



Appendix C - Visual 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 Visual Resources Study is ongoing support of preparing an application for a new license for the Project in accordance with 18 CFR §5.15, as provided in the RSP. Study efforts for the Visual Resources Study will continue into 2024, therefore, this document includes partial findings of the Visual Resources Study, including the Seen Area Analysis (Task 2) and key viewpoints selected in consultation with stakeholders (Tasks 3 and 4). The Visual Resources Study final report will be developed in 2024 and submitted with the Updated Study Report.

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



2 Visual Resources Study

The Commission issued Scoping Document 2 on August 5, 2022, which identified the following environmental resource issues to be analyzed in the National Environmental Policy Act document for the Project relicensing related to scenery and visual resources. The resource issue addresses 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 (Bad Creek II Power Complex [Bad Creek II Complex]):

- Effects of Project construction, operation (including the presence of Project facilities), and maintenance activities on scenery and visual resources.

Nine study tasks were proposed in the RSP for the Visual Resources Study in support of the proposed Bad Creek II Complex and are listed below. More specifically, the study includes an assessment of baseline conditions and an evaluation of potential visual impacts from construction and operation of the Bad Creek II Complex.

- 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

3 Study Goals and Objectives

Tasks carried out for the Bad Creek Visual 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. The main goals of the Visual Resources Study are to assess baseline conditions and provide an evaluation of potential visual impacts from construction and operation of the Bad Creek II Complex through the following objectives:



- Describe the key scenic characteristics of the existing landscape within the Project area and surrounding lands expected to potentially be within visual range of Project facilities.
- Identify areas within the existing landscape from which the existing and proposed Bad Creek facilities are or would potentially be visible.
- Identify existing project operations and maintenance activities that affect visual characteristics.
- Evaluate expected impacts of construction and operation of the Bad Creek II Complex on visual resources and any proposed protection, mitigation, and enhancement measures.

The Visual Resources Study will provide additional information to support the pursuit of the New License for the Project; data collected will be used to support Project feasibility and design processes and to assess potential effects of the proposed Project on scenery and visual resources.

Individual attachments to this document are listed in Table 1 below and the completed Visual Resources Study Report will be provided with the Updated Study Report. Consultation documentation relevant to the Visual Resources Study is included as Attachment 3.

Table 1. Recreational Resources Study Attachments

Study Report Title	Attachment	Attachment Title
Appendix D – Recreational Resources Draft Study Report	1	Seen Area Analysis
	2	Key Viewpoints
	3	Consultation Documentation

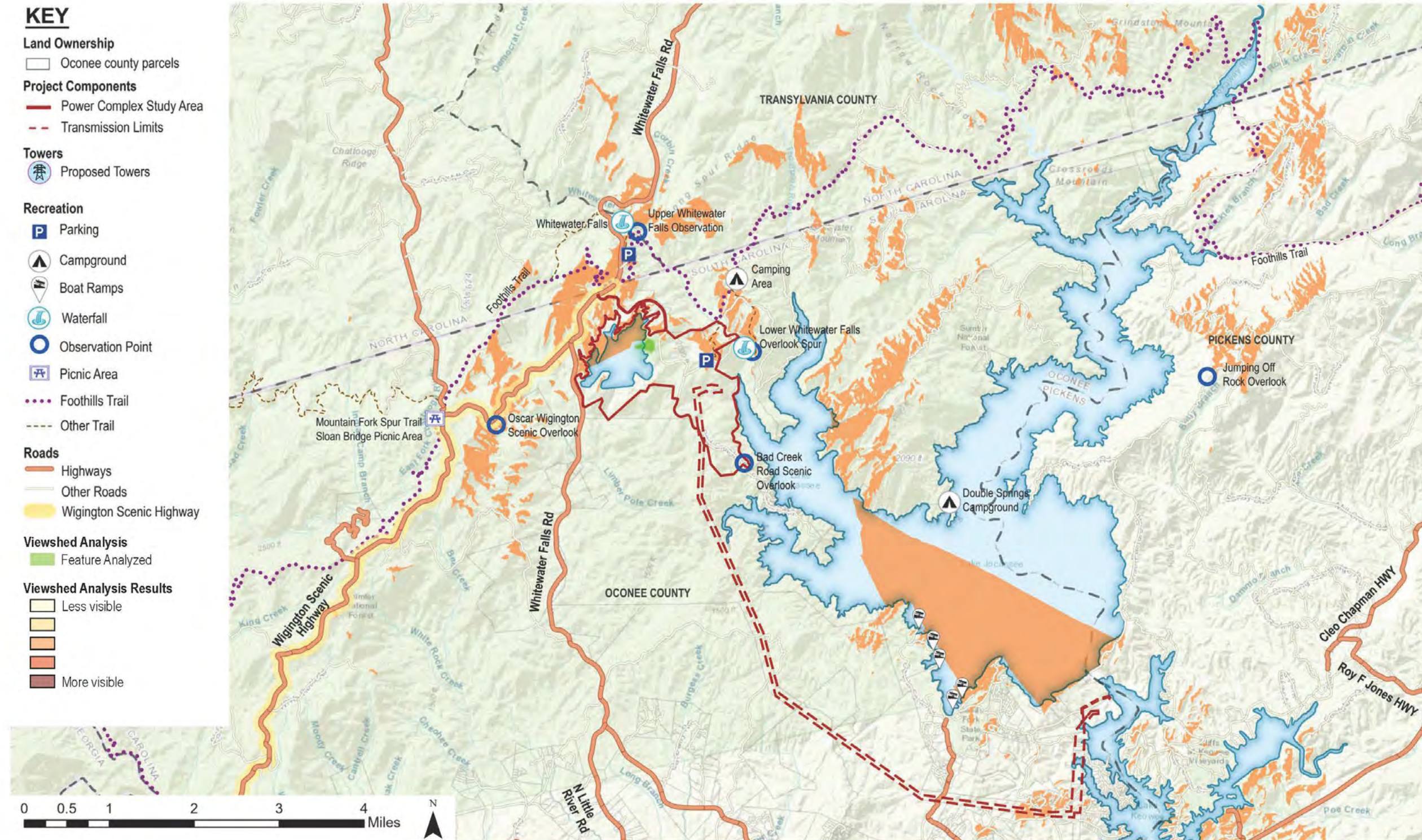
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Attachment 1

Seen Area Analysis

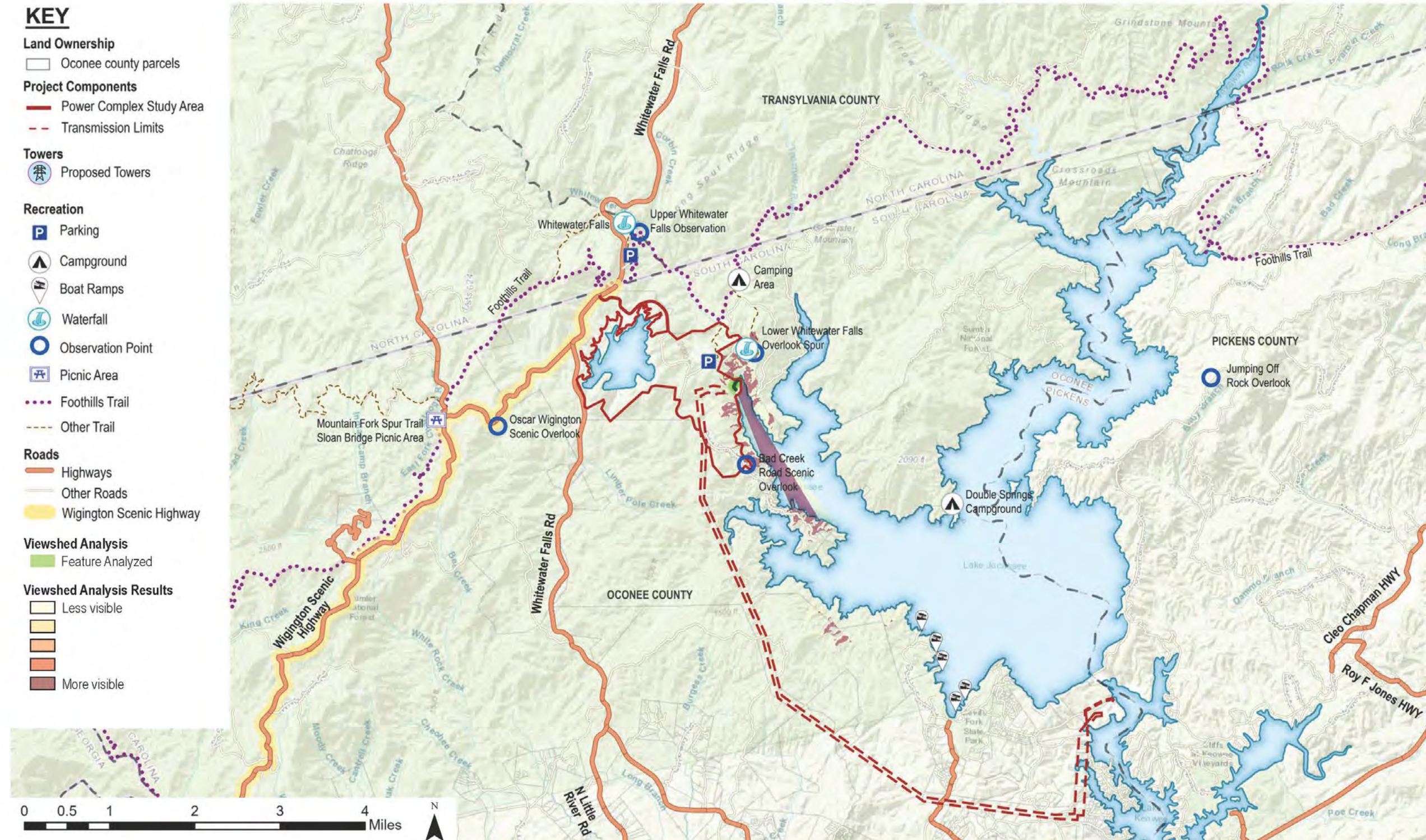
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**Upper Reservoir Inlet/Outlet Structures
Seen Area Analysis**

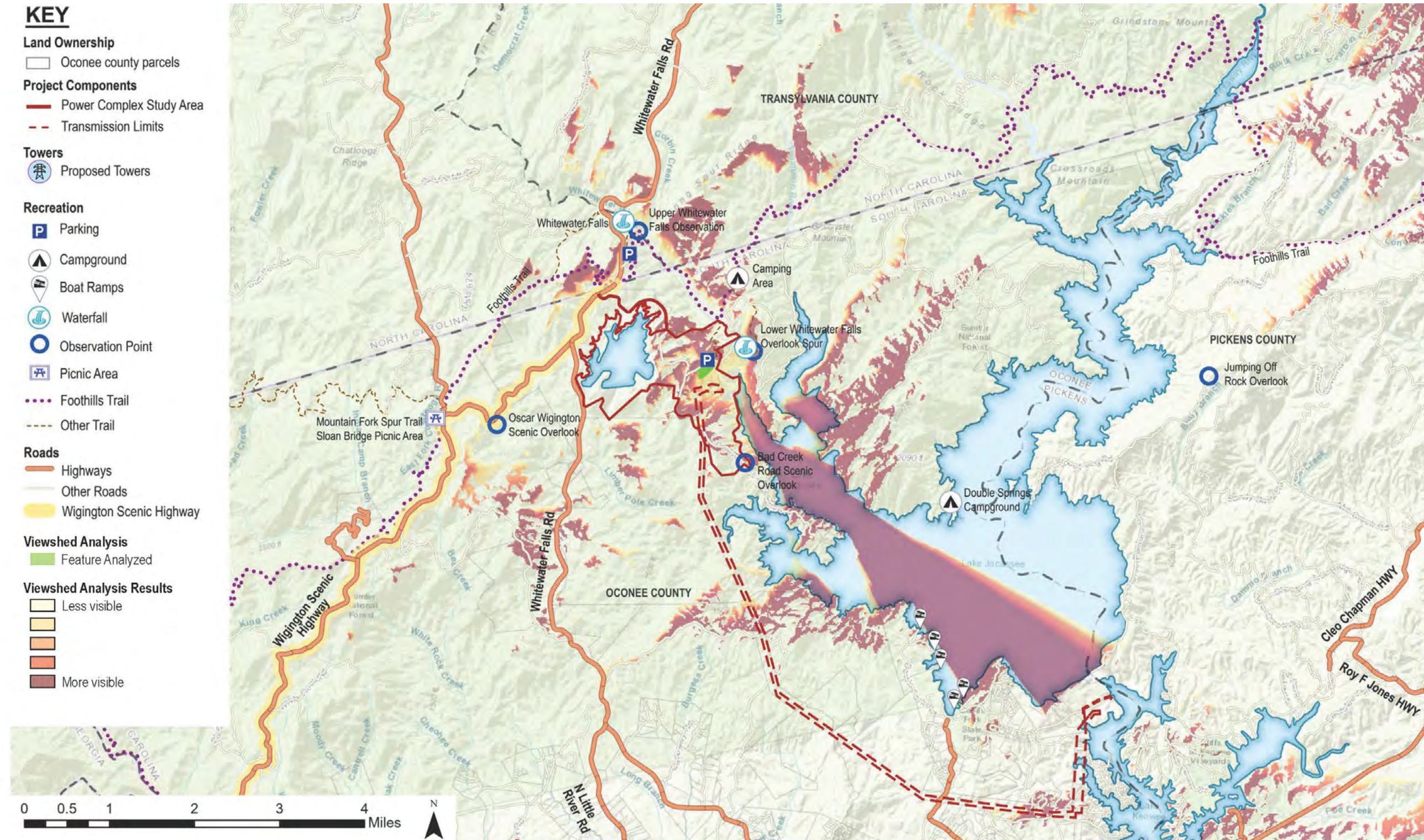
Bad Creek Hydroelectric Project
Oconee County, South Carolina July 14, 2023

