



Water Shortage Response Plan Update

City of Hendersonville, NC

July 2026

What is a Water Shortage Response Plan?

- Staged response for water supply shortages
 - Lack of source water (drought, contamination, etc)
 - Equipment failure
 - High system demands
 - Etc.
- Stages become more restrictive based on the shortage severity
 - Voluntary to Mandatory
 - Uses of water: non-essential, socially/economically essential, essential
 - Prohibit or reduce uses
- Legally mandated NCGS 143-355 (1)
- Hendersonville must update its WSRP for the new French Broad River Intake

Overview – Hendersonville's Water Supply



Current Water Supply

Source	Normal Conditions	Drought Conditions*
Mountain Reservoirs	4.5 mgd	~ 0 mgd
Mills River	12 mgd	>2 mgd
French Broad River	15 mgd	15 mgd
TOTAL	31.5 mgd	>17 mgd

- 2025 Average Day Demand: 7.7 mgd
- 2025 Max Day Demand: 9.9 mgd
- 2040 Average Day Demand: 11.4 mgd
- 2040 Max Day Demand: 17.0 mgd

* Drought Conditions are defined in current WSRP as when the Mills River USGS gauge

What is a Stream Gauge?

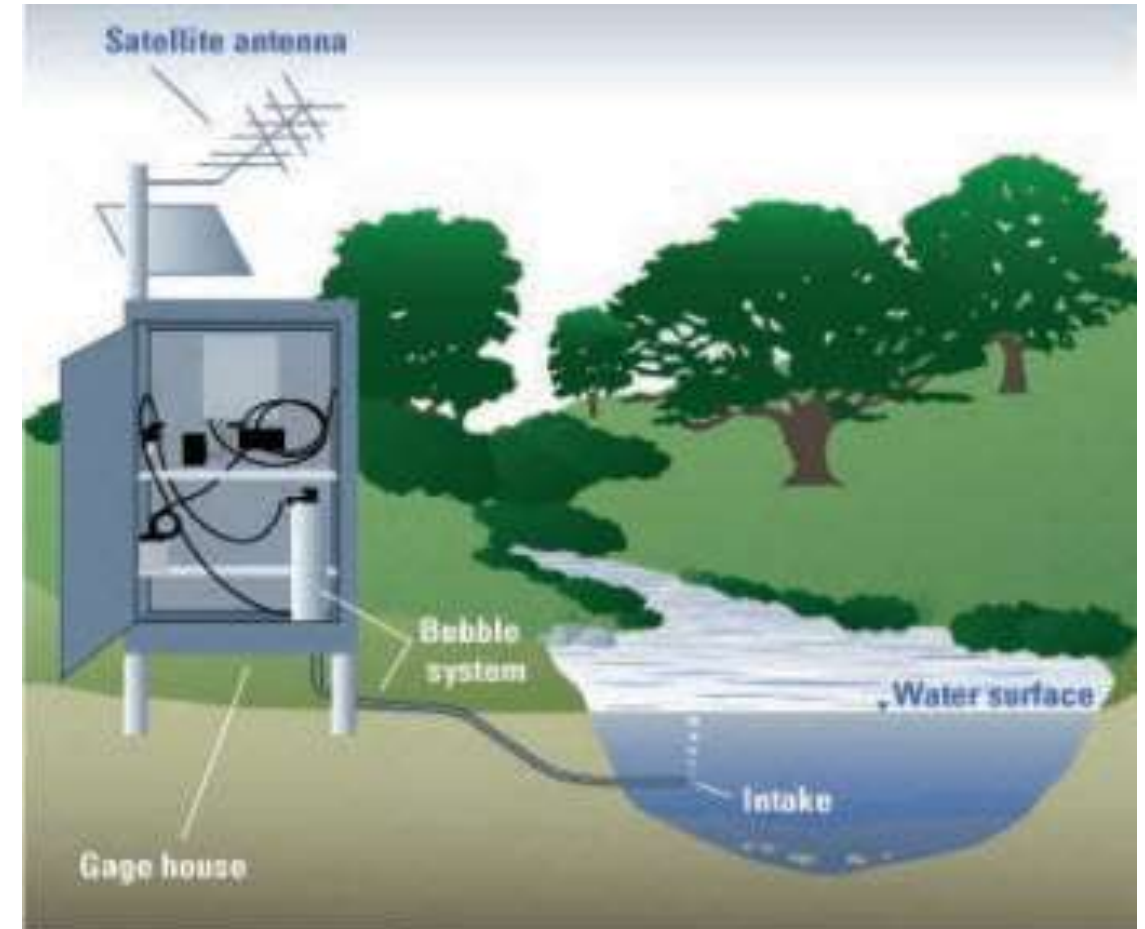
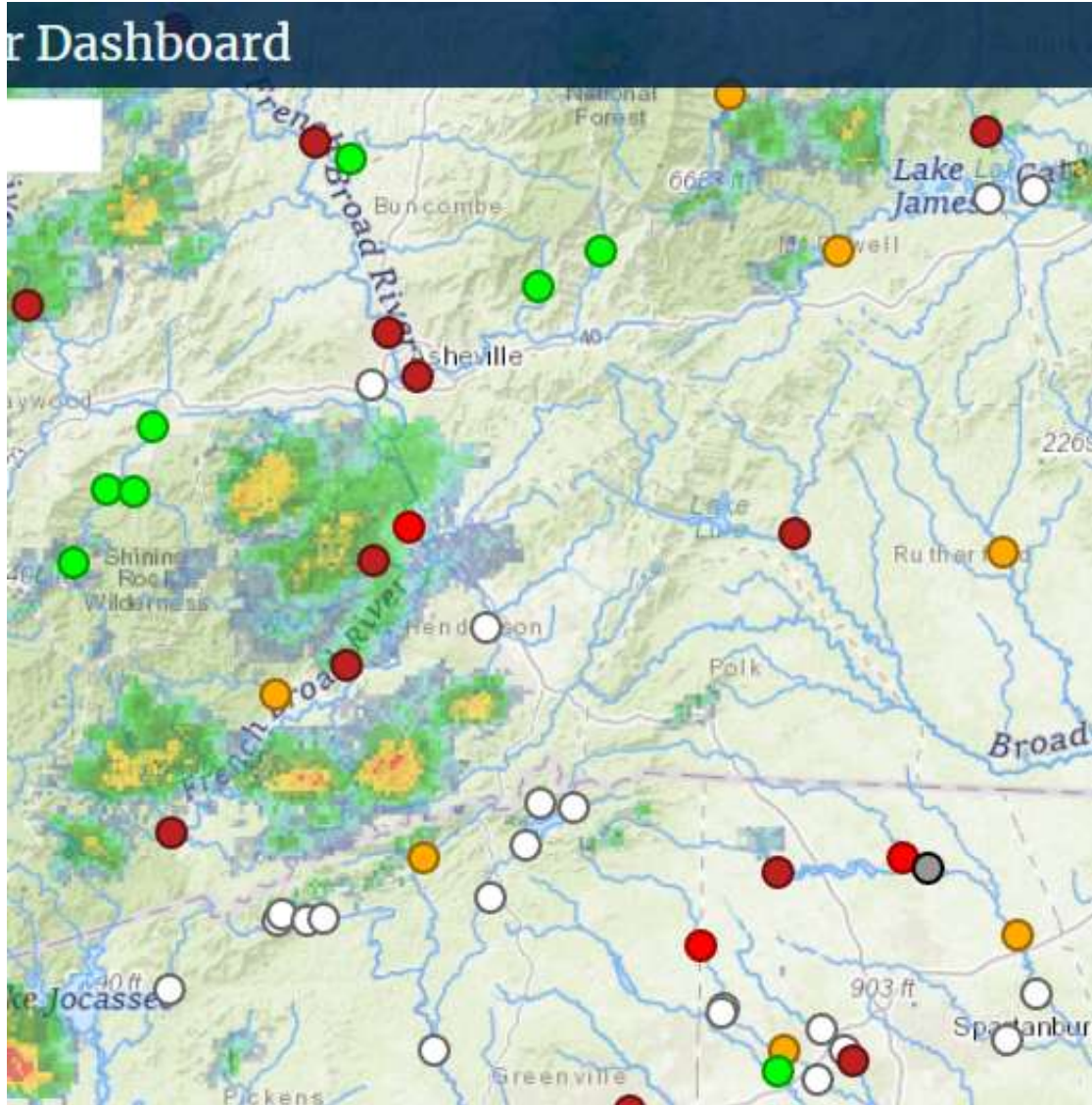


