EXECUTIVE SUMMARY

BROAD RIVER BASIN PLAN 2024

CONTENTS

Monticello Reservoir

FOREWORD

The Broad River Basin Plan is the result of years of preparation, work, and contributions from numerous stakeholders with a vested interest in water management. The state began implementing its vision for a comprehensive and actionable water plan in 2014 with the development of surface water quantity models for each of the eight major river basins in the state. An update of a detailed groundwater model of the Coastal Plain Aquifer System and the development of methodologies for projecting water demands for all water use sectors followed. This voluminous preparatory work, grounded firmly in science, provides River Basin Councils (RBCs) in all eight basins with the technical information they need to understand water availability, propose and test alternative management strategies, and make concerted recommendations to water users, regulatory agencies, and state legislators on future management practices and policies to manage and protect the resource.

This report constitutes the second of the eight river basin plans, and it is organized and supported by the work of the State Water Planning Process Advisory Committee (PPAC). This committee participated in a facilitated process to formulate a thorough, practical, and consistent planning approach that is being applied in the different river basins in South Carolina. Published in 2019, the South Carolina State Water Planning Framework now serves as a comprehensive, uniform guide for the RBCs, each charged with developing an understanding of the water resources in their respective basins; identifying the gaps or risks related to current and future water uses; and developing recommended policies, management practices, and legislative considerations "***designed to ensure the surface water and groundwater resources of a river basin will be available for all uses for years to come, even under drought conditions.***"

The river basin plans are the fourth of a five-step process to update the South Carolina State Water Plan with actionable recommendations and priorities. All eight plans will inform the updated State Water Plan, which is why consistency in the planning process and types of recommendations made is important. The updated State Water Plan will help guide decisions to preserve water for all uses throughout the state.

Lake Blalock

Acknowledgments

The Broad River Basin Council (RBC) consists of the following volunteer stakeholders representing eight different water interest categories. These individuals spent two years sharing their diverse perspectives and offering their expertise, culminating in the development of this River Basin Plan.

Name	Organization	Interest Category
John Alexander	Slater Properties	Agriculture, Forestry, and Irrigation
Kristen Austin	The Nature Conservancy	Environmental Interests and Conservation Groups
Mark Boland	York County	Local Governments
Amy Bresnahan	Dominion Energy SC, Inc.	Electric Power Utilities
Frank Eskridge	City of Columbia	Water and Sewer Utilities
Bryant Fleming	Cherokee County Board of Public Works	Water and Sewer Utilities
Dr. Daniel Hanks (RBC Vice-Chair)	Weyerhaeuser Company	Agriculture, Forestry, and Irrigation
Erika Hollis	Upstate Forever	Environmental Interests and Conservation Groups
James Kilgo	South Carolina Rural Water Association	At-Large
Karen Kustafik	City of Columbia Parks	Water-Based Recreation
Angus Lafaye	Milliken Forestry Co., Inc.	At-Large
Jeff Lineberger	Duke Energy	Electric Power Utilities
Justin McGrady	The SC River Guide	Water-Based Recreation
Paul Pruitt	Milliken & Company	Industry and Economic Development
Bill Stangler	Congaree Riverkeeper	Environmental Interests and Conservation Groups
Ken Tuck (RBC Chair)	Spartanburg Water	Water and Sewer Utilities
Jeff Walker	Inman-Campobello Water District	Water and Sewer Utilities

Chip Few (representing At-Large interests), Steve Hilbert (Water-Based Recreation), Brison Taylor (Water and Sewer Utilities), Jason Wright (Agriculture, Forestry, and Irrigation), and Jim Cook (Industry and Economic Development) also participated on the RBC during some of the planning process but were not active members when the River Basin Plan was finalized.

The Broad RBC would like to thank the following individuals and organizations who contributed to the development of this River Basin Plan by providing technical presentations and information, meeting coordination, modeling, administration, and other support services.

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Grace Houghton
Evan Patrohay
Dr. Amy Shaw
Camren Shea
Kirk Westphal

Lake Blalock

Columbia Canal Water Treatment Plant

What to Know About this Plan

This plan is the second of eight river basin plans to be developed for South Carolina. The Broad RBC, comprising stakeholders representing various water interests, collaborated with South Carolina Department of Natural Resources (SCDNR) and the South Carolina Department of Health and Environmental Control (SCDHEC), and met monthly for almost 2 years. They followed a carefully designed process to establish goals and actions throughout the basin. Through facilitated dialogue, they discussed issues, increased their understanding of various perspectives, and agreed on recommended actions or policies for improved water management. This plan is a direct result of their efforts to improve the sustainability of water resources in the Broad River basin, and to improve the balance between societal and environmental water uses.

Some of the most important findings of and recommendations from the RBC include:

- Surface water availability modeling suggests a low risk of water supply shortages based on current water demands, assuming that droughts will not be more severe than those that have occurred over the previous 90 years in the Broad River basin.
- Potential surface water shortages under scenarios that assume moderate and high economic growth and water demands through 2070 generally can be avoided by optimizing the operation of existing water supply reservoirs. An exception is the City of Gaffney, which could experience water supply shortages as soon as 2025 under certain drought conditions and assuming high growth and high water demand. An additional source of supply or increased storage are necessary to reduce the risk of water supply shortage for the Cherokee County Board of Public Works (BPW) which serves Gaffney, as their demand for water increases.
- If all surface water users withdrew at their permitted and registered amount, there would not be enough water for all users and the basin would be unsustainably stressed. Currently, only 52 percent of the allowable (permitted or registered) surface water is withdrawn from streams, rivers, lakes, and reservoirs on an average annual basis.
- Changes in water use over the next 50 years, based on assumptions of moderate economic and population growth, are not likely to impose significant risk to the aquatic ecology of the basin, though this finding is generalized over large scales, and certain portions of the basin may be more affected than others. Assuming a high rate of growth and high water demands through 2070, the predicted impact to aquatic ecology is more pronounced at several locations in the basin. Large changes in long-term mean daily flows (e.g., 40 to 70 percent), resulting from the unlikely scenario where all surface water users withdraw at their permitted or registered amount, likely would reduce the number of fish species substantially.

Turtles on the Broad River

Rocky Shoals Spider Lilies on the Broad River

- The RBC identified and recommended a toolbox of demand-side water management strategies for both municipal and agricultural water users that, if implemented, would help reduce the potential for shortages and help maintain adequate streamflows for environmental needs. Supply-side strategies that focus on optimizing existing supplies and the operation of reservoirs were identified and recommended. In the case of the Cherokee County BPW which serves Gaffney, strategies included adding an intake on the Broad River, evaluating and establishing an interconnection with Spartanburg Water System, increasing the storage capacity of Lake Whelchel, and further exploring a quarry for added storage.
- In addition to proposing numerous planning process and technical recommendations, the RBC reached consensus on several important policy, regulatory, and legislative recommendations, including:
  - When considering permit applications, reasonable use criteria should be applied to surface water withdrawals, like they currently are for groundwater withdrawals.
  - Laws that allow for regulation of water use need to be enforceable to be effective. The current water law, which grandfathers in most water users, can be improved to support effective management of the state's water resources.
  - Water law and implementing regulations should not distinguish between registrations and permits. All water users that withdraw above the identified threshold should be required to apply for a water withdrawal permit.
  - The water withdrawal permitting process should specifically assess the permit application's alignment with the current River Basin Plan, particularly regarding proposed withdrawals, returns, resource conservation, and drought response.

Introduction: Purpose and Utility of the Plan

This Broad River Basin Plan is the second of eight plans that will be developed for the primary river basins in South Carolina (**Figure ES-1**). Numerous and diverse stakeholders throughout the basin worked with SCDNR, SCDHEC, and others during its development. The plan was prepared in response to the South Carolina Water Resources Planning and Coordination Act, and continues the work that began in 1998 with the South Carolina Water Plan.

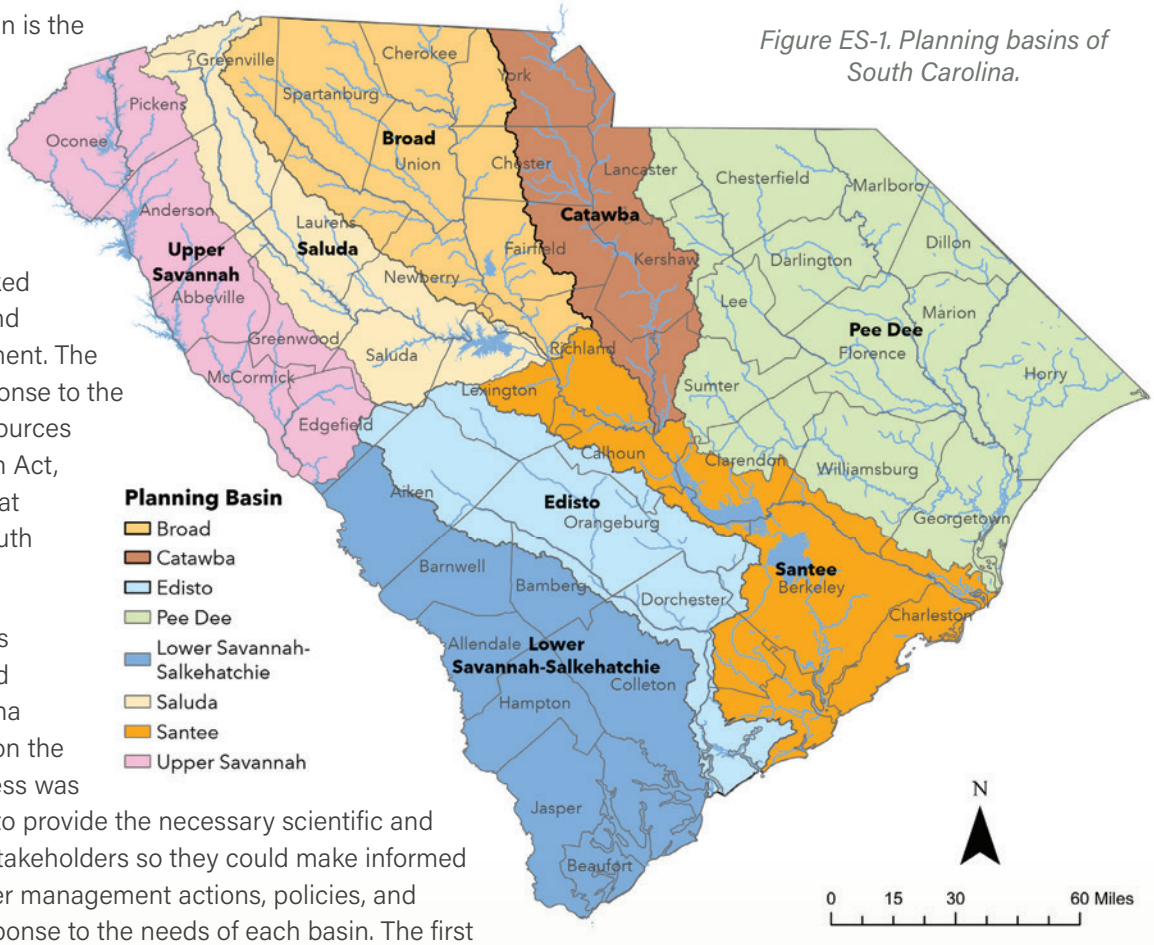


Figure ES-1. Planning basins of South Carolina.