Figure 1. Upper Reservoir Inlet



Lower Reservoir Inlet/Outlet Structures Seen Area Analysis **Bad Creek Hydroelectric Project**
 Oconee County, South Carolina July 14, 2023

Figure 2. Lower Reservoir Inlet/Outlet Structures Seen Area Analysis

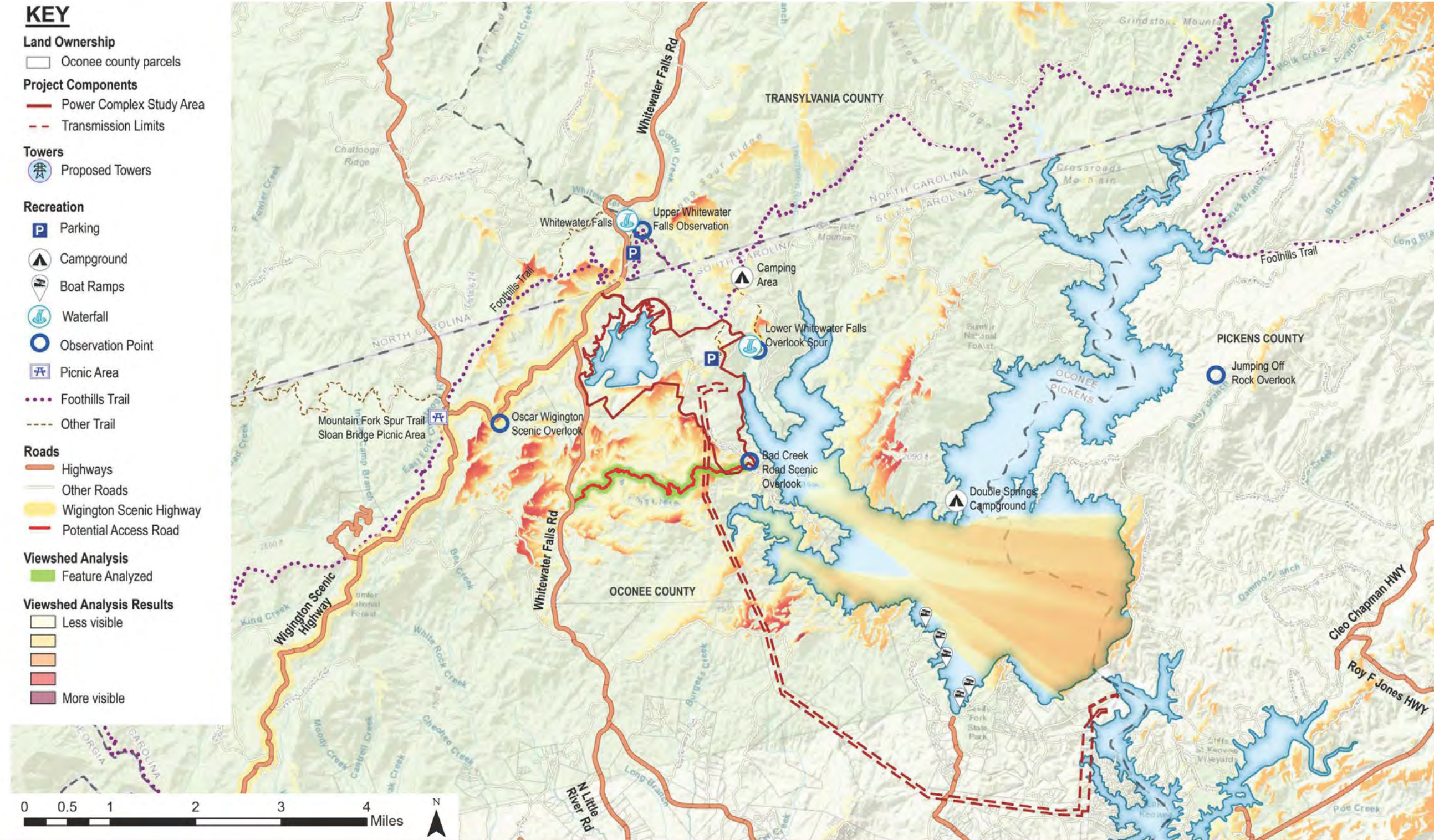


HDR LPDA LANDSCAPE ARCHITECTURE LAND PLANNING

Transformer Yard Seen Area Analysis

Bad Creek Hydroelectric Project
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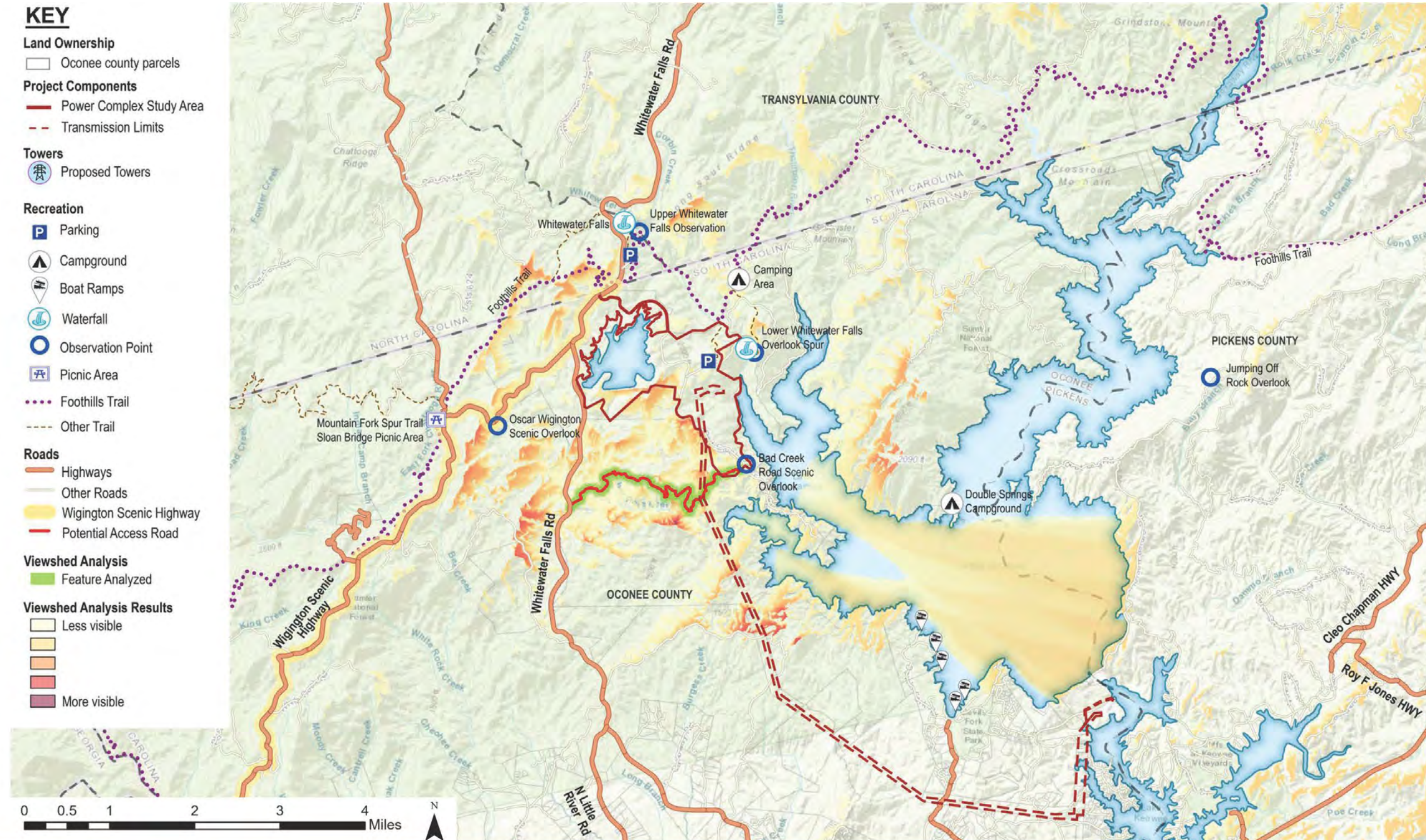
Figure 4. Transformer Yard Seen Area Analysis



**Access Road - Option 1
Seen Area Analysis**

Bad Creek Hydroelectric Project
Oconee County, South Carolina July 14, 2023

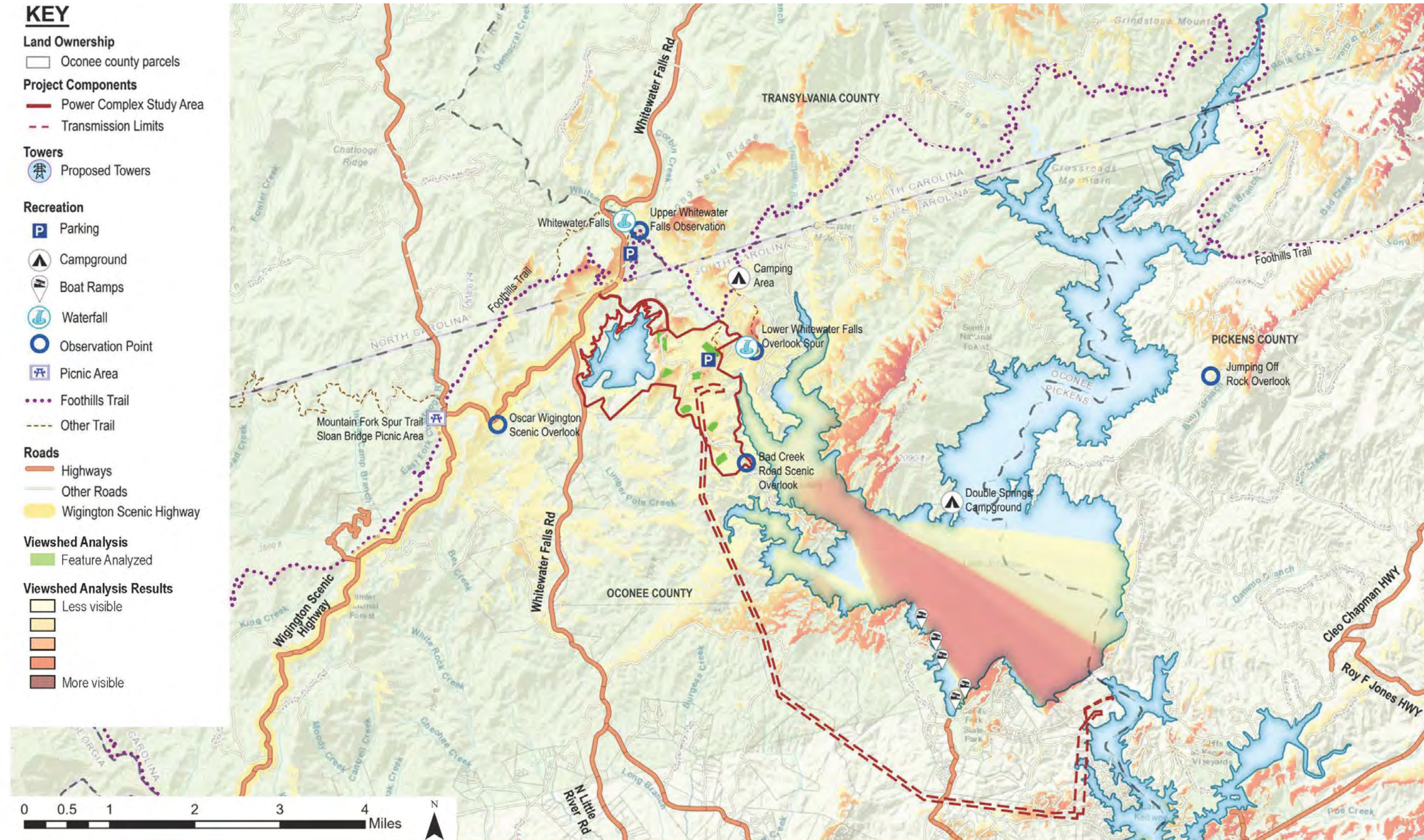
Figure 5. Access Road (Option 1) Seen Area Analysis



