

BASIN 11 NEW RIVER



BASIN DESCRIPTION

The New River Basin is one of six basins in North Carolina that drain the western slope of the Eastern Continental Divide. The basin is the 754 square mile headwaters of the New River sub-basin that continues into Virginia and West Virginia. The New River flows north draining the mountainous terrain of northwestern North Carolina north of Blowing Rock. The New River is formed by the convergence of the North Fork New River and South Fork New River. Twenty-six miles of the South Fork and mainstem of the New River have been designated a National Wild & Scenic River and a State Natural and Scenic River.

WATER USE

Factors Affecting Water Demand

This basin is relatively undeveloped. However, there has been significant population growth in communities in the region. This basin has about 1% of the state's residents and contains all or part of six municipalities in three counties. From 1990 to 1997 year-round population in Watauga County grew by 10.6%.

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 9.6 million gallons per day (mgd), with two-thirds coming from surface water sources. USGS estimated total basin population at 59,130. Residential demand was estimated at 2.5 mgd with about 47% of this demand being supplied by public water systems. Overall, public water systems supplied 3.3 mgd from surface water and 0.8 mgd from ground water for both residential and non-residential uses. The remaining residential water demand was met by 1.4 mgd of self-supplied ground water. In addition, about 4.1 mgd of self-supplied water was withdrawn for non-residential water uses.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 six public water systems using water from this basin. These systems supplied 2.94 mgd of water from this basin to 19,135 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-residential Use | Total Use* |
| New River | 19,135 | 0.89 | 1.53 | 2.9 |

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

On average for these systems, residential use accounted for 30% of total use with non-residential use accounting for 52% and 16% unaccounted-for water.

LWSP systems expect to supply water to 24,925 persons by the year 2020, a 30% increase over 1997 levels. Their demand for water is projected to grow 79% to 5.2 mgd by 2020.

In the 1997 LWSPs, three of the six 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 two of the six LWSP systems in this basin had average demand above this threshold. By 2020, four 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 five mgd of the 5.6 mgd total of water used from this basin, as shown in the table below. Irrigation use comprised 48% of the self-supplied uses, followed by domestic (24%), livestock (23%), commercial (3%), and industrial (2%) uses.

| 1995 USGS Estimated Self-supplied Water Use in mgd | | | | | | |
|--|----------|-----------|------------|------------|------------|-------|
| Sub-basin | Domestic | Livestock | Industrial | Commercial | Irrigation | Total |
| New River | 1.35 | 1.27 | 0.09 | 0.18 | 2.67 | 5.6 |

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 register 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 |
| New River | 0 | 0 | 7 | 2.74 | 7 | 2.74 |

The registered users include one golf course, one ski resort, three private water systems, and Appalachian State University.

WATER AVAILABILITY

LWSPs indicate that three water systems in these sub-basins withdrew about 2.35 mgd of surface water. One of these systems, Blowing Rock, relies on a reservoir for its water supply. The demand on this reservoir averaged about 0.58 mgd in 1997, which exceeded the estimated available supply of 0.4 mgd from the reservoir. Blowing Rock is in the process of trying to identify additional water supplies.

Two of the surface water systems have run-of-river intakes. These intakes supplied about 1.77 mgd of water in 1997. The available supply from these sources, based on information reported in local water supply plans, is about 17 mgd. The Town of Boone has minimum release requirements based on instream flow needs. The town’s Winklers Creek intake must release 2.4 cubic feet per second (cfs) at 7Q10 flow conditions and the South Fork of the New River intake must release four cfs at 7Q10 flow conditions.

Three systems in this basin used about 0.59 mgd of ground water. These systems have an available supply of about 0.69 mgd of ground water based on the 12-hour yields supplied in their LWSPs. Ground water supply in the basin is limited by the relatively low yields of the area.

INTERBASIN TRANSFERS OF SURFACE WATER

Across the state many water users and systems move water between sub-basins to meet their needs. Regulatory approval is generally needed for transfers of 2.0 mgd or more. The table below summarizes the identified interbasin transfers in 1997 associated with this basin.

| Estimated Interbasin Transfers based on 1997 data | | | |
|--|--------|---------|--------|
| Sub-basin | Number | mgd OUT | mgd IN |
| New River | 3 | 0.14 | 0 |

The Town of Blowing Rock is supplied from the New River basin but has service area in two different river basins (Catawba and Yadkin), resulting in minor transfers. In addition, the Town of Boone’s service area has expanded into the Watauga River Basin, resulting in a very minor transfer.

SUMMARY OF INFORMATION FROM 1997 LWSPs

! Total per capita water use for the basin was 153 gallons per day (gpd) in 1997 and is projected to increase to 177 gpd by 2010.

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

! These systems used about 2.35 mgd of surface water and 0.59 mgd of ground water in 1997.

! The reported raw water supply was 17 mgd of surface water and a 12-hour groundwater supply of 0.69 mgd.

