

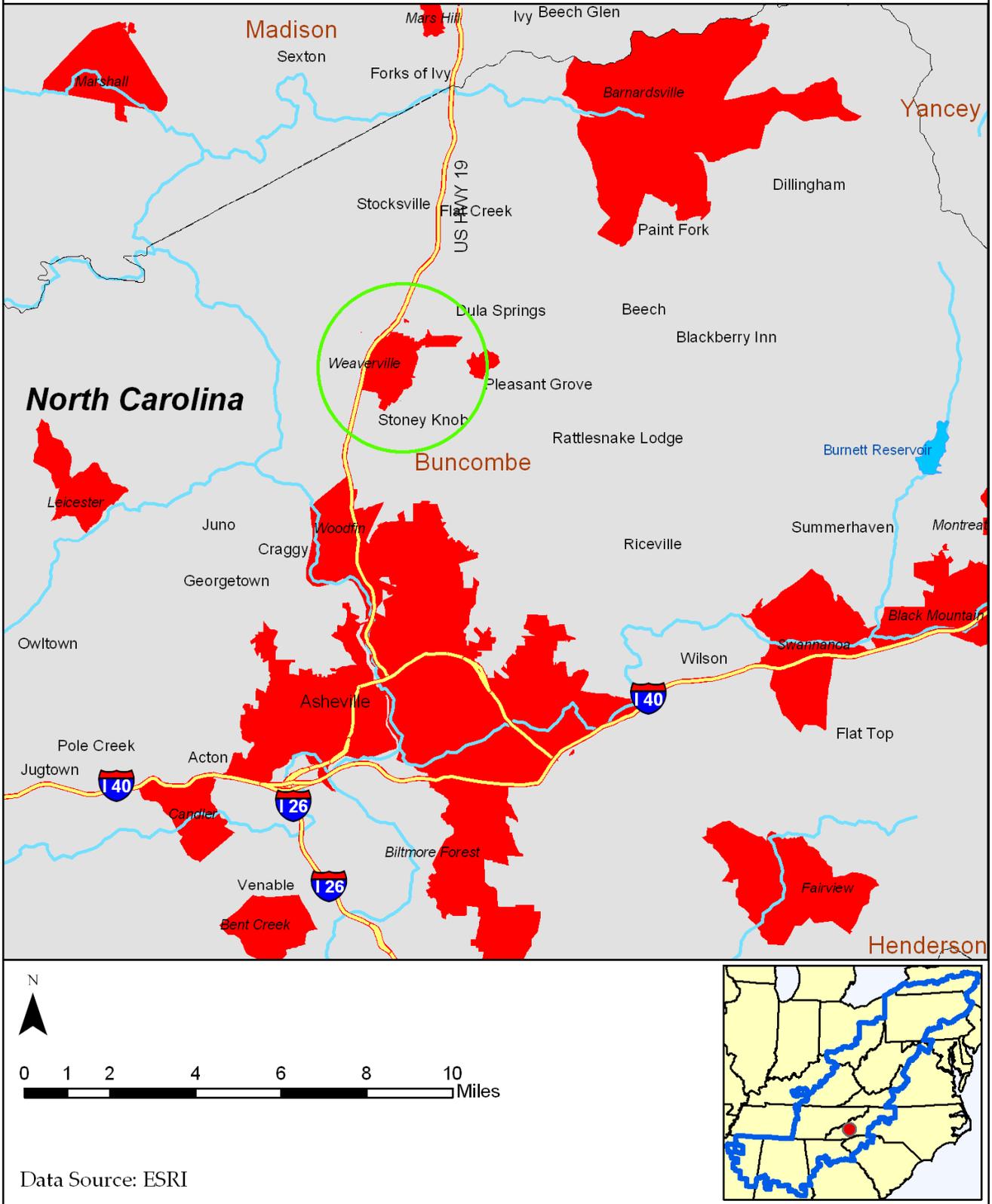
Case Study: **Weaverville, North Carolina**

Weaverville, a town in western North Carolina, is just north of Asheville, in Buncombe County near the Madison County line (refer to Figure E-6). This part of the Appalachians is growing relatively rapidly. Newcomers are lured to the Asheville area from both the northern cities and the deeper parts of the southern United States. They come for the mild climate and the rare combination of a beautiful natural setting and vibrant urban amenities. Many settle outside Asheville, in Weaverville and its neighboring communities, Woodfin (a sanitary district) and Mars Hill (a town in Madison County), home of Mars Hill College. Weaverville has grown from 1,495 residents in 1980 to 2,107 in 1990 (a 40.9 percent increase) to 2,416 in 2000 (a 14.7 percent increase).⁸³ Adding to the pressure of growth is a new interstate highway segment, I-26, which will provide an alternative to the trip to Tennessee on I-40 through the Pigeon River gorge.

