** Photo of Trail Issue #11 does not show the clogged culvert or downstream effects.

**Figure 4-4 Foothills Trail Conditions Assessment – Figure 3 of 19**

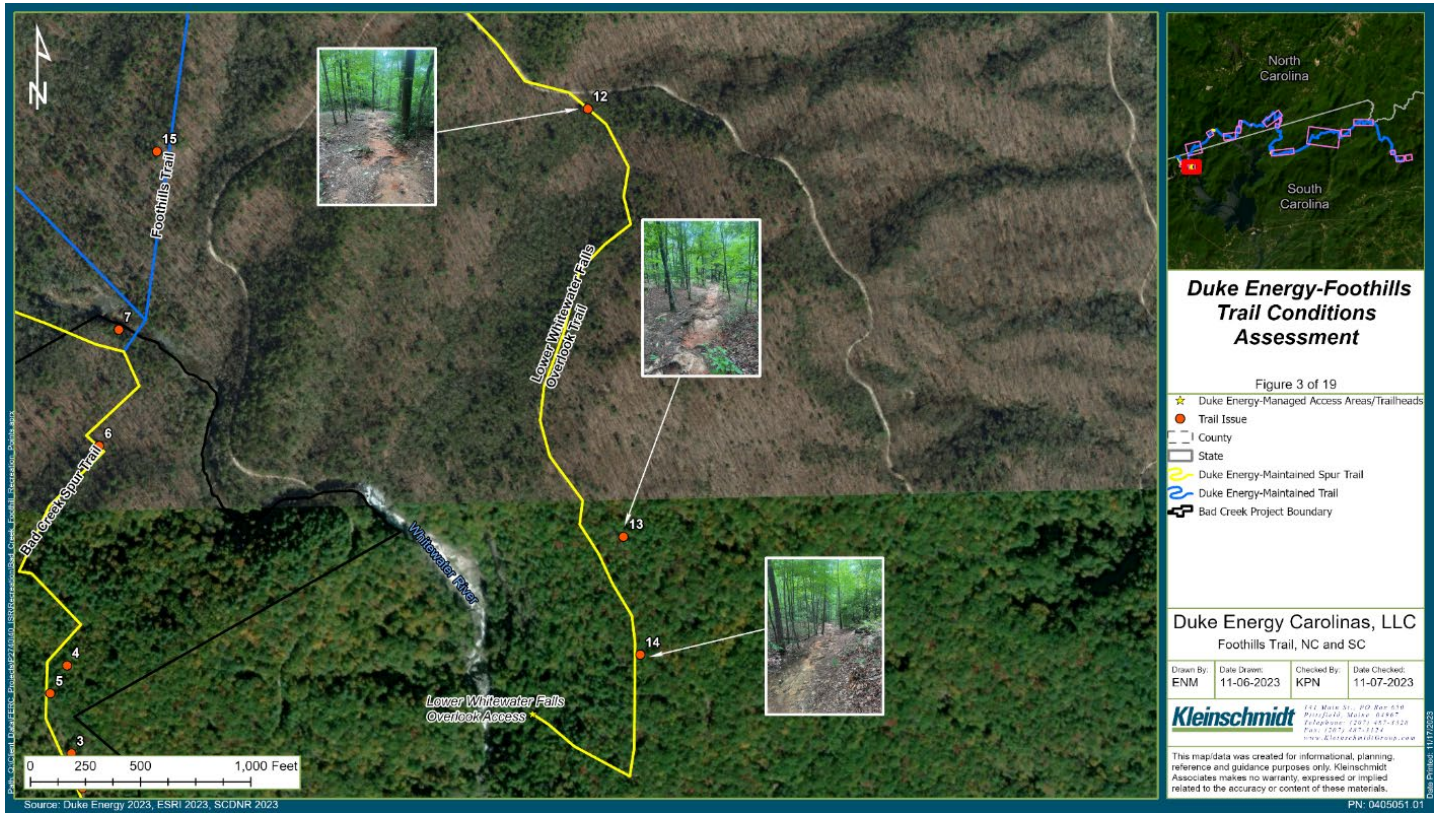


**Figure 4-5 Foothills Trail Conditions Assessment – Figure 4 of 19**

**Figure 4-6 Foothills Trail Conditions Assessment – Figure 5 of 19**

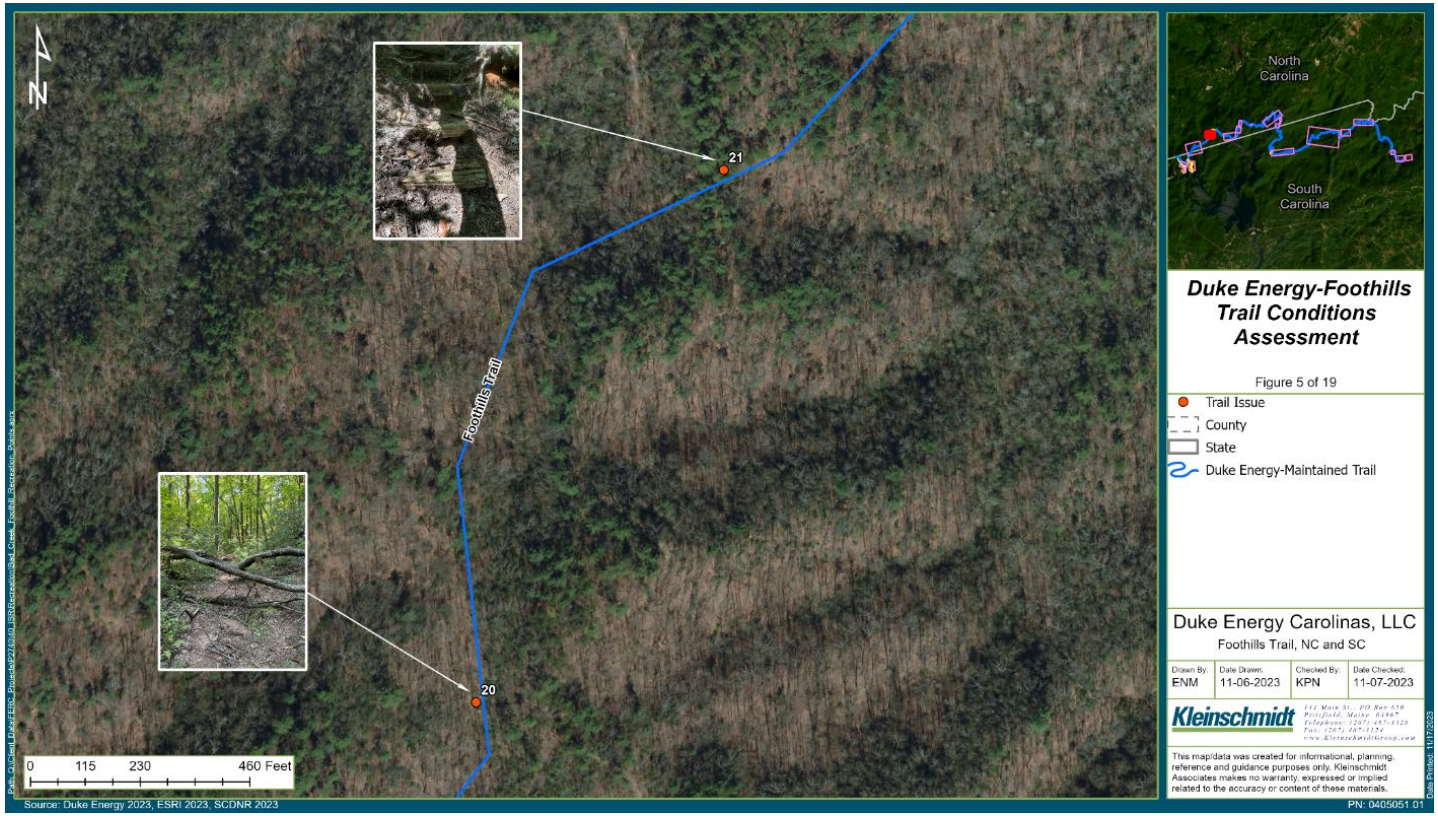


**Figure 4-7 Foothills Trail Conditions Assessment – Figure 6 of 19**

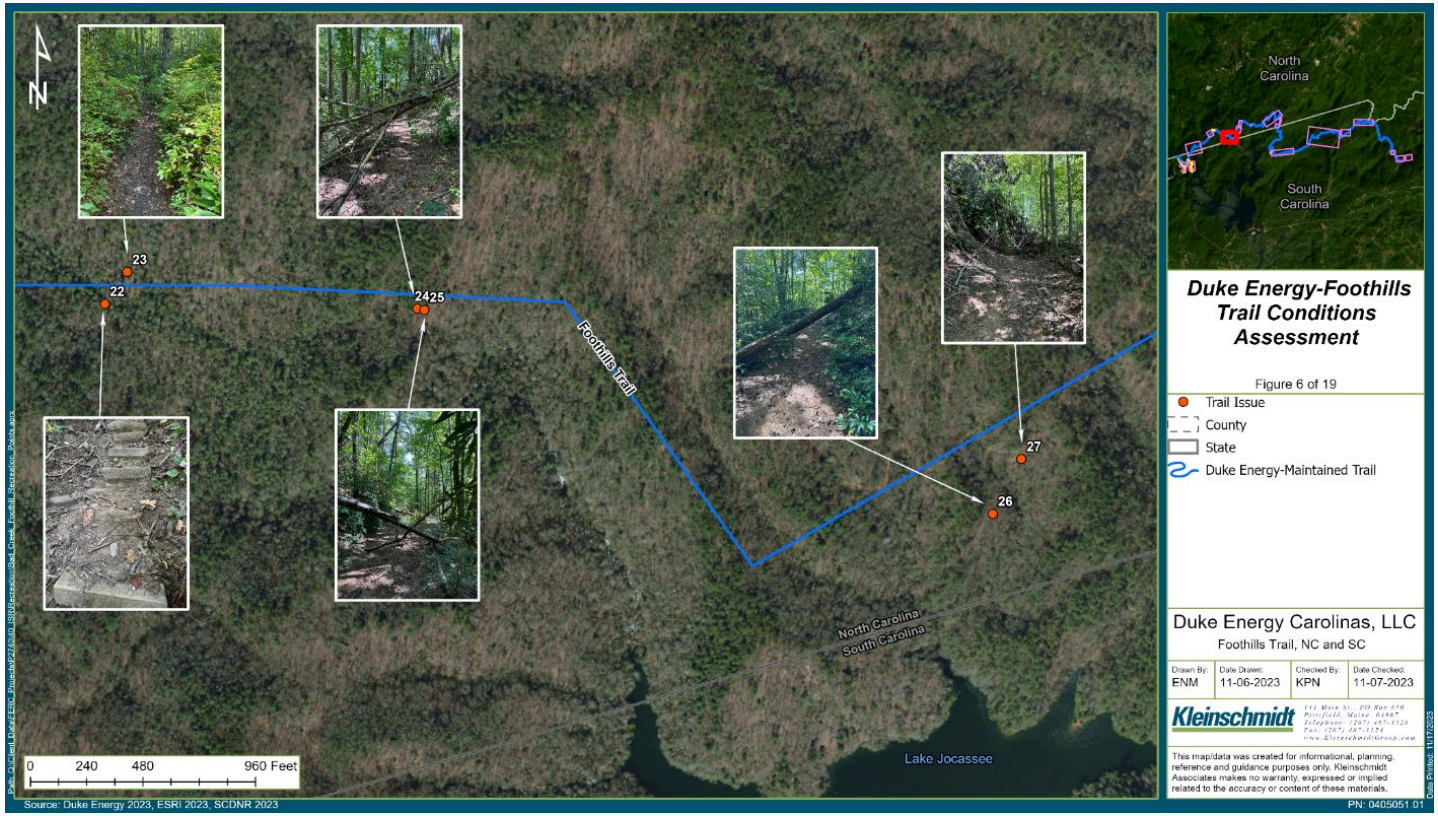


**Figure 4-8 Foothills Trail Conditions Assessment – Figure 7 of 19**

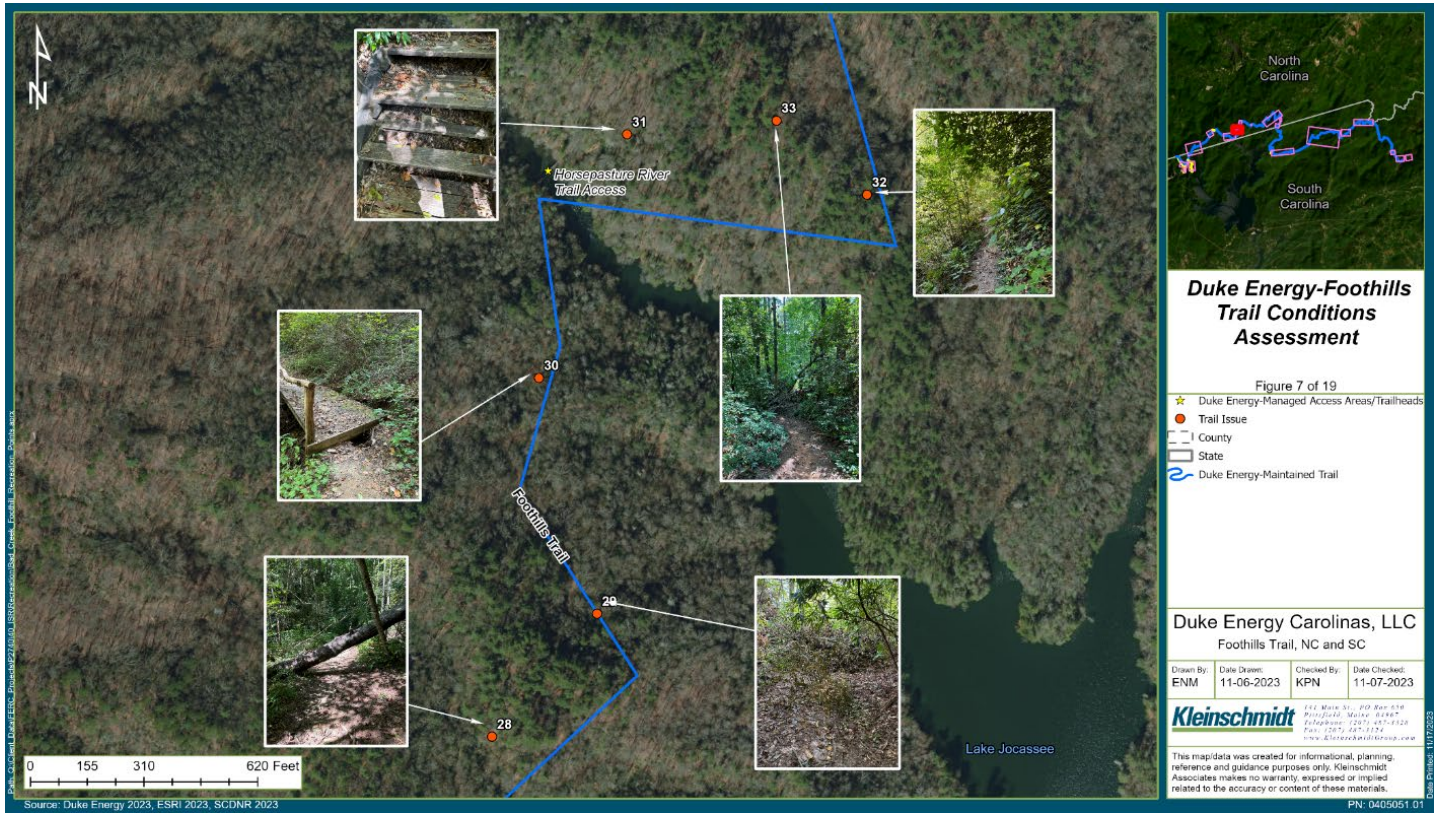


