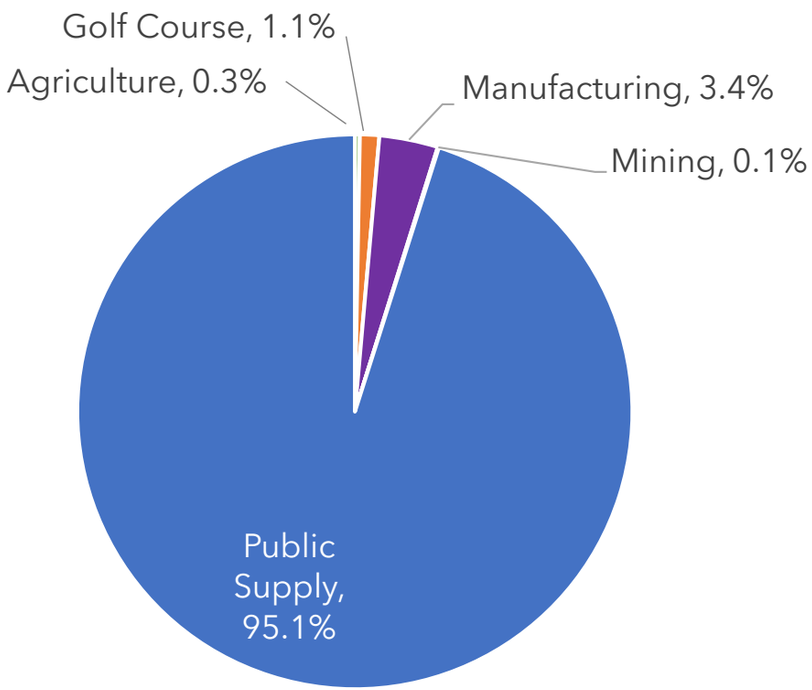
Overview of the Broad River Basin Plan Findings and Recommendations

Current Water Demands in the Broad River 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**

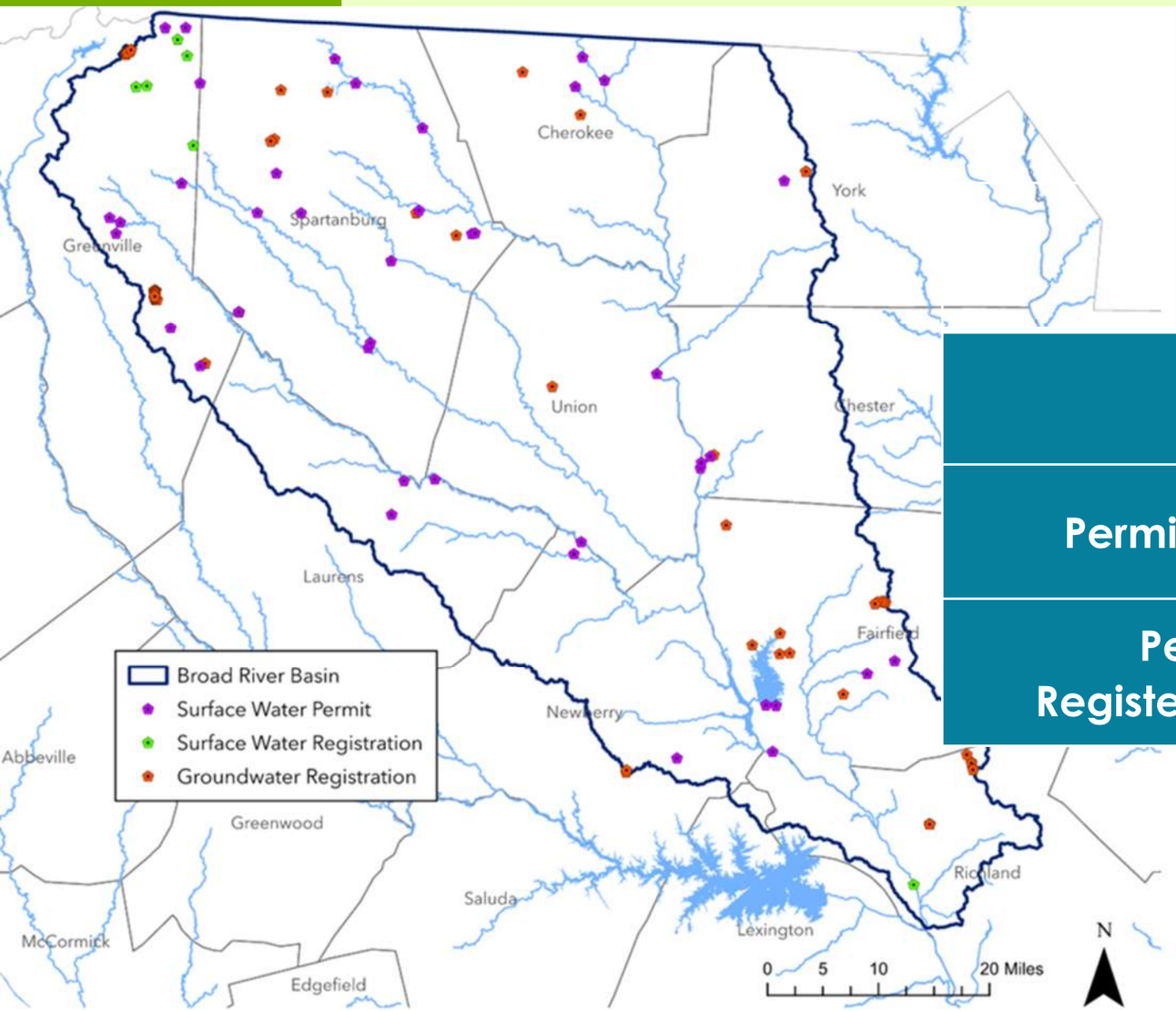
[1] Most thermoelectric withdrawals are returned to the river.



