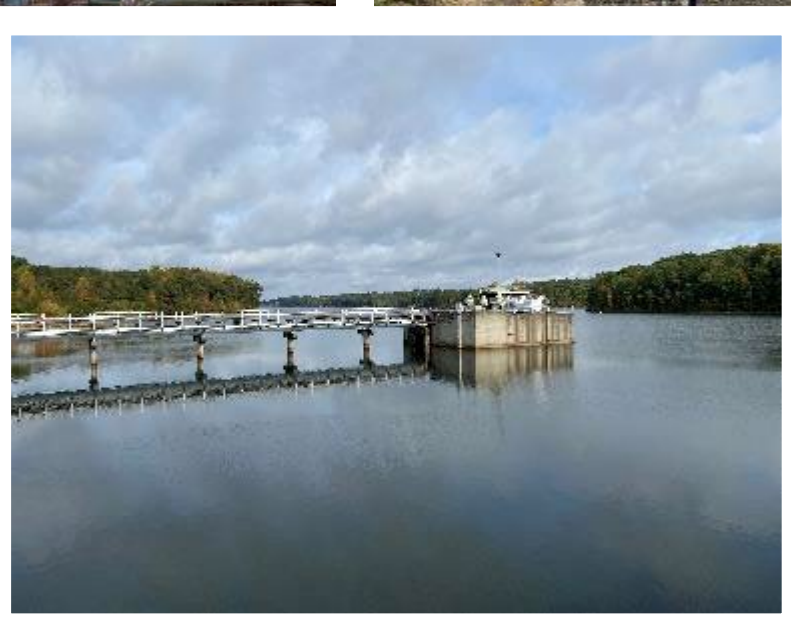


Broad River Basin Plan Public Meeting

February 20, 2024

Broad River Basin Plan – Public Meeting Agenda

• Welcome and Introductions	6:00 – 6:10
• Overview of the Planning Process	6:10 – 6:20
• Draft Broad River Basin Plan Highlights	6:20 – 7:20
• Summary of Draft Plan Comments and Responses	7:20 – 7:30
• Public Comments and Q&A with the RBC	7:30 – 8:00

Welcome and Introductions

Broad River Basin Council

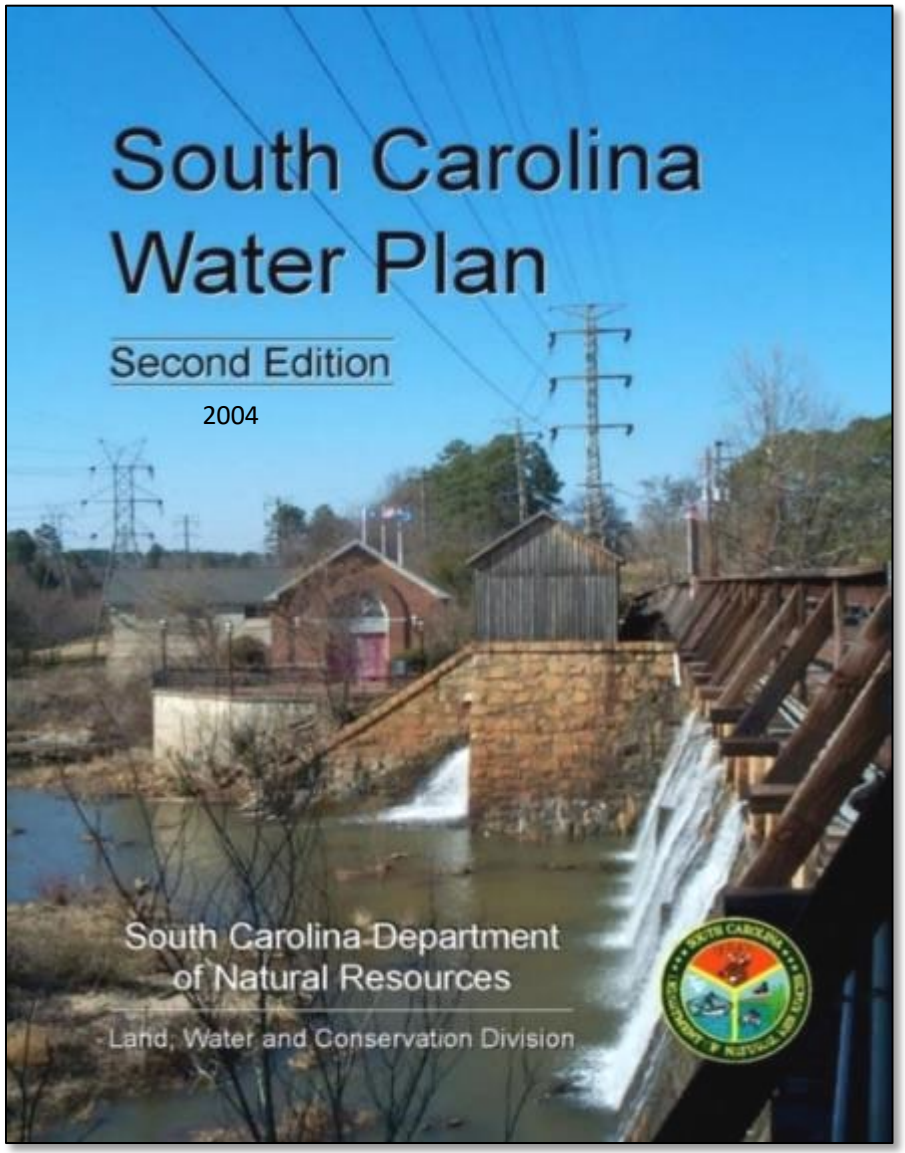
Name	Organization	Interest Category
John Alexander	Slater Properties	Agriculture, Forestry, and Irrigation
Daniel Hanks	Weyerhaeuser Company	
Jason Wright*	His Harvest Partners LLC	
James Kilgo	South Carolina Rural Water Association	At-Large
Angus Lafaye	Milliken Forestry Co., Inc.	
Amy Bresnahan	Dominion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

** Resigned or not currently active*

Cooperators and RBC Support Provided by:

Overview of the Planning Process

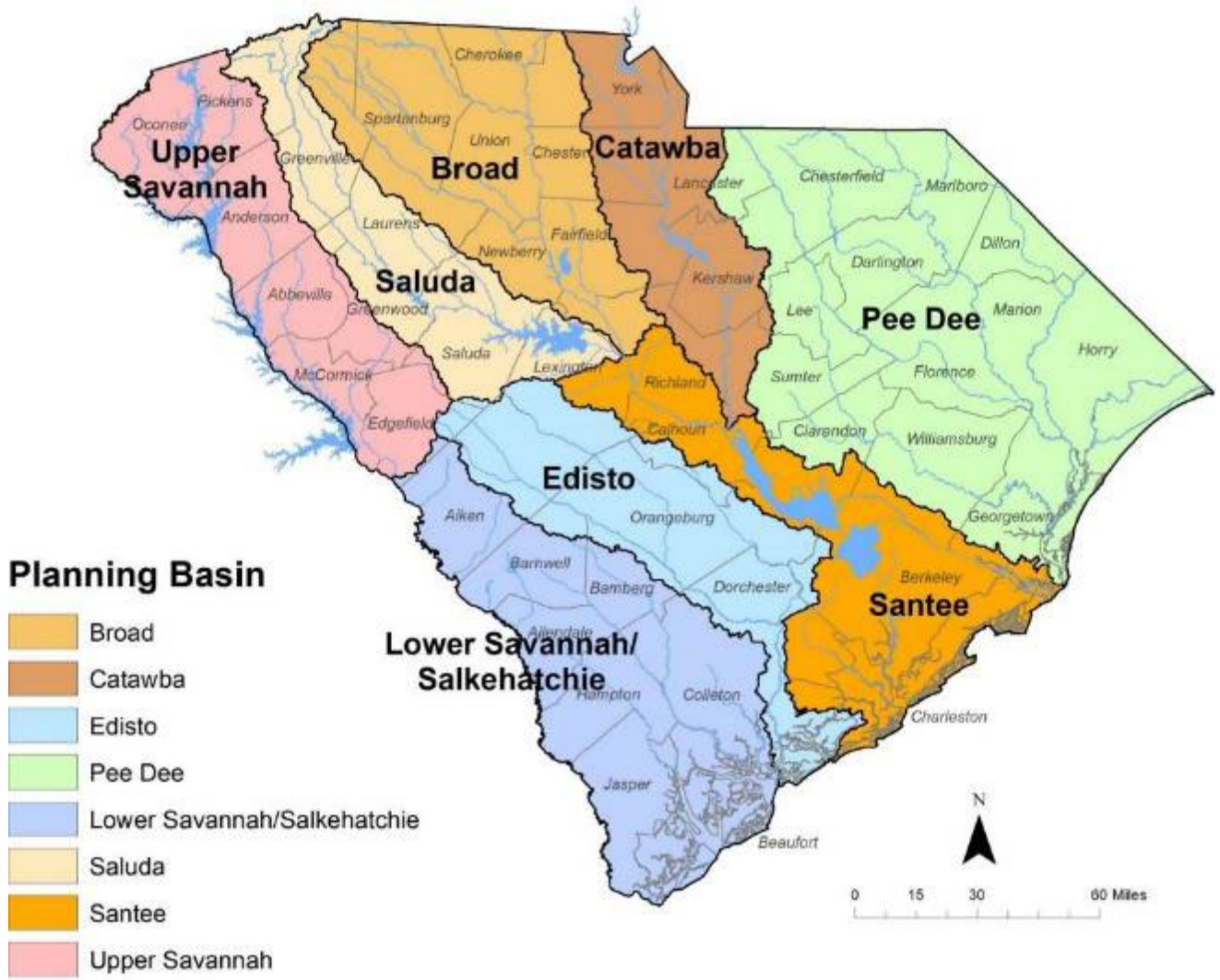
History of State Water Planning



- SCDNR is legislatively mandated to develop a State Water Plan.
- SCDNR published the first edition of the State Water Plan in 1998.
- In 2004, SCDNR published the second edition of the South Carolina Water Plan incorporating lessons learned from the drought of 1998-2002.
- One recommendation was to develop a regional water plan for each major river basin in the State.

