

# BASIN 15 TAR - PAMLICO

## BASIN DESCRIPTION

The Tar-Pamlico Basin is one of four basins that are entirely within North Carolina. It drains 5375 square miles between the Neuse and Roanoke basins. The basin is divided into three sub-basins as shown in the map. The Tar River and Fishing Creek originate in the Piedmont and flow southeasterly. As the waterways flow through Nash County the terrain changes to coastal plain. The Tar River begins in Person County and drains 2277 square miles before merging with the Pamlico River near Washington. Fishing Creek, which drains 891 square miles joins the Tar River near Tarboro. The Pamlico River & Sound sub-basin covers 2207 square miles, much of which is open water and wetlands.



## WATER USE

### Factors Affecting Water Demand

This basin is relatively undeveloped with only about 2% of landcover classified as urban. About one third of land is classified as agriculture. However, counties in three of the state's 12 major metropolitan areas get water from this basin. This basin is home to about 6% of the state's residents and contains all or part of 52 municipalities in 15 counties. From 1990 to 1997 year-round population in three counties in this basin grew by 10% or more.

### 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 94 million gallons per day (mgd), split almost evenly between ground water sources (46 mgd) and surface water sources (48 mgd). USGS estimated total basin population at 405,970. Residential demand was estimated at 25 mgd with almost two-thirds of this demand being supplied by public water systems. Overall, public water systems supplied 26 mgd from surface water and 10 mgd from ground water for both residential and non-residential uses. The remaining residential water demand was met by 9.5 mgd of self-supplied ground water. In addition, about 36 mgd of self-supplied water was withdrawn for non-residential water uses.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.

LWSPs were submitted by 43 public water systems using water from this basin. These systems supplied 39.2 mgd of water to 205,505 persons. The following discussion and table summarize the LWSP population served with water from this basin and its water use for 1997.

Sub-basin	LWSP Population	Residential Use	Non-resid. Use	Total Use*
Tar River	158,444	12.09	16.76	33.8
Fishing Creek	20,541	1.05	0.65	2.3
Pamlico R&S	26,520	1.58	1.01	3.1
<b>Total</b>	<b>205,505</b>	<b>14.7</b>	<b>18.4</b>	<b>39.2</b>

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

For local plan systems, 47% of total water use was for non-residential use while residential use accounted for 38% of total use and 13% was unaccounted-for water.

LWSP systems expect to supply water to 362,693 persons by the year 2020, a 76% increase over 1997 levels. Their water demand is projected to increase 55%, from 39.2 mgd to 60.7 mgd, by 2020.

In the 1997 LWSPs, seven of the 43 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 eight of the 43 LWSP systems in this basin had average demand above this threshold. By 2020, 16 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 46 mgd of the 94 mgd total of water used from this basin, as shown in the table below. Water used for livestock accounted for 45% of the self-supplied uses, followed by domestic (21%), industrial (20%), livestock (13%), and commercial (1%).

Sub-basin	Domestic	Livestock	Industrial	Commercial	Irrigation	Total
Tar River	7.07	3.98	9.10	0.28	15.31	35.7
Fishing Creek	1.55	1.47	0.10	0.06	3.38	6.6
Pamlico R&S	0.86	0.70	0.19	0.11	2.00	3.9
<b>Basin Total</b>	<b>9.5</b>	<b>6.2</b>	<b>9.4</b>	<b>0.5</b>	<b>20.7</b>	<b>46.2</b>

## 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.

Sub-basin	Agricultural		Non-agricultural		Total	
	#	mgd	#	mgd	#	mgd
Tar River	18	15.158	14	4.117	32	19.275
Fishing Creek	3	2.091	0	0	3	2.091
Pamlico River & Sound	18	19.076	7	37.356	25	56.432
Total	39	36.325	21	41.473	60	77.798

\*Excludes water use for power generation.

The registered agricultural users in the basin include 24 irrigators and 12 aquaculture operations. All but one of the aquaculture operations are located in the Pamlico River and Sound Sub-basin. The registered non-agricultural users in the basin include eight mining operations, three industries, one golf course, three waterfowl impoundments, and six private water system withdrawals.

## WATER AVAILABILITY

LWSPs indicate that six water systems in these sub-basins withdraw about 31 mgd of surface water. Three of these systems rely on reservoirs for all or part of their water supply. The combined demand on these reservoirs averaged 15.6 mgd in 1997. The estimated available supply from these reservoirs is 35.7 mgd.