**Figure 4-9 Foothills Trail Conditions Assessment – Figure 8 of 19**

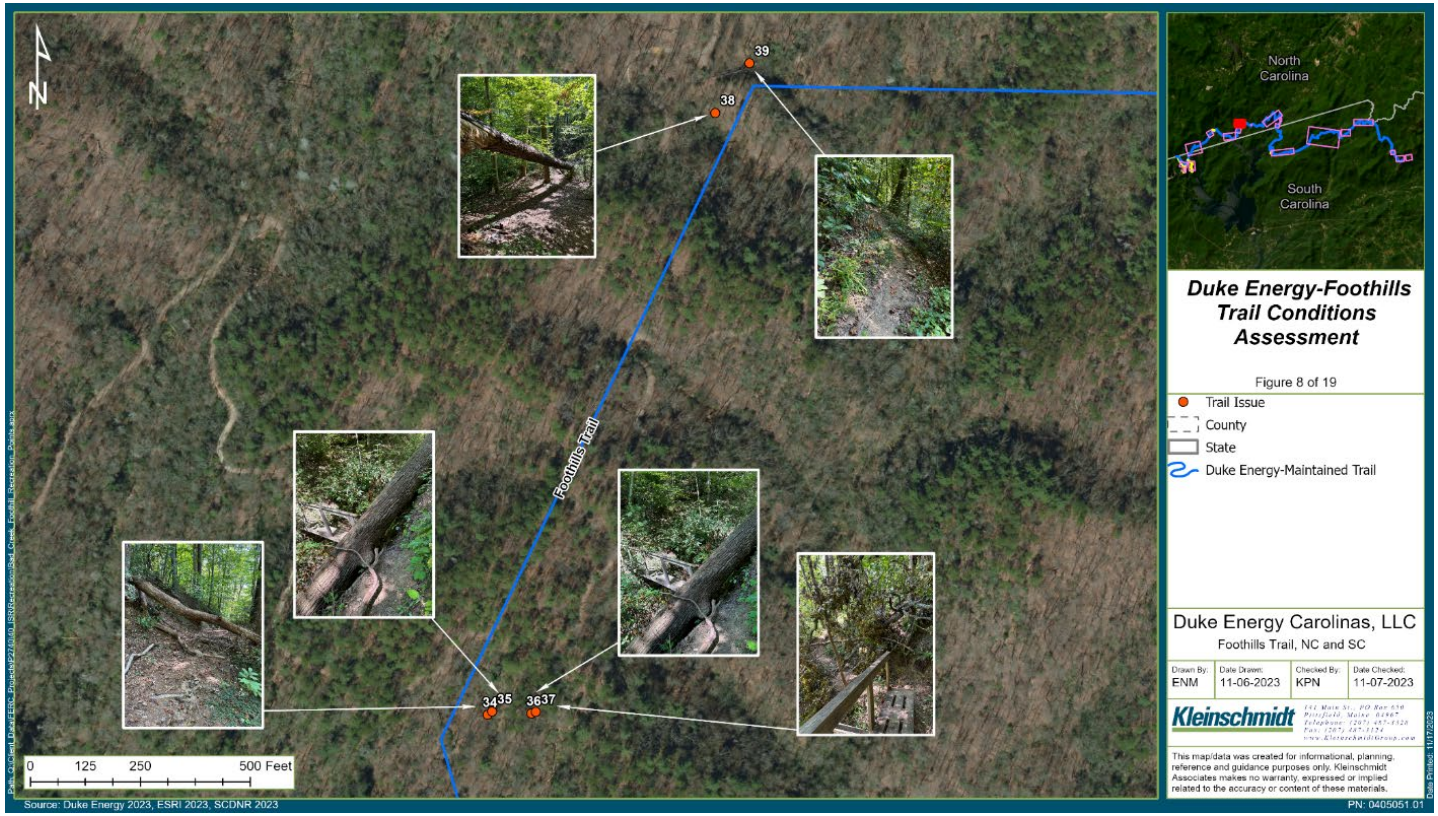


**Figure 4-10 Foothills Trail Conditions Assessment – Figure 9 of 19**

**Figure 4-11 Foothills Trail Conditions Assessment – Figure 10 of 19**

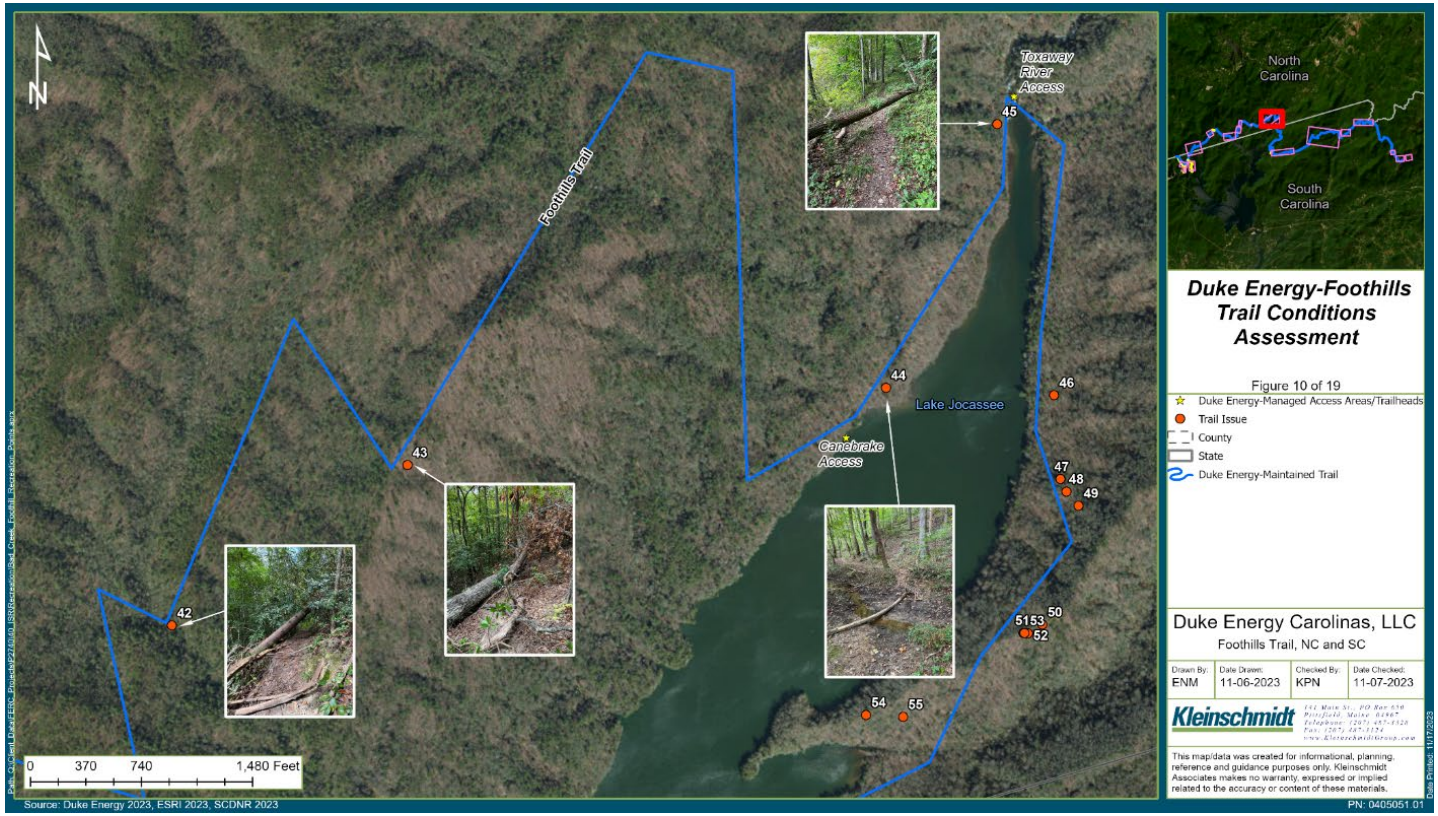
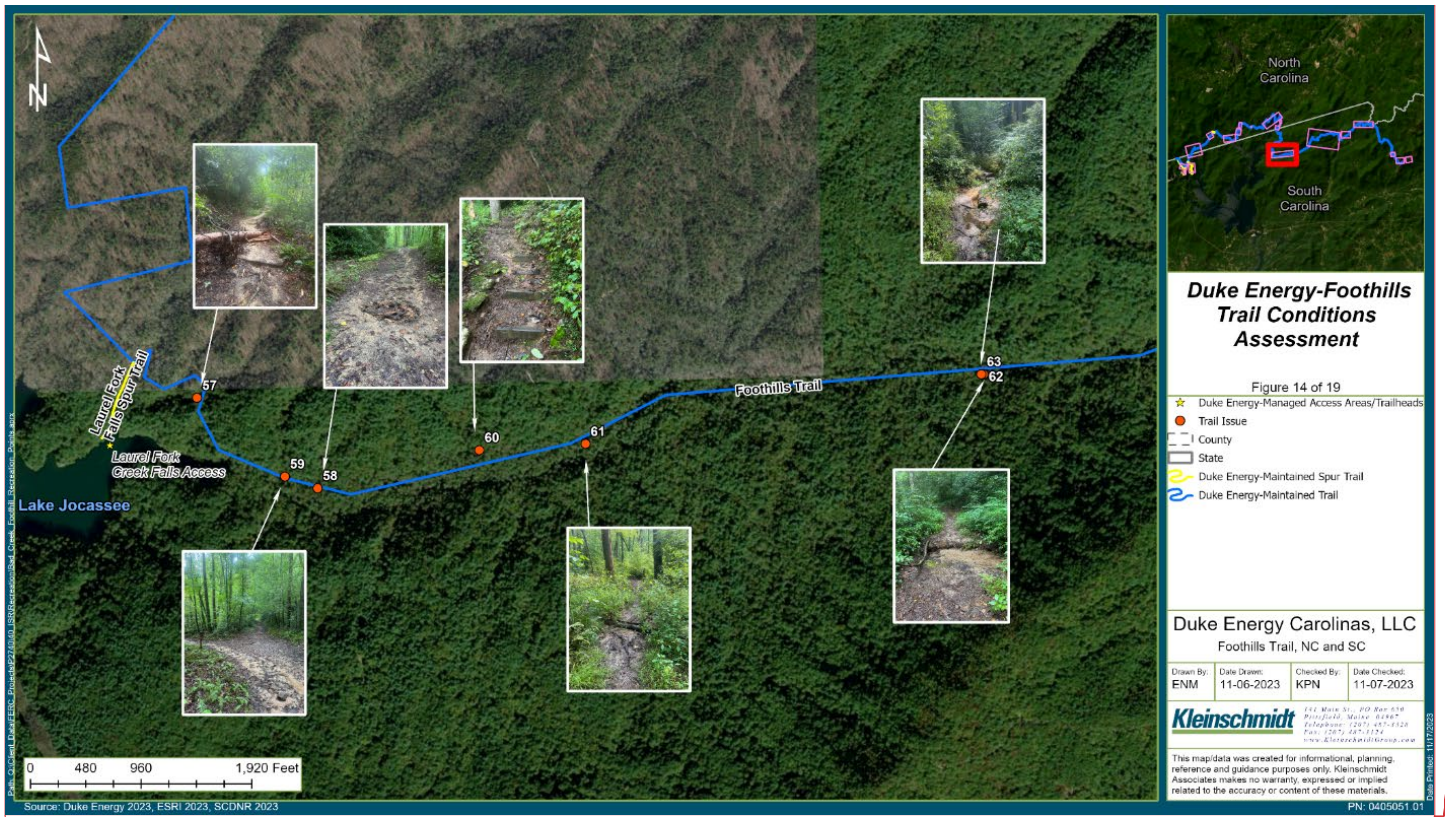