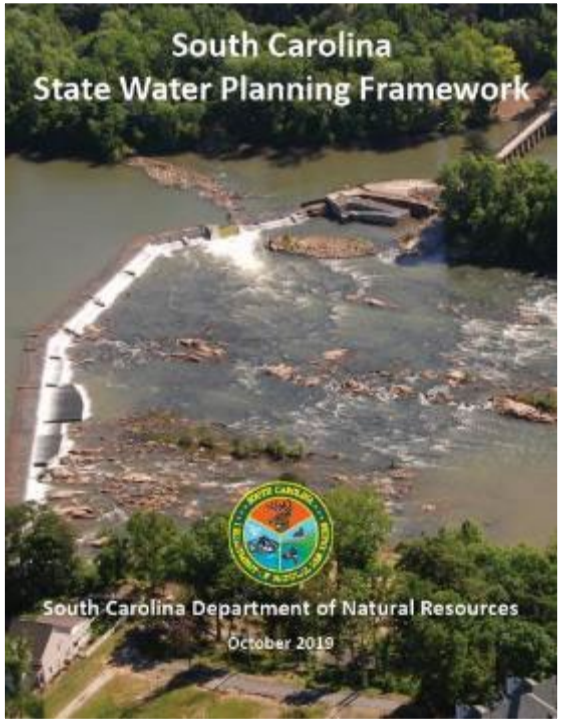
South Carolina's Eight Planning Basins

- River Basin Plans will be developed for the State's eight major river basins using a "bottom-up" approach where stakeholders in each basin lead the development of their basin plan.
- Collectively, the River Basin Plans will form the foundation of a new State Water Plan.



Planning Process Advisory Committee

- Convened by SCDNR in March 2018.
- Purpose - develop a guidance document (Planning Framework) for developing River Basin Plans and for updating the State Water Plan.
- South Carolina State Water Planning Framework (Planning Framework) was published in October 2019 after an 18-month process.



Planning Framework is available for review and download at:
https://hydrology.dnr.sc.gov/water-planning-framework.html

PPAC Committee Members

Jeffery Allen	Clemson University
David Baize	SCAWWA/WEASC
Jeff Boss	Greenville Water
Jesse Cannon	Santee Cooper
Fred Castles, III	Catawba-Wateree Water Management Group
Clay Duffie	Mt. Pleasant Waterworks (retired)
Steve Hamilton	The Dunes Golf and Beach Club
Erika Hollis	Upstate Forever
J.J. Jowers, Jr.	Bamberg County citizen, Edisto Engineers and Surveyors, Inc.
Eric Krueger	The Nature Conservancy
Jeff Lineberger	Duke Energy
Jill Miller	South Carolina Rural Water Association
Dean Moss, Jr.	Beaufort Jasper WSA (retired)
Myra Reece	South Carolina Department of Health and Environmental Control
Ken Rentiers	South Carolina Department of Natural Resources
Bill Stangler	Congaree Riverkeeper
Landrum Weathers	Farmer
Scott Willett	Anderson Regional Joint Water System
Charles Wingard	Walter P. Rawl and Sons, Inc.

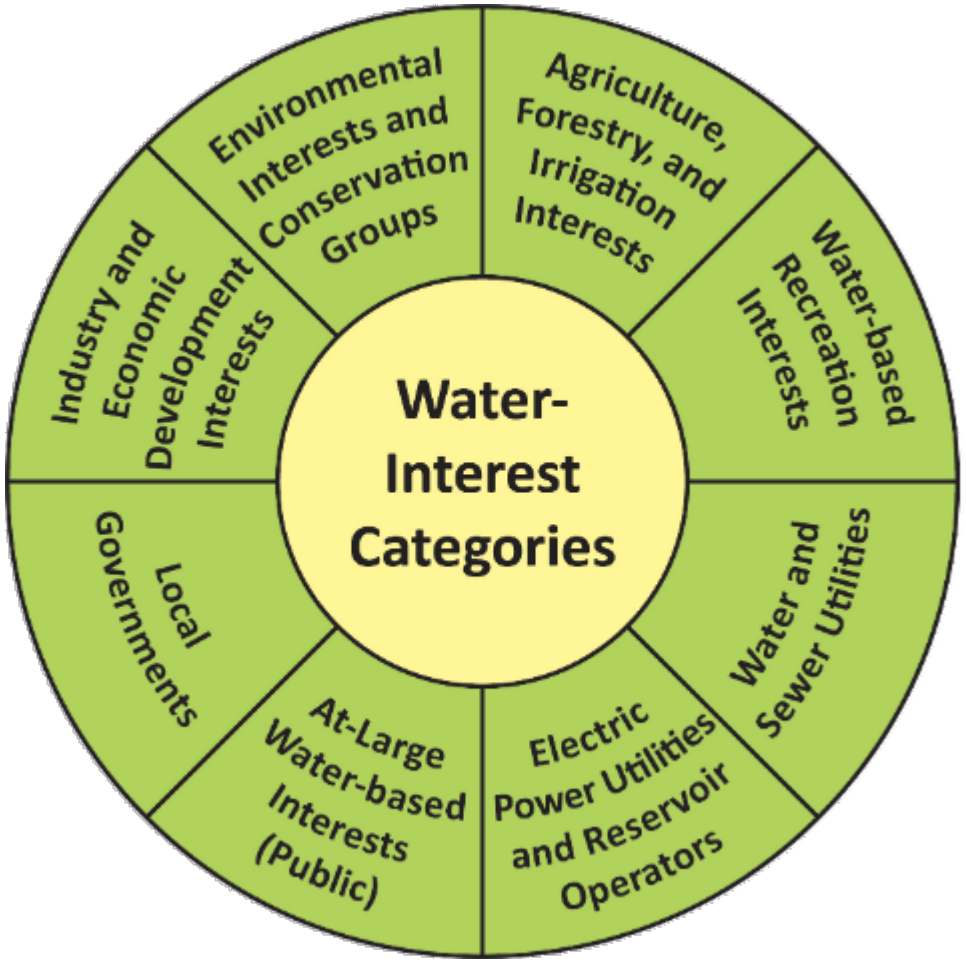
For more information, visit:

https://www.clemson.edu/public/water-assessment/State_Water_Planning_Process_Advisory_Committee.html

https://hydrology.dnr.sc.gov/ppac.html

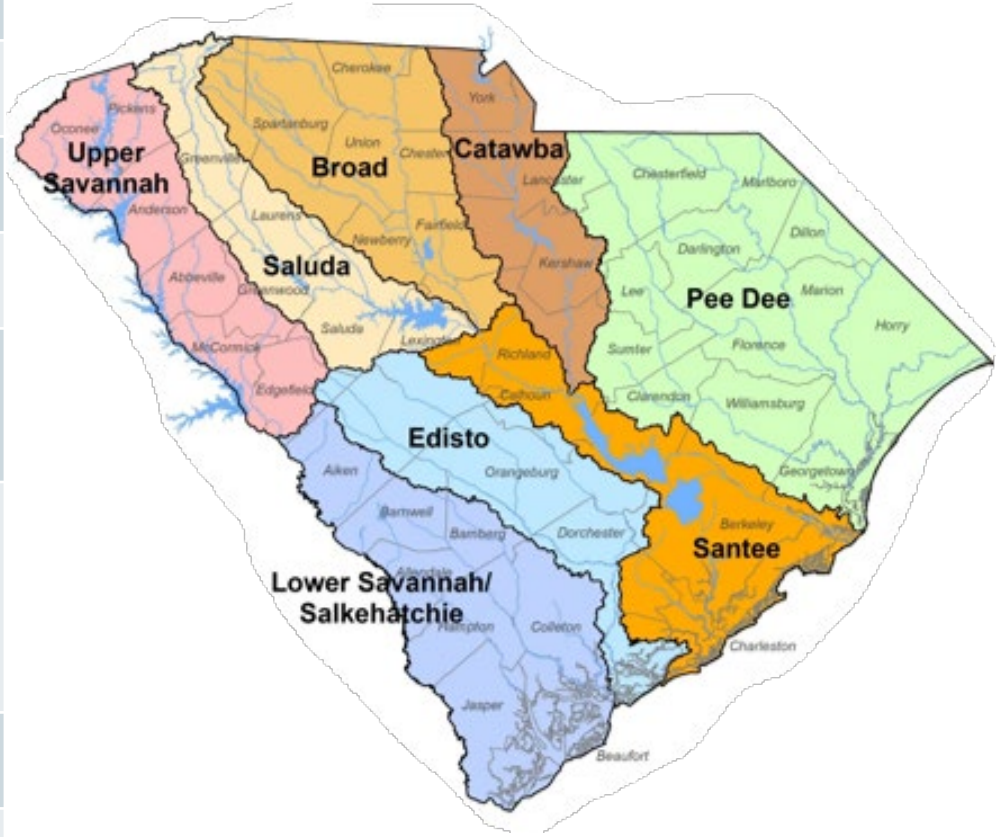
Planning Framework calls for the formation of a River Basin Council (RBC) in each planning basin