In 2014, a five-step process was initiated to update and actualize the South Carolina Water Plan (**Figure ES-2** on the following page). The process was conceived and organized to provide the necessary scientific and water use information to stakeholders so they could make informed recommendations on water management actions, policies, and potential legislation in response to the needs of each basin. The first three steps in the process, now complete for the Broad basin, provide tools and data on surface water and groundwater resources, as well as historical water use, current water demand, and estimates of future demand for the basin. The Broad River Basin Plan is the culmination of Step 4 of the process for the Broad River basin. The plan assesses water availability in the basin over a 50-year planning horizon and presents the recommendations of the Broad RBC—a diverse group of volunteer stakeholders representing eight different water-interest categories.

Section ES-2 describes the planning process in more detail. As prescribed in the South Carolina State Water Planning Framework, the Broad RBC was charged with supporting the development of this River Basin Plan as "***a collection of water management strategies supported by a summary of data and analyses designed to ensure the surface water and groundwater resources of a river basin will be available for all uses for years to come, even under drought conditions.***" This same planning process has been or will be applied in all eight South Carolina river basins.

Specifically, each River Basin Plan will include data, analysis, and water management strategies to guide water resource development in the basin for a planning horizon of 50 years by answering four principal questions:

1. What is the basin's current available water supply and demand?
2. What are the current permitted and registered water uses within the basin?
3. What will be the water demand in the basin throughout the planning horizon, and will the available water supply be adequate to meet that demand?
4. What water management strategies will be used in the basin to ensure the available supply meets or exceeds the projected demand throughout the planning horizon?

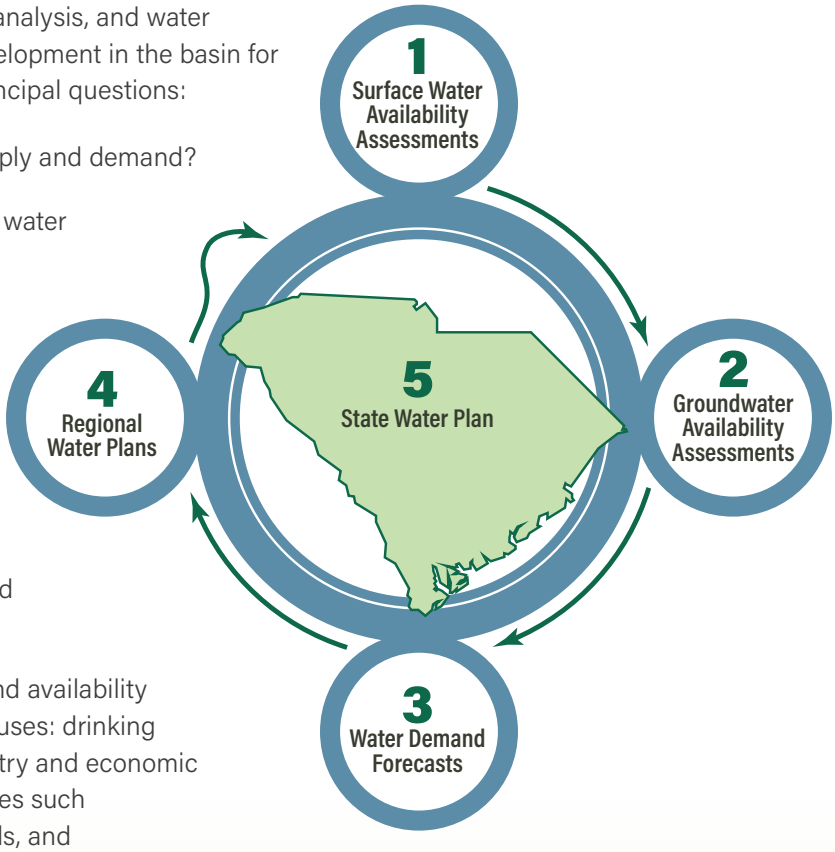


Figure ES-2. South Carolina's five-step process to update the State Water Plan.

River Basin Plans focus principally on the quantity and availability of surface water and groundwater for all designated uses: drinking water, agricultural and other irrigation, forestry, industry and economic development, power generation, nonconsumptive uses such as aquatic habitat suitability and environmental needs, and water-based recreation. Plans do not focus directly on flood management or water quality (these important issues are considered in other plans); however, RBCs are encouraged to consider water management strategies that have secondary benefits with respect to flood management and water quality.

All eight River Basin Plans will be used to inform and update the South Carolina State Water Plan. While these plans do not prescribe regulatory, policy, or legislative decisions, they represent consensus-based recommendations from diverse and vested stakeholders on prudent actions and policies to be considered by citizens, water managers, state agencies, and elected officials to help ensure future water availability for all uses.

ES-4 Overview of the Planning Process

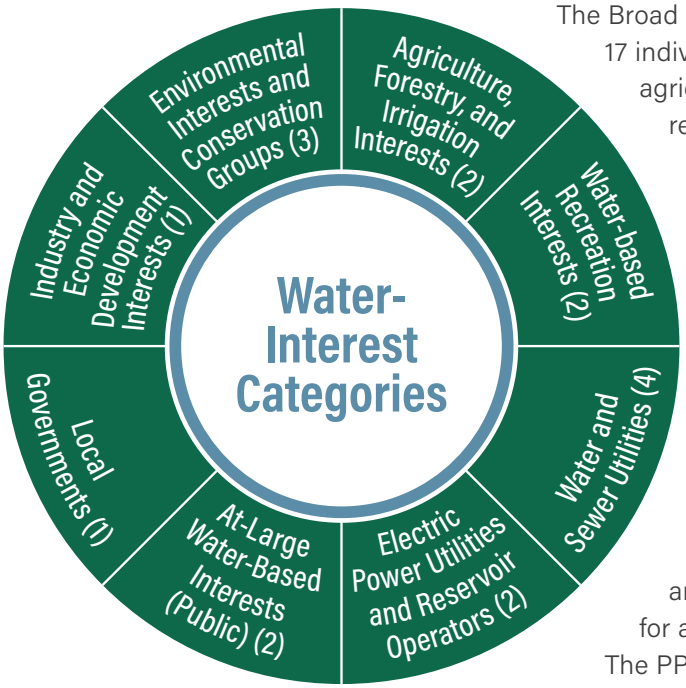


Figure ES-3. Water-interest categories represented in the Broad RBC. Numbers in parentheses indicate RBC member representation at the time the plan was developed.

The Broad River Basin Plan was formulated by the Broad RBC, a group of 17 individual volunteer stakeholders representing local governments, agriculture and forestry, environmental interests, water-based recreation, utilities (water, sewer, electric power), and industry/economic development (**Figure ES-3**).

The Broad RBC met monthly over a 2-year period to follow the systematic planning process prescribed in the 2019 South Carolina State Water Planning Framework. SCDNR and the PPAC, a 19-person group composed principally of the same interest groups as each individual RBC but with academic representation, collaboratively developed the Planning Framework. As stated, its goal was to support the development of River Basin Plans as "a collection of water management strategies supported by a summary of data and analyses designed to ensure the surface water and groundwater resources of a river basin will be available for all uses for years to come, even under drought conditions." The PPAC will continue to function by amending and adapting the Planning Framework as necessary based on lessons learned from individual RBCs, and by helping to ensure consistency between the eight plans so that they cohesively contribute to the effectiveness of the overall State Water Plan.

The river basin planning process is divided into four phases, discussed on the next page and in greater detail in the Planning Framework. Each phase spanned approximately 6 months, equally representing one quarter of the entire process.

The series of about 20 meetings of the RBC involved several field trips within the basin. In May 2022, the RBC toured the Columbia Canal Water Treatment Plant; visited the diversion dam, fish passage, and minimum flow gate at the entrance of the Columbia Canal; observed and learned about the Rocky Shoals spider lily, a threatened species; and visited Dominion Energy's Fairfield Pumped Storage Facility and the Parr Shoals Hydroelectric Facility. In October 2022, the RBC paddled and boated on Lake Blalock to Lake Blalock Dam, learned about Spartanburg Water System's R.B. Simms Water Treatment Plant's new advanced oxidation process, and toured Cooley Farms/Strawberry Hill. These helped connect each RBC member to the physical setting of the river basin and the multiple needs the water serves. This holistic perspective of the basin helped foster consensus-building.

PHASE 1

Orientation, Administrative Tasks, and Background Information

During this phase, RBC members reviewed bylaws, protocols, expectations, and the planning process. They selected a chair and vice-chair and reviewed technical information to aid them in the planning process for the Broad River basin. The RBC also developed a vision statement and a set of supporting goals.

PHASE 2

Comparison of Water Resource Availability and Demand

In this phase, the RBC reviewed the methods, tools, and results from the first three steps of the overall State Water Plan formulation, including surface water availability analysis and water demand projections. This provided a consistent and scientific perspective on the overall balance of supply and demand throughout the basin, as well as current and future risks. The RBC used the surface water model developed in earlier steps to assess the ability of current water supplies to meet current and future water demands.

PHASE 3

Evaluation of Water Management Strategies

This was an interactive phase that involved the RBC and technical team identifying and evaluating surface water management strategies to address water shortages or water supply issues identified in Phase 2. Results of modeling and technical evaluation were reported back to the RBC. This process allowed the RBC to recognize common benefits and agree on recommended strategies and their relative priorities.

PHASE 4

River Basin Plan Preparation

This final phase involved the development of a draft version of the Plan, including recommendations for water management strategies, policies, legislation, and regulatory actions. It also included the formulation of recommendations for drought response initiatives and recommendations for improving the planning process. It included a period for public review and appropriate incorporation of public comments before finalizing the plan.

During Phase I, the Broad RBC developed the following vision statement and goals specifically for the Broad River basin.