As a result of the population influx, there are many well-to-do residents in and around Asheville, and Buncombe County was a competitive county in 2004, in the typology of the Appalachian Regional Commission (ARC) (for a definition of “competitive,” see chapter 1). At the same time, Madison County, like the other counties just outside the metropolitan area, is among the poorest counties in the state—“distressed” in ARC’s typology.

⁸³ Census Bureau, Census 1980 Census of Population; Census 1990 Summary Tape File 1; and Census 2000 Summary File 1.

Figure E-6. Location of Weaverville, NC, in Buncombe County



In the area around Asheville, there is much new construction of housing that meets building codes for water and wastewater services, but there also is much older, rural housing stock that has been handed down in families or is still inhabited by the now-elderly builders. Weaverville and several other municipalities in the area can look to the Metropolitan Sewerage District for wastewater collection and treatment. However, much of the older rural housing stock is plumbed directly into the streams via “straight pipes,” or it has a poorly maintained or failed septic system.

Adding to the water problems is a long tradition of keeping livestock and giving them direct access to the creeks. This is an efficient way to water the cows but a problem for downstream water quality in terms of turbidity resulting from animal waste and eroded stream banks.

A few communities in the Appalachians have had the ability and the foresight to get a water supply high up, at the headwaters, and protect it through land use restrictions or conservation easements, thereby ensuring some quantity of high-quality water for the future. Asheville has done this (see the sidebar, “The Asheville Watershed”). But in many other communities in the Appalachians, the generations-old traditions of finding water as needed and of resisting planning and land use controls leave them at risk of problems when the time comes to expand the water supply. Water has a way of cutting across the gaps between new and old residents, between wealthy and poor, between new systems and old straight pipes. For the thriving community of Weaverville to solve its water supply needs, it had to find a way to handle the legacy of inadequate wastewater treatment in the upstream, rural communities: high turbidity and coliform counts in the source water.

The Asheville Watershed

Although Asheville is located along a major river, the French Broad, early town leaders decided to find and secure a water supply of more pristine quality. They found it in two reservoirs high in the Black Mountains, northeast of the city, over the ridge from Weaverville.

In 1996, to protect this high-quality supply, the city placed a conservation easement on all 18,000 acres of the watershed. William A. Campbell, a lawyer, a professor at the UNC at Chapel Hill's School of Government, and then president of the Conservation Trust for North Carolina, helped negotiate the easement. The easement is monitored annually by the trust representative site visits. The Conservation Trust for North Carolina views its relationship with Asheville as a partnership, and city officials take the monitoring and the easement conditions seriously.

The easement allows limited logging in the watershed, and in 2004 city leaders and citizens were engaged in a vigorous discussion about the terms of a forestry management plan designed to let the city harvest some timber from the watershed without compromising water quality. The easement helped structure the debate, and as long as the land trust is sustained, it helps assure Asheville residents of a safe, high-quality water supply.

Land trusts are active throughout Appalachia and can be useful partners for water systems seeking a higher level of protection for high-quality supplies. For more information, see www.ctnc.org and www.lta.org.

Weaverville, Woodfin, and Mars Hill, seeing the growth trends and the resulting needs for expanded water service, began planning in the late 1980s how to meet projected needs (see Table E-9). Weaverville has supplied water to its residents since voters approved the construction of a municipal water system in 1913. By the late 1980s, its needs were the most severe. Its existing sources, Ox

Creek and Eller Cove, supplied only a small fraction of the town’s predicted twenty-year demand.

Table E-9. Water Demand Trends

Community	Existing Water Supply Safe Yield (in 1987)	2010 Demand	2040 Demand
Weaverville	130,000 GPD (from 3 sources)	990,275 GPD	1.4–2.6 MGD
Woodfin	1,289,150 GPD (from 3 sources)	0.2 MGD (set aside only)	0.5 MGD (set aside only)
Mars Hill	531,115 GPD	0.2 MGD (set aside only)	0.5 MGD (set aside only)

GPD = Gallons per Day

MGD = Million Gallons per Day

Set aside values are estimates for emergency use (additional data was not readily available)

Sources:

M. Keith Webb, "Preliminary Engineering Report" McGill Associates, Asheville, NC, January 1987.

M. Keibth Webb, "Preliminary Engineering Report" McGill Associates, Asheville, NC, November, 1992.

Town of Weaverville Files, "Projected Water Needs; Year 2040" April 1992.