- **Stakeholder-led team** responsible for developing the River Basin Plan
- Up to **25** members representing **8 interest categories**
- Governed by a set of Bylaws
- **Consensus based** decision-making process
- Chair and Vice-Chair elected by RBC

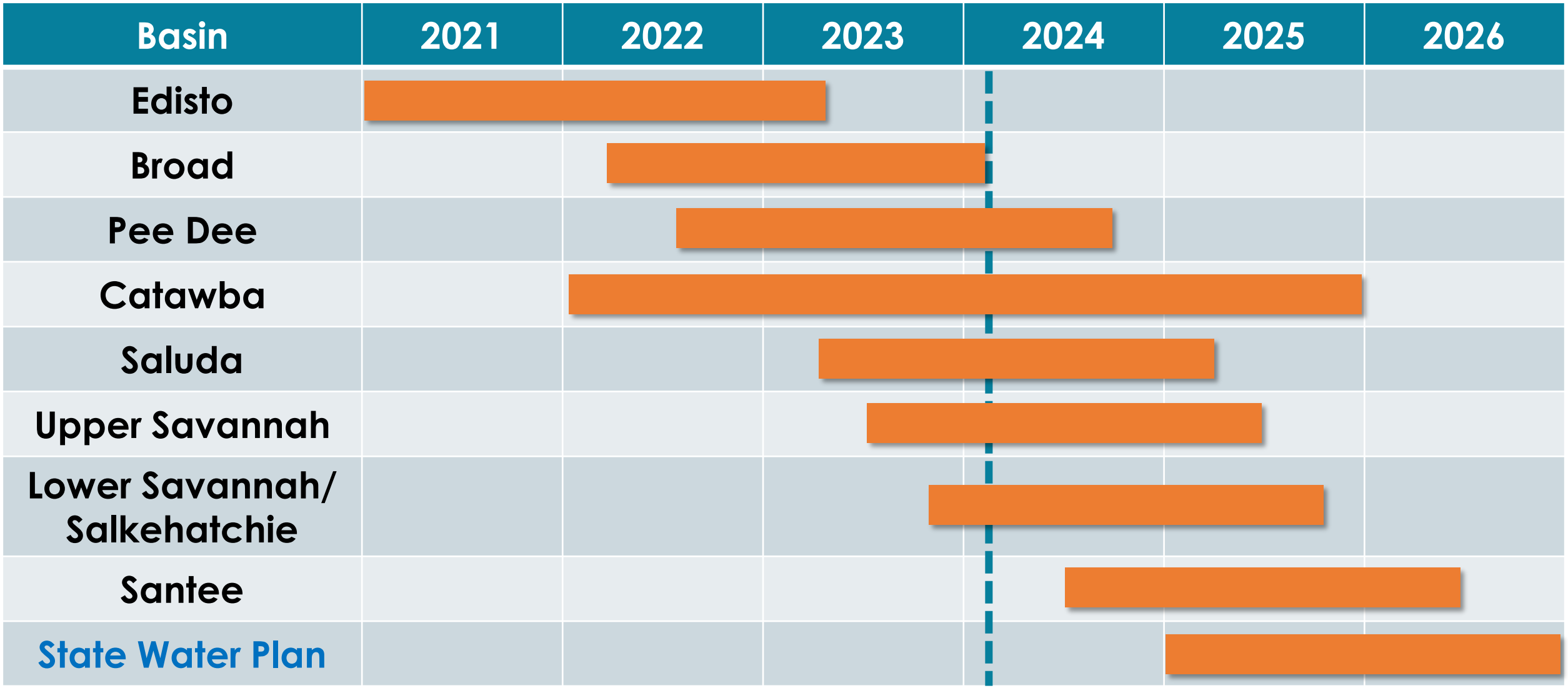


River Basin Planning Current Status

Basin	Status
Edisto	Completed
Broad	March 2022 – present
Pee Dee	June 2022 – present
Saluda	March 2023 – present
Upper Savannah	July 2023 – present
Lower Savannah/ Salkehatchie	Started November 2023
Santee	Scheduled to begin Spring 2024
Catawba	CWWMG's Integrated Resource Plan in progress



State Water Plan - Schedule



Stakeholder Participation

Edisto River Basin Council Field Trip

PPAC Meeting

Broad River Basin Council Meeting

Pee Dee River Basin Council Meeting

Edisto Basin Water Demand Projection Stakeholder Meeting

SWAM Model Stakeholder Meeting

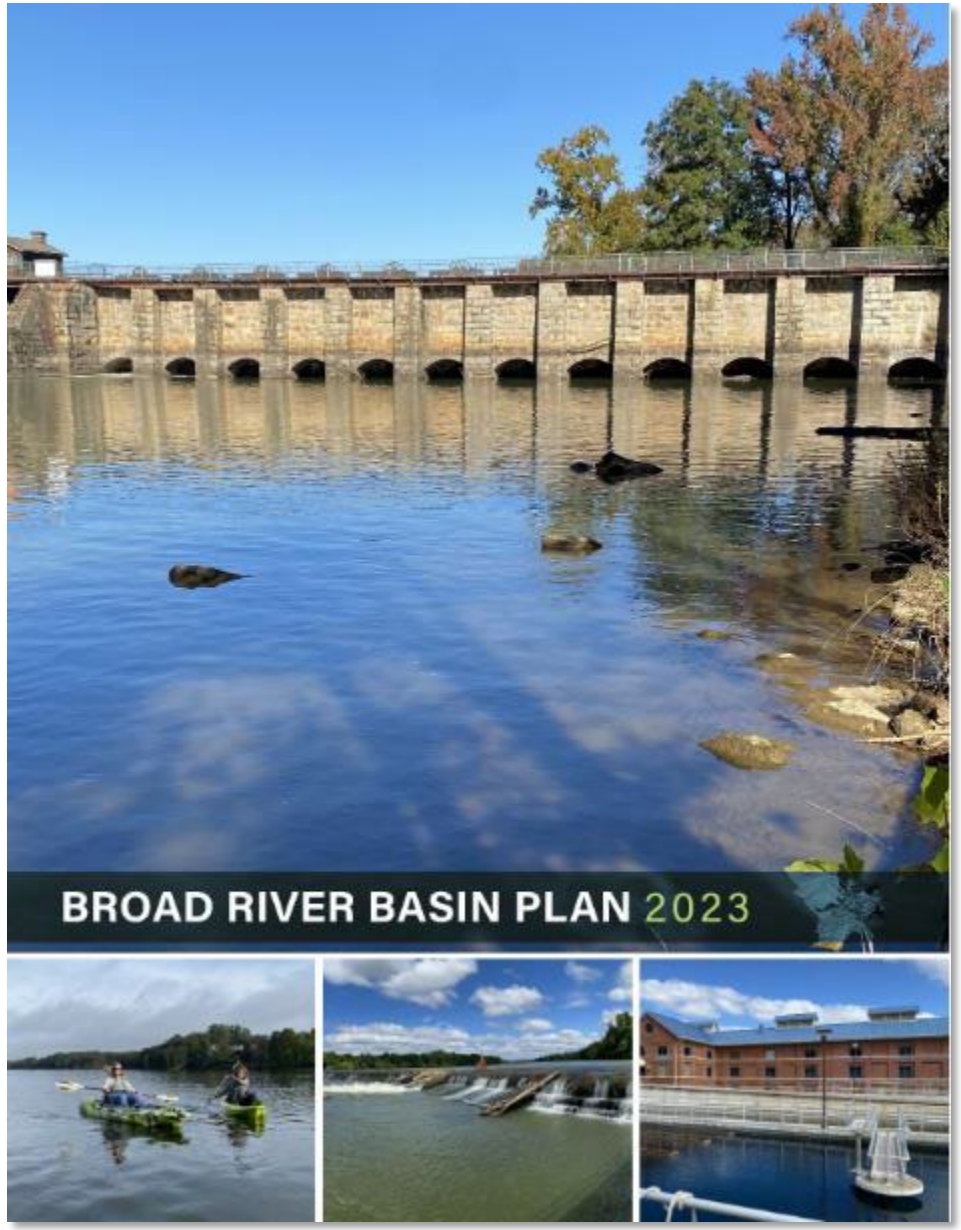
What is a River Basin Plan?

Key Outcomes

- Assesses **current** water supply and demand
- Identifies **future** water demand scenarios
- Identifies water management **strategies** to ensure supply meets or exceeds demand over the Planning Horizon

Features

- **Stakeholder-developed**
- Covers a **50-year** Planning Horizon.
- Considers both **surface water** and **groundwater**
- Current focus is on water ***quantity*** not water ***quality*** with emphasis on drought conditions.
- Supported by hydrologic data, models, and water-demand projections.