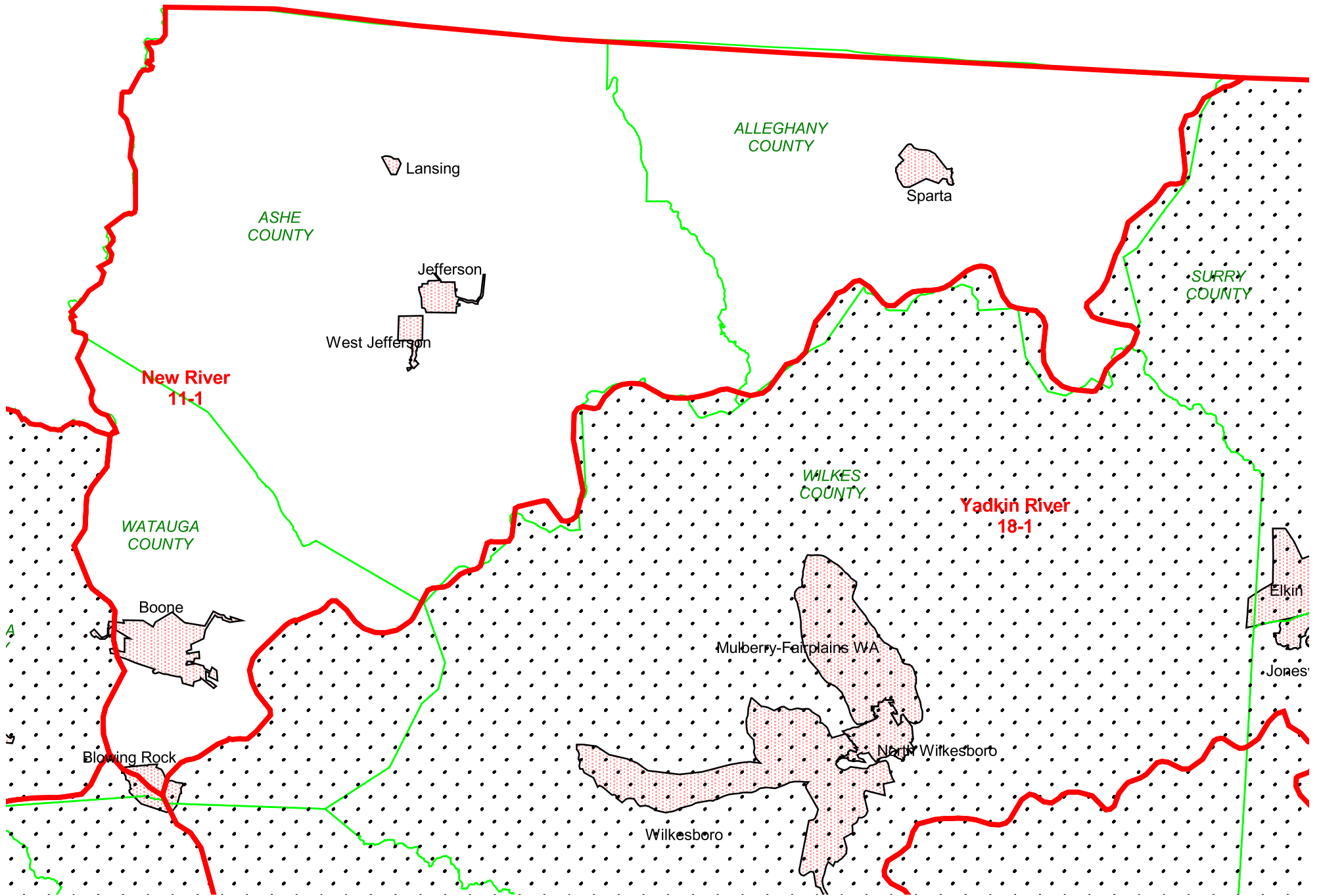
! One system, Sparta, was planning an additional supply totaling 0.13 mgd in the 1997 LWSP. However, Blowing Rock has also begun pursuing additional water supplies.

! The systems are projecting 76% growth in demand by 2020.

! About 0.8 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 | 2 | 2 |
| Demand exceeds 80% of available supply | 2 | 2 |



Basin 11 New River
(unshaded basin)

- LWSP service area
- County Boundary
- Basin Boundary

NEW RIVER BASIN (11)

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 |
| ALLEGHANY | | | | | | | | | |
| SPARTA | Bedrock Wells | 1908 | 2060 | 0.294 | 0.328 | 0.292 | 0.421 | 101% | 78% |
| ASHE | | | | | | | | | |
| JEFFERSON | New River | 1402 | 1600 | 0.256 | 0.298 | 14 | 14 | 2% | 2% |
| LANSING | Bedrock Wells | 210 | 210 | 0.009 | 0.009 | 0.014 | 0.014 | 64% | 64% |
| WEST JEFFERSON | Bedrock Wells | 1108 | 1800 | 0.285 | 0.51 | 0.384 | 0.384 | 74% | 133% |
| WATAUGA | | | | | | | | | |
| BLOWING ROCK | Flat Top Branch | 1350 | 1535 | 0.576 | 0.741 | 0.4 | 0.4 | 144% | 185% |
| BOONE | South Fork/Winklers Creek | 13157 | 15818 | 1.517 | 2.2 | 3 | 3 | 51% | 73% |