Access Road - Option 2
Seen Area Analysis

Bad Creek Hydroelectric Project
Oconee County, South Carolina July 14, 2023

Figure 6. Access Road (Option 2) Seen Area Analysis



HDR LPDA LANDSCAPE ARCHITECTURE LAND PLANNING

Spoils Seen Area Analysis

Bad Creek Hydroelectric Project

Oconee County, South Carolina July 14, 2023

Figure 7. Spoils Seen Area Analysis

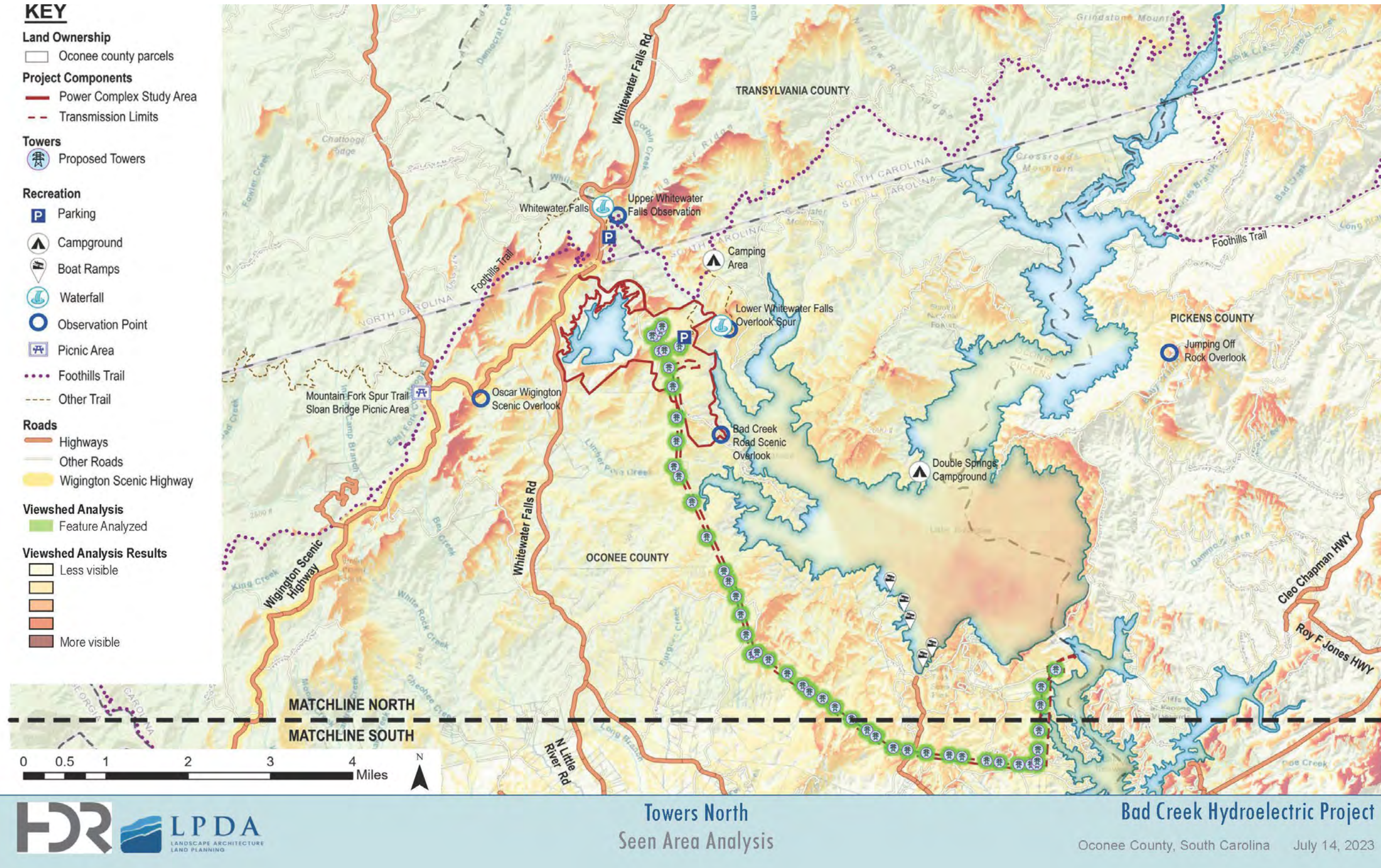


Figure 8. Towers North Seen Area Analysis

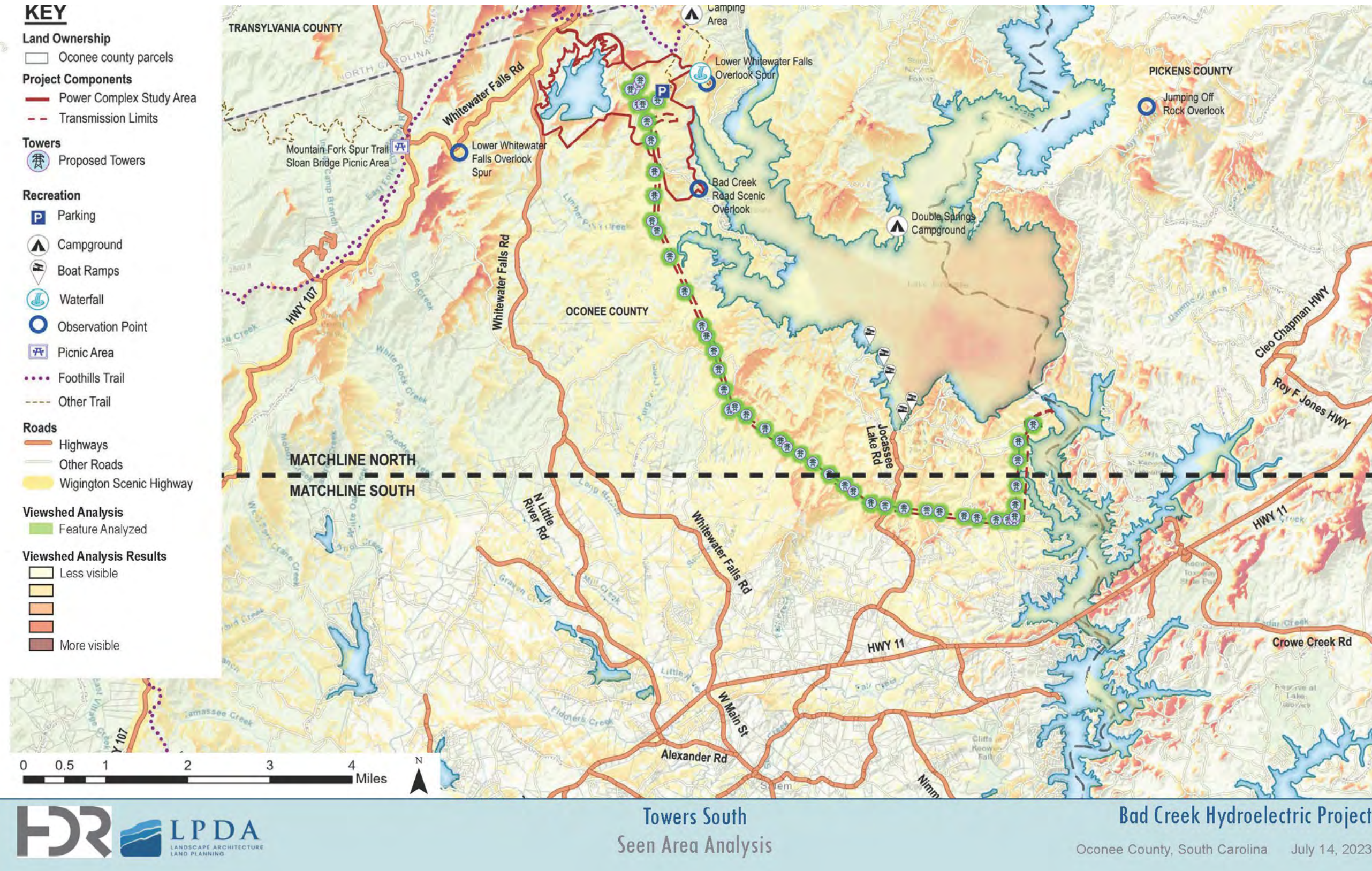


Figure 9. Towers South Seen Area Analysis

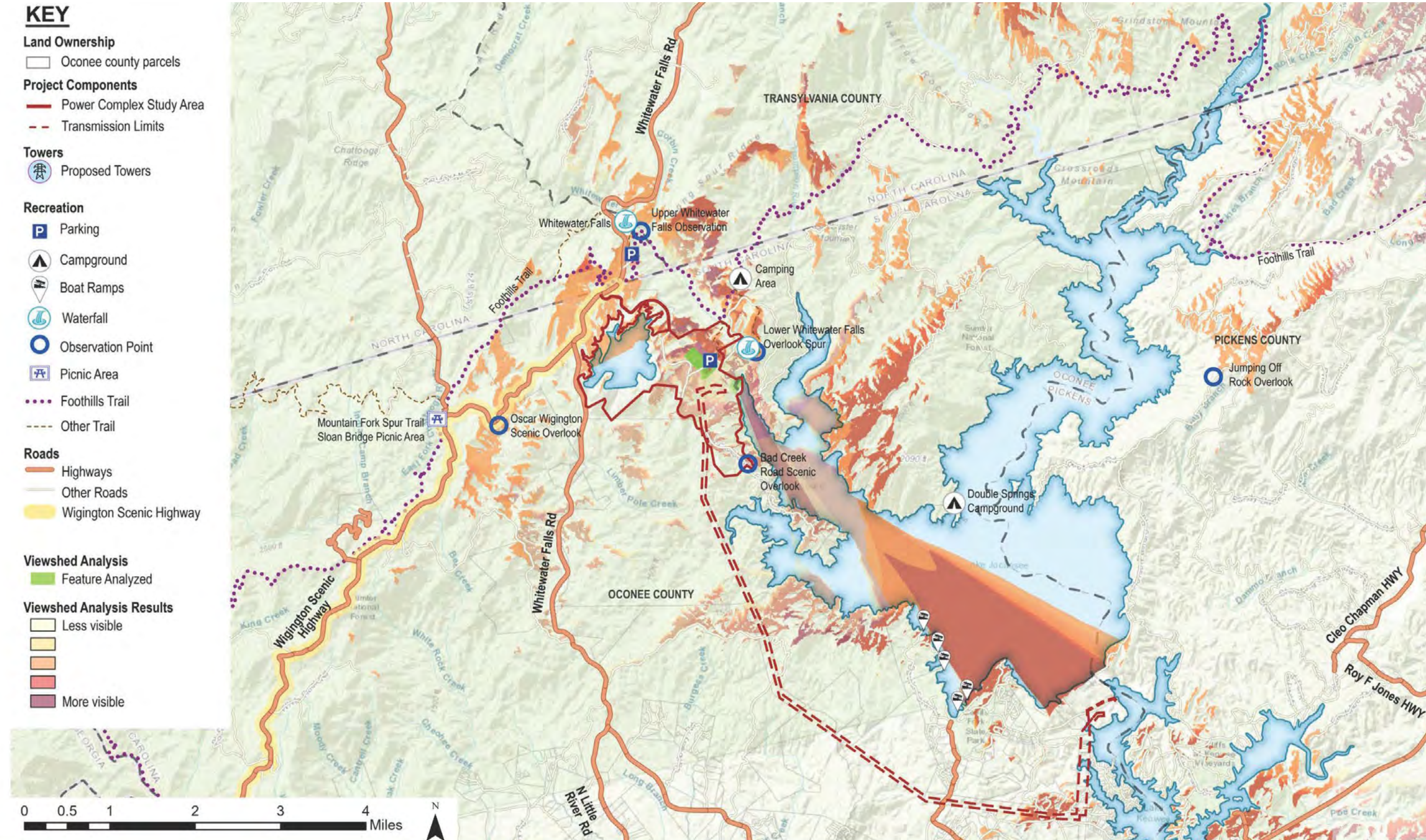


Figure 10. Composite Constructed Project Elements Seen Area Analysis

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

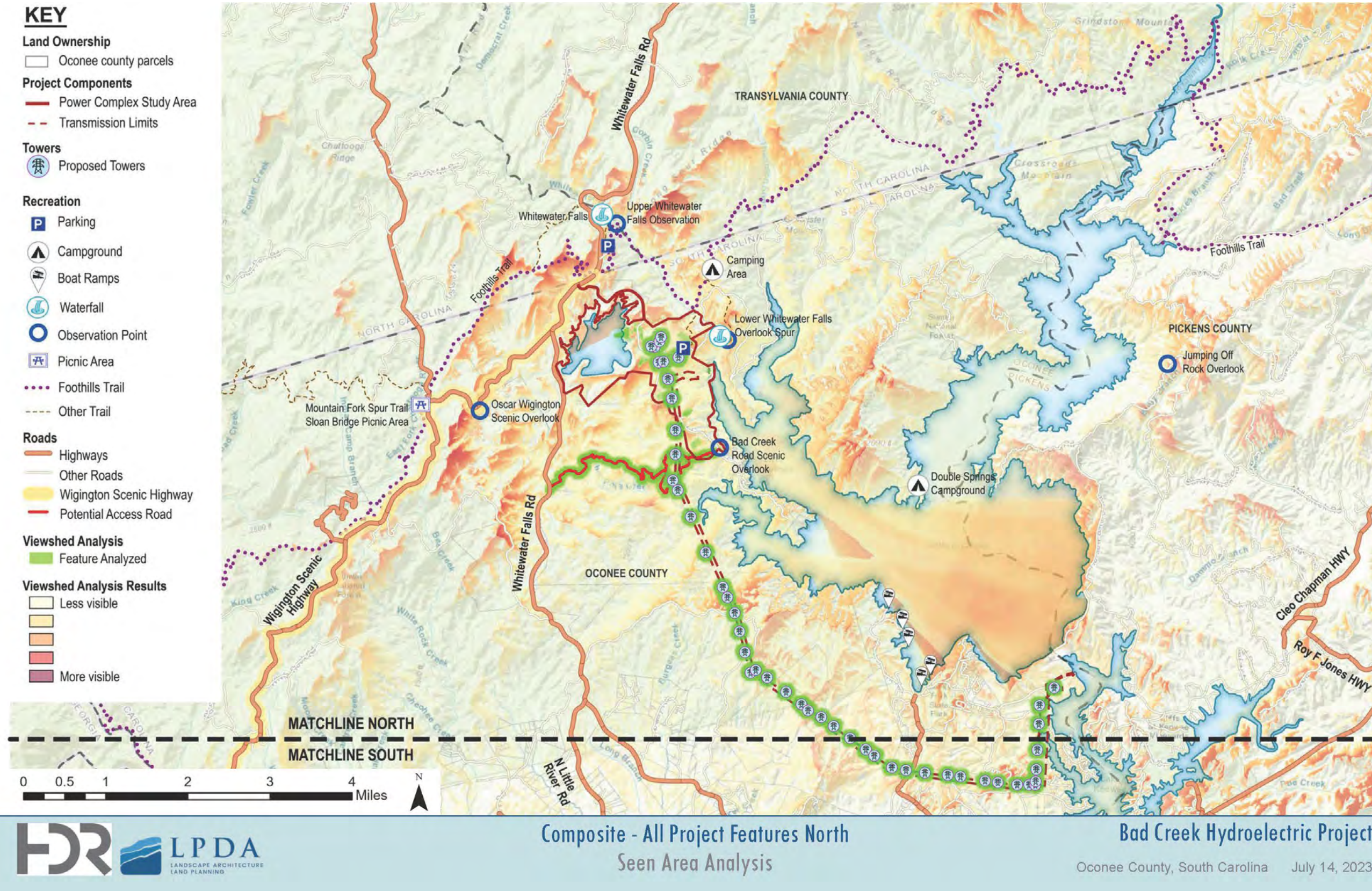


Figure 11. Composite – All Project Features North Seen Area Analysis



Attachment 2

Key Views

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Table 1. 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	Potential Key View
1A	Bad Creek Foothills Trail Parking lot	35.0121490°N 82.9994901°W	West	1929	Switchyard	0.04 mi	NA
1B	Bad Creek Foothills Trail parking lot	35.0121490°N 82.9994901°W	Southwest	1929	Transformer Yard	0.04 mi	NA
2 ¹	Lower Whitewater Falls Overlook Spur	35.0137962°N 82.9900206°W	West	1760	Lower Reservoir Inlet/outlet Structure	0.35 mi	Yes
3	Whitewater River Cove Entrance (from water)	35.0026097°N 82.9905286°W	North	1108	Spoil Area	0.38 mi	Yes ²
4 ¹	Bad Creek Road Scenic Overlook	34.9947366°N 82.9912529°W	Northwest	1639	Southernmost Spoil Area	0.2 mi	Yes
5 ¹	Bad Creek Road Scenic Overlook	34.9947366°N 82.9912529°W	Southwest	1639	Access Road	0.06 mi	Yes
6	Devil's Fork State Park main boat ramps	34.9534575°N 82.9466694°W	Northwest	1108	Transmission Line	1.10 mi	NA
7 ¹	Oscar Wigington Scenic Overlook	35.0010028°N 83.0434883°W	East	2836	Westernmost spoil area	2.00 mi	Yes
8	Devil's Fork State Park boat ramp	34.9632126°N 82.9506040°W	Northwest	1108	Transmission Line	1.50 mi	NA
9 ¹	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	Yes
10 ¹	Fisher Knob Neighborhood	34.9887026°N 82.9815273°W	Northwest	1138	Access Road	0.76 m	Yes

Notes: ¹Potential Key View selected by the Recreational Resources RC for field investigation (July 2023)

²Visualization completed during project planning

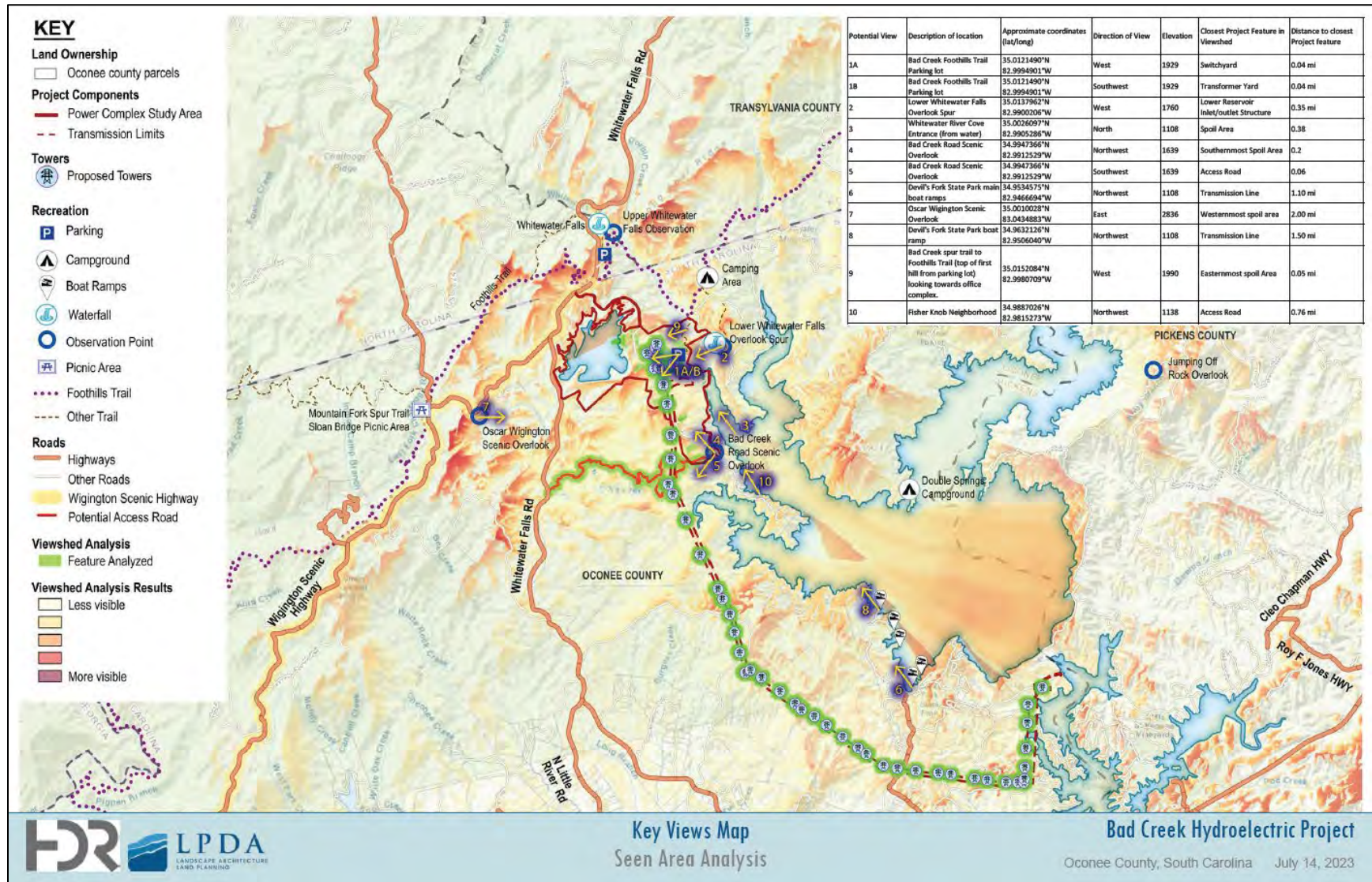


Figure 13. Potential Key Views



Attachment 3

Consultation Documentation

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



JULY 27, 2023

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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



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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**

HEAT STRESS Hydration
 Drinking enough fluids is one of the most important things you can do to prevent heat illness. Water is generally sufficient for hydration.

Urine Color Test

- WELL HYDRATED** (Light yellow)
- HYDRATED** (Yellow)
- DEHYDRATED** (Dark yellow)
- SEVERELY DEHYDRATED** (Dark orange/brown)

Hydrate Before Work

- Being hydrated when you start work makes it easier to stay hydrated through the day.
- If you are dehydrated when you start work, you may not be able to drink enough to catch up with your body's need for water.

Hydrate During Work

- Drink before feeling thirsty. By the time you feel thirsty, you are already behind in fluid replacement. Dehydration is a primary contributor to heat exhaustion.
- Your work performance may suffer when you are dehydrated, even if you don't notice.
- When working in the heat, drink 1 cup (8 ounces) of water every 15–20 minutes.
 - This translates to ¾–1 quart (24–32 ounces) per hour.
- Drinking at shorter intervals is more effective than drinking large amounts infrequently.
- Do not drink more than 48 oz (1½ quarts) per hour! Drinking too much water or other fluids (sports drinks, energy drinks, etc.) can cause a medical emergency because the concentration of salt in the blood becomes too low.

How much water is that?

1 quart = 1/4 gallon = 32 ounces

Hydrate After Work

- Most people need several hours to drink enough fluids to replace what they have lost through sweat. The sooner you get started, the less strain you place on your body from dehydration.
- Hydrating after work is even more important if you work in the heat on a regular basis. Chronic dehydration increases the risk for a number of medical conditions, such as kidney stones.

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

3

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

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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
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- Task 8 – Mitigation Assessment
- Task 9 – Conceptual Design of Bad Creek II Complex



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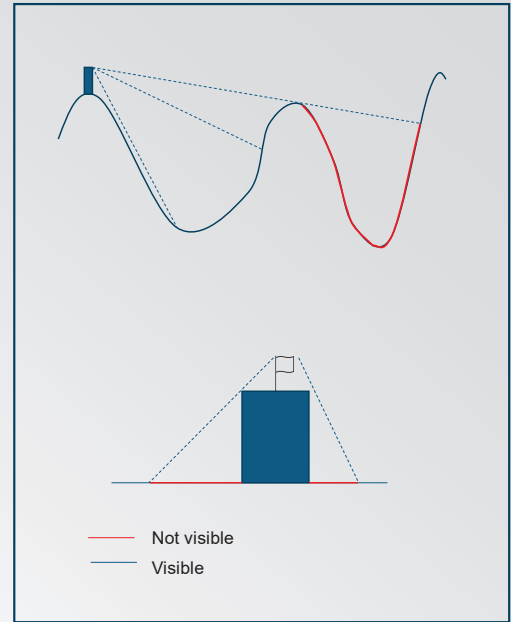
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Task 2 - Seen Area Analysis

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

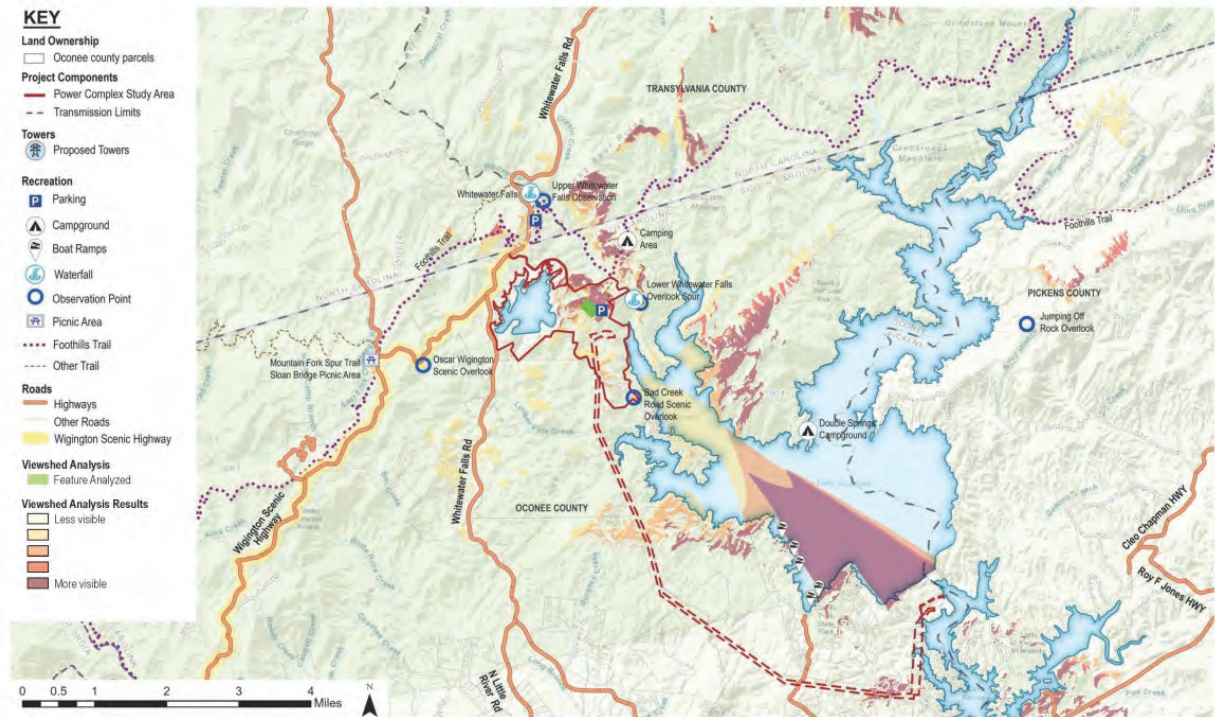
Methodology:

- 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



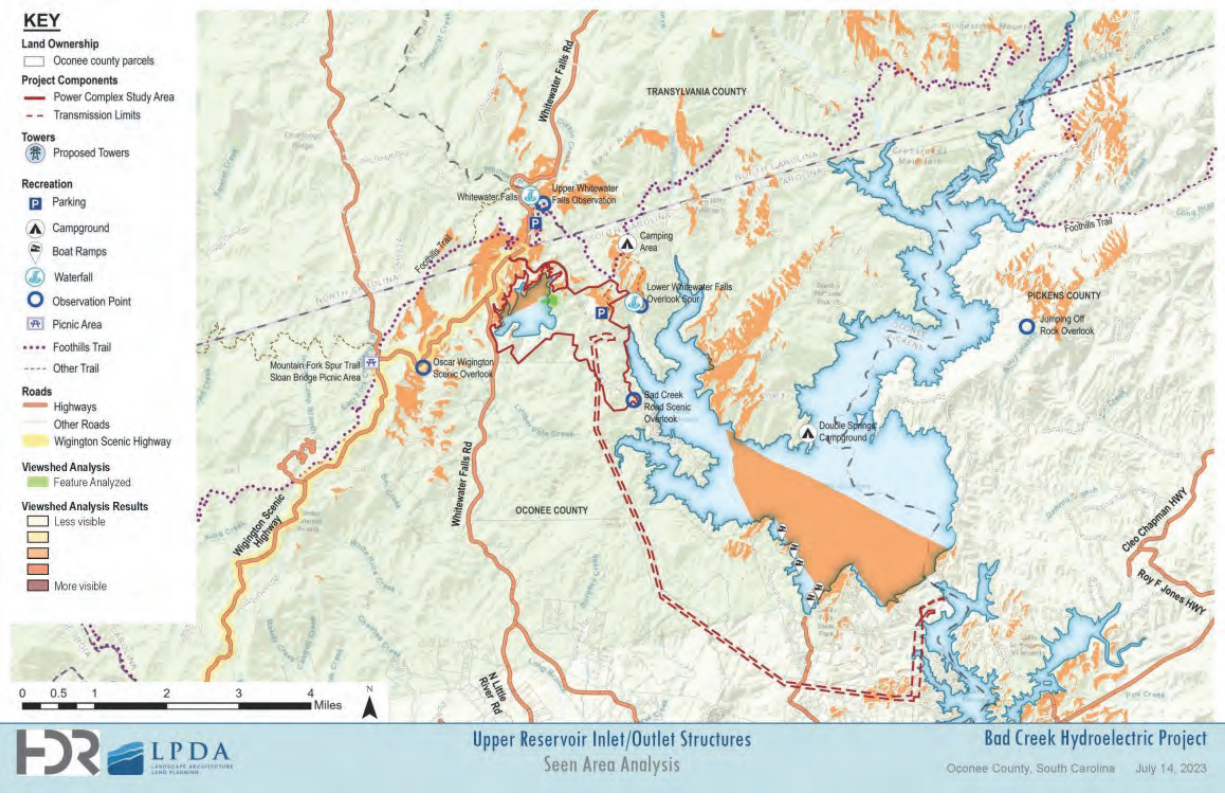
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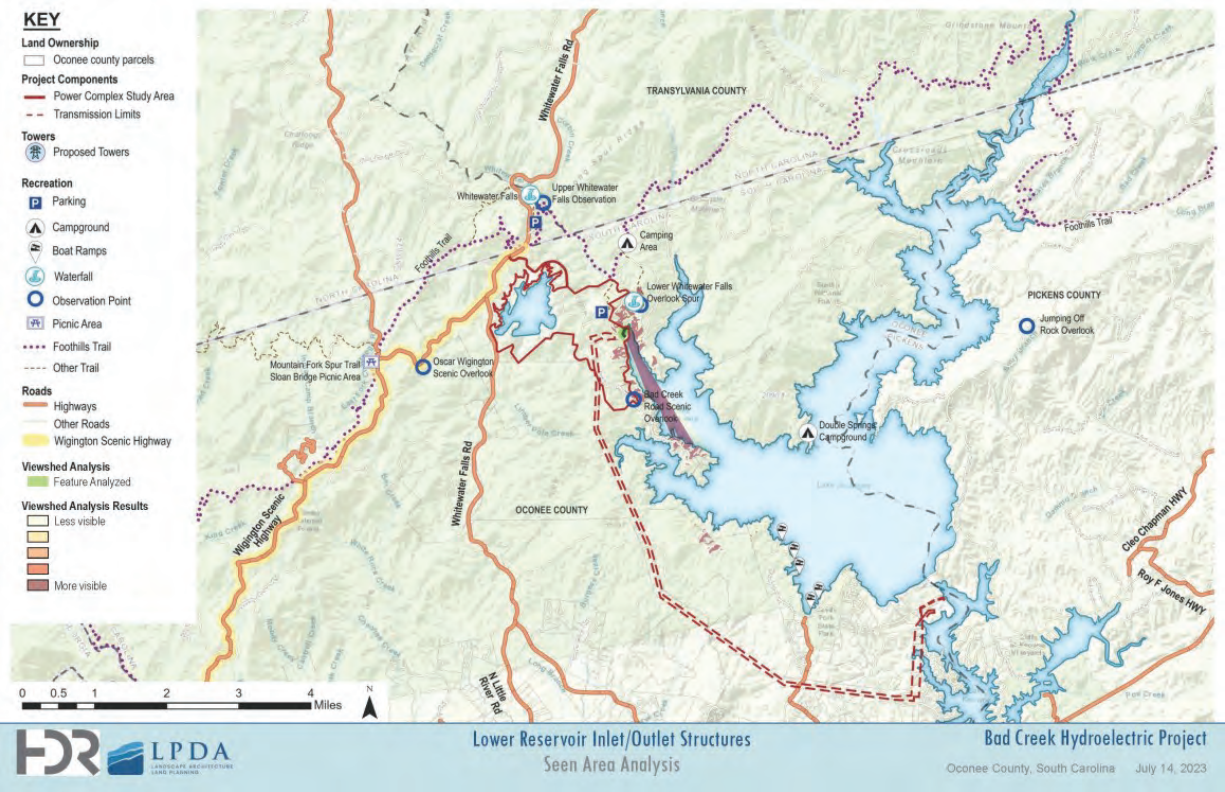