Weaverville, and initially Woodfin and Mars Hill, were interested in the Ivy River, a watershed north of Weaverville, nearly midway to Mars Hill and just across the county line. One turn of the Ivy River lies within Buncombe County, but the majority of the watershed lies within Madison County. The two largest tributaries join to create the main stem of the river, less than six miles from Weaverville, to form the Forks of Ivy.

However, the Ivy River was not classified as a source of drinking water. In the late 1980s, while the three communities were planning for their water needs, North Carolina passed the Water Supply Watershed Protection Act, which added water supply categories to the state’s existing stream classifications and specified accompanying requirements (e.g. land use restrictions) to limit residential density, handle stormwater, maintain vegetated buffers for streams, follow best management practices for agriculture and transportation improvements, and

keep certain uses such as landfills out of the area designated as a water supply watershed. For the communities looking to the Ivy River, and other mountain communities in North Carolina, this act posed some political problems: it meant that one town's water supply, if located in another jurisdiction (as the Ivy River was, located in Madison County), would create limits to growth and impose land use restrictions on people living near that water but outside the town's water service area.

The Water Supply Watershed Protection Act proved to be a serious challenge for the proposed water supply on the Ivy River. By spring 1993, Madison county residents were concerned about the land use restrictions in the act, and they began writing their state legislators and seeking other ways to stop the drinking water intake for Weaverville. The letters expressed serious opposition to the Weaverville drinking-water expansion project into the Ivy River. An April 14, 1993 letter from the Madison County attorney to the North Carolina Department of Environment and Natural Resources (DENR) called the situation an "economic disaster . . . [that takes] land without compensation . . . [causing] depreciating the value of land ...[that is] costing our citizens jobs . . . and substantially depressing the tax base."⁸⁴ Public notices were posed stating that lands had been "condemned without compensation to the owners."⁸⁵

Land use restrictions were not the only problem. Reclassification of the stream as a water supply source required approval by DENR's Division of Water Quality and a sanitary survey and approval by DENR's Division of

⁸⁴ Larry Leake, Madison County Attorney, letter to DENR, 14 April 1993, on file with Town of Weaverville

⁸⁵ 1993 Public Notice "This Property Shown On This Map Has Been Condemned Without Compensation To The Owners" (no author), on file with NC DENR

Environmental Health. Tests done in association with the request for reclassification and the drinking water intake revealed that the water quality in the Ivy River was badly compromised from upstream wastes and agricultural practices. Turbidity was regularly as high as 2,000–3,000 Nephelometric Turbidity Units (NTUs), and coliform levels ranged up to 6,000 colonies per 100 milliliters.⁸⁶ Wide and rapid fluctuation in turbidity and bacteria indicated that there were serious runoff problems from nonpoint sources.

The Division of Water Quality felt that the elevated turbidity and fecal coliform levels should not prevent the reclassification of the stream. However, actual regulatory approval of the new water intake required permission from the Division of Environmental Health, and the health regulators felt that the water intake should not be approved until the pollution sources were identified, corrective actions were implemented, and water-quality standards were met. Also, in 1987 the Environmental Protection Agency (EPA) had passed the Surface Water Treatment Rules, which applied land use restrictions to all surface sources of drinking water and viral inactivation or viral removal requirements. The rules became effective June 30, 1993. All of this meant higher costs for the project.

In July 1991, Woodfin withdrew its interest in the new water intake. Weaverville and Mars Hill decided to evaluate relocation of the intake upstream, above the confluence of the Forks of the Ivy, hoping that this would improve the quality of the source water. However, there were two concerns with this modification. First, additional distribution lines and two intake locations would be required, resulting in an increase of approximately \$600,000 in project cost. Weaverville claimed that this additional cost was unmanageable unless Mars Hill was willing to bear it. Second, because of biological and hydrological

⁸⁶ Review of DENR Public Water Supply (PWS) files, dated July 1994, by Matthew Richardson, July 2004.

limitations, the relocation would limit the amount of water available for withdrawal, to the point that potentially only half of the 2040 water demands would be met. A November 1992 "Long Term Water Supply Engineering Report" for Weaverville raised the costs associated with extending the Weaverville water supply to the Ivy River from \$4.6 million to \$5.4 million. The report also documented that 45.4 percent of the water in the Weaverville system was unaccounted for. This proportion was significantly greater than the generally accepted amount of 10 percent to 15 percent for a water system the size of Weaverville's.