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

Key Finding

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

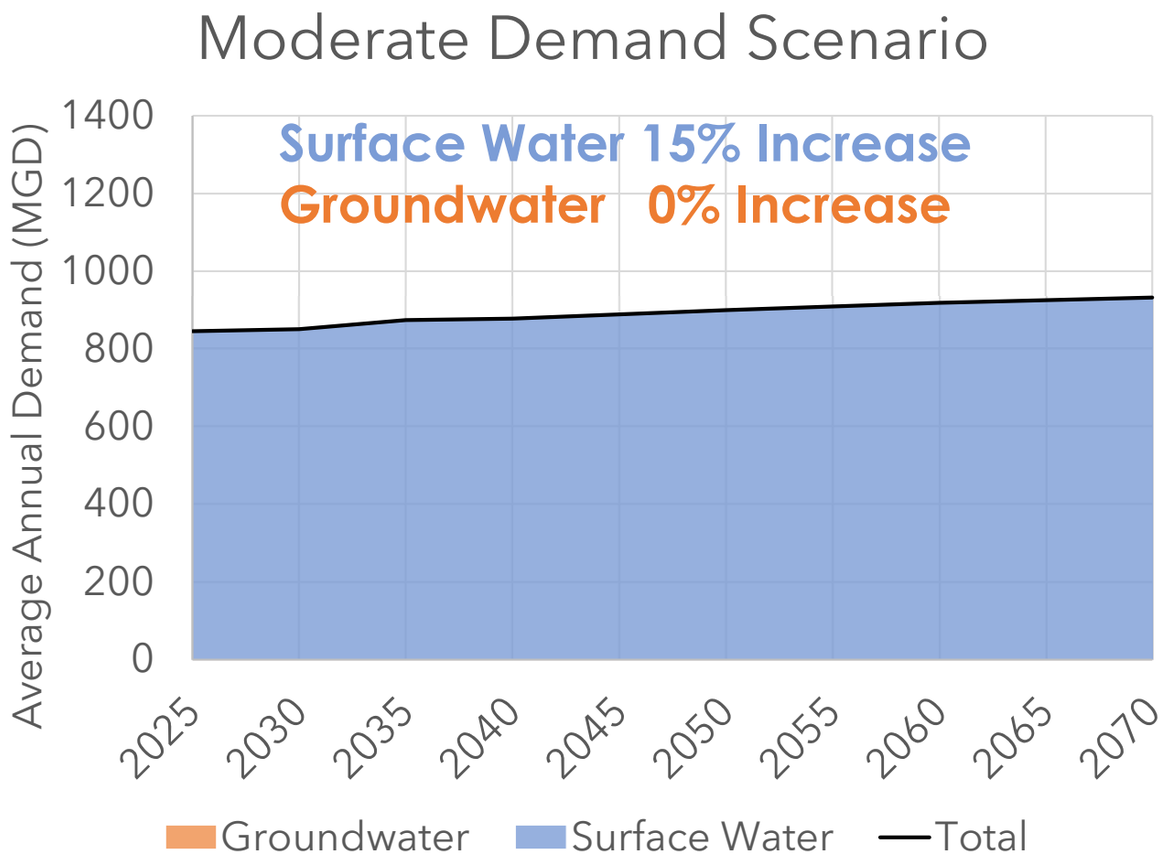


	Surface Water (MGD)
Currently Used	809
Permitted and Registered Amount	1,542
Percent of Total Permitted and Registered Amount Currently in Use	52%