**Figure 4-12 Foothills Trail Conditions Assessment – Figure 11 of 19**

**Figure 4-13 Foothills Trail Conditions Assessment – Figure 12 of 19**

**Figure 4-14 Foothills Trail Conditions Assessment – Figure 13 of 19**

**Figure 4-15 Foothills Trail Conditions Assessment – Figure 14 of 19**




**Commented [EM4]:** Photo of Trail Issue #58 does not show the clogged culvert. It is assumed that the photo is of the downstream effects, but it is not noted.

**Figure 4-16 Foothills Trail Conditions Assessment – Figure 15 of 19**

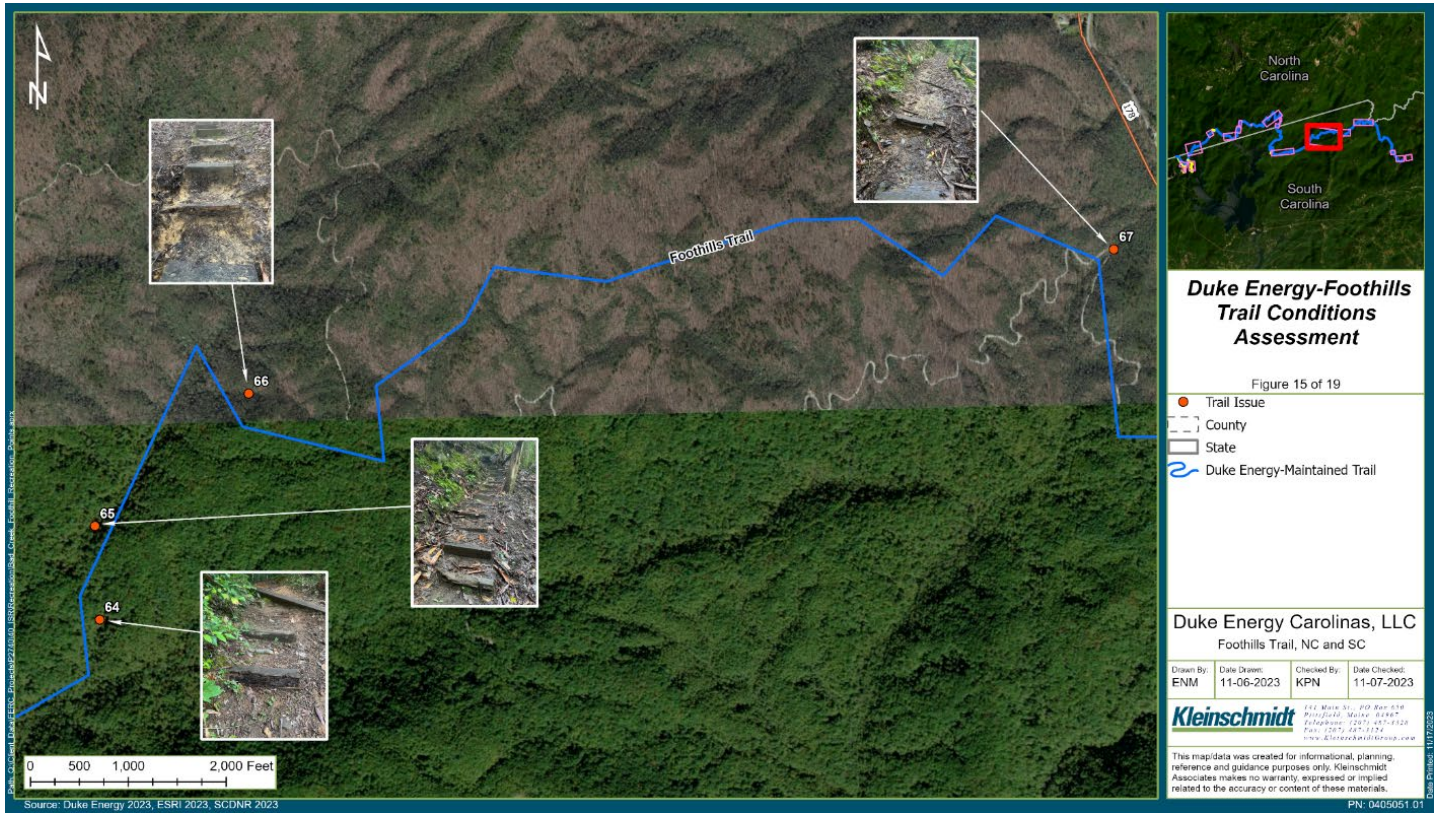


**Figure 4-17 Foothills Trail Conditions Assessment – Figure 16 of 19**

**Figure 4-18 Foothills Trail Conditions Assessment – Figure 17 of 19**

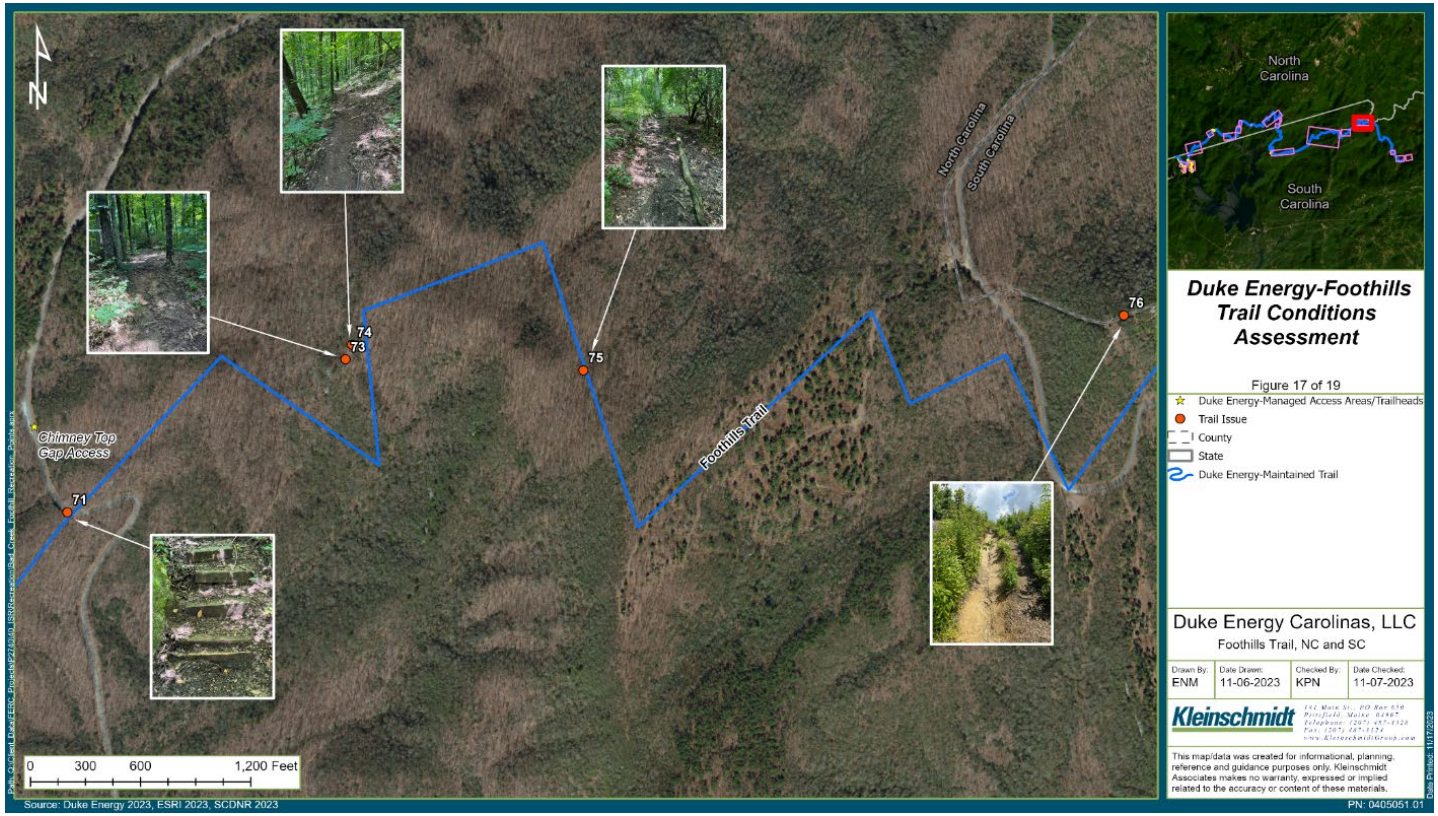


**Figure 4-19 Foothills Trail Conditions Assessment – Figure 18 of 19**

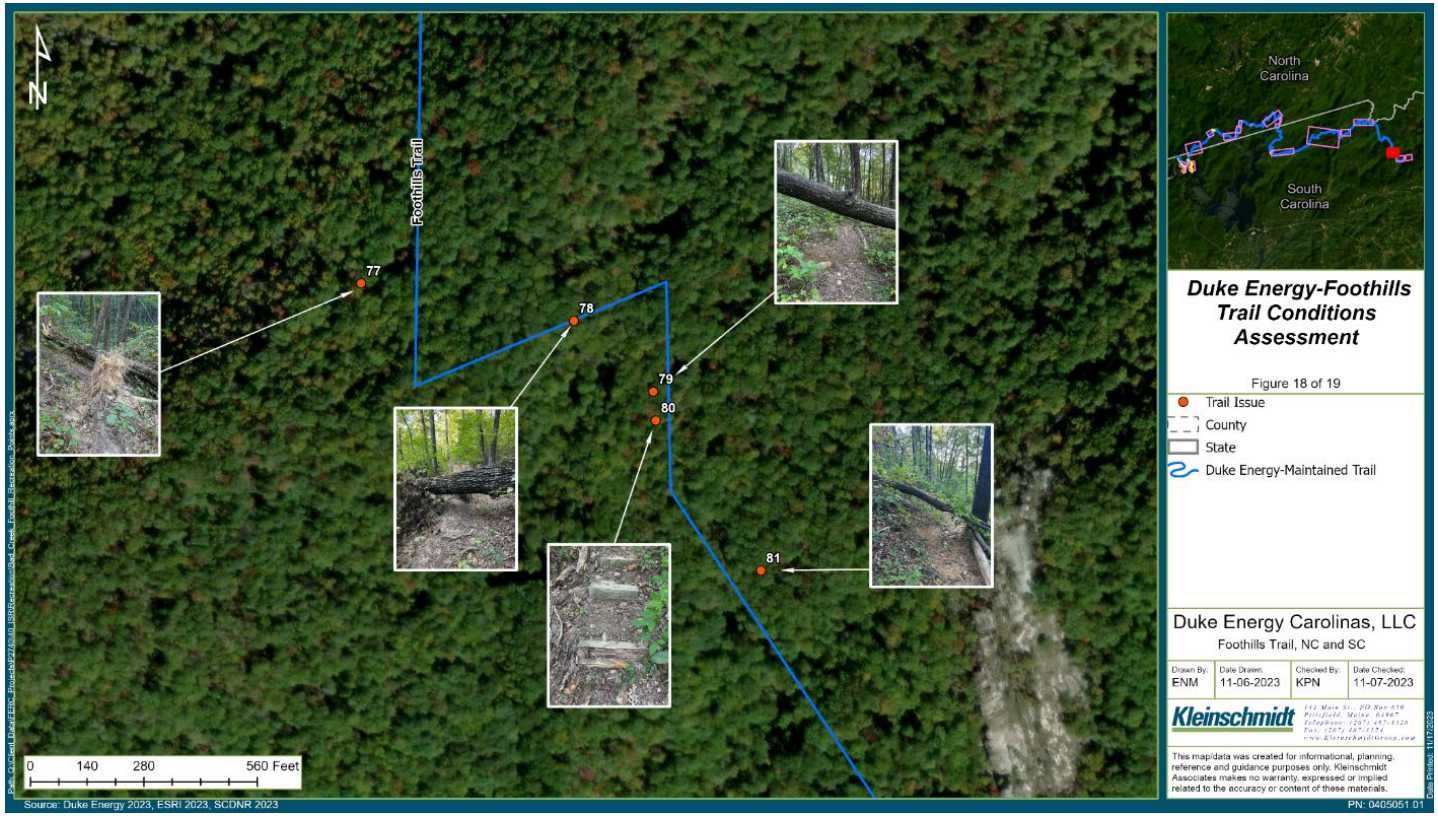