Three of the surface water systems submitting local water supply plans have run-of-river intakes. These intakes supplied about 15.5 mgd of water in 1997. The available supply from these intakes, based on information reported in local water supply plans, is about 36.5 mgd, however, in some cases, available supplies may need to be adjusted for instream flow needs.

Local water supply plans indicate that there are 22 systems with wells. Based on their 12-hour yield they have an available supply of 12 mgd. Portions of the counties in the eastern end of the basin are in Capacity Use Area #1.

The water-bearing geologic deposits of the coastal plain form a regional aquifer system that has historically provided plentiful, high-quality, low-cost water. However, ground water levels in some of the major aquifers have been declining because of over-pumping.

To ensure that ground water remains a reliable long-term water source in the Coastal Plain, the Environmental Management Commission adopted rules in December 2000 establishing a Capacity Use Area for 15 counties in the Central Coastal Plain, including Beaufort, Edgecombe, Martin, Pitt, and Wilson. If approved by the legislature in 2002, permits would be required for all ground water withdrawals over 100,000 gallons per day within these counties. Pumping from the Black Creek and Upper Cape Fear aquifers would be limited or reduced in some areas. Affected water users will need to manage water demand and develop alternative sources of supply to offset these reductions.

## 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.

Sub-basin	Number	mgd OUT	mgd IN
Tar River	3	0	1.3
Fishing Creek	2	0	0.6
Pamlico River & Sound	0	0	0

## SUMMARY OF INFORMATION FROM 1997 LWSPs

! Total per capita water use for this basin was 191 gallons per day (gpd) in 1997 and is projected to decline to 173 gpd by 2010.

! 20 systems are not connected to another water supply system that can provide water in an emergency.

! 10 water systems purchased a total of 2.5 mgd from this basin. Seven of these systems had no purchase contract.

! 10 systems rely on purchase water as their sole supply.

! The reported raw water supply in 1997 was about 72 mgd of surface water and a 12-hour ground water supply of 12 mgd.

! There are six county-wide water systems.

! In the coastal areas, water systems must plan to have adequate water supplies during the summer months when major seasonal peak demands for water occur.

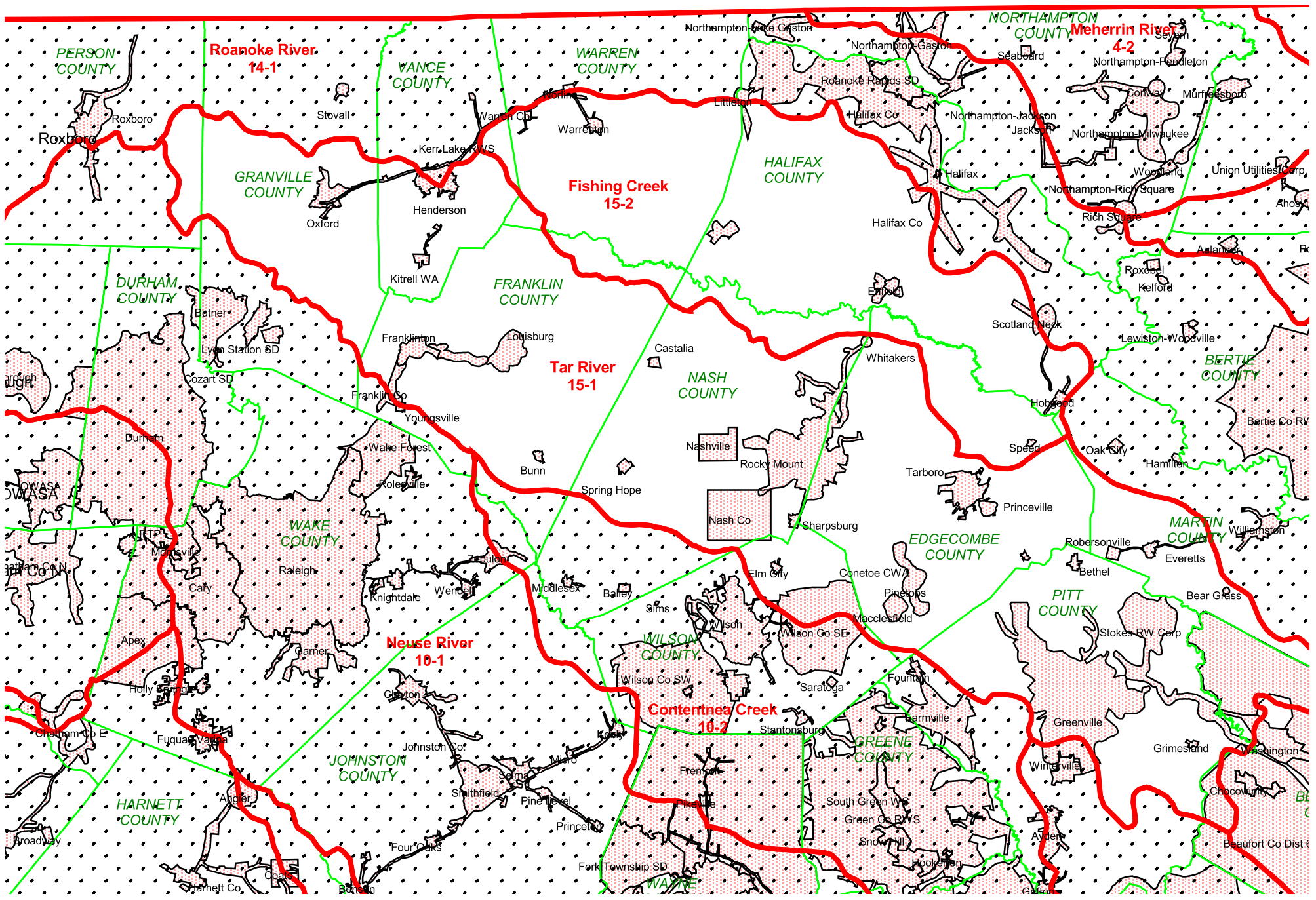
! 18 systems were planning additional water supplies totaling 16.3 mgd in the 1997 LWSPs.