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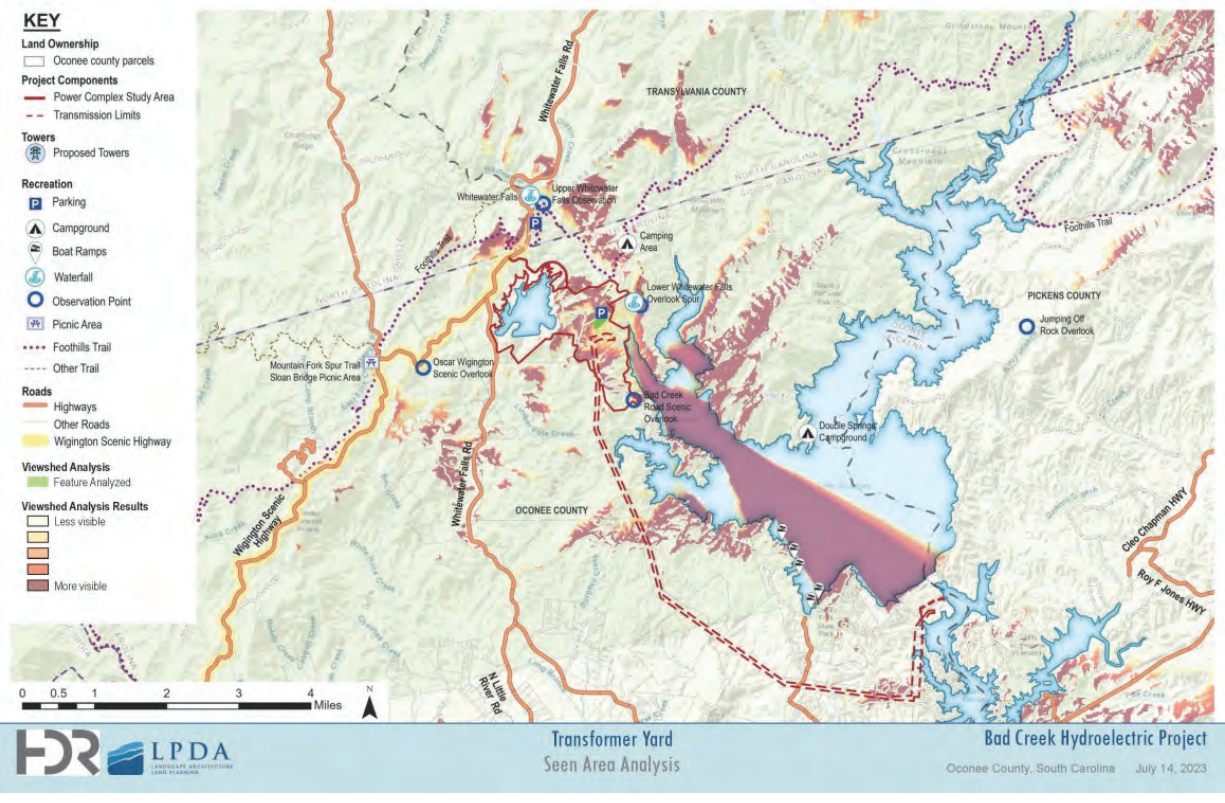
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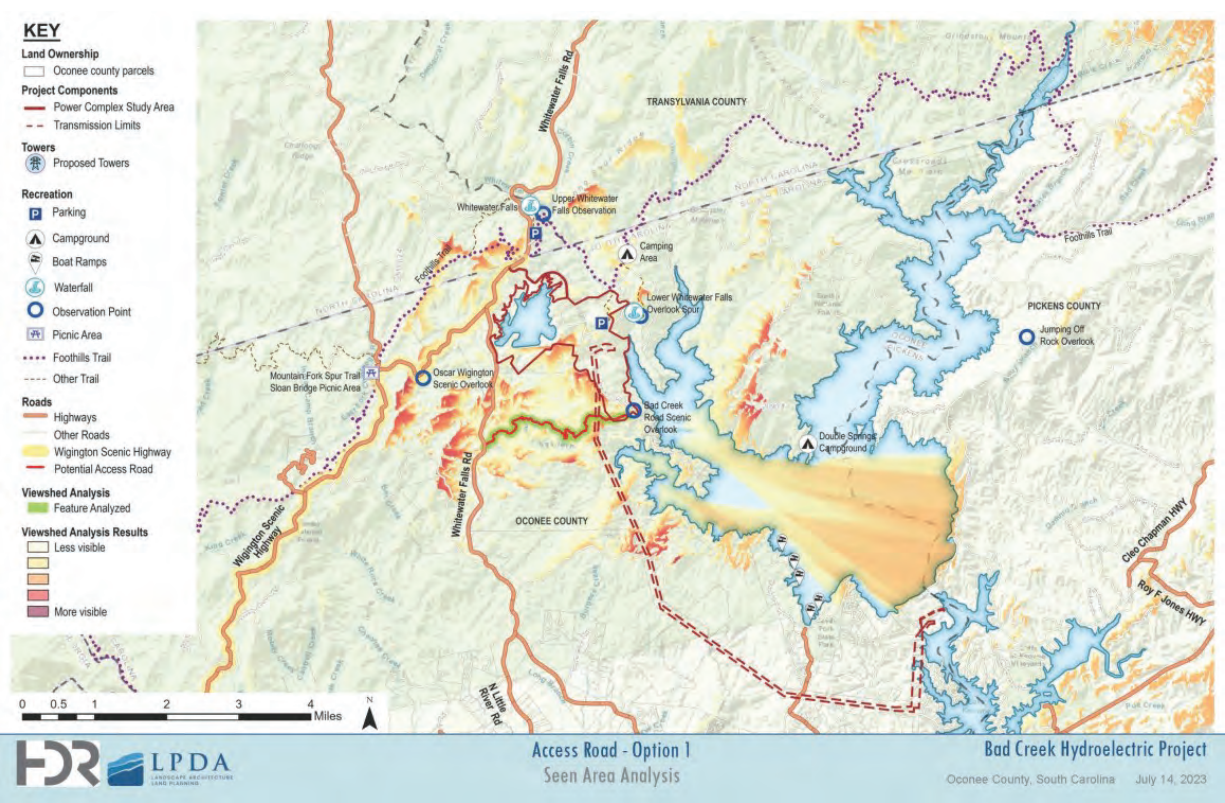
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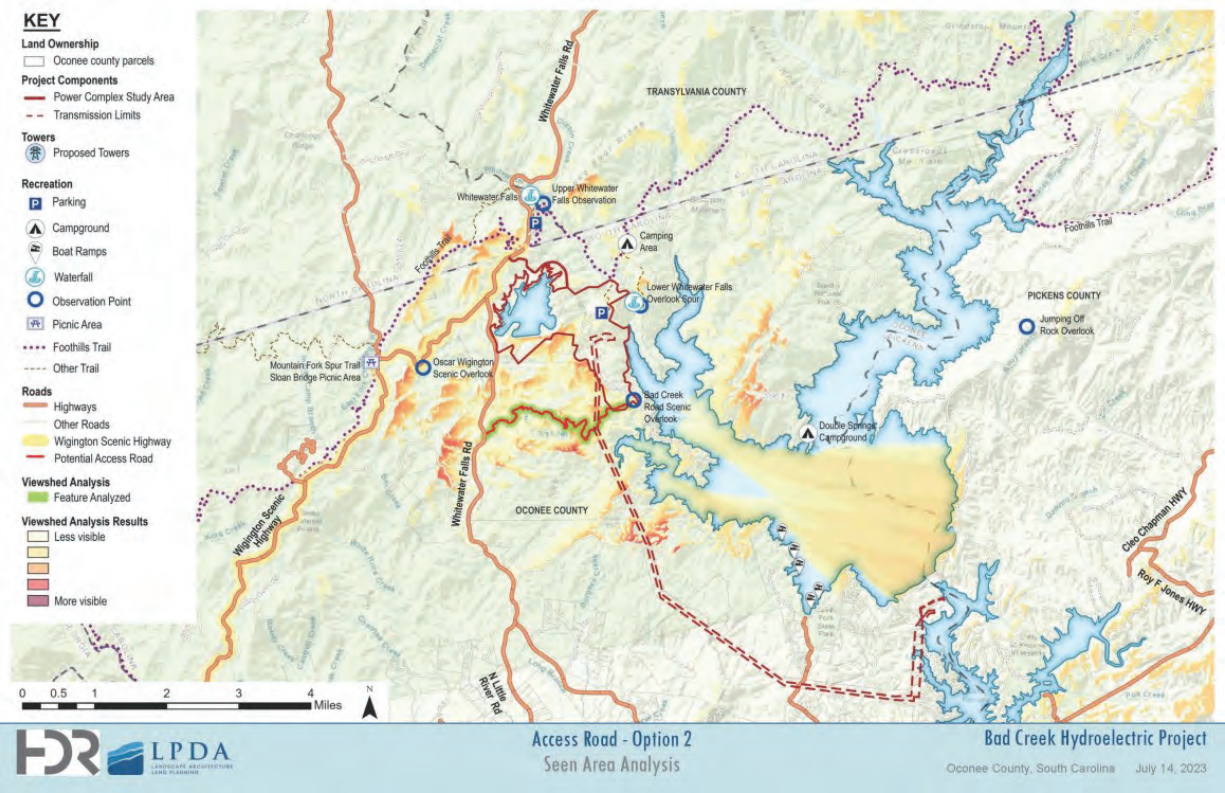
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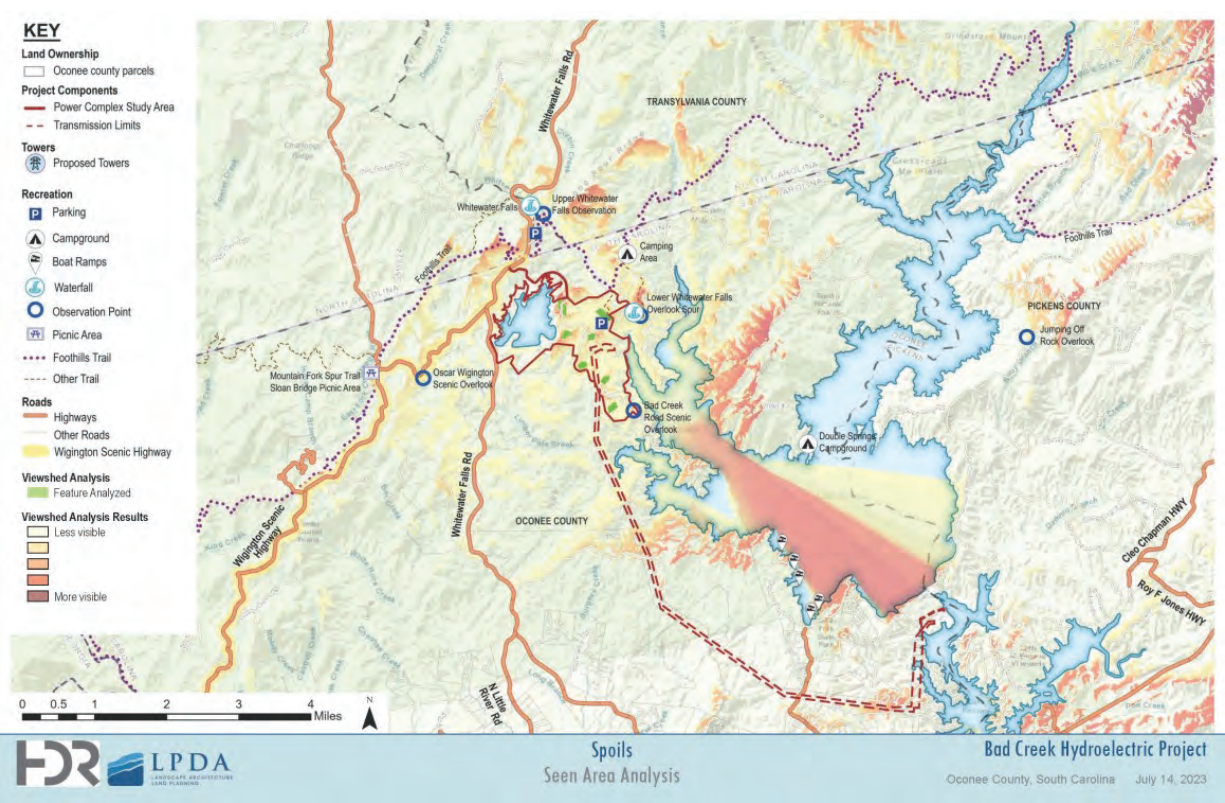
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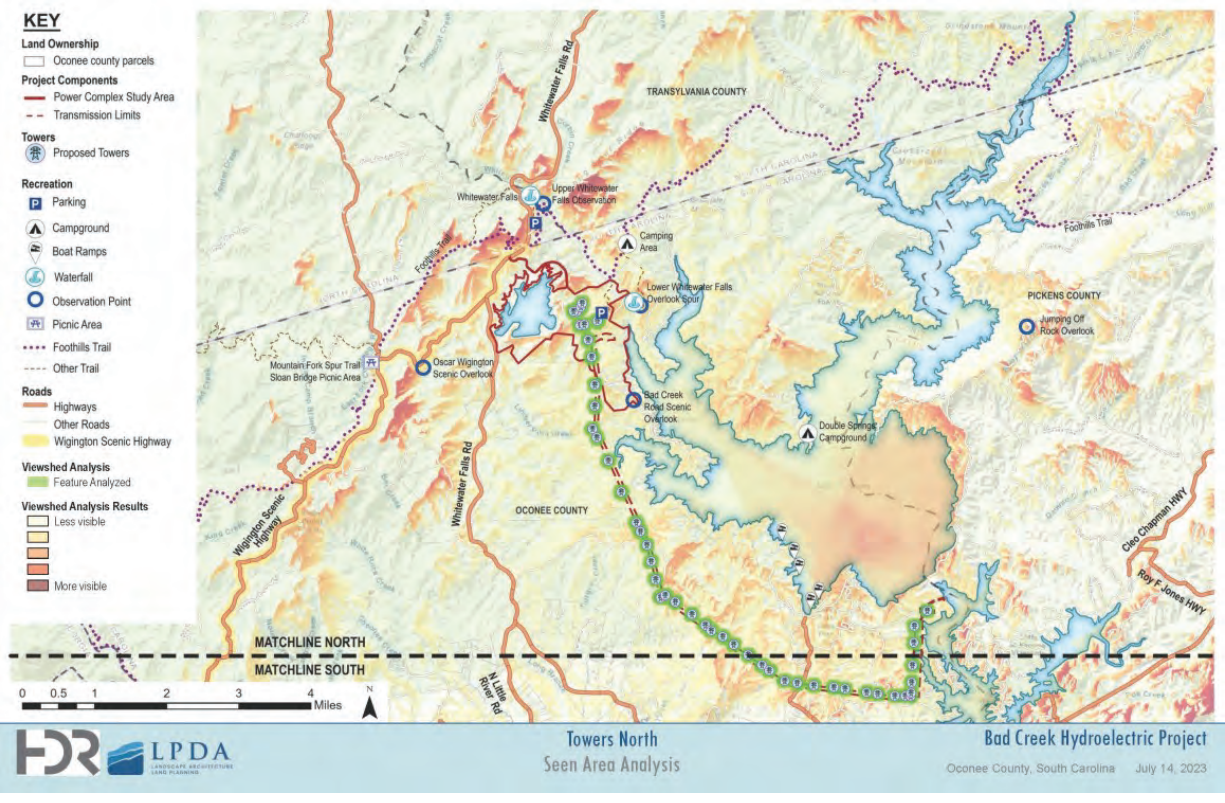
