

ATTACHMENT B

Watershed Based Plan Format

Name of Project: Hiwassee River Tributaries Project Phase 2

Lead Organization: Southeast Tennessee Resource Conservation and Development Council (SETNRCD) will provide overall leadership in this project. Partners including the Natural Resources Conservation Services (NRCS) and county groundwater specialists will provide technical assistance when necessary.

Seth Shaffer is the Executive Director of the nonprofit. He has a Master's in Sustainable Food Systems. His contact information is 423-847-7790 or director.setnrcd@gmail.com.

Matt Heath will serve as the Project Manager. He has worked on several 319 funded projects and previously worked as a Biological Technician with the Upper Colorado River Endangered Fish Recovery Program. He can be contacted at 404-200-8448 or Matt.edward.heath@gmail.com

Watershed Identification (name, location, 12-digit HUC, etc.):

Watershed Name: Hiwassee River

HUC: 06020002

Impaired Segments (TDEC 2014)

Watershed name: Chatata Creek (19.62 Miles)

Bradley County

Waterbody ID: TN06020002012 – 1000

Little Chatata Creek (14.3 Miles)

Bradley County

Waterbody ID: TN06020002012 – 0200

The Hiwassee River Watershed (HUC 0602002) encompasses 1,011.1 square miles of Northern Georgia, West North Carolina, and East Tennessee where it drains into the Tennessee River. In Tennessee, this river and its tributaries run through Meigs, McMinn, Polk, and Bradley County, where the majority of the watershed lays. In this watershed, the Hiwassee Watershed Water Management Plan (2003) states that there are 62 rare species within this watershed; of those rare species 51 are plants, three are mussels (Tan riffleshell, Cumberland bean, Slabside pearlymussel), two amphibians, one bird, one mammal, and four rare fish (Lake sturgeon, Blotched darter, Highfin carpsucker, Snail darter).

Candies Creek in the lower, middle, and upper section (HUC 60200021301, 60200021302, 60200021303) sections have a combined acreage of 70,940.03 acres with 10,024.58 acres being listed as urban, 2,029.77 acres as cropland, 17,036.73 as pastureland, 41,140.21 as forest, 44.31 dedicated to feed lots, and 632.7 acres of water. On the agricultural side, the watersheds are home to 7,271 beef cattle, 424 dairy cattle, 57 swine, 135 sheep, 290 horses, 1,716,188 chickens, 33 turkey, and 70 ducks. For homes, there are 4,049 septic systems in the watersheds with a failure rate of 2.85% all in Hydrological Soil Group C according to the Spreadsheet Tool for Estimating Pollutant Load (STEPL).

The Agency, Coppinger, Dry Valley Creeks, and Parker Branch (HUC 60200021407, 60200021408, 60200021406, 60200021403) group makes up the watershed group that lays close to the Hiwassee River and drains directly or nearly directly into it. These combined watersheds have an acreage of 79,300.68. Of this area 6031.81 acres are Urban, 3865.41 are cropland, 22,497.17 for pastureland, 42,749.45 for forest, 20.3 acres dedicated to feed lots, 3953.26 acres for water, and 204.58 acres for “other” uses. In this watershed there are 6,787 beef cattle, 573 dairy cattle, 79 swine, 84 sheep, 295 horses, 677,569 chickens, 66 turkey, and 23 ducks. STEPL also reports 2,321 septic systems on the property with a failure rate of 2.85% in grade C soil with the exception of Dry Valley and Parker Branch which are classified as Soil Group B.

South Chestuee Creek (HUC 600021401) has a total acreage of 25414.03 with 2253.05 acres designated for Urban, 364.05 for cropland, 8086.03 for pastureland, 14649.53 for forrest, 19.683 for feedlots, 19.683 for feedlots, 40.03 for water, and 21.34 acres for other uses. The watershed also has 3192 beef cattle, 271 dairy cattle, 38 swine, 53 sheep, 112 horses, 760103 chicken, 15 turkey, and 28 ducks. There are 919 septic systems on the South Chestuee Creek with a failure rate of 2.85%. It is located in the Hydrological Soil Group C.