The Four Phases of the Planning Process

Phase 1 Understand Baseline	• Develop a vision statement and goals • Learn about the basin's water resources and modeling tools • Evaluate water demand projections
Phase 2 Assess Future Availability	• Evaluate current and future water availability issues • Identify and quantify potential water shortages through year 2070 for several water demand scenarios
Phase 3 Develop Strategies	• Develop and evaluate water management strategies • Recommend and prioritize strategies
Phase 4 Develop the Plan	• Develop legislative, policy, technical and planning process recommendations • Prepare the River Basin Plan that includes an implementation plan, Identifies drought response initiatives, and considers public input

Draft Broad River Basin Plan Highlights

Draft Broad River Basin Plan Highlights

We Will Review:

- Current and projected water demands in the basin
- Results of current and future water availability assessment
- Streamflow-ecology relationships
- Recommended water management strategies
- Other Plan recommendations and implementation approach
- Issues and challenges

Broad RBC 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.

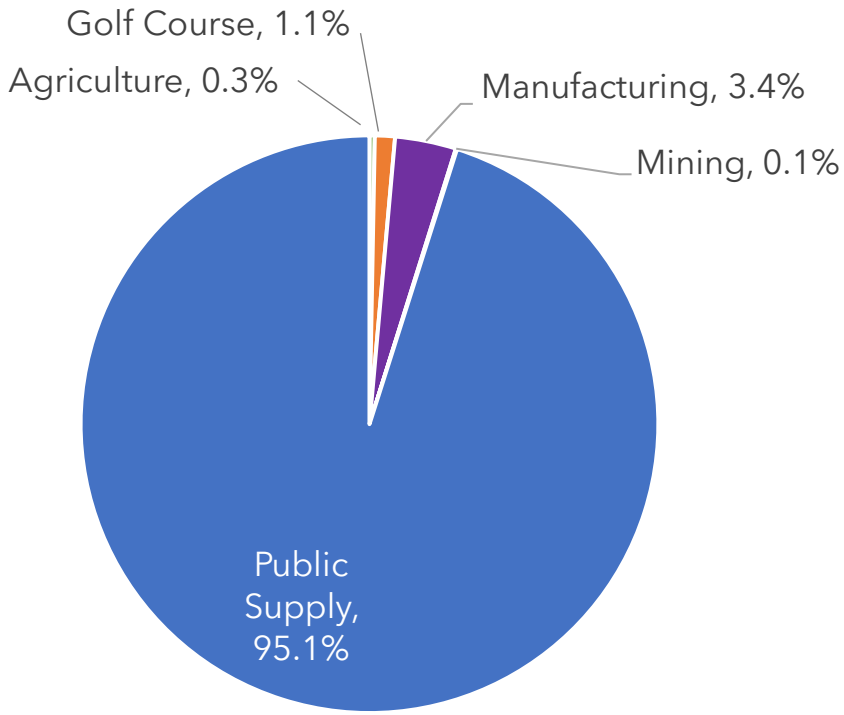
Broad RBC Goals

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.

Current Water Demands in the Basin

Water Use Category	Groundwater (MGD)	Surface Water (MGD)	Total (MGD)
Thermoelectric[1]	0.0	711.1	711.1
Public Supply	0.5	93.0	93.5
Manufacturing	0.2	3.1	3.3
Golf Course	0.1	1.0	1.1
Agriculture	0.0	0.3	0.3
Mining	0.0	0.1	0.1
Total	**0.8**	**808.6**	**809.4**

[1] Most thermoelectric withdrawals are returned to the river.



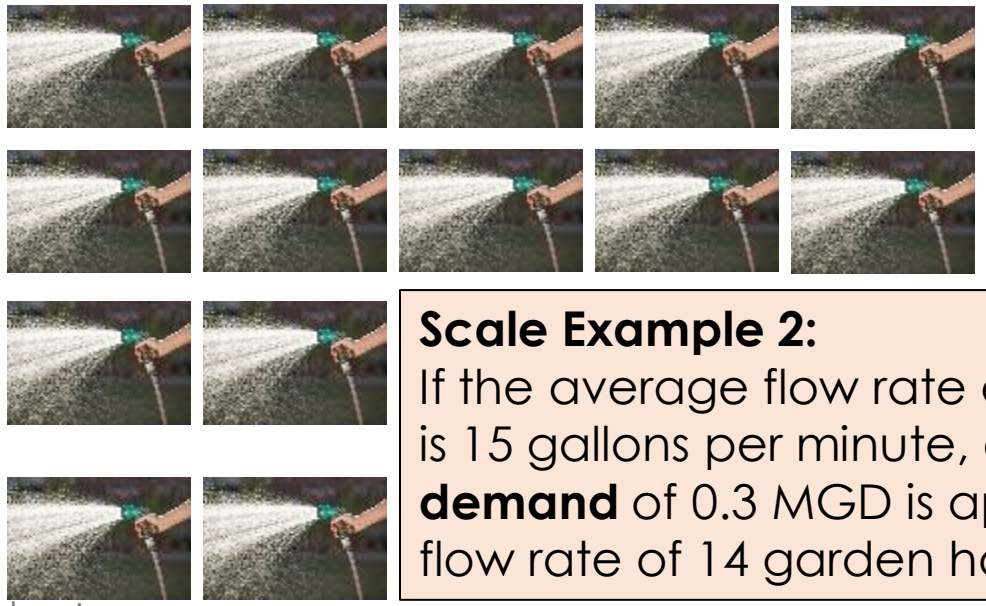
Note: Chart does not include thermoelectric water use, which is largely returned to the river

Current Water Demands in the Basin

Water Use Category	Total (MGD)
Thermoelectric[1]	711.1
Public Supply	93.5
Manufacturing	3.3
Golf Course	1.1
Agriculture	0.3
Mining	0.1
Total	**809.4**

[1] Most thermoelectric withdrawals are returned to the river.

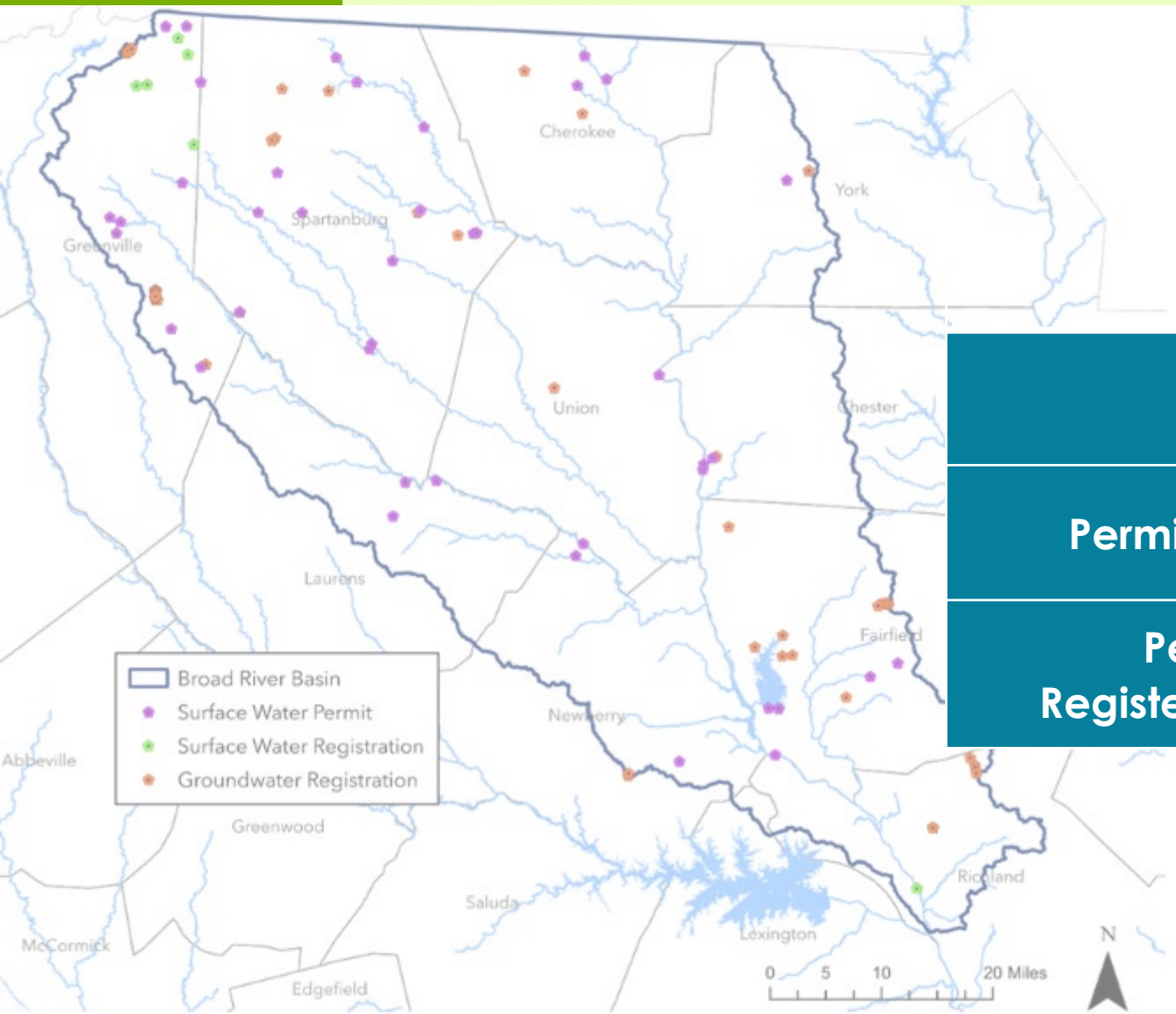
Scale Example 1:
Gaffney's Peachoid water tower holds 1 MG of water.
Public supply throughout the basin would use 93.5 Peachoids in one day.