! About 2.5 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, with sub-basin needs as follows:

Fishing Creek	0.8 mgd
Pamlico River and Sound	0.5 mgd
Tar River	1.2 mgd

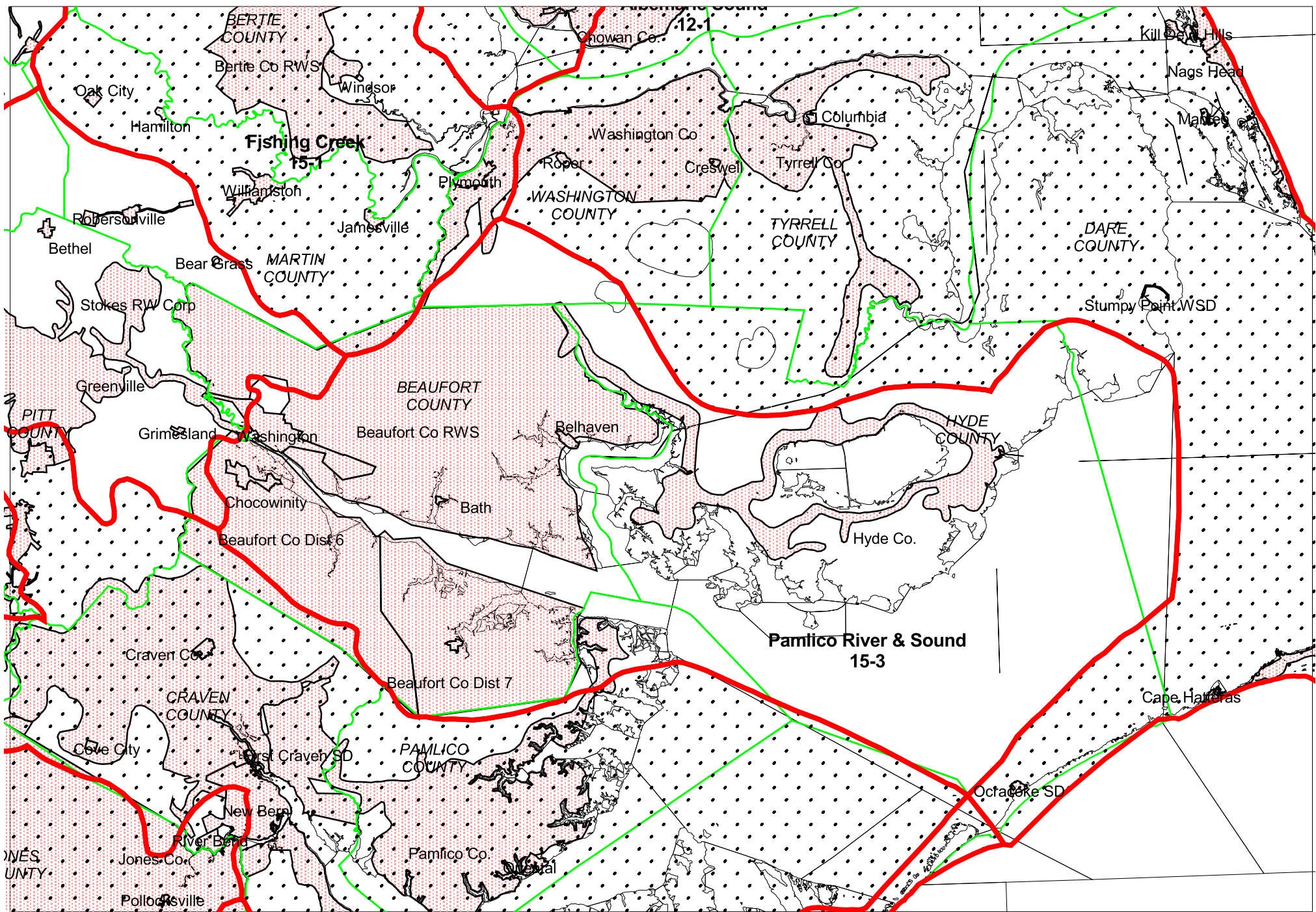
! Systems reporting high Demand-to-Supply Ratios:

	1997	2010
Demand exceeds available supply	5	6
Demand exceeds 80% of available supply	8	15



**Basin 15 Tar - Pamlico Rivers (West)**  
(unshaded basin)

LWSP service area
  County Boundary
  Basin Boundary



**Basin 15 Tar - Pamlico Rivers (East)**  
(unshaded basin)

- LWSP service area
- County Boundary
- Basin Boundary

<b>TAR-PAMLICO RIVER BASIN (15)</b>									
<b>1997 and 2010 Population and Water Use as reported by LWSP systems using water from this basin.</b>									
<b>Water systems showing "Demand as % of Supply" above 80% should be actively managing demand and pursuing additional supplies.</b>									
<b>mgd = million gallons per day</b>									
<b>Water Systems by County</b>	<b>Water Source or Supplier</b>	<b>Year-round Service Population</b>		<b>Average Daily Demand (mgd)</b>		<b>Available Supply (mgd)</b>		<b>Demand as % of Supply</b>	
		<b>1997</b>	<b>2010</b>	<b>1997</b>	<b>2010</b>	<b>1997</b>	<b>2010</b>	<b>1997</b>	<b>2010</b>
<b>BEAUFORT (in proposed Central Coastal Plain Capacity Use Area)</b>									
AURORA	Castle Hayne Aquifer	650	700	0.076	0.082	0.353	0.353	22%	23%
BATH	Castle Hayne Aquifer	199	250	0.021	0.033	0.31	0.31	7%	11%
BEAUFORT CO RWS	WASHINGTON	7180	18648	0.439	1.172	1.6	1.85	27%	63%
BEAUFORT CO WD VI	Unspecified Ground Water	0	5180	0	0.327	0	0.75	0%	44%
BEAUFORT CO WD VII	Unspecified Ground Water	0	3496	0	0.297	0	0.515	0%	58%
BELHAVEN	Yorktown Aquifer	2244	2360	0.331	0.458	0.5	0.75	66%	61%
CHOCOWINITY	Castle Hayne Aquifer	1300	3000	0.156	0.362	0.222	0.648	70%	55%
WASHINGTON	Castle Hayne & Beaufort Aquifers	10097	11491	3.179	3.782	4.2	4.2	76%	90%
<b>EDGECOMBE (in proposed Central Coastal Plain Capacity Use Area)</b>									
EDGECOMBE CO WSD 1	ROCKY MOUNT	0	4070	0	0.223	0	0.3	0%	74%
EDGECOMBE CO WSD 2	TARBORO	0	5268	0	0.289	0	0.376	0%	77%
EDGECOMBE CO WSD 3	ROCKY MOUNT / TARBORO	0	2856	0	0.157	0	0.212	0%	74%
MACCLESFIELD	Lower Cape Fear Aquifer	735	731	0.062	0.0619	0.414	0.414	15%	15%
PINETOPS	Upper Cape Fear Aquifer	2285	2272	0.35	0.351	0.36	0.36	97%	97%
PRINCEVILLE	TARBORO	1652	1643	0.171	0.166	0.25	0.25	68%	66%
SHARPSBURG	ROCKY MOUNT / Bedrock Wells	2004	2796	0.192	0.292	0.282	0.354	68%	83%
TARBORO	Tar River	10909	9933	3.24	3.668	12	12	27%	31%