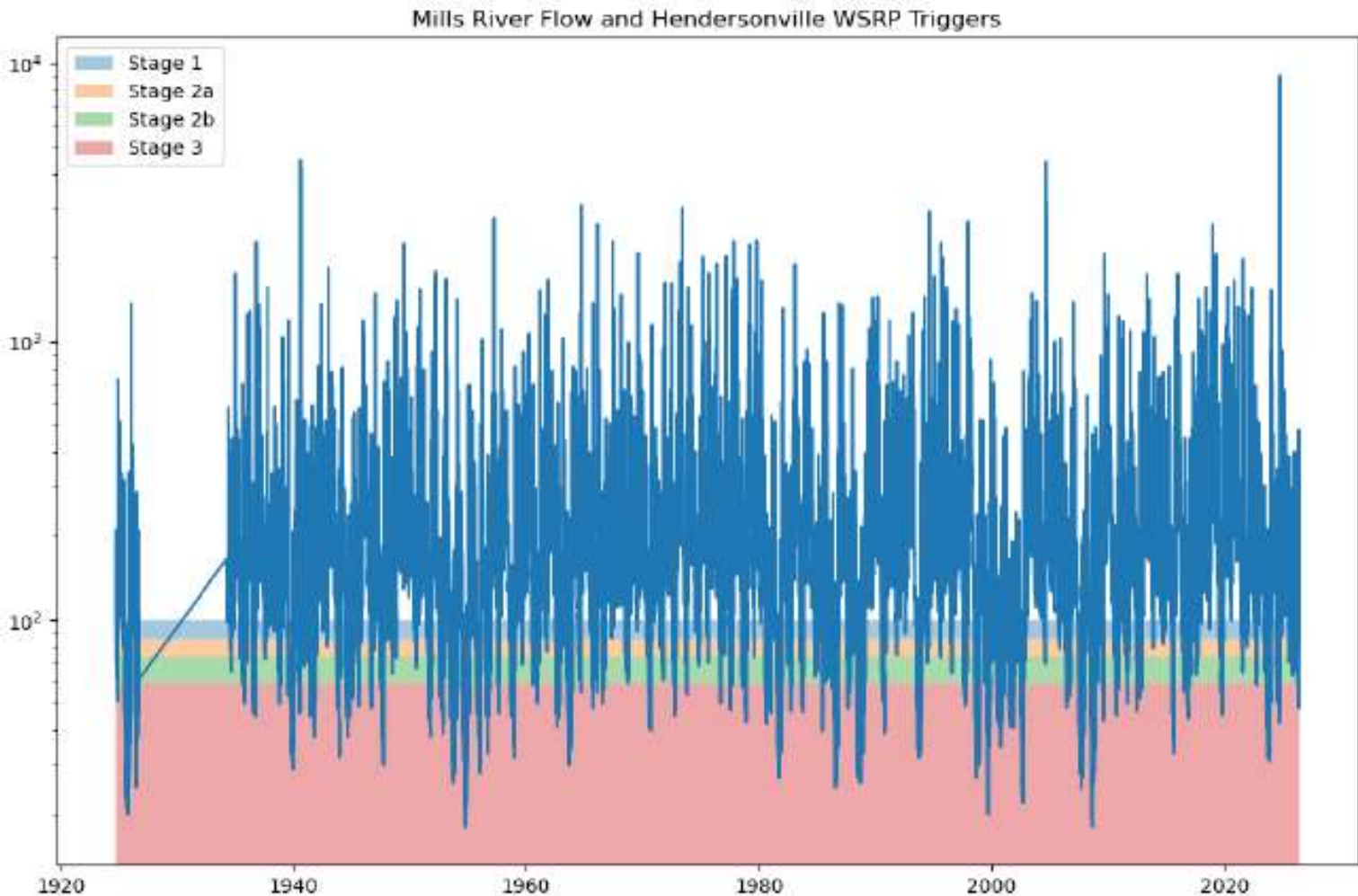
Figure 2. Diagram of a typical streamgauge installation with equipment used to measure stream stage (by L.S. Coplin, U.S. Geological Survey).