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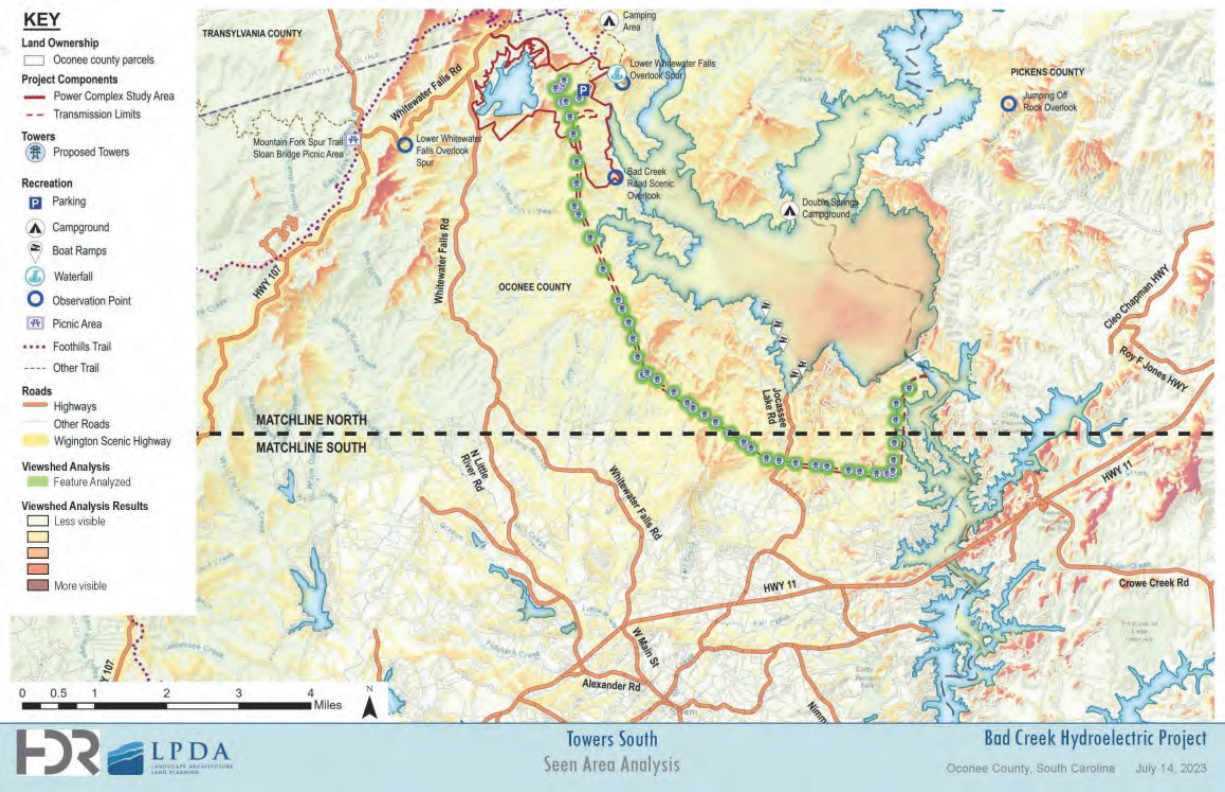
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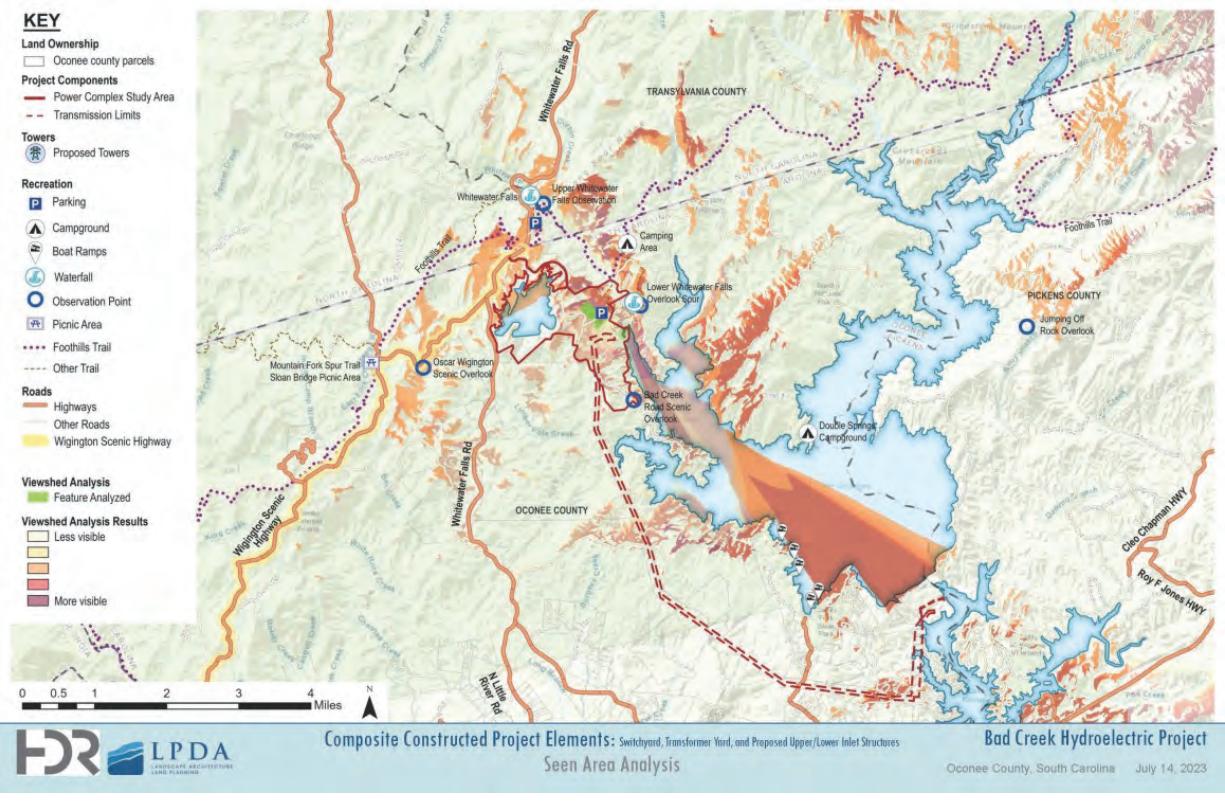
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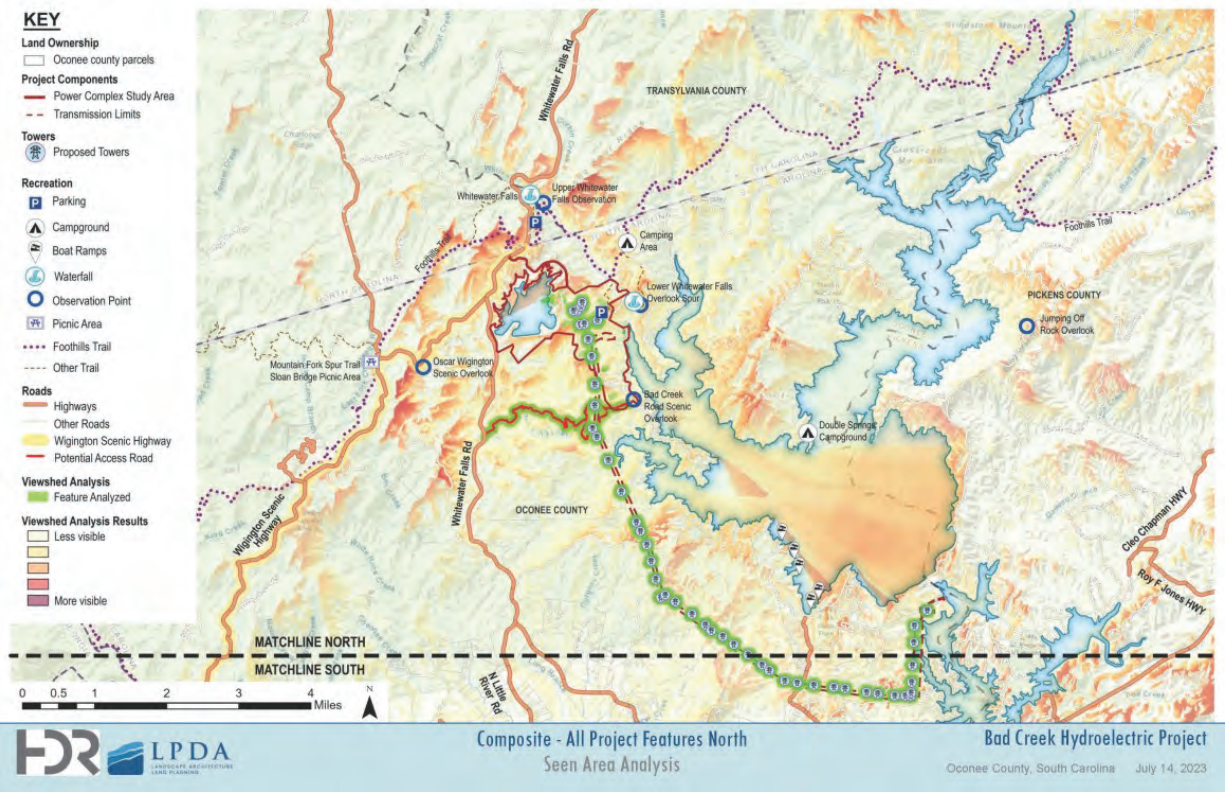
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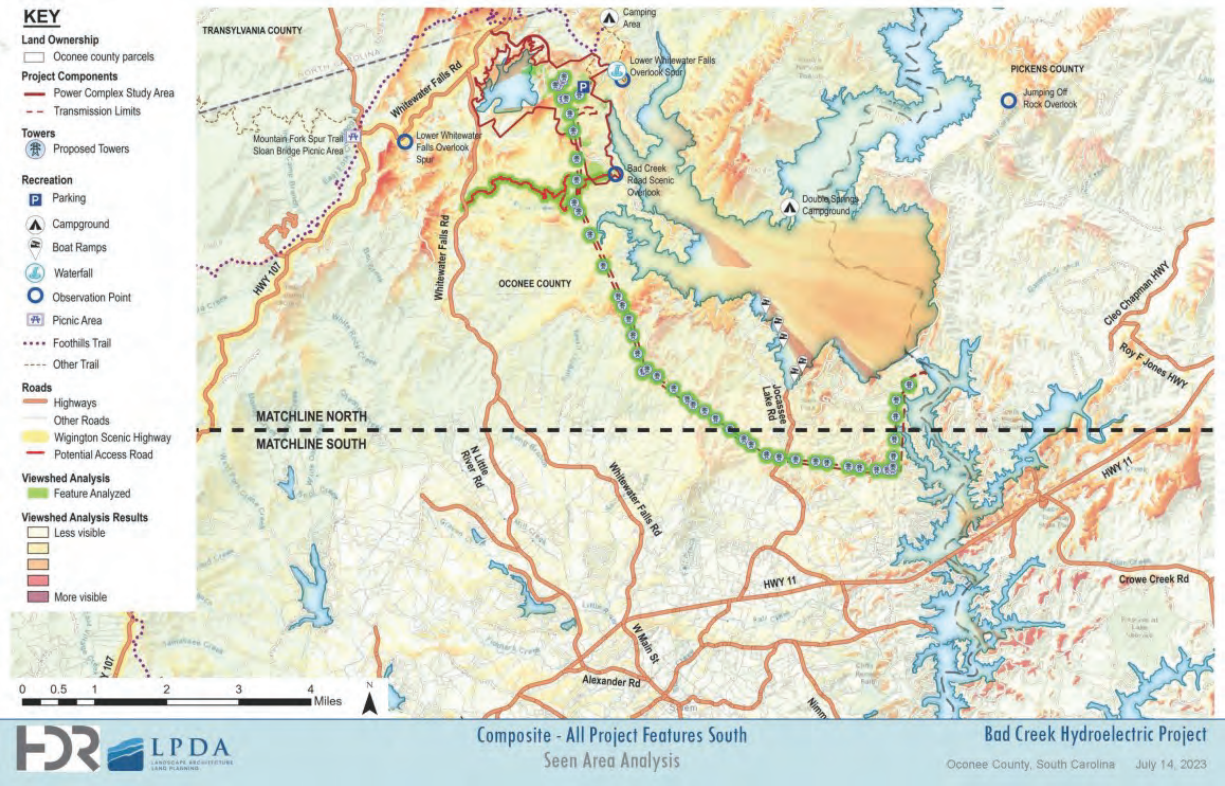
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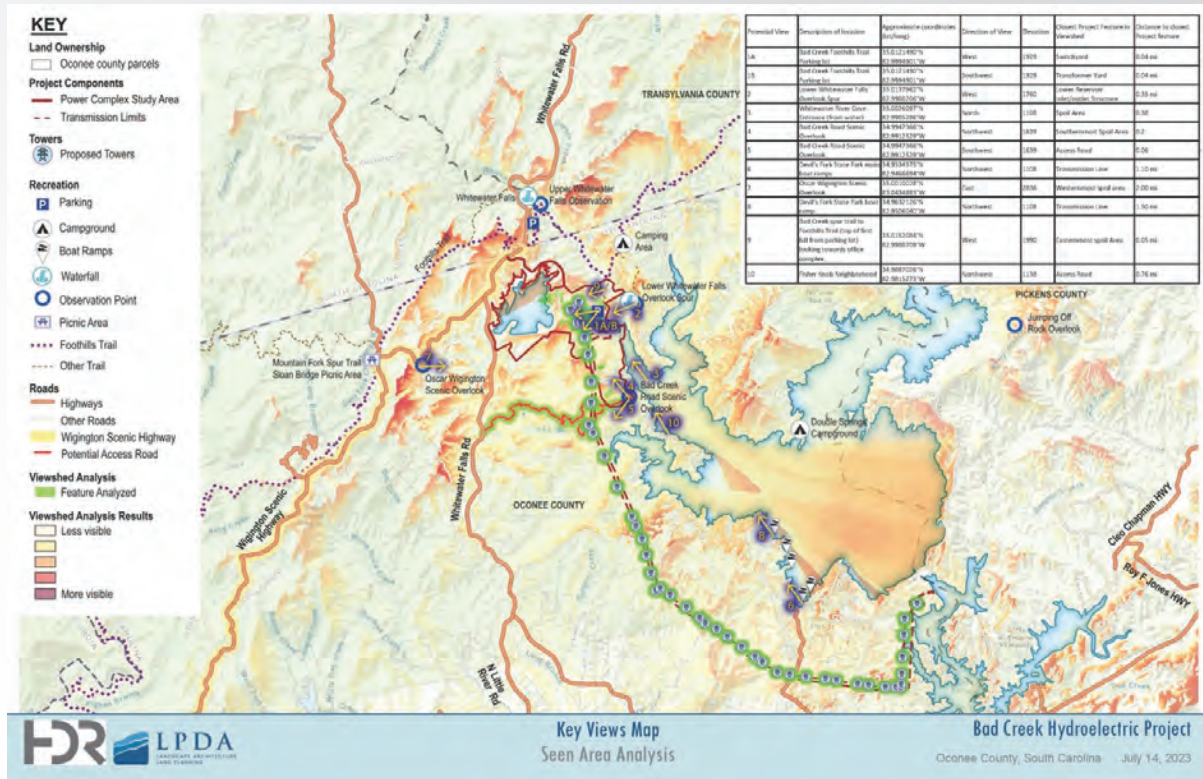
Task 4 – Key Views Selection

