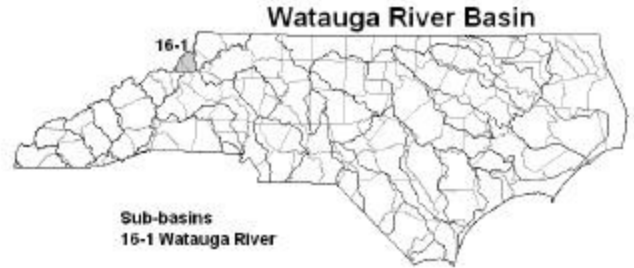


# BASIN 16 WATAUGA

## BASIN DESCRIPTION

The Watauga Basin is one of six basins in North Carolina that drain the western slope of the Eastern Continental Divide and eventually flow into the Mississippi River System and the Gulf of Mexico. The part of this basin in North Carolina constitutes 206 square miles of the headwaters of a larger 883 square mile basin mostly in Tennessee. The North Carolina section of the basin drains the mountains of Watauga and Avery counties through the Elk River and Watauga River. The rivers flow northwesterly into Watauga Lake in Carter County, Tennessee. Over half the land in the basin is forest, with another quarter in pasture land.



## WATER USE

### Factors Affecting Water Demand

This basin has less than 1% of the state's residents and contains all or part of six municipalities in Avery and Watauga counties. From 1990 to 1997 year-round population in Watauga County grew by 10.6%. The area has become popular over the past 20 years for retirees and second home developments.

### 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 4.2 million gallons per day (mgd), with about two-thirds of the demand supplied from surface water sources. USGS estimated total basin population at 16,200. Residential demand was estimated at 0.85 mgd with a little over half of this demand being supplied by public water systems. Overall, public water systems supplied one mgd from ground water and 0.2 mgd from surface water for both residential and non-residential uses. The remaining residential water demand was met by 0.4 mgd of self-supplied ground water. In addition, about 1.9 mgd of self-supplied water was withdrawn for non-residential water uses.

### Local Water Supply Plans (LWSPs)

All 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. The current database reflects water use information for 1997, unless otherwise noted.

LWSPs were submitted by five public water systems using water from this basin. These systems supplied 0.7 mgd of water to 3,784 persons. One new system, Mill Ridge POA, has submitted a LWSP for the first time. The following discussion and 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-residential Use	Total Use*
Watauga River	3,784	0.27	0.12	0.7

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

Residential demand dominates water use accounting for 38% of total water supplied with non-residential use at 17%, and 44% unaccounted-for water.

LWSP systems expect to supply water to over 6,178 persons by the year 2020, a 63% increase over 1997 levels. Their demand is projected to increase 87% from 0.7 mgd to 1.3 mgd, by 2020.

In the 1997 LWSPs, none of the five systems using water from this basin reported that their 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 one of the five LWSP systems in this basin had average demand above this threshold. By 2020, one system projects demand levels that will exceed 80% of its available supply.

### Self-supplied Use

The USGS estimated that self-supplied users, excluding power generating facilities, accounted for 2.3 mgd of the 4.2 mgd total of water used from this basin, as shown in the table below. Irrigation use dominated self-supplied water use accounting for 73% of the total followed by domestic (16%), livestock (6%), and commercial (5%). No self-supplied industrial water use was identified for this basin.

1995 USGS Estimated Self-supplied Water Use in mgd						
Sub-basin	Domestic	Livestock	Industrial	Commercial	Irrigation	Total
Watauga River	0.37	0.13	0.00	0.11	1.66	2.27

**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
Watauga River	0	0	11	2.014	11	2.014

The registered withdrawals include seven private water systems, three ski resorts and one mining operation. The private water systems used 0.4 mgd from wells in 1999. On the days snow was made, the three ski resorts used a combined 1.6 mgd for snowmaking.

**WATER AVAILABILITY**

Local water supply plans indicate that there are four systems with a combined 12-hour ground water supply of 0.74 mgd in this basin. The average daily demand on these wells was 0.43 mgd.

Beech Mountain is the only local water supply plan system using surface water from this basin. The system has two impoundments on the Watauga River that can supply a total of 1.0 mgd of water. One reservoir, Buckeye Lake, has a minimum release of 1.5 cfs from January to September and 2.8 cfs from October to December. In 1997 the system withdrew an average of 0.27 mgd of surface water.

The Watauga Basin is the smallest river basin in the state, with only 283 miles of streams. Supply in the basin is limited by relatively low-yielding wells and by the low-yield of small headwater streams that drain the basin.

**INTERBASIN TRANSFERS OF SURFACE WATER**

Across the state many water users and systems move water between sub-basins to meet their needs. However, only one minor transfer is associated with the Watauga Basin. The Town of Boone, which is supplied from the New River Basin, has a small service area in the Watauga Basin, resulting in a minor transfer into the basin.

**SUMMARY OF INFORMATION FROM 1997 LWSPs**

! Total per capita water use for the basin was 184 gallons per day (gpd) in 1997 and is projected to increase to 198 gpd by 2010.

! All the systems are isolated by mountainous terrain, so none of the systems are connected to another water supply system.

! These systems used 0.27 mgd of surface water and 0.43 mgd of ground water in 1997.