North Mouse Creek Lower upper and lower (HUC 602000021203, 602000021201) have a combined acreage of 48,800 acres with 9077.22 acres in urban, 3030.11 in cropland, 16114.46 in pastureland, 20471.13 in forest, 6.65 in feedlots, 84.5 in water, and 22.68 for other uses. There are 4962 beef cattle, 576 dairly cattle, 58 swine, 104 sheep, 260 horses, 129121 chickens, 5 turkey, and 7 ducks. There are 3618 septic systems in this watershed with a failure rate of 2.85% in group B Hydrological Soil.

South Mouse Creek (HUC 60200021404) has a total acreage of 25229.47, with 12214.55 in urban, 686.08 in cropland, 4310.22 in pastureland, 7902.32 in forest, 11.413 in feedlots, 78.28 with water, and 38.02 in other. South Mouse Creek is also home to the majority of Cleveland City, however there are still 1864 beef cattle, 109 dairy cattle, 14 swine, 35 sheep, 72 horses, 442390 chickens, 8 turkey, and 18 ducks. 6,914 septic systems are in place with a failure rate of 2.85%. It's Hydrological Soil Group is C.

Spring Creek and Rogers Creek (HUC 60200021202, 602000021405) have a combined acreage of 47233.11 with 1361.05 in cropland, 2033.09 in urban, 13431.71 in pastureland, 29787.69 in forest, 5.54 in feedlots, 395.41 in water, and 224.16 in other. There are 4136 beef cattle, 480 dairy cattle, 49 swine, 87 sheep, 217 horses, 107647 chickens, 4 turkey, and 6 ducks. There are 413 septic systems on site with a failure rate of 2.85% in hydrological group C.

The Oostanaula Creek Lower and Upper sections (60200021102, 60021101) has a combined acreage of 44982.71 with 3283.42 in cropland, 4907.53 in urban, 14047.97 in pastureland, 22709.32 in forest, 5.77 in feedlots, and 34.47 in water. There are 4430 beef cattle, 502 dairy cattle, 50 swine, 89 sheep, 230 horses, 109010 horses, 4 turkey and 6 ducks. There are 1824 septic systems in the watershed with a failure rate of 2.85% in Hydrological Group B.

Chatata Creek enters the Hiwassee River at mile 23.9. The state has listed 19.62 miles of Chatata Creek and 14.63 miles of Little Chatata Creek as not meeting designated usages. TVA has tested these waters in addition to the TDEC testing and has confirmed a consistently scored "high poor".

Fifty percent of the 43 square miles that the Chatata Creek watershed covers is deemed unsuitable for agriculture. 35% of the watershed is used for agricultural purposes with 7.3% as row crops and 5.5% designated as urban land use. TVA published a report on the Chatata Creek in 2009 which listed a number of sites that could use improvements. Although this report focusses primarily on siltation, barriers, channel alteration, and trash dumping sites, it does provide insight into what the Stream Corridor Assessment views as potential problems. We will be visiting this document to determine if the sites suggested by the SCA survey can go hand in hand with our projects in creating stream buffers or other BMPs.

The TMDL issued in 2006 for the Hiwassee River listed two sites on Chatata Creek whose coliform microbial density was averaged. One site showed an average of 946 counts per 100 mL, another testing site showed 2,841 counts per 100 mL on average with a maximum amount of 23,590 counts per 100 mL. Fecal coliform testing was not done at the first site, but for the latter and there was an average of 3,053 counts per 100 mL.