VISION STATEMENT

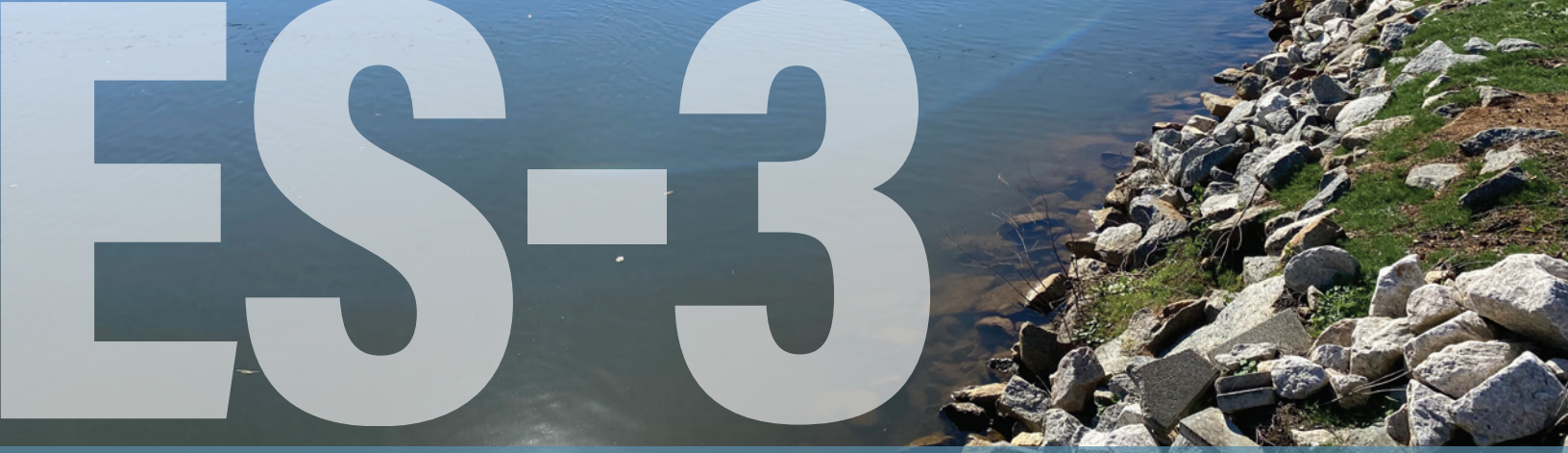
Empowered stakeholders taking coordinated actions to conserve and enhance the resilience of the Broad River Basin to provide water resources for quality of life, while accounting for the ecological integrity of our shared water resources.

GOALS

1. Enhance the understanding of regional water issues and the need for support of policies and behaviors to protect resources through promotion and education.
2. Use sound science and data-driven practices to support collaboration for all entities to effectively and efficiently manage the basin.
3. Provide policy and legislative recommendations.

The planning process included outreach to the public to educate and augment the RBC with important information and perspectives. Two initial informational meetings were held to explain the planning process and solicit participation in the RBC. Two additional meetings were reserved for presentation of the draft plan and solicitation of verbal and written comments, and for the presentation of the final plan after its release, to highlight changes to the plan made in response to public input.

ES-3



Overview of the Broad River Basin

The Broad River basin covers approximately 3,800 square miles in South Carolina, making up 12 percent of the state's total area. The basin extends from the eastern edge of the Blue Ridge Mountains in North Carolina to the confluence of the Broad and Saluda Rivers near the City of Columbia. All of Spartanburg, Cherokee, and Union Counties, as well as significant portions of Newberry, Richland, York, Greenville, Laurens, Chester, and Fairfield Counties and a small sliver of Lexington County, are within the basin boundary. The Broad River basin is the third largest of the state's eight water planning basins and consists of four major subbasins: the Upper Broad River, which includes the Pacolet River, the Lower Broad River, the Tyger River, and the Enoree River, as shown in **Figure ES-4**. Although the Broad River Basin Plan considers upstream uses in the North Carolina portion of the basin, the Plan's analysis and recommendations are for the South Carolina portion of the basin only.

Land use and land cover in the Broad River basin varies from rural farmland and state forests to sprawling urban areas. The cities of Spartanburg, Gaffney, and Union, as well as significant portions of Greenville and Columbia, are located within the basin. Land used for agriculture tends to be in the northern half of the basin. The basin completely contains the 170,000-acre Enoree Ranger District of the Sumter National Forest. As a result, woodland is the dominant landcover in the basin, as shown in **Figure ES-5** on the following page.

The annual average precipitation ranges throughout the basin from 42 to more than 63 inches, with rainfall decreasing from the upper basin to the lower basin. Higher precipitation totals occur in the upper basin from orographic lifting because of the mountains and higher elevations. March is generally the wettest month (averaging 6.17 inches at Tryon, NC, near the top of the watershed, and 4.32 inches at Santuck, SC, in the lower-middle portion of the basin), and October and November are generally the driest months (averaging 4.51 inches in November at Tryon and 3.15 inches in October at Santuck).

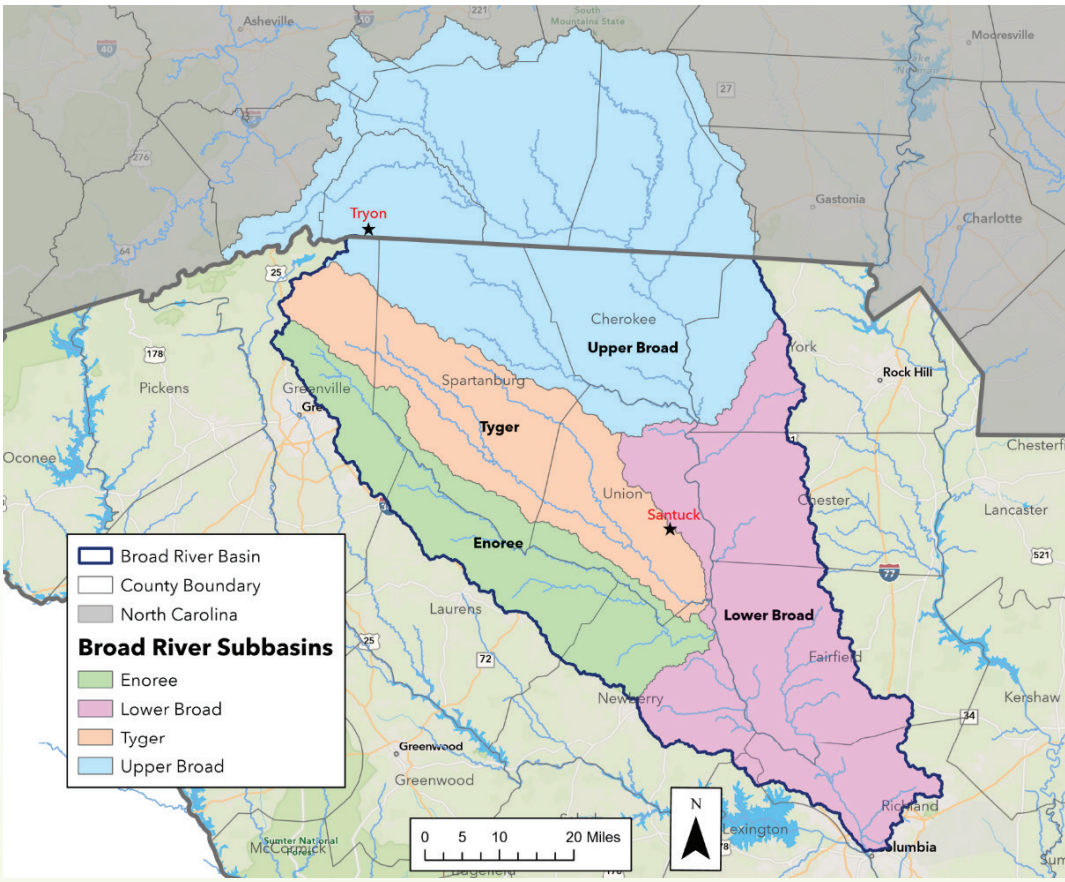


Figure ES-4. The Broad River basin.

Because of the variability in precipitation and differing climates between the stations at Tryon and Santuck, the historical dry and wet years differ between the two. The least amount of precipitation occurred at Tryon in 1988 (approximatley 40 inches), while the least amount of precipitation occurred at Santuck in 2007 (approximately 30 inches). The wettest years for Tryon and Santuck were 1979 (approximately 93 inches) and 1964 (approximately 68 inches), respectively. While individual years for precipitation may vary between these stations, they share similar wet and dry periods: dry periods in the 1950s, late 1980s, early 2000s, 2005 to 2008, and wet periods in the 1960s and 1970s.

Two stream gages on the Broad River recorded the lowest monthly flows on record in August 2002 (U.S. Geological Survey [USGS] 2022). The Tyger River near Delta experienced its record lowest monthly flow in October 2007, while the Enoree River at Whitmire recorded the lowest monthly flow in June 2008. Although there are differences between when the four stations experienced their record low monthly flows, all stations experienced a record low annual flow in 2008. The most recent year of drought conditions (defined by a Standard Precipitation Index of less than -1) in the Broad basin was in 2016 at the Tryon station and in 2016 and 2017 at the Santuck station.

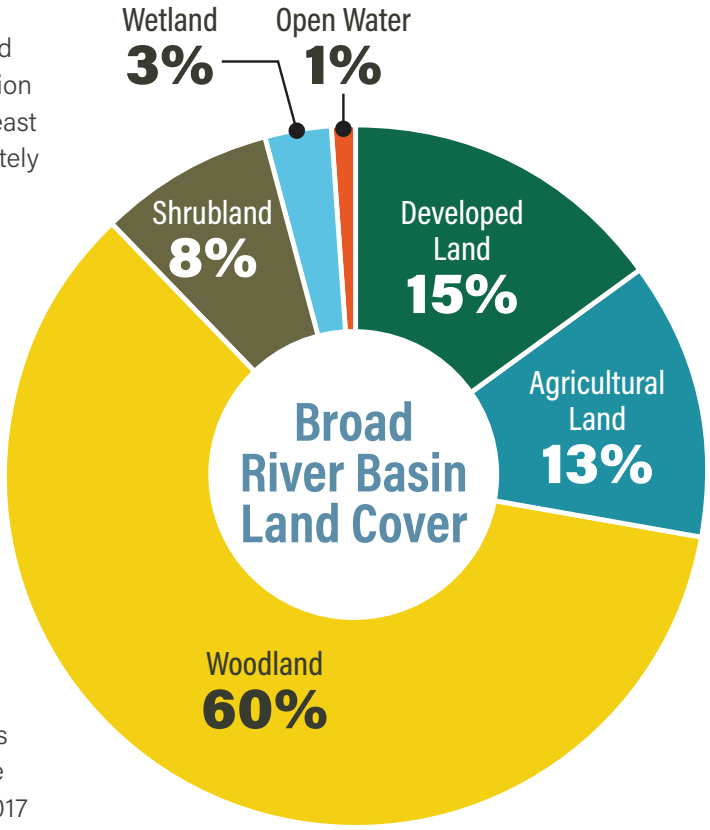


Figure ES-5. Broad River basin land cover.