“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.”



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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
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	Eastermost spoil Area	0.05
10	Fisher Knob Neighborhood	34.9887026°N 82.9815273°W	Northwest	1138	Access Road	0.76

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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)



Recreation Resources Study



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

Recreation & Visual Resources Resource Committee – July 27, 2023 | 25

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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.



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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

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.

The image displays two screenshots from the Fulcrum mobile application. The left screenshot shows a form for a 'Foothills Trail Assessment' with the following details: Date: June 27, 2023; Trail Name: Bad Creek Access Spur; Mile Marker: 3.2; Assessment Type: Bridge - Bridge; Measurements: 30' L x 5' W x 2' H; Description / Details / Comments: Wooden bridge with handrails on both sides. Needs new bridge - old one completely gone. Below the form is a photo of a dense forest. The right screenshot shows the assessment's summary page, including a title 'Foothills Trail Assessment', a subtitle 'Bad Creek Access Spur, 12, Bridge - Bridge, 30' L x 5' W x 2' H', a photo of a grassy area, a map showing the location, and metadata such as 'CREATED: 6/27/2023, 12:33:52 PM UTC by Todd Branham' and 'UPDATED: 6/19/2023, 4:20:41 PM UTC by Todd Branham'. The status is 'Needs Repair' and the location is '35 224860, -82 729979'.