WHITAKERS	ROCKY MOUNT	889	1107	0.064	0.082	0.1	0.1	64%	82%
<b>FRANKLIN</b>									
FRANKLIN CO	LOUISBURG / FRANKLINTON	21	2500	0.936	2.052	1.1	4.1	85%	50%
FRANKLINTON	New City Pond / Old City Pond	2500	3000	0.617	0.671	0.4	0.4	154%	168%
LOUISBURG	Tar River	3500	3670	1.482	0.797	2	2	74%	40%
YOUNGSVILLE	FRANKLIN CO	650	750	0.053	0.073	0.053	0.08	100%	91%
<b>HALIFAX</b>									
ENFIELD	Fishing Creek	3054	3044	0.459	0.579	7.3	7.3	6%	8%
HALIFAX	HALIFAX CO	352	370	0.026	0.027	0.25	0.25	10%	11%
HALIFAX CO	WELDON / SCOTLAND NECK ROANOKE RAPIDS SD / Bedrock Wells	12928	16050	1.756	2.302	2.284	2.284	77%	101%
HOBGOOD	Upper Cape Fear Aquifer	700	854	0.072	0.085	0.148	0.436	49%	20%
LITTLETON	HALIFAX CO	1335	1373	0.106	0.111	0.2	0.2	53%	56%
SCOTLAND NECK	Upper Cape Fear Aquifer	2443	2533	0.37	0.38	0.288	0.3	127%	126%
<b>HYDE</b>									
HYDE CO	Castle Hayne & Yorktown Aquifers	4850	5965	0.501	0.65	0.64	0.98	78%	66%
<b>MARTIN (in proposed Central Coastal Plain Capacity Use Area)</b>									
BEAR GRASS	Upper Cape Fear Aquifer	98	105	0.01	0.01	0.086	0.086	11%	12%
EVERETTS	ROBERSONVILLE	350	350	0.028	0.032	0.027	0.027	104%	119%
PARMELE	ROBERSONVILLE	430	432	0.02	0.022	0.019	0.019	101%	116%
ROBERSONVILLE	Upper Cape Fear Aquifer	2150	2140	1.23	1.37	1.85	1.85		
<b>NASH</b>									
CASTALIA	Bedrock Wells	383	452	0.022	0.024	0.081	0.081	27%	30%
DORTCHES	ROCKY MOUNT	3	113	0.018	0.04	0.045	0.045	40%	89%
NASH CO	ROCKY MOUNT	0	8745	0	0.807	0	0.5	0%	161%
NASHVILLE	ROCKY MOUNT / Bedrock Wells	4252	7123	0.52	0.787	0.945	0.945	55%	83%
ROCKY MOUNT	Tar River Reservoir	58000	68360	15.5	19.2	28	28	55%	69%
SPRING HOPE	Bedrock Wells	1276	1613	0.198	0.252	0.332	0.44	60%	57%
<b>PITT (in proposed Central Coastal Plain Capacity Use Area)</b>									
*STOKES REGIONAL WC	Black Creek Aquifer	750	4300	0.054	0.346	0.144	0.396	37%	87%
BETHEL	Black Creek & Peedee Aquifers	1946	2250	0.16	0.231	0.431	0.431	37%	54%
GREENVILLE	Tar River / Black Creek&Upper Cape Fear Aquifers	61495	90000	11.935	16.625	22.938	31.435	52%	53%
GRIMESLAND	Beaufort Aquifer	423	706	0.044	0.063	0.2	0.2	22%	32%
<b>WILSON (in proposed Central Coastal Plain Capacity Use Area)</b>									
ELM CITY	Bedrock Wells	1743	1838	0.118	0.138	0.1	0.165	118%	83%