

BASIN 6 HIWASSEE RIVER

BASIN DESCRIPTION

The Hiwassee River Basin is one of six basins in North Carolina that drain the western slope of the Eastern Continental Divide and flow into the Mississippi River System emptying into the Gulf of Mexico. The basin drains 641 square miles of Clay and Cherokee counties and is part of a 2,099 square mile basin that begins in Georgia, flows through North Carolina, and merges with the Tennessee River at Chickamauga Lake in eastern Tennessee. The entire river is regulated by the Tennessee Valley Authority for hydropower production. Three dams in North Carolina form Chatuge Lake, Hiwassee Lake, and Apalachia Lake. The basin is predominantly mountainous with over 80% of the land area forested, much of it in the Nantahala National Forest.

WATER USE

Factors Affecting Water Demand

This basin is home to less than 1% of the state's residents and contains all or part of three municipalities in Clay and Cherokee counties. From 1990 to 1997 year-round population in both counties grew by over 10%.

Total Water Use in Basin

The U.S. Geological Survey's (USGS) 1995 summary of water use estimated total water use in the basin at 11.1 million gallons per day (mgd), with 85% coming from surface water sources. USGS estimated total basin population at 28,910. Residential demand was estimated at 1.7 mgd with about 40% of this demand being supplied by public water systems. Overall, public water systems supplied 1.4 mgd of surface water and 0.25 mgd of ground water for both residential and non-residential uses. The remaining residential water demand was met by one mgd of self-supplied ground water. In addition, about 0.9 mgd of self-supplied water was withdrawn for non-residential water uses.

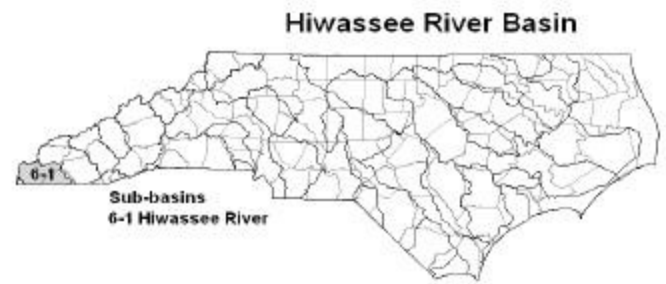
Local Water Supply Plans (LWSPs)

Units of local government that supply or plan to supply water to the public are required to develop a LWSP. The Division of Water Resources (DWR) reviews LWSPs and maintains a database of the LWSP information. This summary is based on data contained in the 1997 LWSPs.

LWSPs were submitted by four public water systems using water from this basin. These systems supplied 1.8 mgd of water to 9,070 persons. The following table summarizes the LWSP population served with water from this basin and its water use for 1997.

1997 LWSP System Water Use from Basin (mgd)				
Sub-basin	LWSP Population	Residential Use	Non-resid. Use	Total Use*
Hiwassee River	9,070	0.87	0.54	1.8

*Total Use includes unaccounted-for water and system process water.



Residential water use accounted for 48% of total use while non-residential use accounted for 29% of total use and 18% was unaccounted-for water.

LWSP systems expect to supply water to 12,441 persons by the year 2020, a 37% increase over 1997 levels. Their demand for water is projected to grow 40% to 2.5 mgd by 2020.

In the 1997 LWSPs, none of the four systems using water from this basin reported that its peak demands will exceed their water treatment capacity by 2010.

Water systems should maintain adequate water supplies and manage water demands to ensure that average daily use does not exceed 80% of their available supply. Data for 1997 indicated that two of the four LWSP systems in this basin had average demand above this threshold. By 2020, two systems project demand levels that will exceed 80% of their available supply.

Self-supplied Use

The USGS estimated that self-supplied users, excluding power generating facilities, accounted for 9.5 mgd of the 11.1 mgd total of water used from this basin, as shown in the table below. Livestock use dominated self-supplied uses consuming 83% followed by domestic (11%), irrigation (5%), and commercial (<1%).

1995 USGS Estimated Self-supplied Water Use in mgd						
Sub-basin	Domestic	Livestock	Industrial	Commercial	Irrigation	Total
Hiwassee R	1.05	7.89	0.00	0.06	0.50	10

Registered Water Withdrawals

Anyone withdrawing 1.0 mgd or more of surface or ground water for agricultural uses or 100,000 gallons per day for other uses is required to registered that withdrawal with DWR. Registered withdrawals in this basin are summarized in the table below.

Registered Water Withdrawals for 1999						
Sub-basin	Agricultural		Non-agricultural		Total	
	#	mgd	#	mgd	#	mgd
Hiwassee River	1	0.864	3	0.032	4	0.896

The users listed above include one aquaculture facility, two mining operations, and one private water system.

WATER AVAILABILITY

LWSPs indicate that two water systems in this basin (Andrews and Murphy) withdrew about 1.56 mgd of surface water in 1997.

The other two systems in this basin (Clay County WSD and Marble) depend on ground water, supplying an average of 0.26 mgd in 1997. They have an overall capacity to supply 0.27 mgd of ground water based on the 12-hour yields supplied in their LWSPs.

Surface water will continue to be a significant source of water for public water systems in the basin. Local water supply plans show that Andrews' reservoir can supply up to 0.8 mgd. Murphy, the other surface water system, has two run-of-river intakes with an estimated yield of 13 mgd

INTERBASIN TRANSFERS OF SURFACE WATER

Across the state many water users and systems move water between sub-basins to meet their needs. The service areas of the four local water supply plan systems in the basin do not overlap any basin boundaries and all water sources are located within the basin. Therefore, there are no potential interbasin transfer issues at this time for any of these systems.

SUMMARY OF INFORMATION FROM 1997 LWSPs

! Total per capita water use for the basin was 200 gallons in 1997 and is projected to increase to 205 gallons per day by 2010.