Figure ES-6. Representative aquatic species in the Broad River basin (Bettinger 2022).

The rivers and streams of the Broad River basin are home to 86 species of freshwater fish, with 69 species being native to the area. Fish commonly found in the basin include the redbreast sunfish, whitefin shiner, and notchlip redhorse. Some introduced species, such as the flathead catfish, prey on or outcompete native fishes. A few fish species have been successfully reintroduced to the Broad River, such as the robust redhorse, as shown in **Figure ES-6**. Mussels are abundant in the Lower Broad River; however, they are rare in the upper reaches of the river because of poor substrate conditions. The Broad River basin is recognized as an excellent destination for recreational fishing of smallmouth bass.

ES-4 Water Availability: Supply and Demand

SURFACE WATER SUMMARY

The Broad River is the main stem of the Broad River basin. The Broad River headwaters originate in North Carolina, and the river discharges into the Saluda River near Columbia. The major tributaries of the Broad River are the Pacolet, Tyger, and Enoree Rivers. The Tyger and Enoree Rivers originate in South Carolina, while the headwaters of the Pacolet River originate in North Carolina. No other river basins flow into the Broad River basin.

Streamflow in the Broad River depends primarily on precipitation and surface runoff (SCDNR 2009). The upper portion of the river, near Gaffney, experiences higher annual rainfall and more significant groundwater discharges to streams, resulting in moderately variable and well-sustained flows. Downstream flows are more variable because of less rainfall and groundwater discharge (SCDNR 2009). Consequently, supplies from these streams may be less reliable during periods of low rainfall. This characteristic becomes more pronounced with increased distance downstream. Streamflow characteristics of the tributaries resemble those of the main stem, with streams draining the upper portion of the subbasin showing the least variability and streams draining the lower portion of the subbasin showing the greatest variability (SCDNR 2009). Because the headwaters of the Broad River and several tributaries of the Pacolet River originate in North Carolina, out-of-state withdrawals on the upper portion of the river have the potential to impact water availability in the Broad River in South Carolina.

The largest reservoirs and lakes in the Broad River basin serve as a critical source of water supply and/or support hydropower operations (**Table ES-1**). Secondary uses include recreation and flood management. The three largest reservoirs

Table ES-1. Characteristics of the largest lakes and reservoirs in the Broad River basin.

Name	Subbasin	Gross Storage Capacity (acre-feet)	Purpose
Monticello Reservoir	Lower Broad	431,000	Power and recreation
Parr Shoals Reservoir	Lower Broad	32,500	Power and recreation
Lake William C. Bowen	Upper Broad	22,700	Recreation and water supply
Lake H. Taylor Blalock	Upper Broad	16,000	Recreation and water supply
Lake John A. Robinson	Tyger	14,000	Recreation and water supply
Neal Shoals Reservoir	Lower Broad	1,492	Power
Lyman Lake	Tyger	6,200	Industry, recreation, and water supply
Ninety-Nine Islands Reservoir	Upper Broad	1,684	Power and recreation
Lake Cooley	Tyger	1,320	Recreation and flood management
Monticello Recreation Lake	Lower Broad	6,000	Power and recreation
Spartanburg Municipal Reservoir #1	Upper Broad	3,388	Water supply
Gaston Shoals Lake	Upper Broad	2,500	Power, recreation, and water supply
Lake Cunningham	Tyger	2,200	Recreation and water supply

Source: Adapted from Table 6-2 in SCDNR (2009) and from SCDNR (2022e).

in the subbasin in terms of surface area and storage capacity are Lake Monticello (on Frees Creek), Parr Shoals Reservoir (on the Broad River), and Lake William C. Bowen (on the South Pacolet River). Additionally, 384 regulated dams and numerous unregulated small dams create small impoundments on many of the Broad River tributaries. These are largely privately owned and are in the upper reaches of the basin (SCDNR 2009).

The Broad River basin has one of the largest streamflow monitoring networks in the state. Comprehensive streamflow monitoring is critical to understanding surface water availability and supporting sustainabile management of surface water resources. There are 31 active gaging stations operated by the United States Geological Survey (USGS) in the Broad River basin in South Carolina and an additional 34 gaging stations that are no longer active but provide historical streamflow and/or stage data. Most of the active gaging stations report mean daily discharge (flow) data.

Supported by data from the active and inactive gaging stations, the Simplified Water Allocation Model (SWAM), a portion of which is pictured in **Figure ES-7**, simulates the surface water stream network of the Broad basin and its subbasins. The model quantifies current and future surface water availability based on natural hydrology and current and projected water demand. It also simulates future water management strategies to reduce risk and improve reliability of surface water supplies.

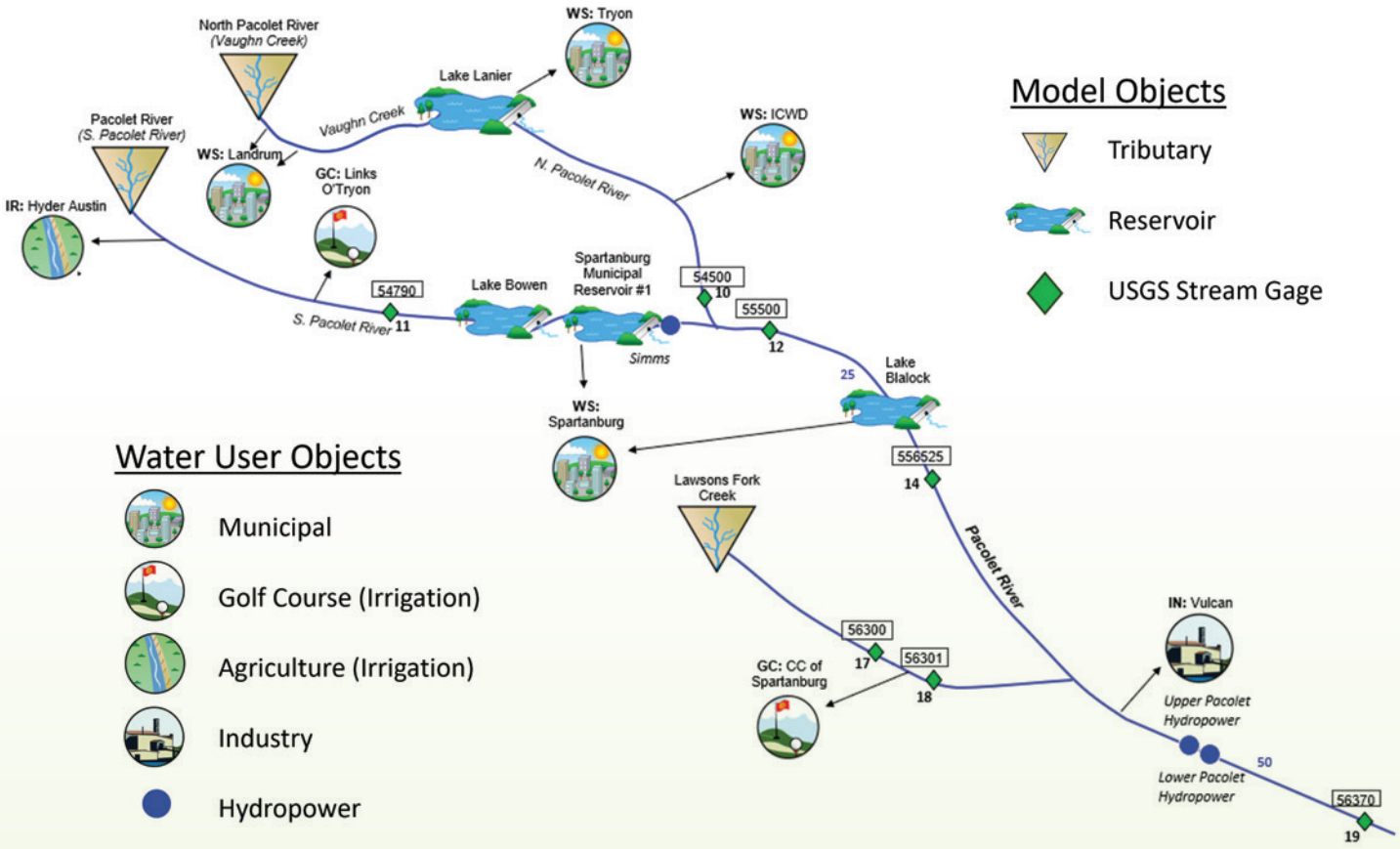


Figure ES-7: Pacolet River portion of the simplified Water Allocation Model framework of the Broad River basin.

GROUNDWATER SUMMARY

Groundwater in the Broad River basin is stored primarily in crystalline bedrock fractures and saprolite rock, which underlie the Piedmont physiographic province (SCDNR 2009). The exception to this is the presence of Coastal Plain sediments, which constitute a shallow, sandy aquifer at the extreme southern end of the basin.

Rainfall is collected in a saprolite layer that is as thick as 150 feet, and subsequently recharges fractures in the underlying crystalline rock aquifer (SCDNR 2009). While the size and number of fractures generally diminish with depth, this appears to minimally impact well yields, which are usually less than 50 gallons per minute (gpm). However, topography does impact well yields (SCDNR 2009). Recharge water is captured in valleys, which commonly are areas with numerous fractures in weaker rock. Consequently, wells in low-lying areas have higher yields than those on hilltops and hillsides. Higher yields in the Piedmont also occur at wells where saprolite is thick, where wells penetrate certain geologic structures like quartz veins, and where wells are placed in highly textured rock (SCDNR 2022). Average well yields in the Broad River basin are about 18 gpm. Groundwater availability in the basin is somewhat limited but generally adequate for domestic use and some small irrigation, industrial, and public supply use (SCDNR 2009, 2022). Many of the groundwater withdrawals in the basin are near interbasin divides, because these locations have fewer surface water options.

The southern end of the Broad River basin contains a very small portion of the Santee-Lynches Capacity Use Area (CUA), which includes Richland County, and an even smaller portion of the Western CUA, which includes Lexington County (**Figure 1-5** in Chapter 1). Under South Carolina's Groundwater Use and Reporting Act (Chapter 5, Section 49-5-60), SCDHEC designates a CUA where excessive groundwater withdrawals present potential adverse effects to natural resources, public health, safety, or economic welfare. SCDHEC then coordinates with affected governing bodies and groundwater withdrawers to develop a groundwater management plan for the CUA.