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

Drone Flight Summary at Whitewater River Cove

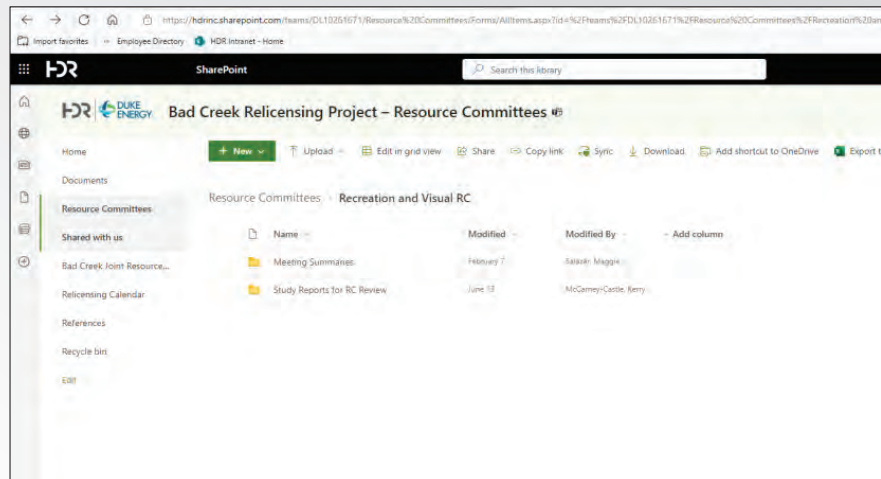
Date	# of Images Collected	~ High Temp (°F)	Notes
28-May	49	63 °F	
31-May	40	75 °F	
2-Jun	93	86 °F	
3-Jun	69	88 °F	
13-Jun	49	79 °F	
24-Jun	105	82 °F	
28-Jun	80	89 °F	
1-Jul	102	93 °F	
4-Jul	105	89 °F	
14-Jul	74	92 °F	Due to lightning, flights ended at 2:30
15-Jul	83	95 °F	Due to storms, flights ended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



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Closing Remarks

- Action item review
- Meeting summary



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From: maggie.salazar@hdrinc.com
Subject: FW: Bad Creek Relicensing - Visual Resources Lighting Evaluation Study
Attachments: potential night views.pdf
Importance: High

From: Crutchfield Jr., John U <John.Crutchfield@duke-energy.com>
Sent: Wednesday, October 11, 2023 8:15 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>; 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>; Amedee, Morgan D. <amedeemd@dhec.sc.gov>; cloningerp@dnr.sc.gov; SelfR <SelfR@dnr.sc.gov>; Rowdy Harris <charris@scprt.com>; Stuart, Alan Witten <Alan.Stuart@duke-energy.com>; suewilliams130@gmail.com; William T. Wood <woodw@dnr.sc.gov>; Willie Simmons <simmons@dnr.sc.gov>; Huff, Jen <Jen.Huff@hdrinc.com>; phil.mitchell@gmail.com; Bill Ranson-Retired <bill.ranson@retiree.furman.edu>
Cc: Kulpa, Sarah <sarah.kulpa@hdrinc.com>; McCarney-Castle, Kerry <kerry.mccarney-castle@hdrinc.com>
Subject: Bad Creek Relicensing - Visual Resources Lighting Evaluation Study
Importance: High

CAUTION: [EXTERNAL] This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Dear Bad Creek Relicensing Recreation & Visual Resources Committee Members:

Per discussion during the July 27, 2023 Resource Committee meeting, please find attached the proposal for the lighting evaluation component of Task 9 (Conceptual Design of Bad Creek II Complex) for the Bad Creek Visual Resources Study.

Duke Energy is planning to use a similar process to plan for collecting images and developing visualizations of Project features for use with Task 4 (Key Views Selection). We are focused on two categories of views for the lighting evaluation: near and distance views. The near views will have a clear view of the facility while the distant views will be focused on evaluating the effects of additional facility lighting on the surrounding landscape.

Similar to the process we will use for the daytime views, we will provide the four (4) images to the Resource Committee for them to select two (2) that will then be used for visualizations. In selecting the four views, we focused on areas that are likely to have nighttime use and potentially already experience some sort of lighting effects. The four views we are proposing are:

- View from the Bad Creek Foothills Trail parking lot
- View from the top of the first hill on the spur trail from the parking lot to the Foothills Trail
- View from a dock at Fishers Knob looking towards the site. Note the location of this site is dependent on gaining homeowner agreement from a resident on Fishers Knob.
- View from the northernmost boat ramp at Devils Fork State Park looking towards the site

The attached drawing shows the approximate locations.

We will capture nighttime images that are representative of the viewer experience (as opposed to longer exposure or enhanced visibility images). We are targeting a moon phase of quarter moon to half-moon in November, so we are likely

looking at the last week of November – weather permitting. We will plan to capture the daytime and nighttime images on the same day.

Please provide comments to me regarding the above proposal by **October 27, 2023**. If you have questions, please reach out to me or Jen Huff at Jen.Huff@hdrinc.com.

Regards,

John Crutchfield

Project Manager II

Water Strategy, Hydro Licensing & Lake Services

Regulated & Renewable Energy

Duke Energy

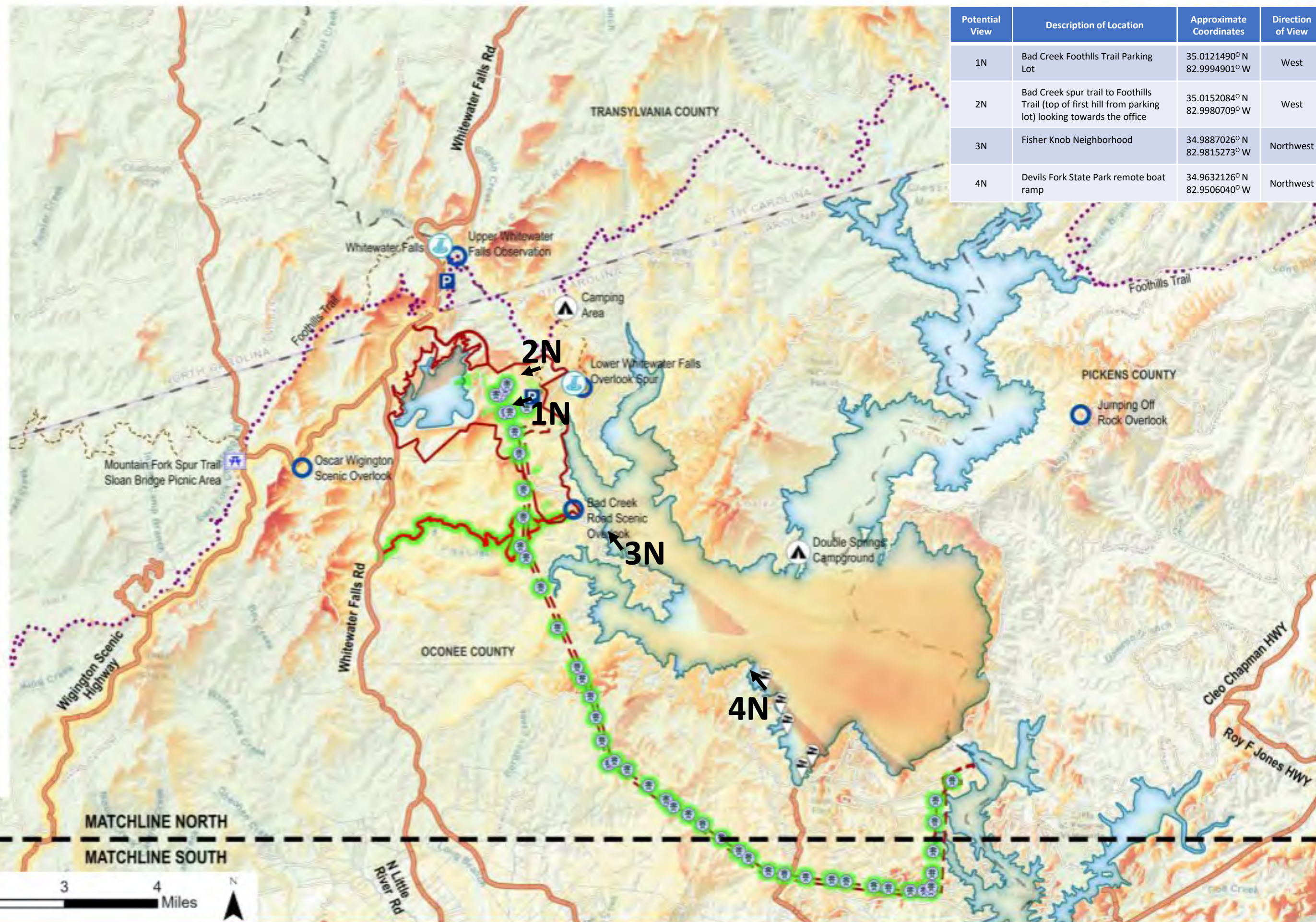
525 South Tryon Street, DEP-35B | Charlotte, NC 28202

Office 980-373-2288 | Cell 919-757-1095

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

Potential View	Description of Location	Approximate Coordinates	Direction of View
1N	Bad Creek Foothills Trail Parking Lot	35.0121490° N 82.9994901° W	West
2N	Bad Creek spur trail to Foothills Trail (top of first hill from parking lot) looking towards the office	35.0152084° N 82.9980709° W	West
3N	Fisher Knob Neighborhood	34.9887026° N 82.9815273° W	Northwest
4N	Devils Fork State Park remote boat ramp	34.9632126° N 82.9506040° W	Northwest



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From: [Crutchfield Jr., John U](#)
To: [Stuart, Alan Witten](#); [Huff, Jen](#); [Kulpa, Sarah](#); [McCarney-Castle, Kerry](#)
Subject: FW: [EXTERNAL] Re: Bad Creek Relicensing - Visual Resources Lighting Evaluation Study
Date: Tuesday, October 17, 2023 6:26:23 AM

CAUTION: [EXTERNAL] This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

FYI.

From: Dale Wilde <dwilde@keoweefolks.org>
Sent: Tuesday, October 17, 2023 3:58 AM
To: Crutchfield Jr., John U <John.Crutchfield@duke-energy.com>
Subject: [EXTERNAL] Re: Bad Creek Relicensing - Visual Resources Lighting Evaluation Study

***** CAUTION! EXTERNAL SENDER *** STOP. ASSESS. VERIFY!!** Were you expecting this email? Are grammar and spelling correct? Does the content make sense? Can you verify the sender? If suspicious report it, then do not click links, open attachments or enter your ID or password.

John,

FOLKS has no comments on this lighting evaluation study.

Ms. Dale Wilde
President, FOLKS
C: 207-604-6539
E: dwilde@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 Oct 11, 2023, at 8:15 AM, Crutchfield Jr., John U <John.Crutchfield@duke-energy.com> wrote:

Dear Bad Creek Relicensing Recreation & Visual Resources Committee Members:

Per discussion during the July 27, 2023 Resource Committee meeting, please find attached the proposal for the lighting evaluation component of Task 9 (Conceptual Design of Bad Creek II Complex) for the Bad Creek Visual Resources Study.

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Please provide comments to me regarding the above proposal by **October 27, 2023**. If you have questions, please reach out to me or Jen Huff at Jen.Huff@hdrinc.com.

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

<potential night views.pdf>

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](#)
Cc: [Kulpa, Sarah](#); [McCarney-Castle, Kerry](#); [Settevendemio, Erin](#)
Subject: Bad Creek Relicensing - Visual Resources Committee Virtual Meeting for View Selection Analysis
Date: Tuesday, December 5, 2023 1:22:48 PM
Importance: High

CAUTION: [EXTERNAL] This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Dear Bad Creek Relicensing Recreation and Visual Resources Committee Members:

Please recall that the Visual Resources Study called for Duke Energy's relicensing consultant, HDR, to capture photographs at six locations in the vicinity of the site during leaf-off conditions. That has now been done, so the next step in the process is for the Recreation and Visual Resources Resource Committee to select four of the six locations, plus two nighttime views, to use for the remaining study tasks. That includes the development of photo simulations of Bad Creek II and an analysis of the effects of the expanded facility on the surrounding landscape.

Duke Energy would like to convene the Resource Committee via a Teams virtual meeting to provide input and gain consensus on the view site selection. We will convene the meeting during the week of January 8-12, 2024, and the meeting will be scheduled for 2 hours, either in the morning (9-11 am) or afternoon (1-3 pm).

Please use the Doodle Poll link below to provide your availability to attend this virtual meeting.

<https://doodle.com/meeting/participate/id/elvBZwjb>

I would appreciate if you would respond to the Doodle Poll meeting availability by no later than Friday, December 15, COB.

I will schedule the Teams meeting via Outlook calendar soon after the Doodle Poll closes.

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

Kulpa, Sarah

Subject: Bad Creek Relicensing - Visual Resources Committee Virtual Meeting for View Selection Analysis
Location: Microsoft Teams Meeting
Start: Thu 1/11/2024 9:00 AM
End: Thu 1/11/2024 11:00 AM
Show Time As: Tentative
Recurrence: (none)
Meeting Status: Not yet responded
Organizer: Crutchfield Jr., John U

CAUTION: [EXTERNAL] This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Dear Bad Creek Relicensing Recreation and Visual Resources Committee Members:

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Duke Energy would like to convene the Resource Committee via a Teams virtual meeting to provide input and gain consensus on the view site selection.

An agenda will be provided for the meeting.

Please contact John Crutchfield if you have any questions regarding the meeting.

Microsoft Teams meeting

Join on your computer, mobile app or room device

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Passcode: Cf6udk

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duke-energy@m.webex.com

Video Conference ID: 115 636 987 4

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Or call in (audio only)

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Bad Creek Relicensing - Visual Resources Committee Virtual Meeting for View Selection Analysis

Friday, December 29, 2023 10:57 AM

Meeting Date: 1/11/2024 9:00 AM

Location: Microsoft Teams Meeting

Link to Outlook Item: [click here](#)

Invitation Message

CAUTION: [EXTERNAL] This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Dear Bad Creek Relicensing Recreation and Visual Resources Committee Members:

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[Alternate VTC instructions](#)

Or call in (audio only)

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Phone Conference ID: 981 740 090#

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Participants

- [Crutchfield Jr., John U](#) (Meeting Organizer)
- Amy Breedlove
- Andrew Gleason

- 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](#)
- [Kulpa, Sarah](#)
- [McCarney-Castle, Kerry](#)