Scale Example 2:
If the average flow rate of a garden hose is 15 gallons per minute, **agricultural demand** of 0.3 MGD is approximately the flow rate of 14 garden hoses on at once.

Key Finding

Only 52 Percent of the Permitted and Registered surface water is currently being used in the basin

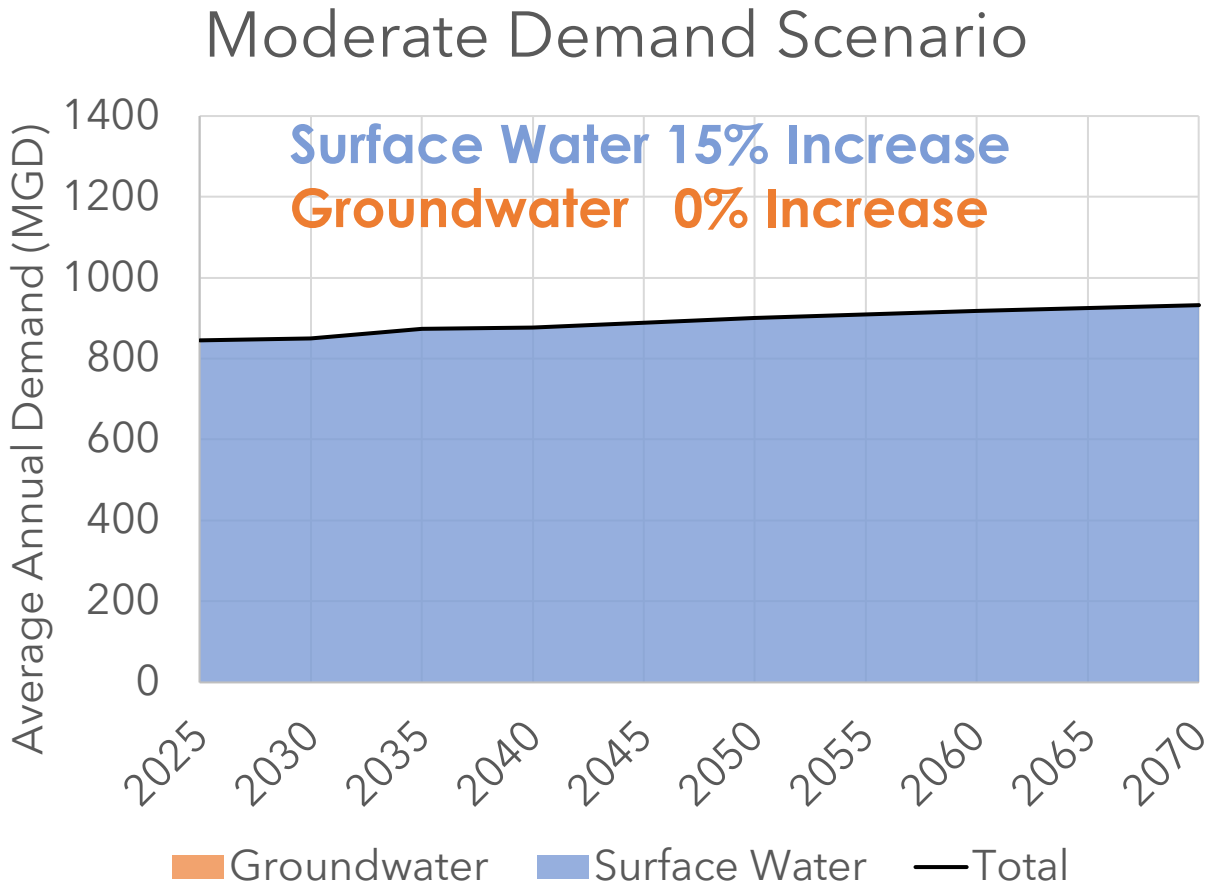


	Surface Water (MGD)
Currently Used	809
Permitted and Registered Amount	1,542
Percent of Total Permitted and Registered Amount Currently in Use	52%

Future Water Demand Scenarios for the Basin

Moderate Demand Scenario
demands increase from 809 MGD (currently used) to 932 MGD by 2070

2070 surface water demands for this scenario are 60% of Permitted and Registered amounts

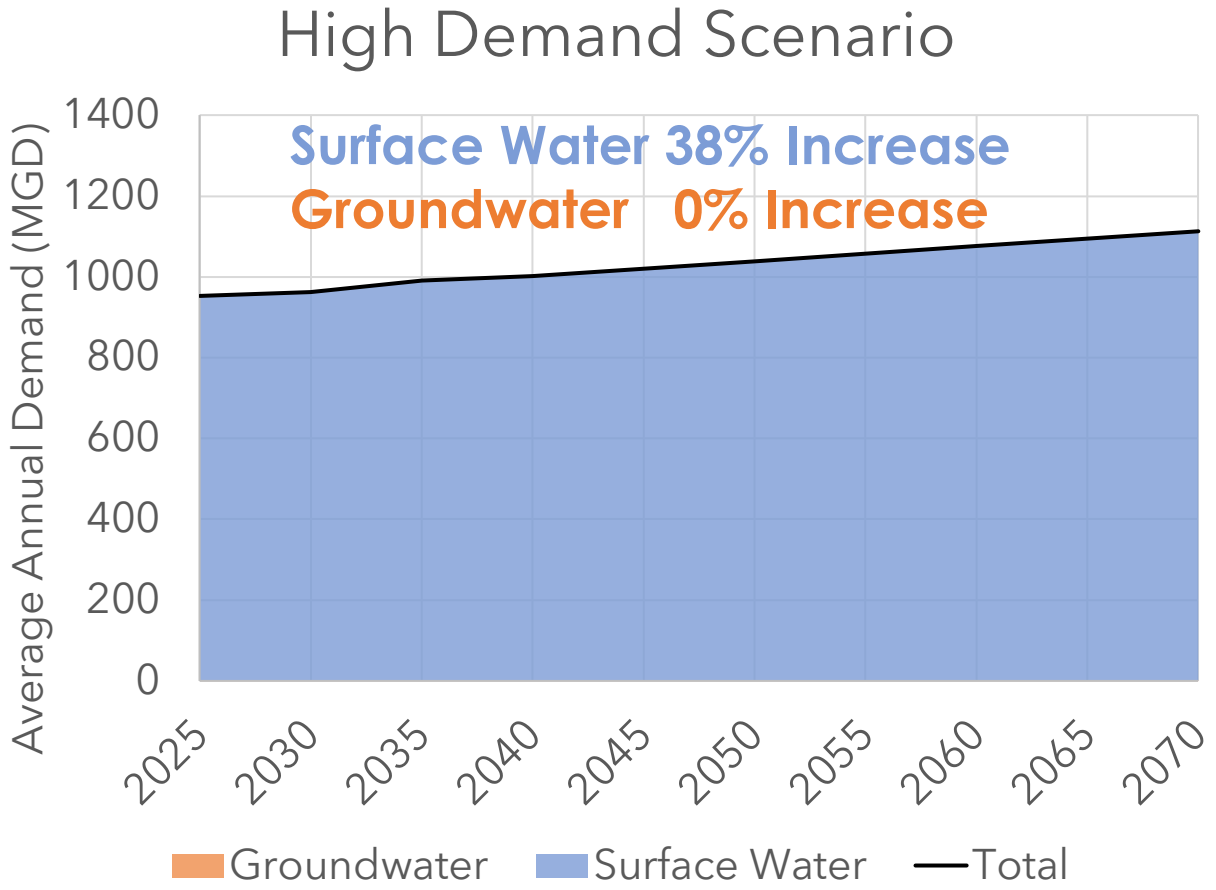


Note: Groundwater demands, projected at a constant average annual demand of 0.8 MGD are too small to be seen on this chart.