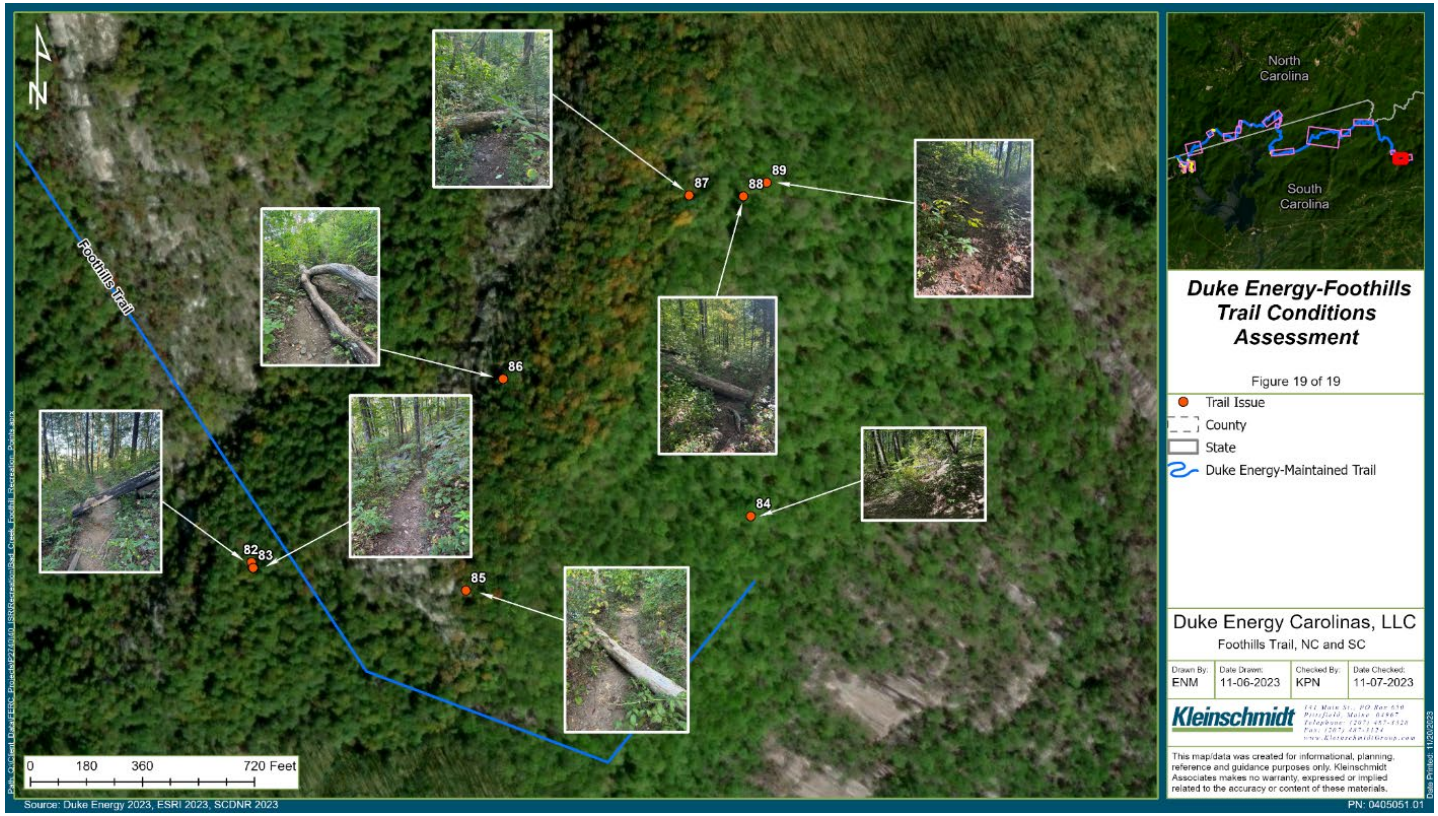


**Figure 4-20 Foothills Trail Conditions Assessment – Figure 19 of 19**



## 5.0 SUMMARY

During the trail Conditions Assessment, Long Cane Trails identified 89 issues within the study area primarily related to trail maintenance and safety. Specifically, 77 issues were identified on the Foothills Trail, seven on the Bad Creek Access Spur, four on Coon Branch, and three on the Lower Whitewater Falls Spur. Issues identified include culvert cleaning, erosion control, steps replacement, signage improvement, bridge maintenance, fallen tree removal, and trail washout repair. Table 5-1 describes the key findings identified by Long Cane Trails for the Foothills Trail and spur trails. The information presented in this Trail Conditions Assessment will be considered by Duke Energy when developing Protection, Mitigation and Enhancement (PME) measures.