Future Water Demand Scenarios for the Broad 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

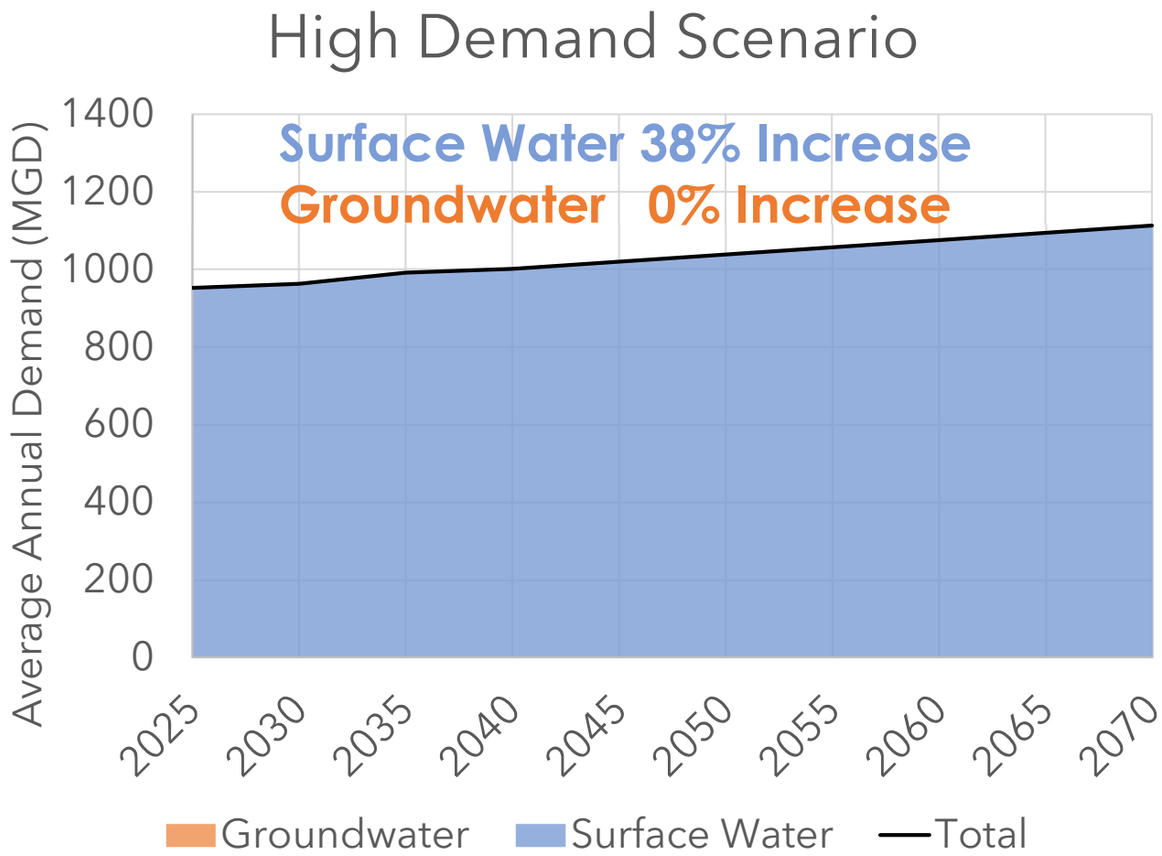


Note: Groundwater demands, projected at a constant average annual demand of 0.8 MGD are too small to be seen on this chart.