DENR pushed the towns to consider consolidation with the Asheville-Buncombe Water Authority (ABWA). Weaverville rejected this option on three counts. First, the ABWA had not yet developed its own source of long-term supply, and Weaverville, because of the immediate pressing need for additional water, could not wait for ABWA's unknown timeframe to be resolved. Second, Weaverville did not want ABWA controlling Weaverville's growth. Third, the fees that Weaverville residents would pay would be for the ABWA's system, whereas these monies could be used for Weaverville's own system.

By January 1993, Weaverville had set aside \$100,000 in town funds, applied for \$1.5 million from the Economic Development Administration, and applied for \$200,000 from ARC. In April 1993, Mars Hill withdrew its interest in the project, leaving Weaverville on its own to face both the political opposition over the watershed restrictions and the problems with the quality of the source water. Opposition to the reclassification heated up, and with Mars Hill out of the picture, residents of Madison County felt that there was no benefit to placing restrictions on land use in the Ivy River basin. Following the discovery of bullet holes in the Weaverville town manager's vehicle, Weaverville employees

required personal security and protection in late spring 1993.⁸⁷ One citizen letter, dated June 23, 1993, to the Governor of North Carolina regarding the Water Supply Watershed Protection Act stated, "Both parties are sneaky, underhanded workers of the Devil, and should be removed from office."⁸⁸ Weaverville attempted to have the watershed removed from the Water Supply Watershed Protection Act through legislation. It succeeded in getting a bill passed, but the legislation was ultimately struck down by the North Carolina Supreme Court as unconstitutional.

Weaverville pushed ahead to find funding and to get help in overcoming the regulatory barriers. On June 1, 1993, the citizens of Weaverville approved (by nearly a 2 to 1 margin, with an 80 percent turnout) a forty-year general obligation bond of \$4.6 million to extend Weaverville's drinking water supply to the Ivy River. The DENR Public Water Supply Section issued an annual permit for the Weaverville drinking water source in the Ivy River, conditioned on Weaverville's meeting all applicable federal and state regulations, with emphasis on protection of the watershed.

In June 1995, Weaverville submitted an application to the state for approval of \$4.6 million in general obligation bonds. In North Carolina, all local general obligation indebtedness has to be approved not only by the voters in the government unit issuing the bonds but also by a state regulatory agency, the Local Government Commission. In November 1996 the bond series was issued. However, only about 85 percent (\$3,904,000) of the approved general obligation bond was needed. The balance was not issued.

⁸⁷ Mike Morgan, Weaverville town manager, interview with Matthew Richardson, July 2004.

⁸⁸ Ms. Carole Dee Shuford's letter to Jim Hunt (former) Governor of North Carolina, June 23 1993; on file with Town of Weaverville

The Farmers Home Administration of the U.S. Department of Agriculture (USDA-FHA) purchased all the general obligation bonds – \$3.9 million worth. Additional project support was provided by a \$1.5 million grant from USDA-FHA, a \$200,000 grant from ARC, and \$100,000 in Weaverville township funds. The application for \$1.5 million from the Economic Development Administration was not approved. (The Drinking Water State Revolving Fund (DWSRF) did not begin until 1997. Therefore DWSRF monies were not available for this project.) Other potential sources of funding in Western North Carolina include the Clean Water Management Trust Fund and the Pigeon River Fund (refer to sidebar). A fairly significant jump in water rates was (accurately) projected for 1998 (see Table E-10).

Table E-10. Customer Water Rates in 1995 and Projected Rates after Project Completion

Location	Current (1995) (per 6,000 gallons residential)	Projected after Project Completion (1998) (per 6,000 gallons residential)	Percent Change
Within city limits	\$23.25	\$26.95	15.9
Beyond city limits	46.47	53.90	16.0

Source: "Application for Approval of GO Bonds; Town of Weaverville" by McGill Associates, Asheville, NC, June 1995.

In January 1995 the environmental health regulators reported to the water quality regulators that they had identified two likely sources of waste runoff: straight pipes for household sewage, and livestock watering and feeding areas and barn lots near streams. With the exception of one facility that had an operating treatment system for livestock waste, all the other livestock operations in the Ivy River watershed were exempt from animal waste registration rules because of the small number of animals (less than 100 head) on each property.