**Table 5-1 Key Findings of Foothills Trail Conditions Assessment**

| Trail | Mile | Key Findings |
|---|---|---|
| Bad Creek Access Spur | 0.1-0.7 | • Culvert Maintenance: A culvert with a clogged drain spanning 80 feet requires cleaning to allow proper water flow.<br>• Wet Areas: Low areas on the trail with standing water need gravel addition to raise and level the path, covering 60 feet and 30 feet sections.<br>• Erosion Control: Removal of barricades placed on the side of the trail to address water retention issues.<br>• Steps Replacement: Several steps need replacement due to rot.<br>• Interpretive Signage: Approximately 100 feet of trail has been rerouted, and new blazes are needed to guide hikers. |
| Coon Branch Spur | 0.2 | • Bridge Maintenance: Railing and decking replacement for a bridge, involving handrails and decking boards.<br>• Railing Replacement: Two handrails need replacement. |
| Coon Branch Spur | 0.4 | • Bog Bridge Installation: Installation of a bog bridge measuring 4 feet x 2 feet.<br>• Drain Clearing: Major drain unclogging is required to prevent overflow onto the trail. |
| Foothills Trail | 31.6-72.8 | • Erosion Control: Multiple sections of the Foothills Trail require erosion control measures such as grade reversals, knicks, or drainage improvements.<br>• Steps Replacement: Various steps along the trail need replacement or repair due to damage.<br>• Fallen Trees: Several fallen trees across the trail need removal.<br>• Bog Bridges: Installation of new bog bridges.<br>• Signage: Adding new trail blazes and interpretive signage.<br>• Brush Removal: Clearing overgrown sections of the trail.<br>• Washout Repair: Addressing trail washouts and water diversion.<br>• New Trail Sections: Creating new trail segments to address erosion and trail conditions. |

## 6.0 CONSULTATION RECORD

This report was provided in draft form to the Recreation Resources Committee for review and comment on [date]. Comments were accepted on the draft report through [date]. Consultation is included in Appendix B. Comments were provided by the following entities:

- Commenter – date
- Commenter – date
- Commenter – date

## 7.0 REFERENCES

Felton, V. 2004. Trail Solutions: IMBA's Guide to Building Sweet Singletrack (IMBA (International Mountain Bicycling Association), Ed.). International Mountain Bicycling Association.

Foothills Trail Conservancy, Inc. 2018. Foothills Trail Guidebook: A Comprehensive Guide. Revised Seventh Edition. January 1, 2018.

# APPENDIX A

# ASSESSMENT FORM

# APPENDIX B

# CONSULTATION DOCUMENTATION

| | |
|---|---|
| **From:** | Elizabeth Miller |
| **To:** | Crutchfield Jr., John U; Amy Breedlove; Andrew Gleason; Andy Douglas; Chris Starker; Dale Wilde; Dan Rankin; Kelly Kirven; Ken Forrester; quattrol; Salazar, Maggie; Amedee, Morgan D.; Pat Cloninger; SelfR; Rowdy Harris; Stuart, Alan Witten; suewilliams130@gmail.com; William T. Wood; Willie Simmons; Huff, Jen; phil.mitchell@gmail.com; Bill Ranson-Retired |
| **Cc:** | Kulpa, Sarah; McCarney-Castle, Kerry |
| **Subject:** | RE: Bad Creek Relicensing - Foothills Trail Corridor Conditions Assessment and Whitewater River Cove Recreation Use Evaluation Draft Reports (READY FOR REVIEW - REVISED) |
| **Date:** | Friday, December 15, 2023 3:39:52 PM |
| **Attachments:** | image001.png<br>image002.png |



Hi John,

Staff with the SCDNR have reviewed the draft Foothills Trail Corridor Conditions Assessment Report. Our comments have been incorporated into the document on the SharePoint. Please let me know if you have any questions.

Thank you,

Elizabeth

Elizabeth C. Miller
SCDNR
Office: 843-953-3881
Cell: 843-729-4636

---

**From:** Crutchfield Jr., John U <John.Crutchfield@duke-energy.com>
**Sent:** Tuesday, November 21, 2023 2:36 PM
**To:** Amy Chastain <BreedloveA@dnr.sc.gov>; Andrew Gleason <andrewandwilla@hotmail.com>; Andy Douglas <adoug41@att.net>; Chris Starker <cstarker@upstateforever.org>; Dale Wilde <dwilde@keoweefolks.org>; Dan Rankin <RankinD@dnr.sc.gov>; Elizabeth Miller <MillerE@dnr.sc.gov>; Kelly Kirven <Kelly.Kirven@KleinschmidtGroup.com>; Ken Forrester <ForresterK@dnr.sc.gov>; Lynn Quattro <QuattroL@dnr.sc.gov>; Maggie Salazar <maggie.salazar@hdrinc.com>; Morgan Amedee <amedeemd@dhec.sc.gov>; Pat Cloninger <CloningerP@dnr.sc.gov>; Ross Self <SelfR@dnr.sc.gov>; Rowdy Harris <charris@scprt.com>; Stuart, Alan Witten <Alan.Stuart@duke-energy.com>; Sue Williams <suewilliams130@gmail.com>; William T. Wood <WoodW@dnr.sc.gov>; Willie Simmons <SimmonsW@dnr.sc.gov>; Huff, Jen <Jen.Huff@hdrinc.com>; phil.mitchell@gmail.com; Bill Ranson <bill.ranson@retiree.furman.edu>
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Duke Energy is extending the review period for Resource Committee members to provide comments on the draft

report until **Monday, December 18** to compensate for the missed review days while the draft report was corrected.

If you have any questions, please contact Alan Stuart or me.

Regards,

John Crutchfield

---

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Duke Energy is requesting a 30-day review period, therefore, please submit all comments by **December 11th**. A confirmation email is kindly requested upon review completion (email me at John.Crutchfield@duke-energy.com).

**Important – Please Read!**

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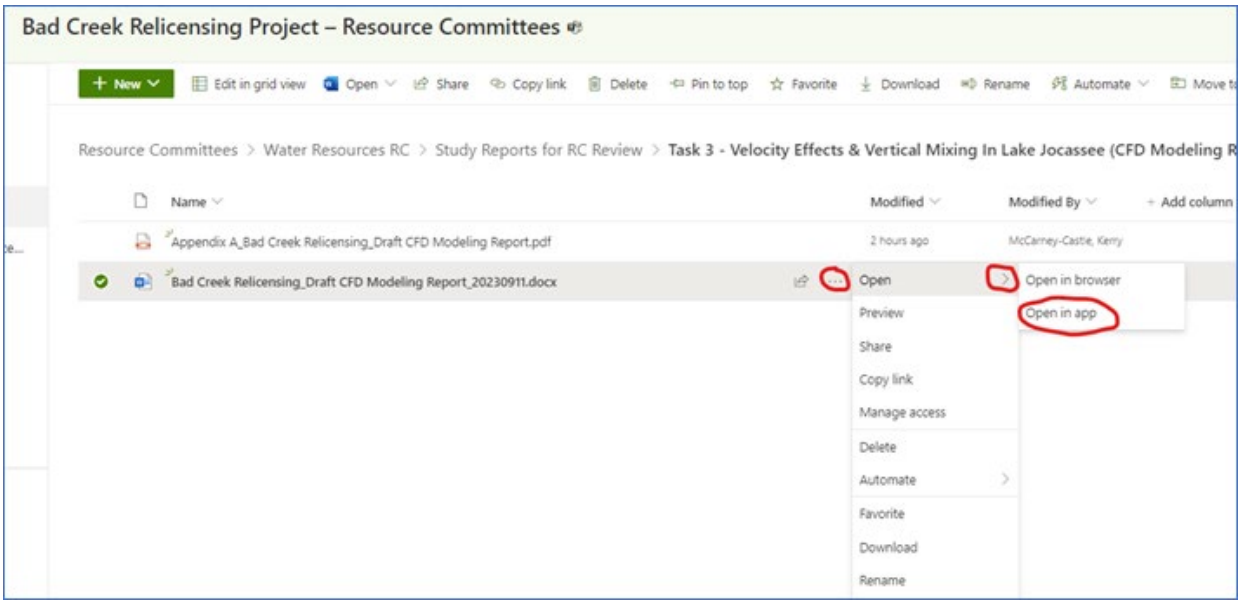


If you have any questions, please contact Alan Stuart or me.