Groundwater use within the basin is limited. In fact, the Broad River basin has the lowest volume of groundwater withdrawals of the eight basins in the state. Consequently, there are no areas experiencing significant water level declines as a result of overpumping within the Broad River basin (SCDNR 2009).

Cooley Farms

Columbia Canal

Spartanburg Water Advanced Oxidation Treatment System

Lake Blalock

WATER DEMAND SUMMARY

Figures ES-8 through ES-10 on the following page summarize the current and projected water demands in the South Carolina portion of the Broad River basin. Total current water withdrawals are approximately 809 million gallons per day (MGD). Only about 0.8 MGD is withdrawn from groundwater, with the rest coming from surface water. Approximately 179 MGD (22 percent) of the water is consumptively used and 630 MGD (78 percent) is returned to the streams and rivers after use.

For this planning effort, two future demand scenarios were developed: the Moderate Demand Scenario, which is based on median rates of water use and moderate growth projections, and the High Demand Scenario, which is based on the maximum monthly rates of water use in recent reporting and high growth projections. Compared to 2025 projected demands, by year 2070, water demand in the Broad River basin is projected to increase by 10 percent to 933 MGD for the Moderate Demand Scenario and by 17 percent to 1,113 MGD for the High Demand Scenario. Included in these projections is 0.8 MGD of groundwater withdrawals, which are projected to remain constant over the planning horizon. Projected water demands are well below the total permitted and registered surface water amounts of 1,542 MGD in the basin. Permitted and registered withdrawals are not, however, proxies for water availability in the basin, because sufficient flows to satisfy such withdrawal rates cannot be guaranteed into the future.

Thermoelectric withdrawals account for just under 88 percent of current total withdrawals, and 83 and 76 percent of projected 2070 Moderate and High Demand Scenario withdrawals, respectively. Approximately 84 percent of the water withdrawn for thermoelectric use is returned to the system, with only 16 percent of the total withdrawal consumed. For planning purposes, Duke Energy's proposed Lee Nuclear Generating Station on the Broad River was projected to come online in 2035, with its demand growing from approximately 18 MGD in 2035 to 36 MGD in 2070.

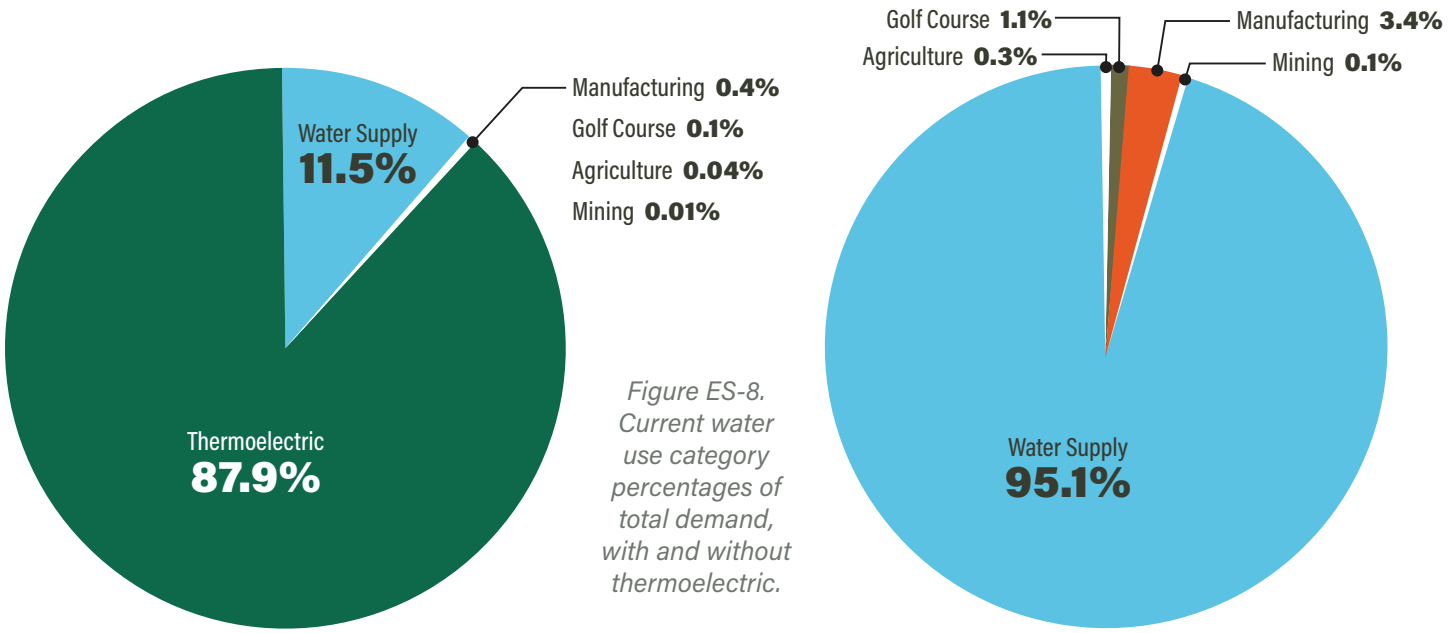


Figure ES-8. Current water use category percentages of total demand, with and without thermoelectric.

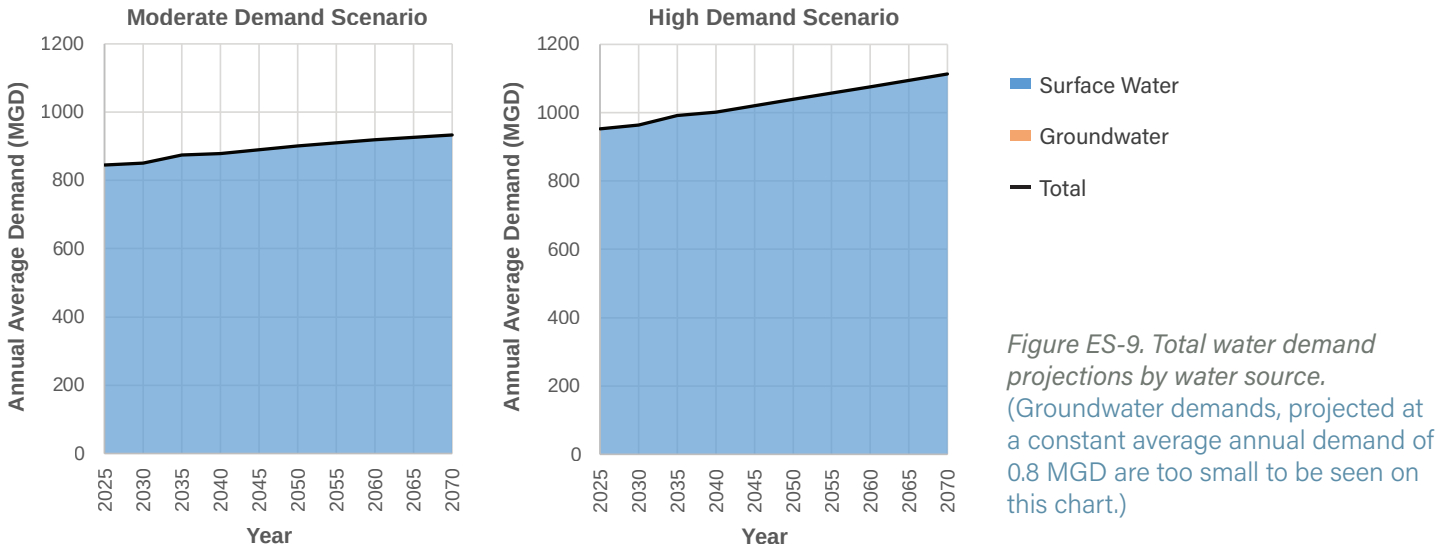


Figure ES-9. Total water demand projections by water source. (Groundwater demands, projected at a constant average annual demand of 0.8 MGD are too small to be seen on this chart.)

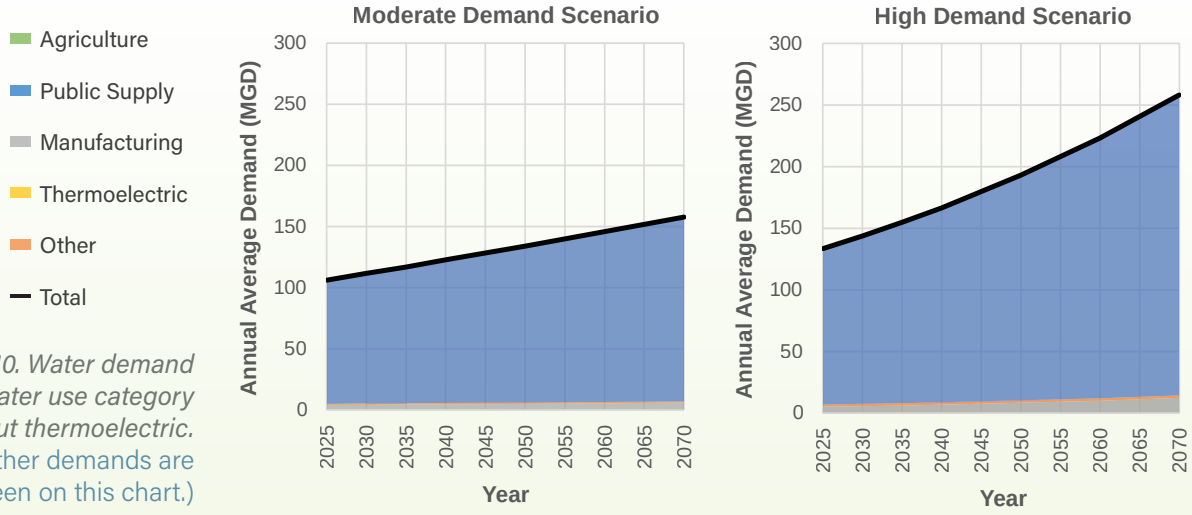


Figure ES-10. Water demand projections by water use category without thermoelectric. (Agriculture and other demands are too small to be seen on this chart.)