The Pigeon River Fund

The Pigeon River Fund was created to help support water quality and water-related projects in the Pigeon and French Broad river basins of North Carolina. It is a good example of how dedicated funds for environmental purposes can sometimes solve other problems. In the early 1990s, Carolina Power & Light Co. (CP&L, now Progress Energy) was renegotiating its federal license for the Walters Project, a dam on the Pigeon River near the North Carolina/Tennessee line. The negotiations were stalled; in fact, the case was in litigation at the Federal Energy Regulatory Commission (FERC) and had become the oldest case on the FERC docket. The issues were complicated by contaminated sediments behind the project dam, the result of decades of uncontrolled waste discharges from the Champion Paper Company mill in Canton, North Carolina. Tennessee absolutely refused to allow any of the sediments to be released through the dam. However, the thirteen-mile stretch of river immediately downstream from the dam received no water from the dammed upstream portions, a condition that was permitted under the power licenses of the Depression era but not under those of the modern era. If the license did not require CP&L to release water to provide minimum flows to the stretch not receiving water, the company would receive a windfall because it could use all the water in the reservoir for power generation. However, this was unacceptable to fishermen and environmentalists and under modern environmental law.

As a compromise, CP&L agreed to put money into a fund, the Pigeon River Fund, more or less equivalent to the value of the extra water it was allowed to keep in the reservoir, until the water quality in the reservoir matched the very high-quality conditions of the tributaries to the stretch. The initial capitalization was \$1 million. The fund, begun in 1996, is overseen by a board of directors as set out in the FERC license. It has funded numerous projects in the region. Its grant amounts are much smaller than those of some other funders, such as the North Carolina Clean Water Management Trust Fund. However, according to Forrest Westall, Water Quality Supervisor for the Division of Water Quality and a fund board member, it has found a special niche in providing planning money for projects that then seek larger grants for implementation.¹ For more information, refer to the website at www.pigeonriverfund.org.

In August 1995, DENR granted conditional approval for the water intake, provided that (1) a program for the elimination of unpermitted sources of fecal coliform contamination was established before plant startup and (2) an engineering report could demonstrate an effective mechanical substitute for a pretreatment reservoir to equalize fluctuations in turbidity, bacteriological concentrations, and chemical quantities. If these parameters were not met, DENR might require development of a new intake location.

The lead engineering firm helped meet the second condition by proposing to add an upstream clarifier with a 30- to 68-minute retention time to the packaged drinking-water plant to control the turbidity of water entering the plant. Similar processes constructed at two plants in Illinois and Kentucky had proved to be successful in removing turbidity and managing total coliform and fecal coliform.⁸⁹

The first condition was more complicated because the sources of the water pollution were outside the jurisdiction of Weaverville. Indeed, they were primarily in another county. Helped in part by attention given in a 1995 Year of the Mountains summit that led then-Governor James B. Hunt to set a goal to eliminate straight pipes in western North Carolina by the end of the decade, in 1996 the legislature established the Wastewater Discharge Elimination (WaDE) Program to manage sources of fecal coliform operating without a permit (see the sidebar, “The Wastewater Discharge Elimination Program”).

⁸⁹ December 19, 1994 Letter from McGill Associates to Mr. Harold Saylor NCDENR; on file with DENR PWS Division

The Wastewater Discharge Elimination Program

At its inception in 1996, the state’s flagship program for eliminating straight piping and failing septic systems, the Wastewater Discharge Elimination (WaDE) program, consisted of one environmental health specialist and one data-entry person. WaDE was forced from the outset to seek partners, and it did so with great success. For example, for the 1998 residential surveys in the Ivy River watershed, it was assisted by the Land-of-Sky Regional Council (LOSRC), Madison County, ARC, and the North Carolina Clean Water Management Trust Fund. Keith Roland, onsite wastewater assessor with the Buncombe County Health Department, contracted with Madison County on a part-time basis to manage the survey and review its results.

In January 2000 the key partners in the WaDE program included the Buncombe County Health Center, Environmental Health Division; the North Carolina Rural Communities Assistance Project; the U.S. Department of Agriculture, Rural Development program; Mountain Housing Opportunities, Inc.; and LOSRC. LOSRC was the financial administrator for processing household loan requests. (For the monies allocated by these and other funders of the Buncombe county/Ivy River watershed WaDE surveys, see Table WaDE-1).