Future Water Demand Scenarios for the Broad Basin

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

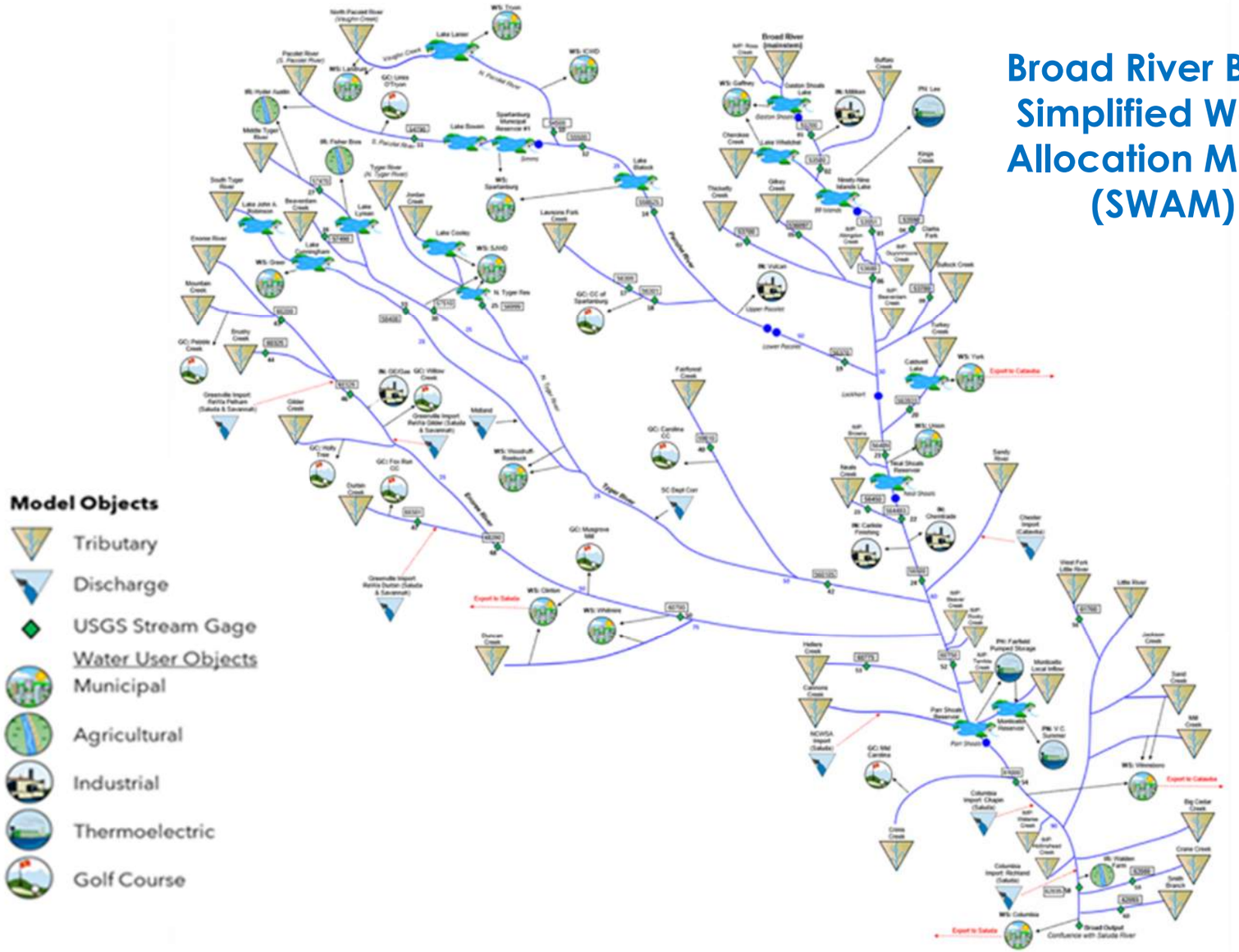
2070 surface water demands for this scenario are 72% of Permitted and Registered amounts



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

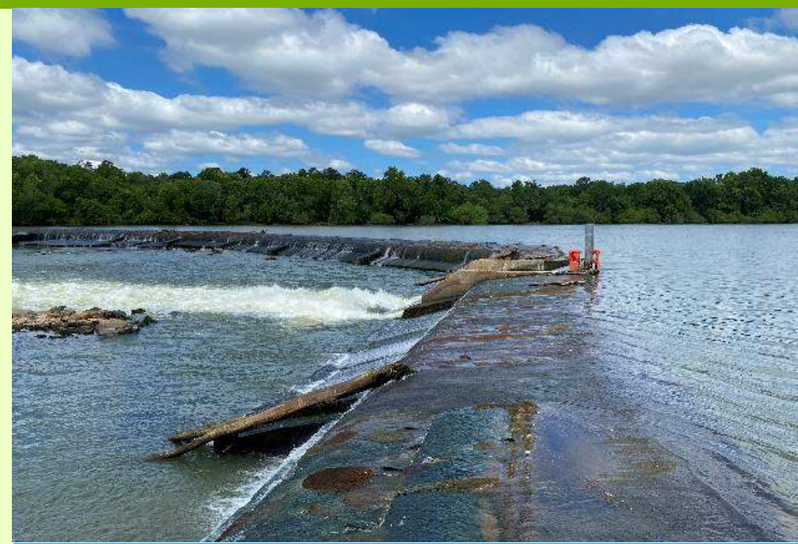
The surface water model was used to compare available supply to current and projected water demands