Parr Shoals Hydroelectric Facility

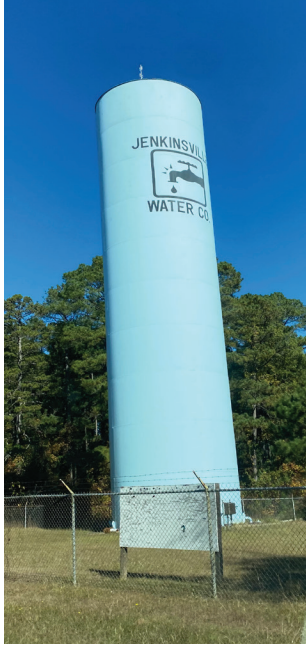
WATER AVAILABILITY SUMMARY

Surface water modeling using current and projected rates of water withdrawals resulted in identifying several key observations and conclusions about the availability of surface water resources in the Broad River basin. These key conclusions, presented in the subsection below, led to the RBC identifying and evaluating a suite of water management strategies to address projected surface water shortages, promote the sustainable use of the resource, and maintain adequate river flows during low flow conditions. Section ES-5 summarizes the evaluation and selection of water management strategies.

In accordance with the Framework, multiple planning scenarios were conducted to evaluate different levels of water demands. The demand scenarios were superimposed on historical hydrology, reflecting conditions over the 90-year period from 1929 to 2019. The following scenarios were evaluated in this analysis:

- **Current Scenario.** A snapshot in time of current demands.
- **Moderate Demand Scenario.** Projected moderate increase in demands through 2070.
- **High Demand Scenario.** Aggressive assumptions of water demand based on maximum monthly rates of water use in recent reporting and high population and demand growth through 2070. This scenario represents an unlikely maximum for total water demand because it is very unlikely these demands would occur month after month and year after year for all water users; however, this scenario provided the RBC with information on which to base conservative management strategies.
- **Permitted and Registered (P&R) Scenario.** A hypothetical scenario in which all existing permitted and registered water users withdraw water at their fully permitted or registered amount. This scenario also represents an unlikely maximum for total water demand because most water users are not expected to need to withdraw their fully permitted or registered amount even 50 years from now, nor would they need to withdraw at that level month after month and year after year.
- **Unimpaired Flow Scenario (UIF).** The RBC requested a fifth scenario be run to understand naturally occurring water in the absence of any human impacts (no withdrawals or returns).

Release from
Lake Blalock Dam



Following are the specific observations and conclusions relative to each planning scenario.

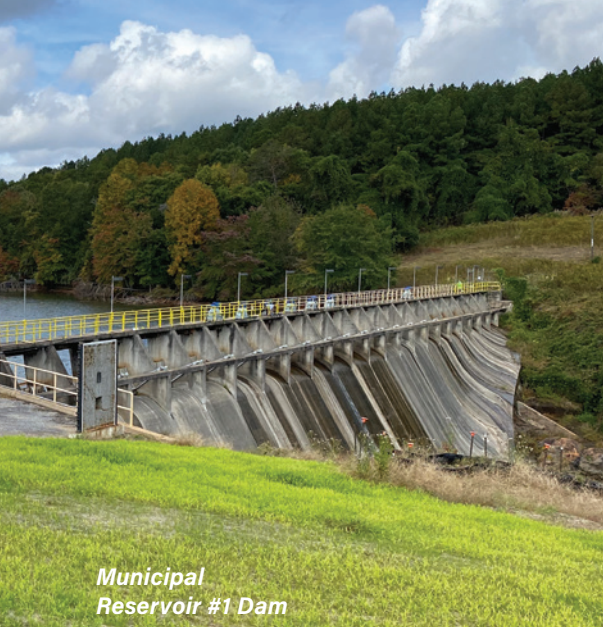
Current Use Scenario: Surface water availability modeling suggests a low risk of water supply shortages under the Current Use Scenario. No water supply shortages were identified using current, monthly average demands when considering the 90-year period of record, covering hydrologic conditions observed from 1929 through 2019.

P&R Scenario: Results of this hypothetical scenario, which include projected water supply shortages for eight public water suppliers, three golf courses, and one agricultural operation, demonstrate that the surface water resources of the basin are over-allocated based on existing permit and registration amounts.

Moderate Demand Scenario: Given current climate conditions and existing basin management and regulatory structure, basin surface water supplies are predicted to be adequate to meet increased demands, resulting from moderate economic and population growth. At 2070 demand levels, two surface water users, Greer Commission of Public Works (CPW) and the proposed Lee Nuclear Generating Station, were simulated to experience shortages at a frequency of 2.4 and 3.0 percent, respectively. This analysis did not include a proposed storage pond to supplement Lee Nuclear Generating Station's supply. River flows throughout the basin are predicted to decrease modestly to moderately, depending on location, compared to the Current Use Scenario. Modeled reductions are most pronounced during low flow periods. At the Broad River outlet, mean and median flows are predicted to decrease by approximately 3 percent, and low flows by about 5 percent, based on 2070 demands.

High Demand Scenario: Modeling that incorporated high water demands demonstrated a shortage for the Cherokee County BPW which serves Gaffney using 2025 demands, at a frequency of 0.3 percent; a shortage for Greer CPW using 2040 demands, at a frequency of 0.8 percent; and shortages for Spartanburg Water System (SWS) and Startex-Jackson-Wellford-Duncan (SJWD) Water District using 2060 demands at a frequency of 0.1 percent. The two water users with shortages in the Moderate Demand Scenario (Greer CPW and the proposed Lee Nuclear Generating Station) exhibit slightly greater shortages under the High Demand Scenario, using 2070 demand levels. Four additional municipal water suppliers and three golf courses also experience shortages at 2070 demand levels. River flows are predicted to be moderately to substantially lower than the Current Use Scenario throughout the basin. Mean and median flows at the Broad River outlet are predicted to decrease by approximately 5 percent, and low flows by approximately 10 percent, based on 2070 demands.

UIF Scenario: Simulated river flows for the UIF Scenario are generally higher than simulated Current Scenario flows, as expected. However, on the Enoree River, the simulated UIFs are lower than Current Scenario flows. This reflects the removal of wastewater returns in the system for the UIF Scenario. The lack of wastewater returns in the Enoree River more than offsets the lack of consumptive surface water use. At the Broad River outlet, mean and median UIF Scenario flows are approximately 5 and 6 percent higher than Current Scenario flows, respectively. At this same location, low flows in this scenario (25th to 5th percentile flows) are approximately 12 to 19 percent higher than Current Scenario flows.

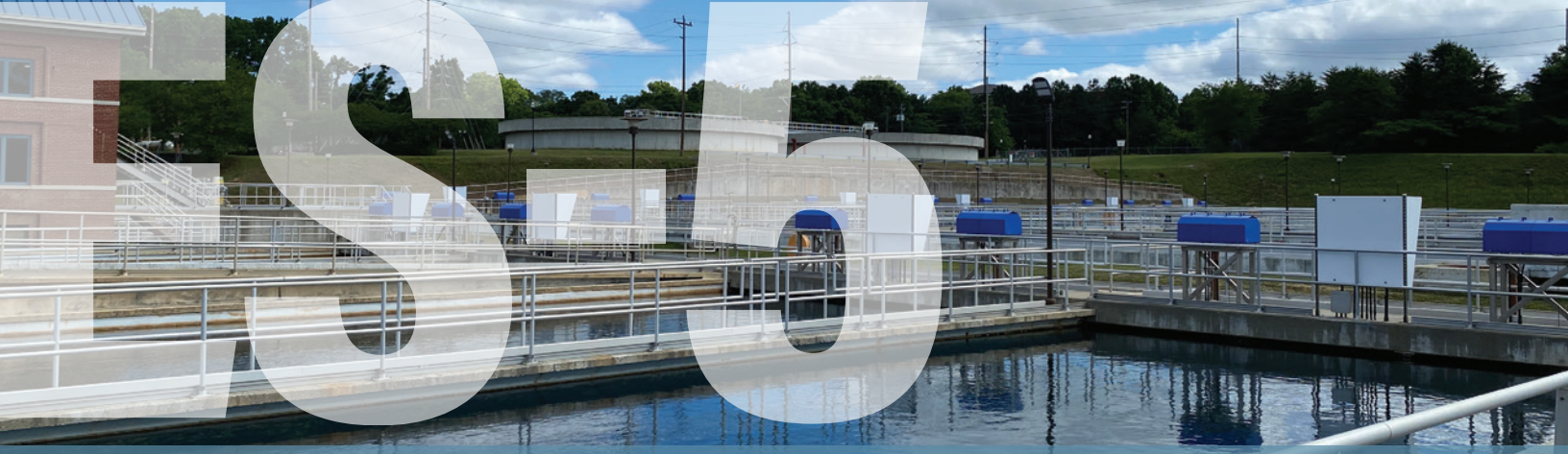


Municipal Reservoir #1 Dam

Lake Blalock Dam

To assess potential ecological risk associated with increasing water use in the basin, biological response metrics developed by Bower et al. (2022) were correlated to model-simulated flows from the various planning scenarios. Simulated flow metrics for the UIF and Moderate Demand 2070 Scenarios result in low risk for ecological integrity and tolerance (The Nature Conservancy et al. 2022). Large changes in mean daily flow for the P&R Scenario are predicted to reduce the number of fish species by more than 20 percent at several key locations in the basin. For the High Demand Scenario using 2070 demands, the predicted impact is less pronounced but still significant, with one key location predicted to lose up to 45 percent of fish species because of simulated change in mean daily flow. While simulated changes in mean daily flows demonstrate some risk under the P&R and High Demand Scenarios, low-risk outcomes were simulated for the other flow metrics evaluated (timing of low flow, high flow duration, and high flow frequency).

Results and conclusions are based on modeling that assumed historical climate patterns from the past 90 years. In subsequent phases of river basin planning, the RBC has identified the need to evaluate potential impacts to water supply availability, resulting from more severe droughts, which are likely to have occurred more than 100 years ago, and changing climate, such as increasing temperatures and more variable precipitation.



ES-6 Water Management Strategies Evaluated

The Planning Framework identifies a two-step process to evaluate water management strategies. As a first step, proposed management strategies are simulated using models to assess their effectiveness in eliminating or reducing identified shortages or in increasing water supply. For strategies deemed potentially effective, their feasibility for implementation is addressed considering cost and benefits, consistency with state regulations, reliability, environmental and socioeconomic impacts, and potential interstate or interbasin impacts. Section ES-6 discusses recommendations based on this information. The RBC identified and evaluated the water management strategies, which are grouped into demand-side and supply-side strategies in **Table ES-2**.

Table ES-2. Water management strategies evaluated by the Broad RBC.

