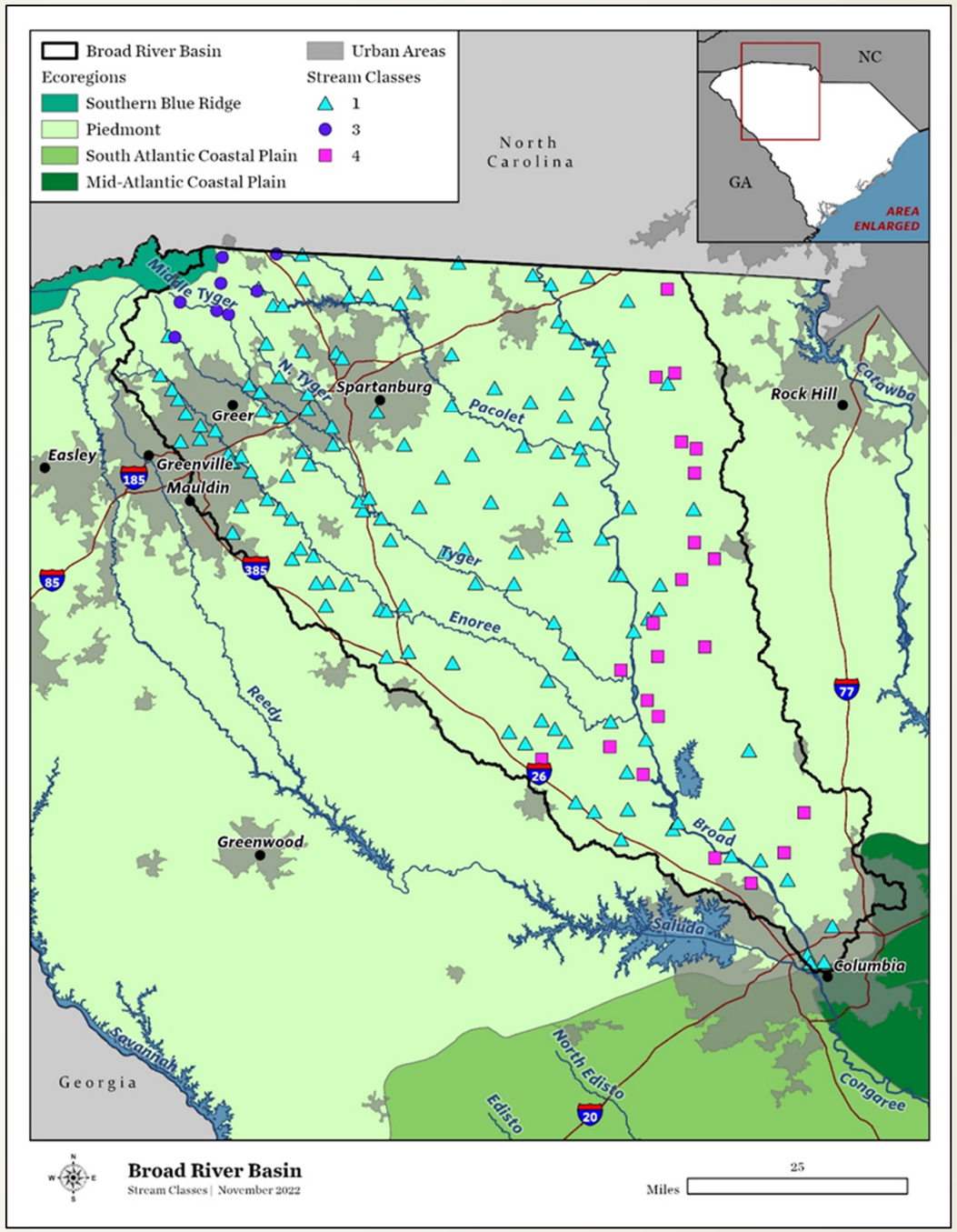
Proposal

- Incorporate 5 flow-ecology metrics as performance measures of Broad River water use scenarios. They are:
  - Mean Daily Flow
  - Duration of High Flow
  - Frequency of High Flow
  - Duration of Low Flow
  - Timing of Low Flow

- These were chosen based on:
  - Relevance to water withdrawal and drought management
  - Strength of relationship
  - Distribution: All stream classes and basin area represented
  - Readily calculable in SWAM

Proposal


Broad River Basin
Urban Areas
Ecoregions
Stream Classes
Southern Blue Ridge
Piedmont
South Atlantic Coastal Plain
Mid-Atlantic Coastal Plain
1
3
4
North Carolina
NC
GA
AREA ENLARGED
Middle Tyger
N. Tyger
Spartanburg
Greer
Pacolet
Rock Hill
Catawba
Easley
Greenville
Mauldin
185
385
85
Tyger
Enoree
Reedy
77
26
Broad
Greenwood
Saluda
Columbia
Savannah
Georgia
North Edisto
Edisto
20
Congaree
Broad River Basin
Stream Classes | November 2022
25
Miles

Proposal

- **Why?** This enables you to evaluate the actual impact on the basin's health *and* compare multiple scenarios quickly

- **How** to use them? There are multiple possibilities. We recommend:
  - Evaluate the performance of water use scenarios on stream and river health
    - Strategic nodes, stream reaches of interest, and selected tributaries.
  - Use them in a risk management context: high, medium, low risk (we have an example)