Regards,

***John Crutchfield***
Project Manager II
Water Strategy, Hydro Licensing & Lake Services
Regulated & Renewable Energy
Duke Energy
525 South Tryon Street, DEP-35B | Charlotte, NC 28202
Office 980-373-2288| Cell 919-757-1095

| | |
|---|---|
| **From:** | Crutchfield Jr., John U |
| **To:** | Kelly Kirven; Kerry McCarney-Castle; Sarah Kulpa |
| **Cc:** | Alan.Stuart@duke-energy.com |
| **Subject:** | FW: [EXTERNAL] Re: Bad Creek Relicensing - Foothills Trail Corridor Conditions Assessment and Whitewater River Cove Recreation Use Evaluation Draft Reports (READY FOR REVIEW - REVISED) |
| **Date:** | Monday, December 18, 2023 11:33:27 AM |
| **Attachments:** | image001.png<br>image002.png |

---

**From:** Dwilde@Keoweefolks.org <dwilde@keoweefolks.org>
**Sent:** Monday, December 18, 2023 11:25 AM
**To:** Crutchfield Jr., John U <John.Crutchfield@duke-energy.com>
**Cc:** Stuart, Alan Witten <Alan.Stuart@duke-energy.com>
**Subject:** [EXTERNAL] Re: Bad Creek Relicensing - Foothills Trail Corridor Conditions Assessment and Whitewater River Cove Recreation Use Evaluation Draft Reports (READY FOR REVIEW - REVISED)



John,

Friends of Lake Keowee Society has comments to add to the Foothills trail corridor conditions assessment. I hiked a large portion of the FHT over the summer, and I must say that I noticed that there were more places that needed repair on the eastern side of the trail.

Dale Wilde
President, FOLKS

C: 207-604-6539
dwilde@keoweefolks.org

www.keoweefolks.org

"Friends of Lake Keowee Society is dedicated to the preservation and enhancement of Lake Keowee and its watershed through advocacy, conservation, and education."



> On Dec 11, 2023, at 7:08 AM, Crutchfield Jr., John U <John.Crutchfield@duke-energy.com> wrote:
>
> Dear Bad Creek Relicensing Recreation Resources Committee:
>
> Just a reminder that comments are due on the Foothills Trail Conditions Assessment Draft Report on **Monday, December 18**.
>
> Regards,
>
> John

---

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**Sent:** Tuesday, November 21, 2023 2:36 PM
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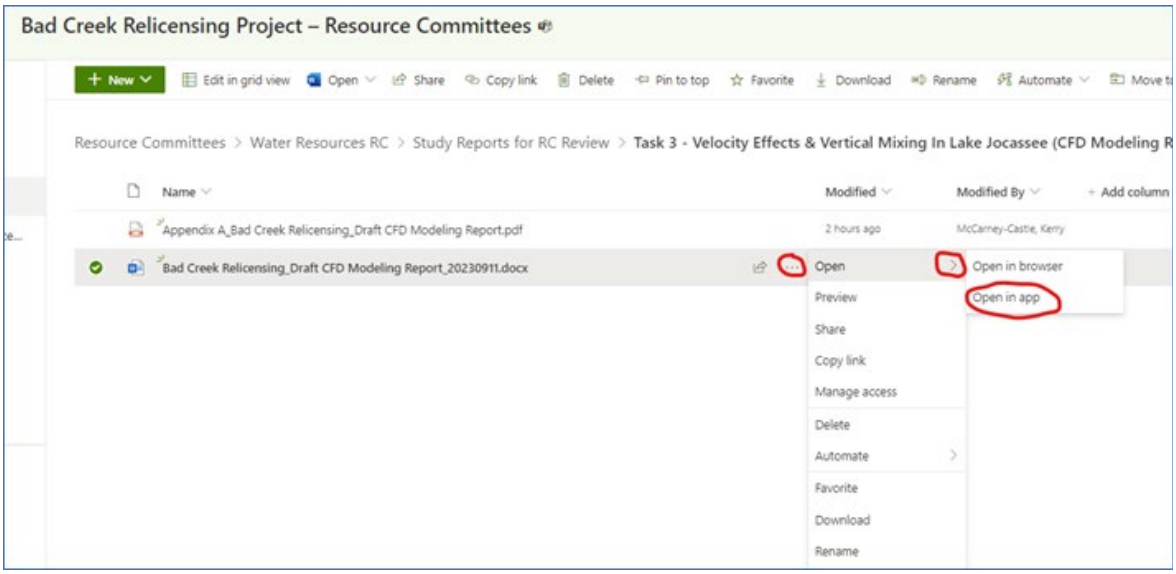


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***John Crutchfield***
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Water Strategy, Hydro Licensing & Lake Services
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525 South Tryon Street, DEP-35B | Charlotte, NC 28202
Office 980-373-2288| Cell 919-757-1095

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| **Date:** | Monday, December 18, 2023 11:30:57 AM |
| **Attachments:** | image002.png<br>image003.png |

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John,

Sorry for the delay, I thought both were due on the 18th. Friends of Lake Keowee Society has no comments on the Whitewater River Cove Recreation Use Evaluation draft report.

Dale Wilde
President, FOLKS

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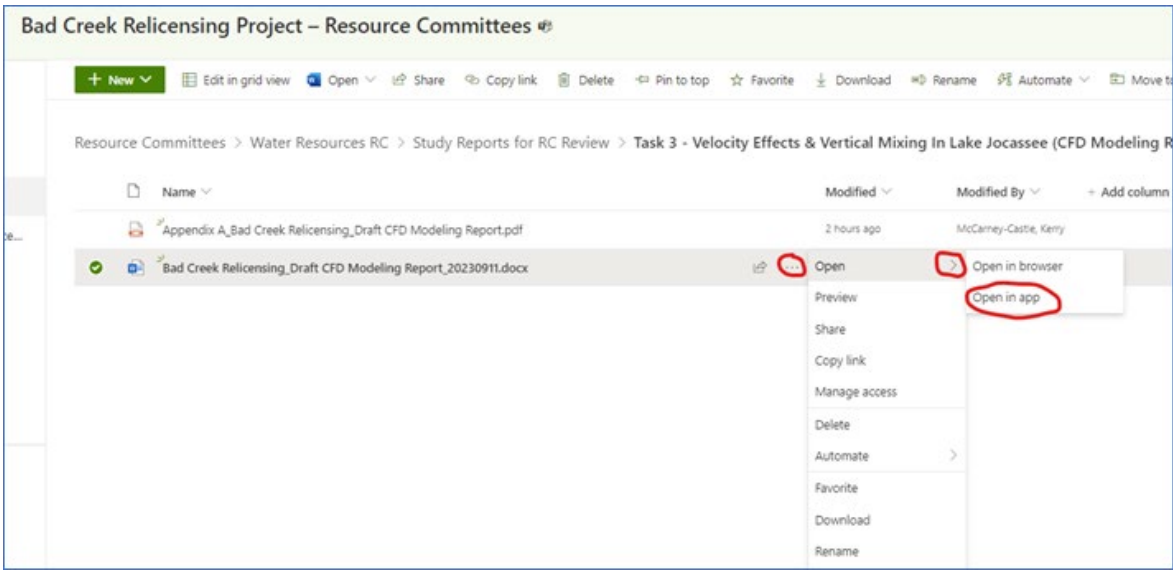


If you have any questions, please contact Alan Stuart or me.