Demand-Side Strategies		Supply-Side Strategies
Agricultural Conservation and Efficiency Practices	**Municipal Conservation and Efficiency Practices**	
Water Audits and Nozzle Retrofits	Development, Update, and Implementation of Drought Management Plans	Adjust/Optimize Reservoir Operations (Municipalities with Projected Shortages).
Irrigation Scheduling	Public Education on Water Conservation	Optimize Seasonal Distribution of Gaston Shoals Allocation (Cherokee County BPW).
Soil Management	Conservation Pricing Structures	Renegotiate Gaston Shoals Allowance with Federal Energy Regulatory Commission (FERC) Licensee (Cherokee County BPW).
Crop Variety, Crop Type, and Crop Conversions	Residential Water Audits	Raise Dam Height of Lake Whelchel to Increase Storage (Cherokee County BPW).
Irrigation Equipment Changes	Landscape Irrigation Program and Codes	Convert a Quarry to Use for Storage (Cherokee County BPW).
	Water Efficiency Standards for New Construction	Build a New Intake on the Broad River, below Buffalo Creek (Cherokee County BPW).
	Leak Detection and Water Loss Control Program	Establish an Interconnection with SWS (Cherokee County BPW).
	Reclaimed Water Programs	Build a New Reservoir on King's Creek (Cherokee County BPW).
	Car Wash Recycling Ordinances	Build a New Regional Reservoir (Cherokee County BPW and other Water Suppliers).
	Time-of-Day Watering Limit	

ES-6 Recommendations

RECOMMENDED WATER MANAGEMENT STRATEGIES

The RBC's water management strategy recommendations align with their vision and goal statements developed for the Broad River basin. By assessing and recommending these specific strategies, the stakeholders who make up the RBC are recommending actions that help achieve their vision statement to "***conserve and enhance the resilience of the Broad River Basin to provide water resources for quality of life, while accounting for the ecological integrity of our shared water resources.***" The feasibility assessment and the evaluation of water management strategies using the SWAM model support the RBC's goals of "***enhance[ing] the understanding of regional water issues and the need for support of policies and behaviors to protect resources through promotion and education,***" and "***us[ing] sound science and data-driven practice to support collaboration for all entities to effectively and efficiently manage the basin.***"

Based on potential effectiveness and feasibility, the Broad RBC recommended that all the identified municipal and agricultural demand-side strategies (**Table ES-2**) be included in the implementation plan. The Broad RBC did not prioritize the demand-side strategies because of the different circumstances facing each water utility and agricultural operation (e.g., current operations and programs, utility size, financial means). The demand-side strategies instead represent a "toolbox" of potential approaches to conserve water, reduce system losses, and improve water use efficiency. Each municipal and agricultural water user is encouraged to further evaluate and implement the suite of strategies that work best for their system or operation.

After assessing the potential effectiveness and feasibility of the supply-side strategies, the RBC prioritized the strategies as follows:

As-Needed and Ongoing Strategies

As water demands increase over the coming decades, the Broad RBC recommends that Greer, Spartanburg, SJWD, and Cherokee County BPW adjust reservoir operations to optimize their supplies. Modeling results suggest that minor adjustments to reservoir operations can extend supply availability and eliminate projected shortages in most instances.

Short-Term Strategies (Cherokee County BPW)

Optimizing supply availability from Gaston Shoals and pursuing a new water intake on the Broad River downstream of the confluence with Buffalo Creek are recommended short-term strategies for Cherokee County BPW.

Mid-Term Strategies (Cherokee County BPW)

Mid-term strategies that are recommended for further consideration, subject to increasing water demands and the effectiveness of the implemented short-term strategies, are raising the dam height of Lake Whelchel to increase storage, further evaluating the feasibility of converting a quarry to a water supply reservoir, and establishing an interconnection with SWS.

Long-Term Strategies (Cherokee County BPW)

If demands continue to grow beyond current projections, or changes to hydrology reduce the effectiveness of the short- and mid-term strategies, it is recommended that Cherokee County BPW further explore the option of a new local or regional reservoir.

Broad RBC Meeting

DROUGHT RESPONSE RECOMMENDATIONS

Ongoing drought management in South Carolina occurs at the state, regional, and local levels. At the state level, SCDNR develops, coordinates, and executes a statewide drought mitigation plan. The state also created the South Carolina Drought Response Committee (DRC) to be the major drought decision-making entity in the state. The DRC is a statewide committee chaired and supported by SCDNR and its South Carolina State Climatology Office, with representatives from local interests. Because the severity and impact of drought conditions can vary across the state, SCDNR delineated four Drought Management Areas (DMAs) that generally follow the major basin divides within the state (recognizing that some of the eight basins with RBCs flow into other basins downstream). The Broad River basin is entirely within the Central DMA.

Broad RBC Drought Management Recommendations: Through consideration and discussion, the Broad RBC developed the following five recommendations related to drought planning and response:

1. The RBC recommends that water utilities review and update their drought management plan and response ordinance every 5 years, or more frequently if conditions change.
2. The RBC recommends that water utilities, when updating their drought management plan and response ordinance, look for opportunities to develop response actions that are consistent with those of neighboring utilities.
3. The RBC recommends that water utilities coordinate, to the extent practical, their drought response messaging.
4. The RBC encourages water utilities in the basin to consider drought surcharges on water use during severe and/or extreme drought phases.
5. When droughts occur, the RBC encourages water users and those with water interests to submit their drought impact observations through the Condition Monitoring Observer Reports.

Under the Planning Framework, the Broad RBC has assumed additional responsibilities to help monitor and coordinate drought response effectively in the Broad River basin. Two broad categories summarize these responsibilities:

Communication

- **Collect and evaluate local hydrologic information for drought assessment.**
- **Provide local drought information and recommendations to the DRC regarding drought declarations.**
- **Communicate drought conditions and declarations to the rest of the RBC, stakeholders, and the public.**

Coordination of Drought Responses

- **Advocate for a coordinated, basinwide response by entities with drought management responsibilities (e.g., water utilities, reservoir operators, large water users).**
- **Coordinate with other drought management groups in the basin as needed.**

Broad River

POLICY, LEGISLATIVE, REGULATORY, TECHNICAL, AND PLANNING PROCESS RECOMMENDATIONS

During the final phase of the planning process, the Broad RBC developed, considered, and agreed on various policy, legislative, and regulatory recommendations. The RBC also offered technical recommendations and suggestions for improving the planning process. The following subsections summarize these recommendations.

Policy, Legislative, and Regulatory Recommendations

The Broad RBC engaged in discussion about issues and concerns with existing policies, laws, and regulations governing water withdrawals and water use. The consensus-based recommendations in **Table ES-3** are intended to guide SCDHEC and the legislature when considering changes to existing laws and regulations that govern water withdrawals and assist local government efforts to protect water resources.

Table ES-3. Broad River Basin Council policy, legislative, and regulatory recommendations.

Legislation and Regulatory Recommendations	▪ Regulation 61-119, Surface Water Withdrawal, Permitting, Use and Reporting (Surface Water Act), should allow for reasonable use criteria to be applied to all surface water withdrawals, like those that currently exist for groundwater withdrawals. ▪ Laws that allow for regulation of water use need to be enforceable to be effective. The current water law, which grandfathers in most water users, can be improved to support effective management of the state's water resources. ▪ Water law and implementing regulations should not distinguish between registrations and permits. All water users, who withdraw above the identified threshold, should be required to apply for a water withdrawal permit. ▪ The water withdrawal permitting process should specifically assess the permit application's alignment with the current River Basin Plan, particularly regarding proposed withdrawals, returns, resource conservation, and drought response.
Local Government Recommendations to Protect Water Resources	▪ The Broad RBC or the PPAC should develop a model riparian buffer ordinance for local jurisdictions to consider.

Technical and Program Recommendations

The RBC may make technical and program recommendations to address any data gaps or information needs identified during the river basin planning process. The following recommendations in **Table ES-4** should be taken as considerations for future phases of the river basin planning process. To implement these recommendations, the Broad RBC will need support from SCDNR, SCDHEC, and other technical experts.

Table ES-4. Broad River Basin Council technical and program recommendations.

Model Improvement Recommendations	▪ Consider incorporating future climate projections into modeling analyses (e.g., projected temperature, evapotranspiration, and precipitation trends) to better address potential supply-side changes in hydrology. Consider incorporating historical climate information such as dendroclimatology (tree ring data) to inform drought risk and/or drought scenarios.
Data-Related Recommendations	▪ Recognizing that comprehensive, reliable, and long-term hydrologic data are critical to water planning, funding mechanisms to support continued USGS efforts to maintain and expand streamflow gages should be identified. ▪ The Broad RBC recommends the funding and establishment of a mesoscale network of weather and climate monitoring stations in South Carolina.
Technical Study Recommendations	▪ The Broad RBC should identify the financial impacts of increased sedimentation on reservoirs and water resources and communicate the results to local governments to demonstrate the value of riparian buffers, sedimentation and erosion control measures, and other policies and controls that reduce sediment generation and transport. ▪ The Broad RBC, with support from technical experts, should evaluate the impact of future land use changes on water resources quantity and quality. ▪ The Broad RBC should continue to consider ecological flow standards, including new and/or improved data, as it becomes available. ▪ The Broad RBC should identify potential pinch points where current and projected low flows may lower the assimilative capacity of the streams. Strategies may need to be identified to mitigate low flows at these potential pinch points. ▪ While the RBC should maintain its focus on the assessment of water quantity, future planning efforts in the Broad River basin should include evaluation of surface water quality, including nutrient loading and sedimentation, which is important to maintaining affordable public water supplies and the ecological health of the streams, rivers, and lakes. ▪ The Broad RBC supports further investigation and potential piloting of low-tech, process-based approaches to stream restoration.
Technical Training Recommendations	▪ The facilitator should create an online library of, or a catalog of links to, technical information that will enhance the RBC's technical understanding of water resources concepts and issues.
Water-Related Planning Effort Alignment Recommendation	▪ For river basins with state or federal specially designated streams (e.g., National Wild and Scenic Rivers or State Scenic Rivers), the RBCs should assess alignment between the RBP and the management plan associated with the special designation.

Recommendations to Improve the River Basin Planning Process

Table ES-5 lists the recommendations that should be considered for development of future river basin plans.

Table ES-5. Broad River Basin Council recommendations to improve the river basin planning process.

Recommendations Related to RBC Membership, Meeting Schedules, or Procedures	▪ RBCs and their planning teams should consider regularly polling the RBC members to identify if adjustments to meeting times, locations, and dates would allow for easier and/or more member attendance and/or increased in-person attendance. ▪ SCDNR, the RBC planning teams, and the RBCs should conduct regular (e.g., annual) reviews of the RBC membership to make sure all interest categories are adequately represented. ▪ Where appropriate and allowed, experts who present technical information to the RBCs should offer proposed recommendations for RBC consideration.
Recommendations to Improve Communication Among RBCs and Other Groups	▪ RBCs should consider developing and executing a communication plan early in the initial 2-year planning process, and conducting education and outreach before completing the River Basin Plan. ▪ SCDNR should take lead in organizing an annual statewide meeting of the RBCs with the Agriculture and Natural Resources Committee of the State Senate and the Agriculture, Natural Resources and Environmental Affairs Committee of the State House to communicate the value of water planning, highlight progress and recommendations, and share ideas among RBCs.
Funding Recommendation	▪ The South Carolina legislature should continue to fund state water planning activities, including river basin planning.