Current WSRP triggers frequency analysis

As written, current WSRP has some logical inconsistencies– assuming those were errors, this would be the current WSRP requirement

- Made some adjustments for consistency:
 - Stage 1: Flow between 32.5 to 25th percentile for seven consecutive days within a 30-day period
 - Stage 2A: Flow between 24.5 to 19th percentile for 3 consecutive days
 - Stage 2B: Flow between 19 to 11.5th percentile for 3 consecutive days
 - Stage 3: Flow less than 11th percentile for 3 consecutive days

Stage	Occurrence Frequency (stage or greater)	
1	23.6%	
2a	17.6%	
2b	14.1%	
3	9.1%	



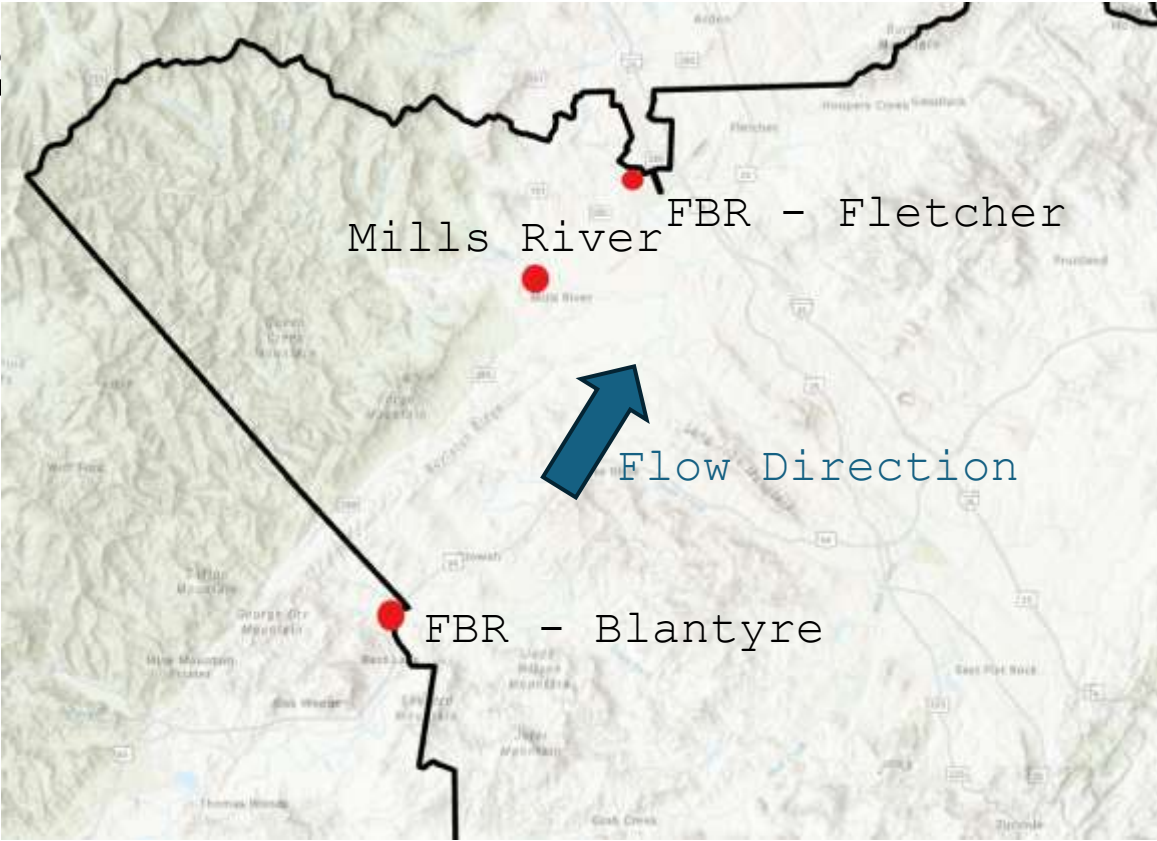
Setting Stage Triggers

- A River's 7Q10 - hydrologic benchmark representing the lowest consecutive 7-day average streamflow that statistically occurs once every 10 years.
- Regulatory agencies generally allow withdraws of 20% of 7Q10 streamflow and broadly assume no environmental impacts.