Table WaDE-1. WaDE Funding Sources

Source of Funds	Amount (FY 1999-2000)	Amount (FY 2000-2001)
Mountain Housing Opportunities, Inc, WaDE	\$ 61,200 49,126	\$ 62,400 53,000
U.S. Department of Agriculture, Rural Development	46,200	2,400
Land-of-Sky Regional Council	8,563	2,000
North Carolina Rural Communities Assistance Project	6,648	—
N.C. Department of Environment and Natural Resources, Non Point Source Division	4,126	—
Western North Carolina Housing Partnership, Inc.	3,500	—
Buncombe County Health Center, Environmental Health Division	2,000	4,500
Total	\$181,363	\$124,300

Source: NCDENR WaDE’s “Buncombe Environmental Survey Project Report,” Asheville, NC, October 2000

WaDE began door-to-door surveys to determine the scope of the problems. Numerous partners supported it in this effort: the local health departments, the towns, the Land-of-Sky Regional Council, the North Carolina Rural

Communities Assistance Project (RCAP), the USDA Rural Development program, and a nonprofit entity called Mountain Housing Opportunities, Inc. During the surveys, the surveyors distributed educational materials on wastewater treatment and conducted dye tests (dropping dye tablets into sinks and toilets to see if colored water emerged into a stream or septic tank area). The number of violations discovered was roughly three times the number anticipated. WaDE's October 2000 report on Madison County cited 996 violations based on a survey of 5,360 homes. By the time of the report, 133 of the 996 violations had been corrected. The approximate cost of the survey per household was \$50.98. In Buncombe County (a portion of which lies in the Ivy River watershed), in a survey of 1,243 homes, 161 violations were discovered, including 117 straight pipes, 35 failing septic systems, 4 unpermitted pit privies, and 2 homes with no waste facilities whatsoever. Forty-eight of the 161 violations had been corrected by October 2000. The approximate cost of the survey per household was \$47.58.⁹⁰

A welcome surprise from the survey was how well the inspectors were received. Surveyors documented 95.0 percent of the homeowners as extremely cooperative, 4.9 percent as hesitant, and only 0.1 percent as uncooperative. Almost all the people who were identified as having a violation or a problem cooperated with repairs.⁹¹ Probably a major reason that they did so was the financial assistance that WaDE and its partners put together to help repair the problems. The Buncombe and Madison county health departments processed the

⁹⁰ NCDENR WaDE's "Buncombe Environmental Survey Project Report," Asheville, NC, October 2000

⁹¹ Matthew Richardson, "North Carolina's Waste Discharge Elimination System" (paper submitted for Applied Environmental Finance Class, spring 2004; on file with author and professor).

violations resulting from the surveys and led property owners to the financial resources administered on behalf of WaDE and its partners through the Land-of-Sky Regional Council. In November 1999, USDA set aside \$45,000 to finance corrective actions for residential wastewater elimination in the Ivy River watershed. Meanwhile, Mountain Housing Opportunity made \$60,000 available for housing rehabilitation.

The small community of Stumptown was identified as the source of numerous straight pipes. With funding from the North Carolina Clean Water Management Trust Fund and matching town grants (which took nearly five years to negotiate), Stumptown was connected to the regional wastewater collection and treatment system.

It is easy to see why wastewater problems are costly to correct in Madison County. The roads wind up and down past rocky, fast-flowing streams and creeks that drain into the French Broad River. Houses are near streams and often far apart from each other, usually on back roads. A resident can install a conventional septic system for about \$2,000 if he or she has enough land for a septic tank and a drainage field downhill from the home. However, if wastewater has to be pumped uphill, costs can easily reach \$8,000 or more. Therefore, punitive measures against straight piping have been loosely enforced. Local officials are aware that even \$2,000 may be beyond the means of many families. “Who would tell cash-strapped people – more often than not, elderly – that they had to sell or abandon their home or family farmstead because of a housing code violation?” wrote Fred D. Baldwin, freelance writer⁹²

⁹² Fred D. Baldwin, “Cleaner Water: North Carolina’s Straight-Pipe Elimination Project,” *Appalachia Magazine* [online], September–December 1999, available at www.arc.gov/index.do?nodeId=1277.

To address agricultural practices, in 1999 the Nonpoint Source Management Program of DENR collaborated with the USDA's Natural Resources Conservation Service (NRCS), Madison County Soil and Water Conservation District, to secure \$1,072,750 in funding from a combination of federal and state sources. The monies were allocated to work with forty animal operations in the Ivy River watershed to establish controlled grazing demonstrations, promote education, develop alternative watering systems, redistribute livestock, and restore vegetation. According to Russell Blevins, a conservationist with the USDA-NRCS district in Madison County, the agricultural community has accepted and supported the program, even though most grants require 25 percent cost-sharing by the farmer.⁹³

Meanwhile, in 1998, Weaverville completed construction of the Ivy River Water Treatment Plant. The plant is working well, under the direction of an experienced operator, Tony Laughter, Weaverville's public works director, Larry Sprinkle, and the town manager, Michael JaVan Morgan. In 2000 the utility served about 1,125 customers in Weaverville and another 550 in the county along the water supply line from the Ivy River. The system was working well by March 1999, and the plant was meeting all state and EPA standards.⁹⁴ The plant also monitors stream conditions, giving the basis for future assessment of the upstream wastewater improvements. Coliform and turbidity levels vary greatly, so the plant will have to review data over a long period to determine just how effective all the work in the Ivy River watershed has been. The preliminary data look promising, though.