Future Water Demand Scenarios for the Basin

High Demand Scenario
demands increase from 809 MGD (currently used) to 1,113 MGD by 2070

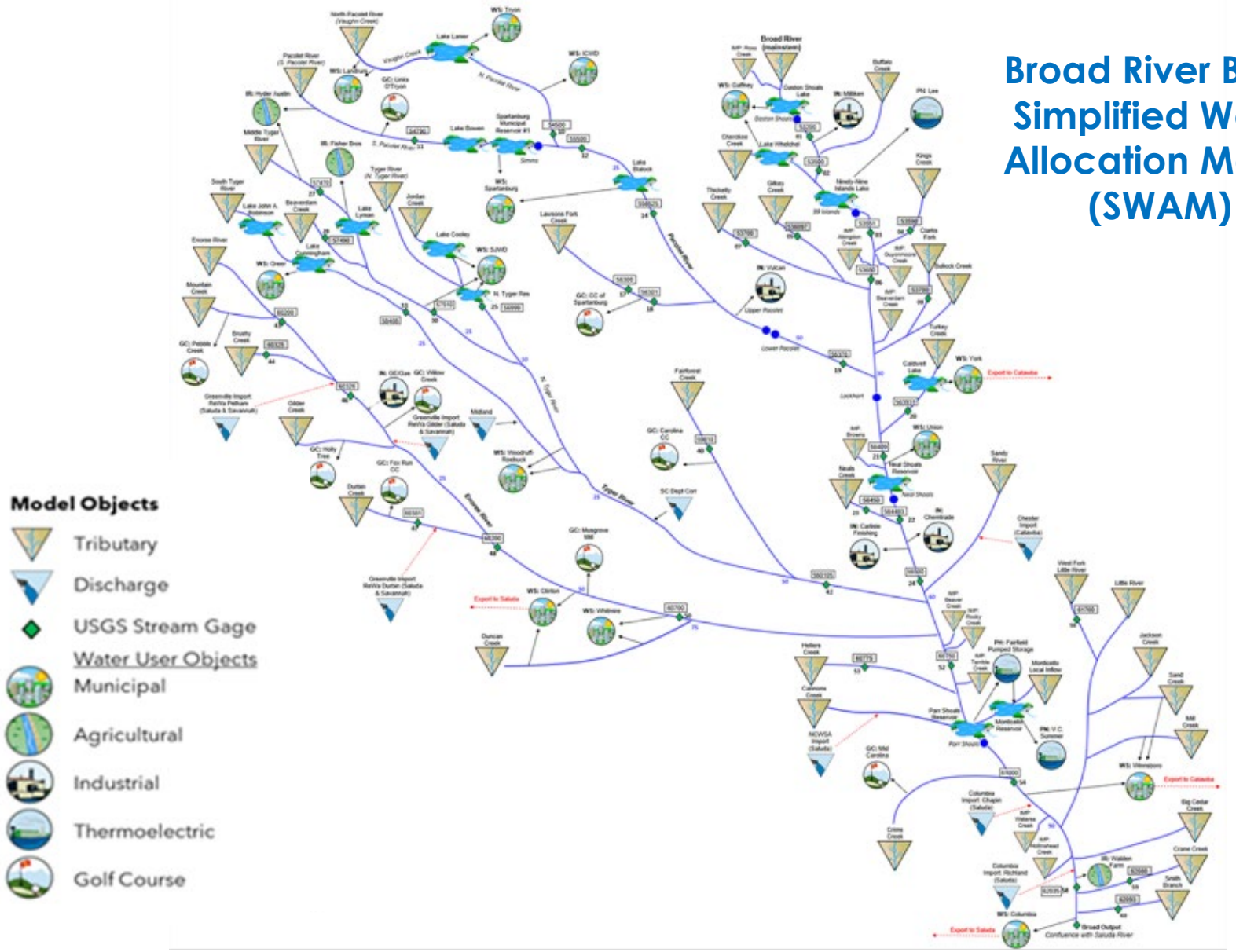
2070 surface water demands for this scenario are 72% of Permitted and Registered amounts



Note: Groundwater demands, projected at a constant average annual demand of 0.8 MGD are too small to be seen on this chart.

Current and Future Water Availability Assessment

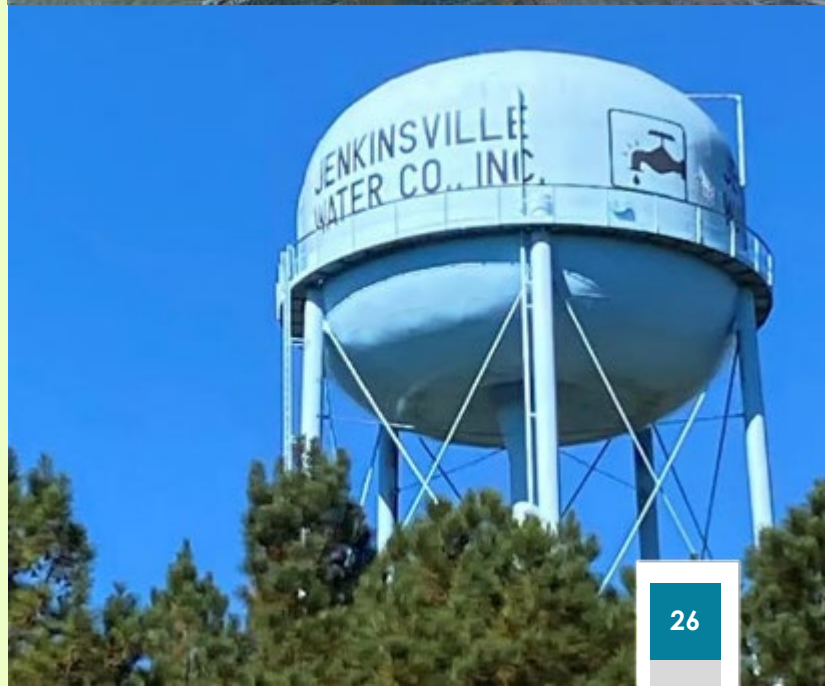
A surface water model was used to compare available supply to current and projected water demands



Broad River Basin Simplified Water Allocation Model (SWAM)

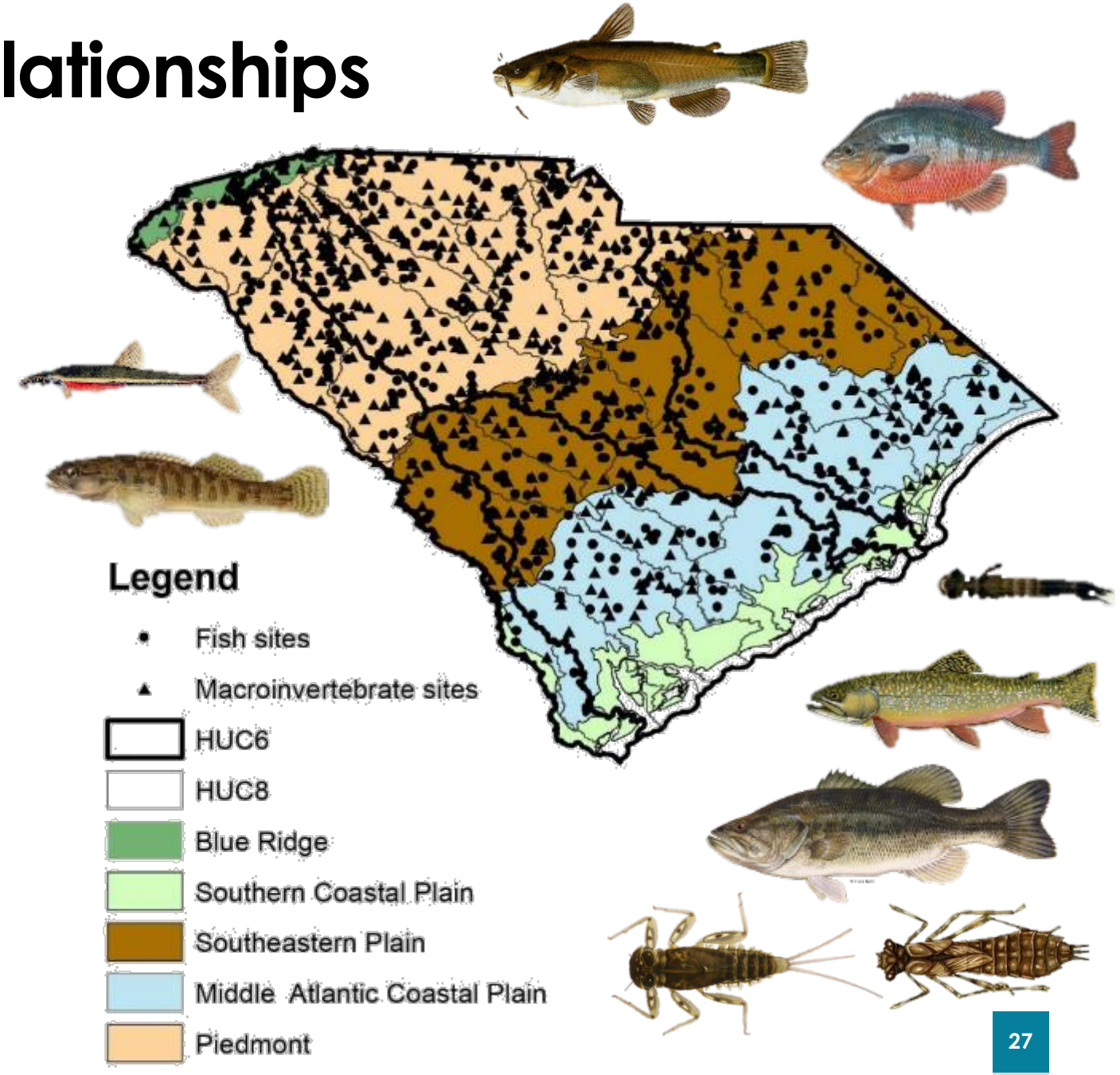
Surface Water Key Findings

- Surface water resources of the Broad River basin are generally sufficient to meet current needs.
- Potential public supply shortages seen in the High Demand Scenario can generally be avoided by optimizing the operation of existing water supply reservoirs.
- Cherokee County BPW's (Gaffney) existing supplies may be insufficient to meet projected 2025 high demands during drought conditions. A variety of surface water strategies assessed in the Plan may reduce this risk.
- While unlikely to occur, if fully permitted and registered amounts were withdrawn, the basin would be unsustainably stressed with frequent shortages and more severe low flows.