! All water systems within the Hiwassee River Basin are isolated and can not feasibly connect to any other water supplier.

! The systems used 1.56 mgd from surface water and 0.26 mgd ground water.

! The reported raw water supply was 13.8 mgd of surface water and a 12-hour groundwater supply of 0.27 mgd.

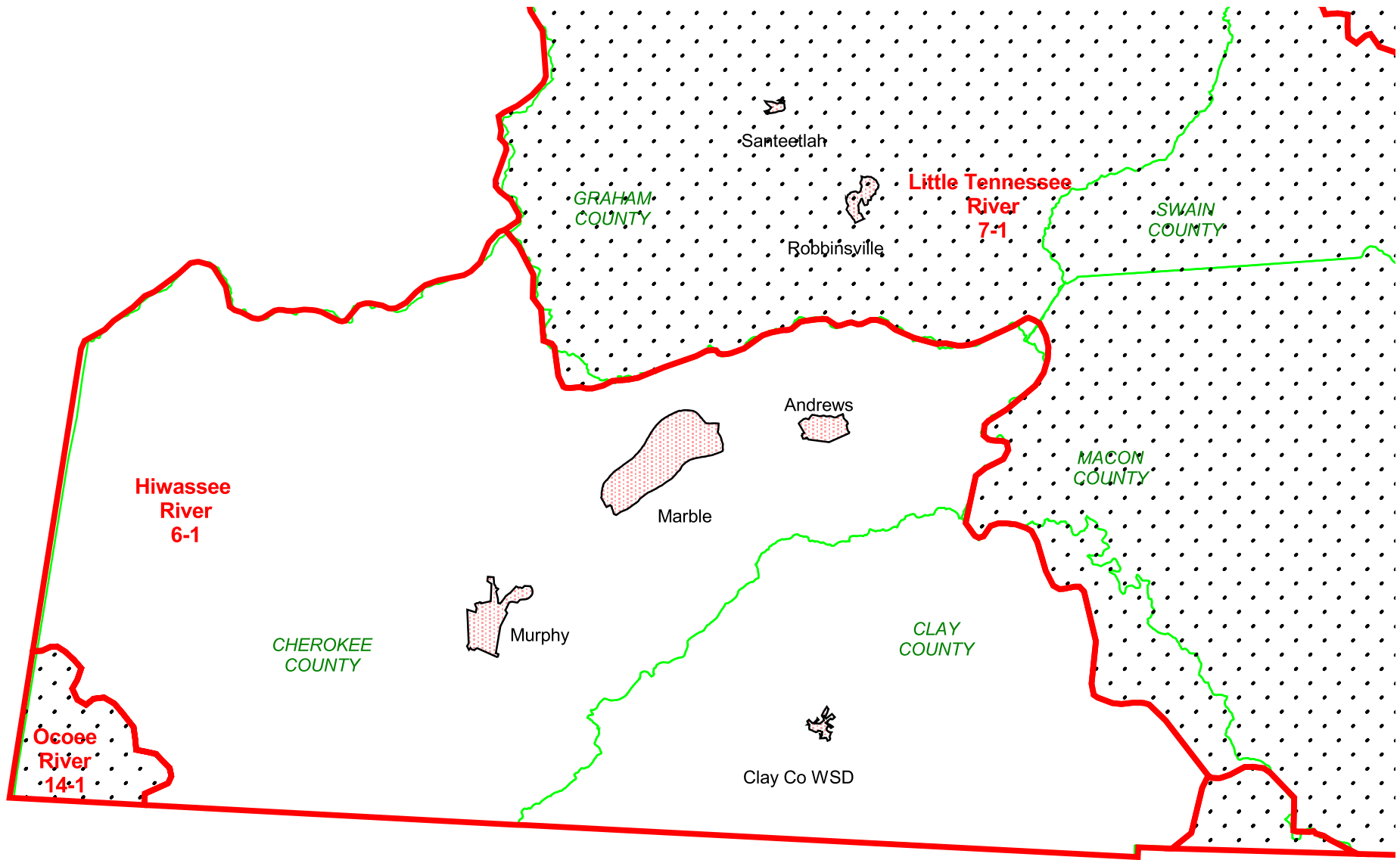
! The systems are projecting 37% growth in population and 40% growth in demand through 2020.

! Two systems were planning additional supplies totaling about 0.5 mgd in 1997 LWSPs.

! About 0.3 mgd of additional water supply will be needed by water systems to ensure that water demands in 2010 do not exceed 80% of available supply.

! Systems reporting high Demand-to-Supply Ratios:

	1997	2010
Demand exceeds available supply	1	1
Demand exceeds 80% of available supply	2	2



Basin 6 Hiwassee River

(unshaded basin)

- LWSP service area
- County Boundary
- Basin Boundary

HIWASSEE RIVER BASIN (6)

1997 and 2010 Population and Water Use as reported by LWSP systems using water from this basin.

Water systems showing "Demand as % of Supply" above 80% should be actively managing demand and pursuing additional supplies.

mgd = million gallons per day

Water Systems by County	Water Source or Supplier	Year-round Service Population		Average Daily Demand (mgd)		Available Supply (mgd)		Demand as % of Supply	
		1997	2010	1997	2010	1997	2010	1997	2010
CHEROKEE									
ANDREWS	Don Holland Res.	4160	5449	0.645	0.927	0.8	0.88	81%	105%
MARBLE	Bedrock Wells	1200	1500	0.092	0.132	0.154	0.154	60%	85%
MURPHY	Hiwassee River	2800	2900	0.914	0.925	13	13	7%	7%
CLAY									
CLAY CO WSD	Bedrock Wells	910	995	0.163	0.236	0.115	0.457	142%	52%