⁹³ Russell Blevins, district conservationist, USDA-NRCS, telephone interview with Matthew Richardson, 15 July 2004.

⁹⁴ Town of Weaverville Water System 1999 Water Quality Report, Weaverville, NC

A 1999 report by the Nonpoint Source Management Program rated the Ivy River as having the 5th and 11th worst water quality (depending on water quality metric) of the 130 streams in seven counties monitored by the citizen-based Volunteer Water Information Network. However, the 1999 raw data documentation file in DENR’s Public Water Supply Section reports a 40- to 50-percent decrease in fecal coliform numbers (based on the number of days that have less than 300 fecal coliform colonies per 100 milliliters) from the same time period the previous year.⁹⁵ In addition, VWIN’s statistical trend analysis of the Ivy River watershed for 1992–2002 reports some improvement. Measured fecal coliform concentrations in the Ivy River watershed have noticeably decreased in the past five to ten years.⁹⁶ This is primarily a result of alternative livestock feeding and watering operations coordinated by Blevins and the Madison County Soil and Water Conservation District.

The Weaverville water system recovers its costs through user charges (water sales, tap fees, reconnection fees, interest income, etc.). Water rates are based on meter size and location within or outside town limits. Rates were raised by about 25 percent from 1992 to 2000, about 43 percent from 2000 to 2004 (see Table E-11).

Table E-11. Weaverville Customer Water Rates 1992, 2000, and 2004

	Cost inside Town				Cost outside Town			
	2,000 gal./mo.	4,000 gal./mo.	6,000 gal./mo.	10,000 gal./mo.	2,000 gal./mo.	4,000 gal./mo.	6,000 gal./mo.	10,000 gal./mo.
1992	\$5.90	\$12.10	\$18.59	\$31.57	\$11.80	\$24.19	\$37.17	\$ 63.13
2000	7.38	15.13	23.25	39.49	14.76	30.25	46.47	78.91
2004	10.60	21.70	33.30	56.50	21.20	43.30	66.60	113.00

⁹⁵ Microbiological Operations Reports for Town of Weaverville’s Ivy River WWTP, on file at NC DENR Public Water Systems (PWS) Division

⁹⁶ Ms. Marilyn Westphal, analytical chemist and VWIN coordinator, conversation with Matthew Richardson, July 20, 2004

Source: 1992, 2000, and 2004 Town of Weaverville Water Department, Ordinances to Establish a Schedule of Rates, Fees, Charges & Penalties

Weaverville's median household income in 2000 was \$45,100 per year. In that year, water rates accounted for 0.20 percent to 1.10 percent of such income for people within the town limits, 0.39 percent to 2.10 percent for people outside the town limits (see Table E-12).

Table E-12. Weaverville Water Rates as Percentage of Median Household Income, 2000

Percent age of 2000 MHI inside Town				Percentage of 2000 MHI Outside Town			
2,000 gal./mo.	4,000 gal./mo.	6,000 gal./mo.	10,000 gal./mo.	2,000 gal./mo.	4,000 gal./mo.	6,000 gal./mo.	10,000 gal./mo.
0.20	0.40	0.62	1.10	0.39	0.80	1.20	2.10

Source: Census Bureau, Census 2000 Summary File1; Table P1

In 2002, Weaverville residential water cost more than water in 90 percent of North Carolina (based on the charge for 3,000 gallons per month for a residential account).⁹⁷

The construction of I-26 has developed a growth corridor in the area. This is a benefit to some people (relative to economic growth) but a detriment to those who are opposed to "outsiders" in the area. Regardless, there is currently a general consensus by the parties involved that water quality in the Ivy River watershed has noticeably improved, and consequently the regional flora and fauna also have flourished.