Streamflow-Ecology Relationships

Objective: Identify relationships between river flow and aquatic habitat suitability to better inform water flow standards throughout the state and serve as a tool supporting informed decision making in the river basin planning process.



Streamflow-Ecology Relationships

Key Finding

Simulated flow regimes of the **Current Use** and **Moderate Demand 2070 Scenarios** demonstrate **low risk to fish and aquatic macroinvertebrates.**

Simulated flow regimes of the **Permitted and Registered** and **High Demand 2070 Scenarios** suggest greater reductions in mean daily flow, which **may lead to reduced fish species richness.**

- Ecological risk was only assessed in primary and secondary tributaries of the Broad River basin.
- The evaluation suggests low risk to other aquatic ecology metrics (besides fish species richness) for all four planning scenarios.

Surface Water Management Strategies

Portfolio of Demand Side Strategies




Municipal Strategies (Examples)

- Update, and implementation of drought management plans
- Public education about water conservation
- Conservation pricing structures
- Residential water audits
- Landscape irrigation program and codes
- Water efficiency standards for new construction
- Leak detection and water loss control program
- Reclaimed water programs
- Car wash recycling ordinances
- Time-of-day watering limit

Agricultural Strategies (Examples)

- Water audits and nozzle retrofits
- Irrigation scheduling
- Soil management
- Crop variety, type, and conversion
- Irrigation equipment changes

Some of these strategies are already in practice throughout the basin.

Surface Water Management Strategies

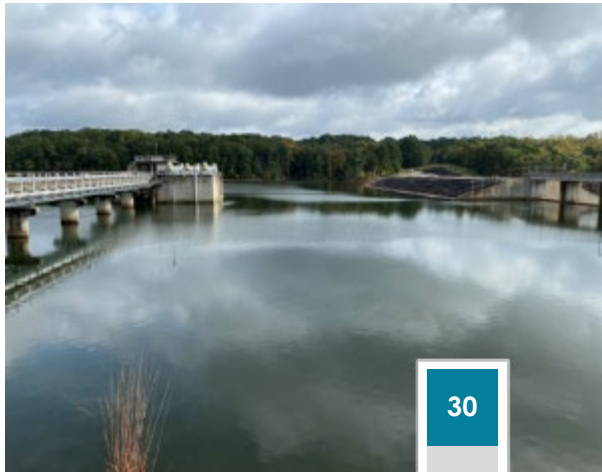
Supply Side Strategies

Public Water Suppliers with Reservoirs

- Adjust reservoir operations for higher demands as needed (often reservoirs in series).

Cherokee County BPW (Gaffney)

- Seasonal distribution of Gaston Shoals allocation
- Renegotiated allowance from Gaston Shoals
- Raise Lake Whelchel dam
- New quarry storage
- New Broad River intake
- Connection to SWS
- New reservoir on King's Creek
- New regional reservoir



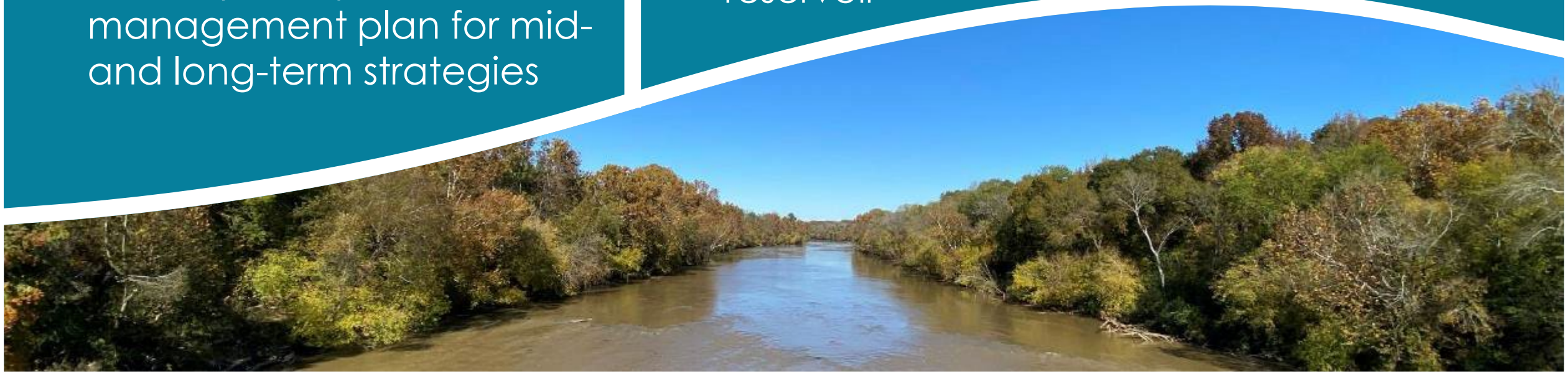
Recommended Supply Side Strategies for Cherokee County BPW (Gaffney):

Short-Term Strategies:

1. Distribute Gaston Shoals allocation seasonally to be proportional to demand
2. Explore feasibility of a new intake on the Broad River
3. Develop adaptive management plan for mid- and long-term strategies

Mid- and Long-Term Strategies:

1. Raise dam height of Lake Whelchel
2. Further evaluate feasibility of converting a quarry to a supply reservoir
3. Explore an interconnection with SWS
4. Explore option of new local or regional reservoir



Broad RBC Recommendations

Example Technical and Program 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 scenario

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.

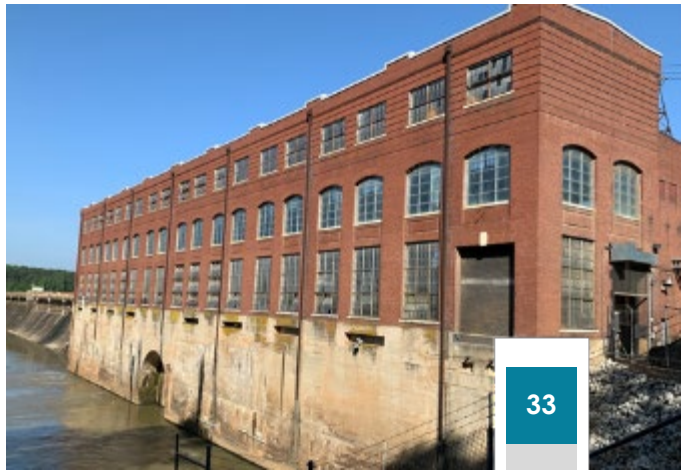
Broad RBC Recommendations

Example Policy, Legislative, and Regulatory Recommendations

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.



Identified Issues, Challenges, and Threats

- Surface water resources of the basin are over-allocated based on existing permit and registration amounts.
- Currently only one surface water user in the Broad River basin is subject to Minimum Instream Flow requirements under the SC Surface Water Withdrawal Law.
- Potential threats include:
  - urbanization
  - reservoir sedimentation
  - more severe droughts
  - increasing temperatures which increase evaporative losses

Photo credit: Todd Pusser

Implementation Plan

The RBC-developed implementation plan includes specific short-term (5-year) and long-term strategies and actions to address the following five objectives:

1. Improve water use efficiency to conserve water resources
2. Optimize and augment sources of supply
3. Improve drought management
4. Effectively communicate RBC findings and recommendations
5. Improve technical understanding of water resource management issues

Example Implementation Strategy

Strategy		5-Year Actions	Responsible Parties	Budget
Objective 1. Improve water efficiency to conserve water resources.				
A. Municipal Conservation	Public Education of Water Conservation	1. Identify **funding** opportunities (Years 1–5). 2. Establish a **baseline of residential per capita water use** (Year 1) by system. 3. Implement **outreach and education program** about recommended water management practices and funding opportunities (Years 1–5). 4. Individual water users to **implement conservation practices** (Years 3–5). 5. Develop **survey of practices implemented**, funding issues, and funding sources used (beginning in Year 5 as part of 5-year plan update). 6. **Review and analyze per capita water usage** to improve understanding of water savings of strategies (beginning in Year 5 as part of 5-year plan update).	**The RBC with support of SCDHEC, SCDNR, and contractors** — Identify funding opportunities and develop information to distribute. Conduct surveys and analyze results. **Municipal Withdrawers** — Implement appropriate strategies and seek funding from recommended sources, as necessary.	Costs of implementation will vary by municipality according to current program capabilities and financial means. Chapter 6.1.6 provides discussion of cost-benefit of individual strategies. Ongoing RBC meeting budgets include the cost of RBC support activities.