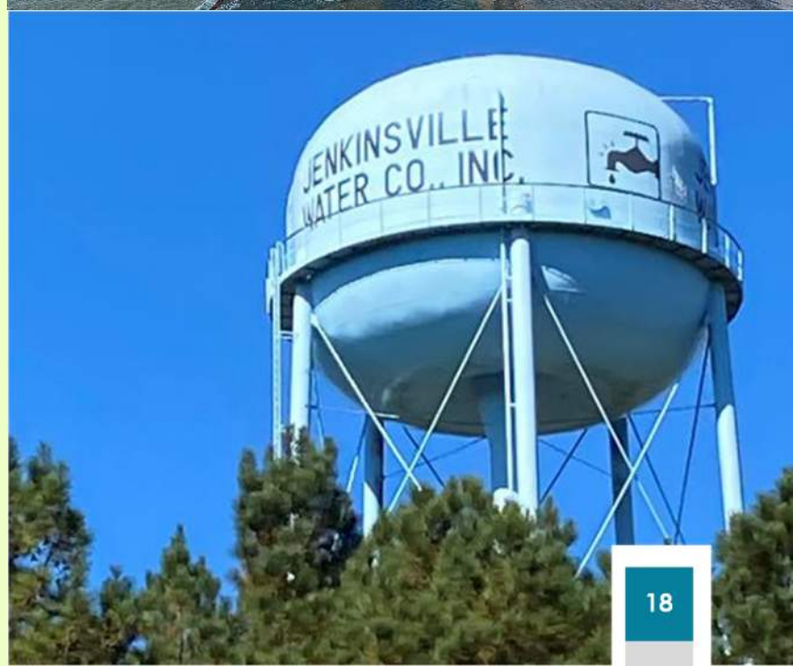


Broad River Basin Simplified Water Allocation Model (SWAM)

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

Key Finding

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

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



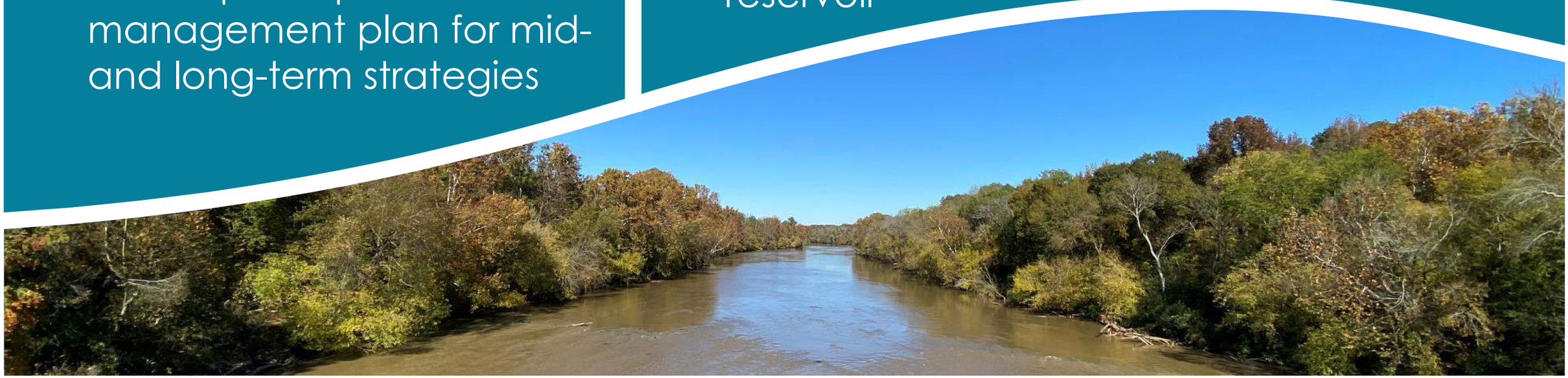

Recommended Supply Side Strategies for Cherokee County BPW (Gaffney):

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



Planning Process Recommendations

1. Conduct regular (e.g., annual) reviews of the RBC membership to make sure all **interest categories** are adequately represented.