As for Governor Hunt's call for eliminating straight piping in western North Carolina by the end of the decade, in July 2002, in a survey of 1,844 homes, the number of straight piping violations was down to 265, and 154 of them had been corrected through septic system replacement or were in the process of being

⁹⁷ Review of the North Carolina League of Municipalities Survey "How Much Does Water Cost?" December 2002. Rpt#329. www.nclm.org.

resolved.⁹⁸ As of July 2004, there remained some homes in the watershed that were not in compliance with straight-pipe laws.⁹⁹ Funding for repairs and replacements was available to the homeowners but had not been used. Blevins identified three main reasons for this: (1) the funding was primarily in the form of low-interest loans, not grants, and homeowners were choosing not to go into debt; (2) some homeowners did not qualify for loans; and (3) some strong-willed homeowners were opposed to large organizations (such as DENR and the U.S. Government) instructing them in their actions on their own land.¹⁰⁰

Future drinking-water needs are difficult to determine precisely. To estimate the national needs for drinking water infrastructure over the next twenty years, EPA conducts nationwide surveys every four years, the most recent survey for which results are available was in 1999. They are based on a methodology that samples a portion of the nation's drinking water systems and then draw additional information from the Safe Drinking Water Information System to extrapolate drinking water needs at the state and national levels. To determine needs for a specific geographical location such as Weaverville, one must re-extrapolate the needs to the local level on the basis of an inventory of water systems in that geographical area. Using the 1999 EPA methodology and working with the eight small and the two medium-sized drinking-water systems in Weaverville, the estimated twenty-year drinking-water needs for Weaverville are \$13,927,340 (UNCEFC calculated estimate). Note that one of the two medium-sized systems was an EPA survey sampling point, therefore the

⁹⁸ WaDE's "Buncombe Environmental Health Survey Project" status reports 1999 through 2002

⁹⁹ (however the documentation is unclear on the precise number); WaDE's "Buncombe Environmental Health Survey Project status reports 2002

¹⁰⁰ Blevins, interview.

proposed needs values are actual reported values, rather than modeled estimates for this single system. Given that EPA's survey is conducted on the national level, and estimation of Weaverville's needs is a community-level analysis with a series of extrapolations, a number of data limitations may be identified.

Weaverville's town manager reported that over the next twenty years, with potentially two plant expansions, the \$14 million estimate is a loose but reasonably accurate estimate.

Although Weaverville has a secure source of water for the future, Mars Hill is reaching capacity with its source. Mars Hill and Weaverville officials have been engaged in discussions regarding supplying Ivy River water to Mars Hill. Weaverville's town manager is open to the idea of selling treated water to Mars Hill but says the town cannot sell water more cheaply to Mars Hill residents than it does to Weaverville residents. Mars Hill officials think that the rates are unreasonable. However, given the projected growth rates in the region, it is likely only a matter of time before Mars Hill is supplied with Ivy River water.

Future regional issues include Weaverville's high water rates relative to the rest of North Carolina, growth associated with the recently completed segment of I-26, the remaining residential straight pipes, the quality of Ivy River water, and Mars Hill's drinking water capacity limitations.

Weaverville could never have foreseen the obstacles in its path when it set out to find a new water source in the 1980s. Through persistence and creativity, it overcame those obstacles. The community could not have secured the water supply it now has, without the outside help such as the ARC, USDA-RUS, and WaDE, potential funding sources including the N.C. Clean Water Management Trust Fund and the Pigeon River Fund, the state legislature, and many partners at the local and regional level that worked hard to address problems and calm fears.

The primary goals of WaDE are twofold: (1) identification and correction of violations from onsite wastewater systems through door-to-door surveys and (2) identification of sources of financial assistance for wastewater management, for low-income homeowners and communities.

Typical WaDE surveys discover that from 9 percent to 60 percent of the homes are in violation. Noncompliance involves straight piping of black or gray water, failing and overflowing systems, and outhouses. The WaDE Survey Manual familiarizes communities with wastewater treatment processes and assists them in successfully completing surveys aimed at eliminating straight piping. The manual includes sample letters, survey forms, sample notifications of violations, press releases, and a recommended list of stakeholders that should participate in the community effort. The eight basic components of a survey project include funding, administration, surveying, corrections, financial assistance, enforcement, education, and data gathering/reporting. During the surveys, educational information is disseminated, and where plumbing configurations are not self-evident, the surveyors drop dye tablets into sinks and toilets (different colors for each) to see if colored water emerges into a stream or septic tank area.

For more information on WaDE, visit the website of the Environmental Finance Center of the University of North Carolina at Chapel Hill, at www.efc.unc.edu/, and click on N.C. Onsite Wastewater Systems: Funding and Resources.