As mentioned previously, the majority of *E. coli* being deposited into Chatata Creek is due to local livestock. In this watershed, the USDA 2012 census lists the following livestock counts: 3,137 beef cattle, 184 dairy cattle, 23 swine, 58 sheep, 122 horses, 744,424 chickens, 14 turkeys and 30 ducks. Due to the TMDL issued and our previous knowledge in working with other distributors, we will be putting our primary focus on the cattle operations in order to reduce the greatest amount of *E. coli* being deposited into the stream.

Another portion of our grant will be dedicated to fixing failed septic systems. The TMDL issued shows that 4,477 families on the Chatata Creek have septic systems and 1,374 families on Little

Chatata Creek are on septic systems. According to the 1992 and 1998 summary of the status of onsite treatment, 2.85% of the septic systems have failed and are in need of repair.

Causes and Sources of NPS Pollutants

NPS pollution can be difficult to identify and manage due to the variability of land uses, runoff events, grazing rotations and other dynamic factors. The 2020 303(d) list released by TDEC identifies a number of possible sources of NPS pollutants in the tributaries of the Hiwassee River.

The loss of biological diversity due to siltation can be attributed to the alteration in stream-side or littoral vegetative cover, erosion from streamside cattle grazing, and stormwater runoff from urbanization. *Escherichia coli* (*E. coli*) concentrations can be attributed to grazing in riparian or shoreline zones, animal feed operations, and sanitary sewer overflows. According to the Chatata Creek Watershed Stream Corridor Assessment published in December 2009 by TVA, a bacterial study conducted by University of Tennessee Knoxville indicated that 80% of fecal contamination within this specific watershed is from bovine sources.

Estimate of Load Reductions

The primary cause of the 303(d) listing for these creeks are *E. coli* contamination, and as such our BMPs will focus on reducing *E. coli*. Other causes for delisting include sedimentation/siltation as well as alteration in stream-side or littoral vegetative covers, both of which will be covered with the same projects in mind. With the severe droughts we have been experienced in the area, much of the pasture may be damaged with soil exposed. We are planning to do a number of forage and biomass planting in fields as both an incentive for farmers to work with us as well as a way to reduce the amount of sediment and runoff being flushed into streams.

Practice Code	Practice Name	Unit	Amount	Lbs./N Per Year	Lbs./P Per Year	Tons of Sediment Per Year
614	Watering System	Lbs./N/Unit/Year	90	6320.7	529.2	0.036
561	Heavy Use Area	Lbs./N/sqft/Year	77640 sq/ft	6987.6	776.4	155.28
516	Pipeline	Lbs./N/foot/Year	42000	5460	840	252
382	Fence	Lbs./N/foot/Year	123000 ft	30750	2460	738

512	Forage and Biomass Planting	Lbs. /N/acre/Year	1800 acres	12204	1188	315
006	Septic Improvements	Lbs N/unit/year	150	17892	1887	534.6
		Total		79614.3	7680.6	1994.916

BMP List, Educational Activities and Budget

BMP Name	Quantity	Cost/Unit	Budget Estimate
Watering System	15	6854.4	102816
Heavy Use Area	12,940 sq/ft	21.48	277951.2
Pipeline	7,000	15	105000
Fence	20,500 ft	16.38	335790
Forage and Biomass Planting	300 acres	2151.66	645498
Septic Improvements	150	3000	450000

Educational Event	Quantity	Cost/Unit	Budget Estimate
Agricultural Workshop	12	600	7200
Septic Installer Workshop	6	600	3600
Residential Septic System Workshop	6	600	3600
Nonpoint Source Pollution Events	18	600	10800

Total Budget for Project:	\$1,942,255.2
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*Cost estimated from 2015 EQIP Payment Schedule and previous area estimates for septic repairs