2. Consider developing and executing a **communication plan** early in the initial 2-year planning process and conducting education and outreach prior to completion of the River Basin Plan.

3. SCDNR should take lead in organizing an annual state-wide 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.

Technical and Program Recommendations

1. Consider incorporating **future climate projections** into modeling analyses to better address potential supply-side changes in hydrology. **Consider incorporating historical climate information such as tree ring data** to inform drought risk and/or drought scenarios.

2. 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.

Technical and Program Recommendations

3. Identify funding mechanisms to support continued USGS efforts to **maintain and expand streamflow gages**.

4. Funding and establishment of a **mesoscale network of weather and climate monitoring stations** in South Carolina.

5. Evaluate the impact of **future land use changes** on water resources quantity and quality.

6. Identify potential **pinch points** where current and projected low flows may lower the **assimilative capacity** of the streams.

Technical and Program Recommendations

7. Future planning efforts in the Broad River basin should include evaluation of **surface water quality**, including nutrient loading and sedimentation.

8. Further investigation and potential piloting of **low-tech, process-based approaches to stream restoration.**

9. 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.

Drought Management Recommendations

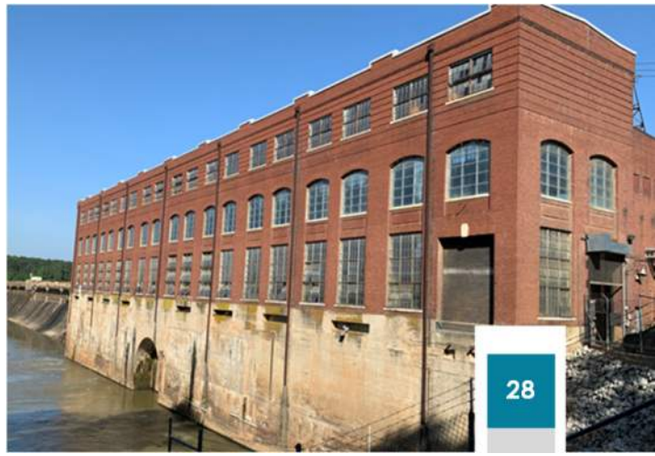
1. Water utilities should **review and update their drought management plan and response ordinance every 5 years** or more frequently if conditions change.
2. Water utilities should look for opportunities to develop drought response actions that are **consistent** with those of neighboring utilities.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

Policy, Legislative, and Regulatory Recommendations

1. When considering permit applications, **reasonable use criteria should be applied to surface water withdrawals**, like they currently are for groundwater withdrawals.

2. 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.

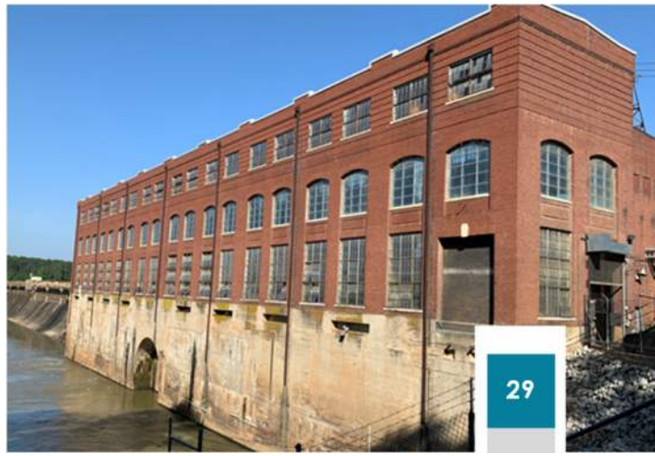
3. Water law and implementing regulations should **not distinguish between registrations and permits**. All water users that withdraw above the identified threshold should be required to apply for a water withdrawal permit.



Policy, Legislative, and Regulatory Recommendations

4. 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.

5. The Broad RBC or the PPAC should develop a **model riparian buffer ordinance** for local jurisdictions to consider.



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.

Submitting Comments of the Draft Plan

The Draft Broad River Basin Plan is available at:

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

Comments can be e-mailed to Dr. Tom Walker at:

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Comments must be received by: December 29, 2023