Proposal: Low-Med-High Risk Ranges

	Instream Flow Performance Recommendations and Risk Ranges											
Stream Type:	**Piedmont Perennial Runoff**			**Piedmont Flashy**			**SE Plains Perennial Runoff**			**SE Plains Stable Baseflow**		
							Risk Ranges					
	Low	**Med**	**High**	**Low**	**Med**	**High**	**Low**	**Med**	**High**	**Low**	**Med**	**High**
Flow Metric												
Mean Daily Flow (FR)	>0.78	0.64-0.78	<0.64	>0.71	0.49-0.71	<0.49	>0.66	0.42-0.66	<0.42	>0.75	0.52-0.75	<0.52
Duration of High Flow (NF)				<0.16	0.16-0.39	>0.39						
Frequency of High Flow (MS)				<0.20	0.20-0.43	>0.43						
Low Flow Duration (FR)										<0.13	0.13-0.40	>0.40
Calendar Day of Lowest Flow (BHF)	>327											
Calendar Day of Lowest Flow (NF)				<278								
Calendar Day of Lowest Flow (MT)				>285								

FR=Fish Species Richness: The number of fish species found in a stream or river reach

NF=Nesting fishes - the group of fish species who build nests for their eggs, and typically guard the site and the young hatchlings.

MS=Shannon diversity of aquatic insects. Shannon diversity accounts for both the number of species at a site, and also how equally their numbers are distributed

BHF=Brood hiding fishes. Brood hiders bury or place their eggs in a concealed location, but do not guard or provide any parental care

MT=Macroinvertebrate Tolerance: Aquatic insects which tolerate stagnant water, low oxygen and pollution. This includes worms, nematodes, gnats, mosquitoes, etc.

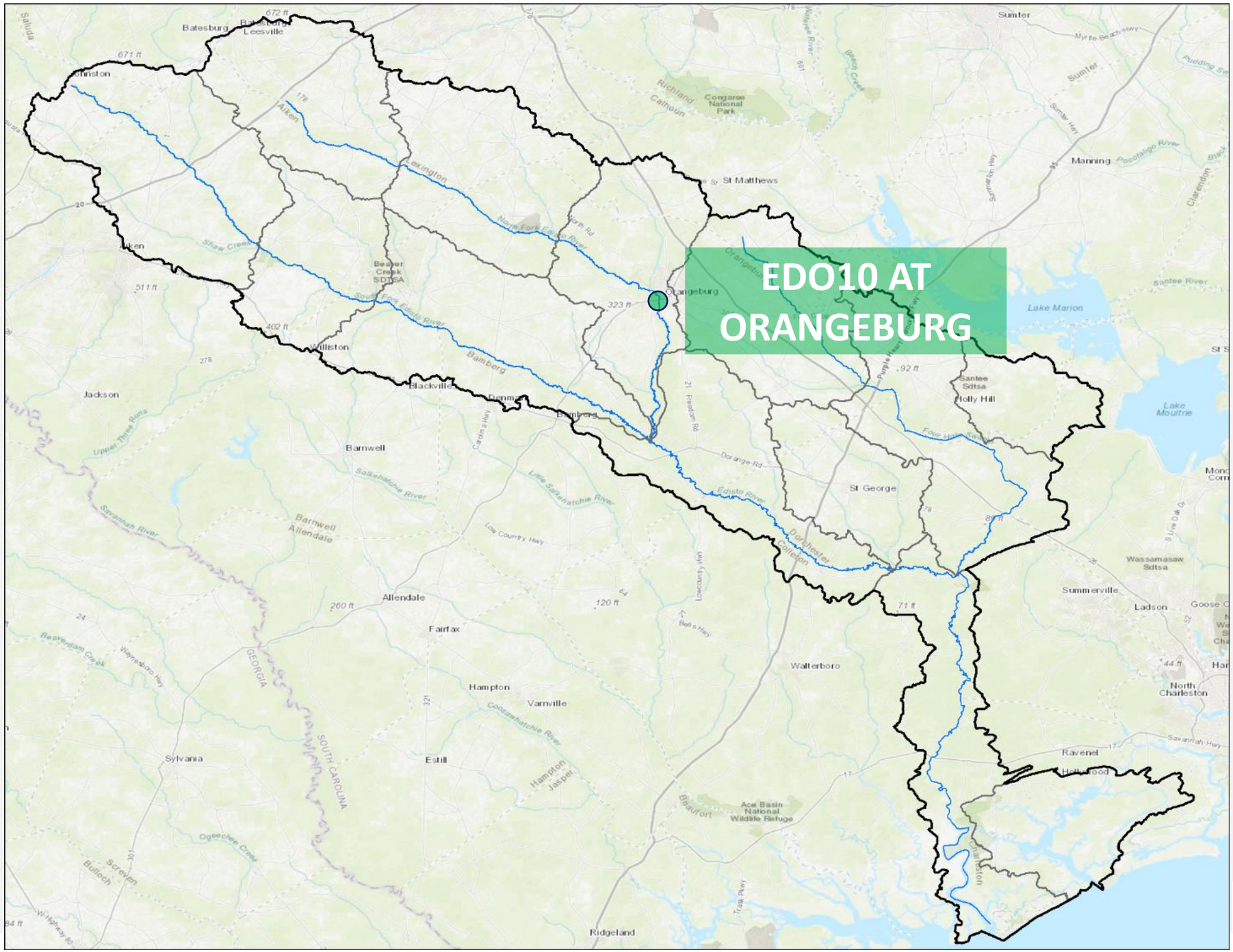
EDO10

HUC 10 Outlet

USGS Gage

Other Strategic Nodes

Flow Performance Measures



Mean daily flow: EDO10 NORTH FORK

Scenario	Current	Predicted	% change	Bio Metric	Change in Bio	SE
UIF	723.21	741.43	2.5%	Richness	1.9%	15
HD 2070	723.21	709.94	-1.8%	Richness	-1.4%	15
Full	723.21	622.04	-14.0%	Richness	-10.4%	15
BAU	723.21	721.48	-0.2%	Richness	-0.2%	15