ES-7 Broad River Basin Plan Implementation

The Broad RBC identified five implementation objectives for the Broad River Basin Plan as listed in **Table ES-6**. These five objectives were developed based on themes that emerged from the recommended water management strategies; the drought response recommendations; and certain planning process, programmatic, and technical recommendations. The RBC prioritized these objectives, as directed by the Planning Framework. **Table ES-7**, on the following page, presents representative corresponding short-term strategies and actions to achieve each objective. A detailed plan for implementing the RBC-identified strategies and actions can be found in Table 10-2 of the plan. The RBC also identified, discussed, and selected long-term strategies that build on the short-term actions and strategies. The long-term strategies are listed in Table 10-5 of the plan.

Table ES-6. Implementation objectives and prioritization.

Objective	Prioritization	Prioritization Justification
Group 1 – Objectives related to water users		
Objective 1. Improve water efficiency to conserve water resources.	**High**	Water conservation is a good practice to implement, even if water shortages are not an immediate concern.
Objective 2. Optimize and augment sources of supply.	**Medium**	Surface water modeling indicated most suppliers will not need to adjust their water supplies within the next 5 years.[1]
Objective 3. Improve drought management.[2]	**High**	Maintaining up-to-date drought plans and supporting ordinances is critical for public supplier response and to coordinate actions at a basin and state level.
Group 2 – Objectives related to actions the RBC must undertake with support from SCDNR, SCDHEC, and technical specialists		
Objective 4. Effectively communicate RBC findings and recommendations.	**High**	Communication is essential to ensuring stakeholders pursue all objectives, and communication should be ongoing.
Objective 5. Improve technical understanding of water resource management issues.	**Medium**	Additional technical information is necessary to inform and continually update the RBC's understanding of basin issues and best practices to manage concerns.

[1] Modeling indicated that Cherokee County BPW could experience shortages based on 2025 projected water demands under certain drought conditions. Although Objective 2 is medium priority for the Broad RBC, Cherokee County BPW may take actions related to this objective within the five years following publication of this River Basin Plan.

[2] Some strategies related to Objective 3 also involve actions that the RBC must undertake with support from SCDNR, SCDHEC, and technical specialists.

Cooley Farms

Table ES-7. Implementation objectives and representative short-term actions.

Objective	Representative Short-Term (5-Year) Strategies and Actions[1]
Group 1 – Objectives related to water users	
Objective 1. Improve water efficiency to conserve water resources.	▪ Identify funding opportunities. ▪ Implement outreach and education program. ▪ Water withdrawers to implement conservation practices.
Objective 2. Optimize and augment sources of supply.	▪ Public water suppliers to assess how current operations affect reservoir drawdown, identify what conditions may require changes to operations, and adjust reservoir operations as necessary to better balance available supply. ▪ Identify public water suppliers without interconnections to neighboring water systems and explore opportunities and funding to build new interconnections. ▪ Actions specific to Cherokee County BPW: **a.** Assess seasonal demand patterns and determine what redistribution of Gaston Shoals withdrawals could best extend their existing supplies. **b.** Further explore development of a new intake on the Broad River. **c.** Explore a potential interconnection with SWS. **d.** Explore supply benefit, cost, and permitting requirements for raising Lake Whelchel Dam or converting a quarry to a water supply reservoir. **e.** Monitor demands and hydrologic conditions to determine when timing of future investments may be necessary.
Objective 3. Improve drought management.	▪ Develop materials and an outreach strategy to inform public water suppliers about RBC's drought management recommendations. ▪ Public water suppliers on the RBC should review and update their drought management plans and supporting water shortage response ordinances and share the updates with the State Climate Office (SCO).

[1] *These examples are representative and do not reflect the complete list developed by the RBC, which are in Table 10-2 of the Broad River Basin Plan.*


Broad River

Table ES-7. Implementation objectives and representative short-term actions. (continued)

Objective	Representative Short-Term (5-Year) Strategies and Actions[1]
Group 2 – Objectives related to actions the RBC must undertake with support from SCDNR, SCDHEC, and technical specialists	
Objective 4. Effectively communicate RBC findings and recommendations.	▪ The Broad RBC will meet quarterly (or otherwise as needed) to focus on implementing plan actions and identifying funding. ▪ Develop and implement a communication plan and conduct education and outreach activities. ▪ With support from SCDNR, gauge interest in conducting an annual statewide meeting of the RBCs with appropriate House and Senate committees to communicate the value of water planning, highlight progress and recommendations, and lobby for continued funding.
Objective 5. Improve technical understanding of water resource management issues.	▪ Develop a communication strategy and conduct outreach with USGS and funding entities to emphasize the importance of streamflow data to the planning process. ▪ Explore information and approaches to understand how land use changes impact water resource quality and quantity. ▪ Estimate sedimentation impacts to reservoirs, and considering future land use, identify financial and other impacts. Communicate those impacts to local governments. ▪ Continue to update and apply ecological flow relationships as new data become available. ▪ Identify specific water quality issues and concerns and develop an approach to address them. ▪ Identify locations in the basin where current and projected low flows may lower the assimilative capacity of streams. ▪ Consider using tree-ring data (dendroclimatology) to assess the severity, frequency, and duration of historical droughts and incorporate future climate projections (e.g., projected temperature, evapotranspiration, and precipitation trends) to better address potential hydrologic variability in the basin. ▪ Create an online library, or catalog of links to technical information, that will enhance the RBC's technical understanding of water resources concepts and issues. ▪ Investigate the feasibility of low-tech, process-based approaches to stream restoration, and identify potential funding for pilot projects, if deemed feasible.

[1] *These examples are representative and do not reflect the complete list developed by the RBC, which are in Table 10-2 of the Broad River Basin Plan.*

Lake Blalock

Broad River near Peak, SC

Funding Opportunities

Existing federal funding sources may be leveraged to support the River Basin Plan implementation. For example, EPA's Water Infrastructure Finance and Information Act program offers funding to support eligible water and wastewater infrastructure projects, including those related to drought prevention, reduction, and mitigation. Other funding to support drought mitigation efforts may be available through the Federal Emergency Management Agency's Hazard Mitigation Grant Program (HMGP) or Building Resilient Infrastructure and Communities (BRIC) programs.

U.S. Department of Agriculture (USDA) offers numerous programs for farmers and ranchers to reduce risk from drought or to restore land impacted by drought; however, agricultural water use in the Broad River basin is limited and expected to already be efficient. In 2022, Congress passed the Inflation Reduction Act, which may provide additional funding to programs related to agricultural conservation. On the state side, in September 2022, $70 million in USDA "Partnerships for Climate-Smart Commodities" funding was invested in two South Carolina land-grant universities to promote "climate-smart" agricultural practices in South Carolina. There may be opportunities to leverage this new funding source to implement the agricultural conservation strategies recommended in this plan. Chapter 10 of the plan includes a detailed list of funding programs and opportunities.

Lake Monticello Park

Implementation Considerations

The Broad RBC may encounter challenges in the implementation of the identified strategies, and this will necessitate adaptation, sharing of lessons, and regular periodic revisitations and updates to the plan. Some of the potential challenges include:

- ***Identification of sufficient funding.*** Withdrawers may have limited financial capacity to pursue the recommended water management strategies, and procedural assistance will likely be needed from the RBC and regulatory agencies.
- ***Timing of available funding.*** Identification of immediately available funding opportunities, the provision of support in funding applications, and the investigation of new funding sources are vital to implementation of the recommended near-term water management strategies. The RBC also noted that funding applications may present a technical or resource barrier to many water withdrawers. The provision of support for the development of applications could be key to securing funding for implementation.
- ***Stakeholder understanding and acceptance.*** The RBC has opportunities to influence decisions, and has presented its organized and collaborative recommendations in this plan, but it has no authority to enforce recommendations in the basin. Stakeholder acceptance can result only from deliberate, coordinated outreach that is grounded in data and science.
- ***Funding and interest in conducting an annual statewide meeting of the state's multiple RBCs.*** A recommended communication strategy under Objective 4 is to conduct an annual statewide meeting of the state's multiple RBCs, the Agriculture and Natural Resources Committee of the State Senate and the Agriculture, Natural Resources and Environmental Affairs Committee of the State House to communicate the value of water planning, highlight progress and recommendations, and lobby for continued funding. Other RBCs have not heard or endorsed this strategy. In addition to being dependent on the interest levels of the parties involved, this strategy also would be contingent upon a funding source and availability of a planning body.
- ***Maintaining momentum.*** Maintaining momentum will be critical for the durability of the plan, its effective early implementation steps, and its ability to adapt as social, economic, regulatory, political, and hydrologic conditions in the basin evolve. The Planning Framework states that the River Basin Plan should not be perceived as a static document, and the RBC should not be a stagnant planning body between successive updates. Rather, the RBC is to be "actively engaged in promoting the implementation of the recommendations proposed" and "will continue to meet on a periodic basis to pursue River Basin Plan implementation activities as needed" (SCDNR 2019, p. 90). The Broad RBC has identified quarterly meetings as desirable in the first year after publication of the River Basin Plan to pursue funding and implementation. After the first year, meetings may be held less frequently as needed, but at least once per year.

Summary

The Broad RBC, the second of eight statewide RBCs to convene, has successfully followed the Planning Framework to develop a River Basin Plan for the Broad River basin. Throughout the planning process, the RBC determined that there generally is a low risk of water supply shortages for most of the water users in the basin. This finding is based on recent historical hydrology and does not consider the potential for droughts that are more severe than those of the past 90 years. Recognizing the supply risk to some users and the potential impact of future withdrawals on low flows and ecology in the basin, the RBC identified a suite of demand-side and supply-side water management strategies to reduce these risks. The recommended water management strategies are based on model evaluation and feasibility assessment and are supported by an implementation plan. The RBC also developed a variety of technical and planning process recommendations to help inform and support further water planning efforts. Notably, the RBC achieved consensus on major policy, legislative, and regulatory recommendations that could be considered by decision makers to improve water management.

Lake Monticello Park

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Broad River at Columbia's Riverfront Park

Broad River at Columbia's Riverfront Park

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