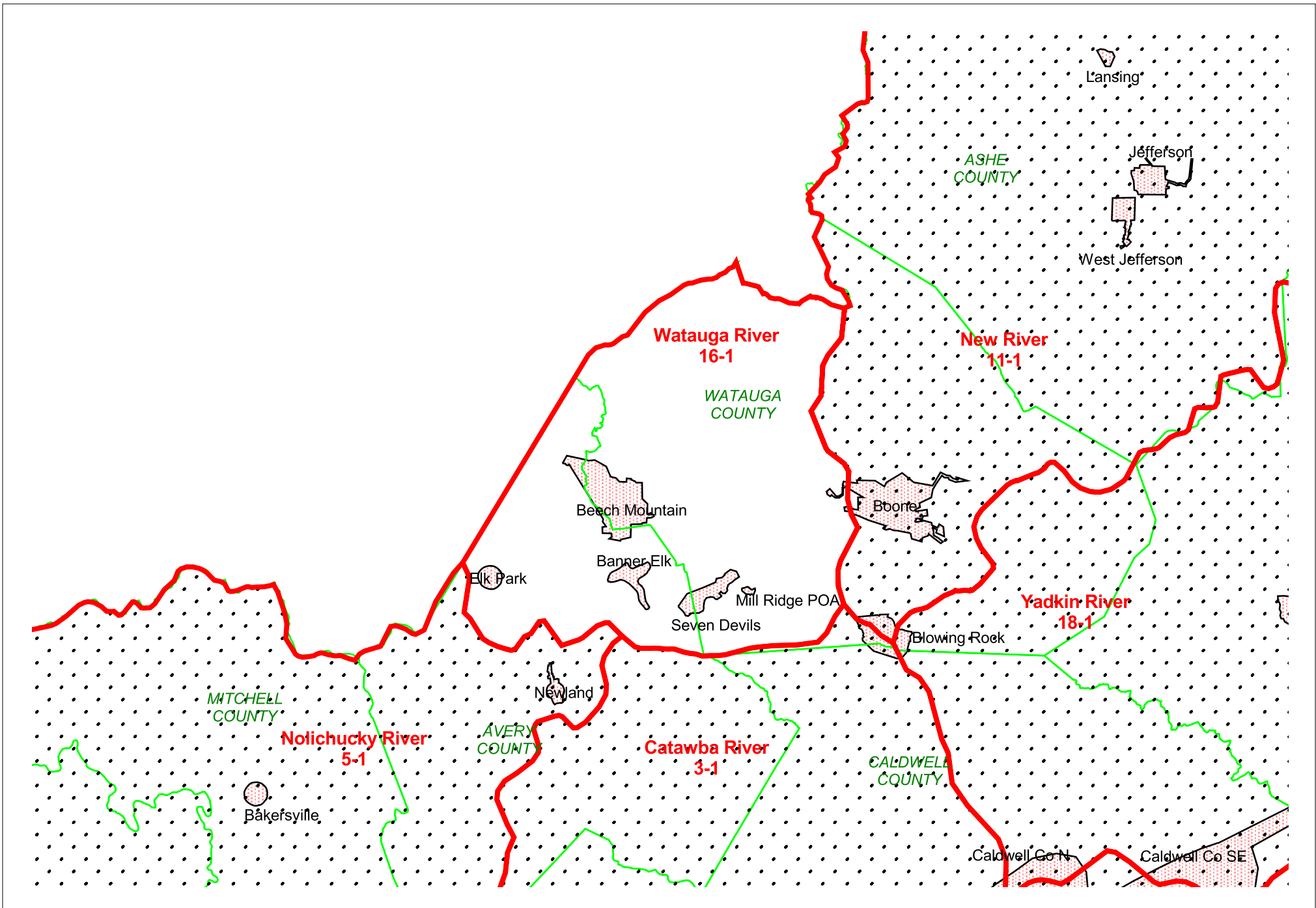
! The reported raw water supply was 1.0 mgd of surface water and a 12-hour groundwater supply of 0.74 mgd.

! Two systems, Seven Devils and Banner Elk, were planning additional supplies totaling 0.36 mgd in the 1997 LWSPs.

! The systems in this basin are expecting significant growth through 2020. The LWSP population is projected to increase 63% over 1997 levels and water demand is projected to nearly double from 0.7 mgd to 1.3 mgd.

! Systems reporting high Demand-to-Supply Ratios:

	1997	2010
Demand exceeds available supply	0	0
Demand exceeds 80% of available supply	1	0



# Basin 16 Watauga River

(unshaded basin)



LWSP service area



County Boundary



Basin Boundary

**WATAUGA RIVER BASIN (16)**

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
AVERY									
BANNER ELK	Bedrock Wells	841	1400	0.196	0.289	0.316	0.488	62%	59%
ELK PARK	Bedrock Wells	500	550	0.08	0.12	0.236	0.236	34%	51%
WATAUGA									
BEECH MOUNTAIN	Buckeye Lake	2233	2850	0.265	0.404	1	1	27%	40%
MILL RIDGE PROP. OA	Bedrock Wells	75	85	0.024	0.026	0.043	0.043	54%	61%
SEVEN DEVILS	Bedrock Wells	135	175	0.13	0.164	0.147	0.263	88%	62%