Stage	Source Water Demand	Withdraw within 20% 7Q10	Response
1 - Advisory	Current Full Capacity - 15mgd	Yes	Voluntary. Limit all non-essential uses
2 - Warning	Current Average Day Demand - 7.75mgd	Yes	Mandatory. Further limit or prohibit certain non-essential uses
3 - Alert	20% of Reduction of Current Average Day Demand -	Yes	Mandatory. Prohibit non-essential uses. Limit socially and economically essential uses.

Proposed Trigger

- All three river gauges at or below flow trigger for a 7-day rolling average
- 14-day waiting period to move into next severe response level
- Exit a stage if above a flow trigger for a 7-day rolling average (no



Stage	Mills River (USGS 03446000) cfs	FBR Blantyre (USGS 03443000) cfs	FBR Fletcher (USGS 03447687) cfs
1 - Advisory	42	178	237
2 - Warning	42	165	214
3 - Alert	42	158	201
4 -			

Water Use Classifications –

Class	Domestic	Commercial/Industrial	Public
Essential	Sustain life, hygiene and basic sanitation	none	Public Safety, Firefighting, Hospital and Patient Care
Socially/Economically Essential	Kitchen, laundry, minimal watering of vegetables/trees to sustain life	Commercial vehicle washing, laundromats, irrigating golf course greens, minimal irrigation to sustain livestock/crops, cooling operations	Filling Swimming Pools indented for use by public serving multiple households, schools, government facilities
Non-Essential	Washing vehicles, lawn irrigation, washing impervious surfaces,	Irrigating lawns, parks, golf courses	Irrigating public parks and recreational areas

Current Plan

Stage Title	Reduction Goal	Allowable Rate Surcharge	Effectiveness
1 - Advisory	10%	0%	Voluntary
2a - Alert Level 1	20%	110%	Mandatory
2b - Alert Level 2	30%	120%	Mandatory
3 - Emergency	40%	130%	Mandatory

Proposed Plan

Stage Title	Reduction Goal	Allowable Rate Surcharge	Effectiveness
1 - Advisory	5%	0%	Voluntary
2 - Warning	10%	110%	Mandatory
3 - Alert	20%	120%	Mandatory
4 - Emergency	30%	130%	Mandatory

Frequency Analysis: Proposed Triggers with Current Demands

- With current proposed triggers and associated WSRP assumptions, drought stages are almost never triggered with historical hydrology
- The proposed trigger levels for the French Broad flow, especially at Fletcher, are the most limiting to WSRP stage implementation– flows rarely drop below the proposed trigger levels

WSRP Stage Frequency Analysis				
	Stage 1 or greater	Stage 2 or greater	Stage 3 or greater	Stage 4 or greater
Total days (in Pd. of record)	80	40	0	0
Total yrs	3 (1954, 2002, 2008)	1 (1954)	0	0

	Mills River 7-Day Avg Flow	FB @ Blantyre 7-Day Avg Flow	FB @ Fletcher 7-Day Avg Flow
Days where Stage 1 trigger is met	3.80%	0.30%	0.12%
Days where Stage 2 trigger is met	3.80%	0.19%	0.02%
Days where Stage 3 trigger is met	3.80%	0.14%	0.00%
Days where Stage 4 trigger is met	3.80%	0.09%	0.00%

Summary of Changes

- FBR Intake reduces the historic daily

Stage/Level	Current WSRR Occurrence Frequency	Proposed WSRP Occurrence Frequency	Reduction %
1 - Advisory	23.6%	0.12%	99.5%
2 - Warning	17.6%	0.02%	99.9%
3 - Alert	14.1%	0%	~100%
4 - Emergency	9.1%	0%	~100%

- Minor revisions to stage titles and reduction goals
- No major revisions to water use classifications, conservation measures, or

Next Steps

- Adoption by City Council at upcoming meeting.
- Recommendation from the Water and Sewer Advisory Council.