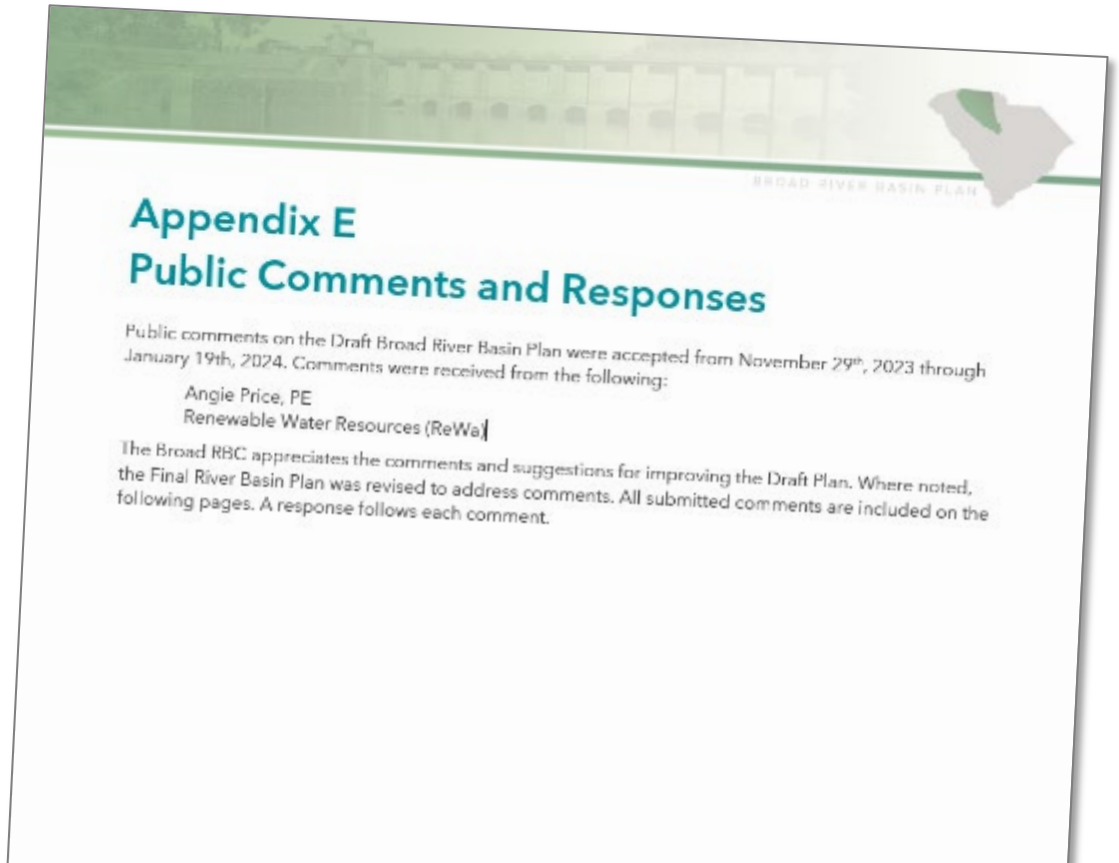
Summary of Draft Plan Comments and Responses

Public Comments and Responses

Public comments on the Draft Broad River Basin Plan were accepted from November 29th, 2023, through January 19th, 2024. Comments were received from the following:

Angie Price, PE

Renewable Water Resources (ReWa)



The comments and RBC responses are documented in Appendix E of the Final Plan

Public Comments and Responses

1. In the executive summary, numerous objectives are outlined. Clarification regarding the entities or individuals accountable for these objectives is sought to facilitate public engagement and coordination for implementation. A mechanism to track progress with the implementation of these objectives and measure success would be beneficial to stakeholders.

Response: For brevity, only the objectives and associated strategies and actions to meet those objectives were included in the Plan's Executive Summary. Table 10-2 of the Plan identifies the entities responsible for implementing each action and/or strategy. A note has been added to the Executive Summary to make the reader aware of the additional implementation details that are included in Table 10-2 of the Plan. As part of the Broad RBC's ongoing planning efforts, they will be tracking the implementation of the identified actions and strategies. Progress metrics, which are listed in subchapter 10.3 of the Plan, were selected by the Broad RBC to monitor the success or failure of actions and strategies. The Broad RBC will continue to review the progress metrics to measure the effectiveness of their implementation efforts.

Public Comments and Responses

2. To enhance the River Basin Planning process, it is recommended that additional communication channels be used to share the outcomes of the planning efforts to a broader audience. Please consider the creation of succinct fact sheets or informative short videos to benefit public accessibility throughout the planning process and moving forward.

Response: The RBC appreciates the comment and agrees that reaching a broader audience will be critical during implementation of the Plan. A two-page fact sheet was created to summarize the Plan's key findings and can be found at: hydrology.dnr.sc.gov/pdfs/basin-planning/broad/Broad RBP Summary Sheet.pdf. The RBC will consider creating additional facts sheets, videos, or other methods to improve accessibility and public understanding as they continue to meet during the implementation phase.

Public Comments and Responses

3. ReWa supports the establishment of a model riparian buffer ordinance, aligning with recommendations included in the Policy, Legislative, Technical, and Planning Process section. Significant streambank erosion, particularly in the Enoree River sub-basin, poses a threat to wastewater infrastructure. Protecting streambanks through natural vegetative growth not only benefits water quality but also safeguards essential infrastructure. The Plan suggests that either the Broad RBC or PPAC take the lead in developing the model ordinance. For optimal implementation, local government representatives should be involved in the development process and targeted as stakeholders for communication and education initiatives of the Broad RBC.

Response: The RBC appreciates the comment.

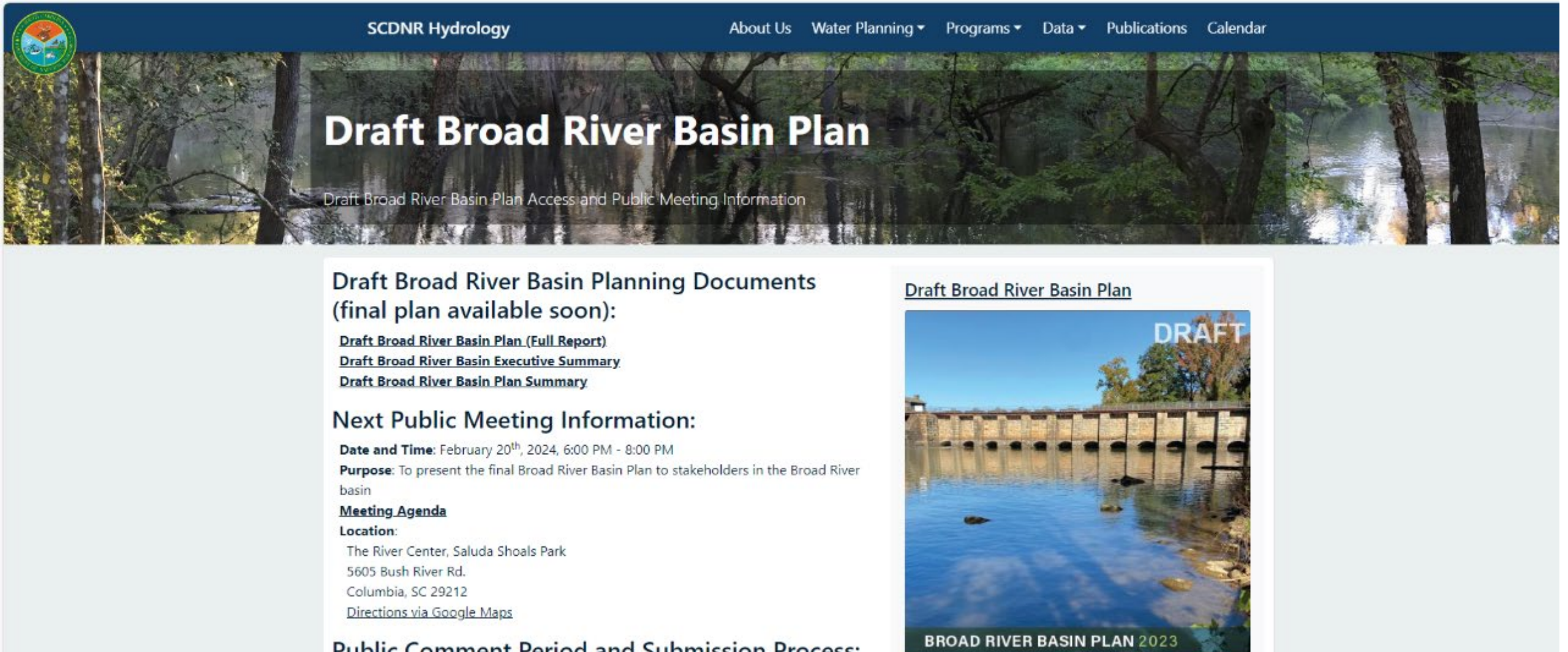
Public Comments and Responses

4. ReWa fully supports water reuse as a potential strategy to "reduce demands on surface water and groundwater" ultimately extending source water supplies. The challenges posed by contaminants of emerging concern (CECs) are an issue common to many source waters, not exclusively to reuse water. Like other water sources, reuse water has been impacted by the prevalence of contaminants of emerging concern in our daily lives. A continued focus on source control, research, and affordable treatment methods is essential to ensure that all water resources are protected including reuse water. Preserving water reuse as a viable and sustainable option in the long-term is imperative.

Response: The RBC appreciates the comment.

The Final Broad River Basin Plan is available at:

https://hydrology.dnr.sc.gov/broad-river-basin-plan.html



Additional Public Comments and Q&A with the RBC