Regards,

***John Crutchfield***
Project Manager II
Water Strategy, Hydro Licensing & Lake Services
Regulated & Renewable Energy
Duke Energy
525 South Tryon Street, DEP-35B | Charlotte, NC 28202
Office 980-373-2288| Cell 919-757-1095

**From:** Crutchfield Jr., John U
**To:** Andy Douglas
**Cc:** Amy Breedlove; Andrew Gleason; Chris Starker; Dale Wilde; Dan Rankin; Elizabeth Miller; Kelly Kirven; Ken Forrester; quattrol; Salazar, Maggie; Amedee, Morgan D.; Pat Cloninger; SelfR; Rowdy Harris; Stuart, Alan Witten; William T. Wood; Willie Simmons; Huff, Jen; phil.mitchell@gmail.com; Bill Ranson-Retired; Kulpa, Sarah; McCarney-Castle, Kerry; suewilliams130@gmail.com
**Subject:** RE: [EXTERNAL] Re: Bad Creek Relicensing - Foothills Trail Corridor Conditions Assessment and Whitewater River Cove Recreation Use Evaluation Draft Reports (READY FOR REVIEW)
**Date:** Tuesday, December 19, 2023 12:06:21 PM



Andy: Good afternoon. I wanted to follow-up on your comment received on December 4. Duke Energy's response to the comment, which will be included in the Initial Study Report, is given below.

| Agency | Date Submitted | Report Section | Comment | Duke Energy Response |
|---|---|---|---|---|
| SC Wildlife Federation | 12/4/2023 | na | Has Duke Energy determined the impact of any potential seismic activity (non earthquake type disturbances such as blasting for the new turbine project). I can't recall any discussion about that. If there has been, please direct me to it. Their concern was impact on birds, aquatic critters, mammals, etc. They were especially worried about how this may be especially disruptive during the critical springtime mating and nesting season. | Potential impacts to wildlife resources as a result of seismic activity from underground blasting for the proposed Bad Creek II Complex were not directly identified by the FERC in their Scoping Document 1 or Study Plan Determination. In Scoping Document 1, FERC staff did identify effects of noise during Bad Creek II construction, and Project operation and maintenance activities on wildlife as a Terrestrial Resources potential impact. The environmental report (18 CFR §5.18(b)) to be filed with the license application will contain information about the affected environment; analysis of anticipated continuing or new environmental impacts due to operation or proposed changes thereto; proposed environmental measures and measures recommended by relicensing participants; and unavoidable adverse impacts that may occur despite recommended or proposed environmental measures.<br><br>Blasting associated with construction of the new underground powerhouse would be a temporary impact and will be evaluated through review of relevant published research on the effects of noise on wildlife (e.g., Shannon et al. 2016[1]), anticipated noise levels (decibels) associated with the type of blasting expected at the Project, projected frequency of blasting, and considering of time of year.<br><br>Effects of Bad Creek II construction on seismic activity in the project area was identified by FERC as a potential Geology and Soil Resources impact in Scoping Document 1. Duke Energy notes that prior to construction, detailed construction plans in conformance with FERC's dam safety regulations and guidelines will be prepared for review by FERC's Division of Dam Safety and Inspections. |

Let Alan and me know if you have any additional questions.

Regards,
John Crutchfield

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**From:** Andy Douglas <adoug41@att.net>
**Sent:** Monday, December 4, 2023 11:56 PM
**To:** Crutchfield Jr., John U <John.Crutchfield@duke-energy.com>; Sue Williams <suewilliams130@gmail.com>
**Cc:** Amy Breedlove <breedlovea@dnr.sc.gov>; Andrew Gleason <andrewandwilla@hotmail.com>; Chris Starker <cstarker@upstateforever.org>; Dale Wilde <dwilde@keoweefolks.org>; Dan Rankin <rankind@dnr.sc.gov>; Elizabeth Miller <MillerE@dnr.sc.gov>; Kelly Kirven <kelly.kirven@kleinschmidtgroup.com>; Ken Forrester <forresterk@dnr.sc.gov>; Lynn Quattro <quattrol@dnr.sc.gov>; Maggie Salazar <maggie.salazar@hdrinc.com>; Morgan Amedee <amedeemd@dhec.sc.gov>; Pat Cloninger <cloningerp@dnr.sc.gov>; Ross Self <selfr@dnr.sc.gov>; Rowdy Harris <charris@scprt.com>; Stuart, Alan Witten <Alan.Stuart@duke-energy.com>; William Wood <woodw@dnr.sc.gov>; Willie Simmons <simmonsw@dnr.sc.gov>; Huff, Jen <jen.huff@hdrinc.com>; phil.mitchell@gmail.com; Bill Ranson <bill.ranson@retiree.furman.edu>; Sarah Kulpa <sarah.kulpa@hdrinc.com>; Kerry McCarney-Castle <kerry.mccarney-castle@hdrinc.com>
**Subject:** [EXTERNAL] Re: Bad Creek Relicensing - Foothills Trail Corridor Conditions Assessment and Whitewater River Cove Recreation Use Evaluation Draft Reports (READY FOR REVIEW)



John, I was asked by a stakeholder if we had determined the impact of any potential seismic activity (non earthquake type disturbances such as blasting for the new turbine project). I can't recall any discussion about that. If there has been, please direct me to it.

Their concern was impact on birds, aquatic critters, mammals, etc. They were especially worried about how this may be

especially disruptive during the critical springtime mating and nesting season.
Thank you.....

Andy Douglas

On Monday, December 4, 2023, 04:57:04 PM EST, Sue Williams <suewilliams130@gmail.com> wrote:

AQD has no comments on the Whitewater River Cove Use Evaluation Draft report.

Sue Williams
Six Mile, SC

> On Dec 4, 2023, at 06:24, Crutchfield Jr., John U <John.Crutchfield@duke-energy.com> wrote:

Dear Bad Creek Relicensing Recreational Resources Committee:

Just a reminder that comments on the Whitewater River Cove Recreation Use Evaluation Draft are due **December 11th**.

Thanks,

John

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**From:** Crutchfield Jr., John U
**Sent:** Monday, November 13, 2023 4:42 PM
**To:** Amy Breedlove <BreedloveA@dnr.sc.gov>; Andrew Gleason <andrewandwilla@hotmail.com>; Andy Douglas <adoug41@att.net>; Chris Starker <cstarker@upstateforever.org>; Dale Wilde <dwilde@keoweefolks.org>; Dan Rankin <RankinD@dnr.sc.gov>; Elizabeth Miller <MillerE@dnr.sc.gov>; Kelly Kirven <Kelly.Kirven@KleinschmidtGroup.com>; Ken Forrester <forresterk@dnr.sc.gov>; Lynn Quattro <quattrol@dnr.sc.gov>; Maggie Salazar <maggie.salazar@hdrinc.com>; Morgan Amedee <amedeemd@dhec.sc.gov>; Pat Cloninger <cloningerp@dnr.sc.gov>; Ross Self <SelfR@dnr.sc.gov>; Rowdy Harris <charris@scprt.com>; Stuart, Alan Witten <Alan.Stuart@duke-energy.com>; Sue Williams <suewilliams130@gmail.com>; William Wood <woodw@dnr.sc.gov>; Willie Simmons <simmonsw@dnr.sc.gov>; 'Huff, Jen' <Jen.Huff@hdrinc.com>; 'phil.mitchell@gmail.com' <phil.mitchell@gmail.com>; Bill Ranson <bill.ranson@retiree.furman.edu>
**Cc:** Sarah Kulpa <sarah.kulpa@hdrinc.com>; Kerry McCarney-Castle <kerry.mccarney-castle@hdrinc.com>
**Subject:** Bad Creek Relicensing - Foothills Trail Corridor Conditions Assessment and Whitewater River Cove Recreation Use Evaluation Draft Reports (READY FOR REVIEW)
**Importance:** High

Dear Bad Creek Relicensing Recreational Resources Committee:

Duke Energy is pleased to distribute two reports for your review:

1. *Foothills Trail Corridor Conditions Assessment Report.* This draft report includes methods and results of the Foothills Trail corridor conditions assessment (Task 2) and is available on the Bad Creek Relicensing SharePoint site at the following link:

   <image002.png>

   Task 2 - Trail Conditions Assessment Draft Report.

2. *Whitewater River Cove Recreational Use Evaluation*. This draft report includes methods and results from the recreational use evaluation in Whitewater River cove (Task 3) and is available on the Bad Creek Relicensing SharePoint site at the following link:

   <image002.png>

   Task 3 - Whitewater River Cove Recreational Use Evaluation Draft Report.

Duke Energy is requesting a 30-day review period, therefore, please submit all comments by **December 11th**. A confirmation email is kindly requested upon review completion (email me at John.Crutchfield@duke-energy.com).

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<image003.png>

If you have any questions, please contact Alan Stuart or me.

Regards,

***John Crutchfield***

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[1] Graeme Shannon, Megan F. McKenna, Lisa M. Angeloni, Kevin R. Crooks, Kurt M. Fristrup, Emma Brown, Katy A. Warner, Misty D. Nelson, Cecilia White, Jessica Briggs, Scott McFarland and George Wittemyer. 2016. A Synthesis of two decades of research documenting the effects of noise on wildlife. Biol. Rev. 91, pp. 982-1005. Doi: 10.1111/brv.12207.