Timeline, Tasks, and Assessment of Progress

This project will be divided up into separate phases with emphasis on designated hotspots rather than the entirety of the Hiwassee River. The first phase will focus on Chatata and Little Chatata Creeks. Within the first two months we will reach out to farmers who were previously interested in the grant that were not within watersheds we previously served. In the first three months, we plan to have one of the farmer workshops, this is especially important to advertise the forage and biomass BMPs in a timely fashion to meet planting timetables as the recent severe drought has caused quite a bit of damage to grazing fields. Another farmer BMP workshop will be done in the next year. The workshop with septic installers and residents will be done within the first six months. We are planning to do at minimum 25 septic system repairs, however this may change if we get an increased amount of interest – we may reduce the cost share to accommodate for increased interest. On the agriculture end, we plan on installing a number of BMPs throughout the timeline of the grant with a focus on reducing the amount of cattle going to stream banks for water as well as improving farms to reduce the amount of pollution going into the streams. We are planning on installing 20,500 feet of fence as both exclusion and cross fencing to improve soil quality, 15 watering stations with an accompanying 12,940 sq/ft of heavy use areas, 7000 feet of pipeline, and 300 acres of forage and biomass planting.

Progress will be measured month to month with the nonprofit's board overseeing and approving vouchers and project coordinator's work. Every fiscal quarter we will send in quarterly reports as required by the state, alongside financial reimbursement requests unless we require them on a more immediate basis. On September 15th of every year we will submit to the state a document summarizing our work containing four separate photos called "4x4s". At the end of the grant cycle we will publish our close out report which will contain a summary of what we have done, problems that we have encountered, and how, in the future, those problems could be avoided.

Towards the end of the grant cycle, we will begin planning Phase III for work on another stream in the Hiwassee Watershed in order to continue our work to reduce the overall total amount of *E. coli* going into the Hiwassee. We will work from the headwaters of tributaries down to the river itself. The plan is to visit the majority of the watershed over time in order to improve water quality of the Hiwassee River as well as its tributaries.

Outreach and Education

A key component to the success of this project will be the involvement of the local community. Our goal is to educate local citizens on the threats facing their watershed and communicate the various ways they can be involved, whether through volunteer efforts or participation in grant-funded programs.

We plan to host farmer BMP workshops, a septic contractor and homeowner kickoff meeting, and stream cleanups during this grant cycle. To broaden our outreach efforts, we plan to coordinate with groups such as the Future Farmers of America, County 4-H groups, local

schools, and local nonprofit organizations. Additionally, mailers will be used to inform community members of cost-share programs and outreach events.

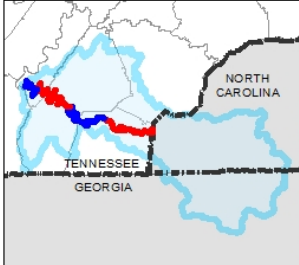
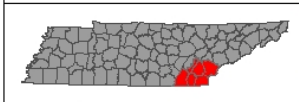
Criteria to Assess Achievement of Load Reduction Goals

We will work with TDEC and ground water specialists in order to measure the improvements that our practices have made. We will provide a list of the locations and practices installed, and will see after implementation if water quality has been improved. These results will be seen in any future TMDL or 303(d) listings or delistings. Additionally, these BMPs will have an estimated load reduction as seen in the Estimated Load Reduction section of this Watershed Based Plan which uses information provided in the FY2017 319 RFP for constructing these plans.

Monitoring and Documenting Success

Success of this project is based off of the BMPs installed which are known to reduce the amount of *E. coli* contamination in the creek. Additionally, we will also see reduction in erosion and sedimentation in the creek as a consequence of installing these BMPs – both of which are important in the improvement of overall water quality, where sedimentation likely impacts the ability of *E. coli* to subsist in the water column. We will submit all records to the state office defining the BMPs installed as well as their location. The Tennessee Department of Environmental Conservation (TDEC) will be conducting water quality monitoring to test the efficacy of installed BMPs and for delisting purposes.

HIWASSEE RIVER and
HIWASSEE RIVER EMBAYMENTS
BRADLEY, HAMILTON, MCMINN,
MEIGS, MONROE and POLK
COUNTIES, TN



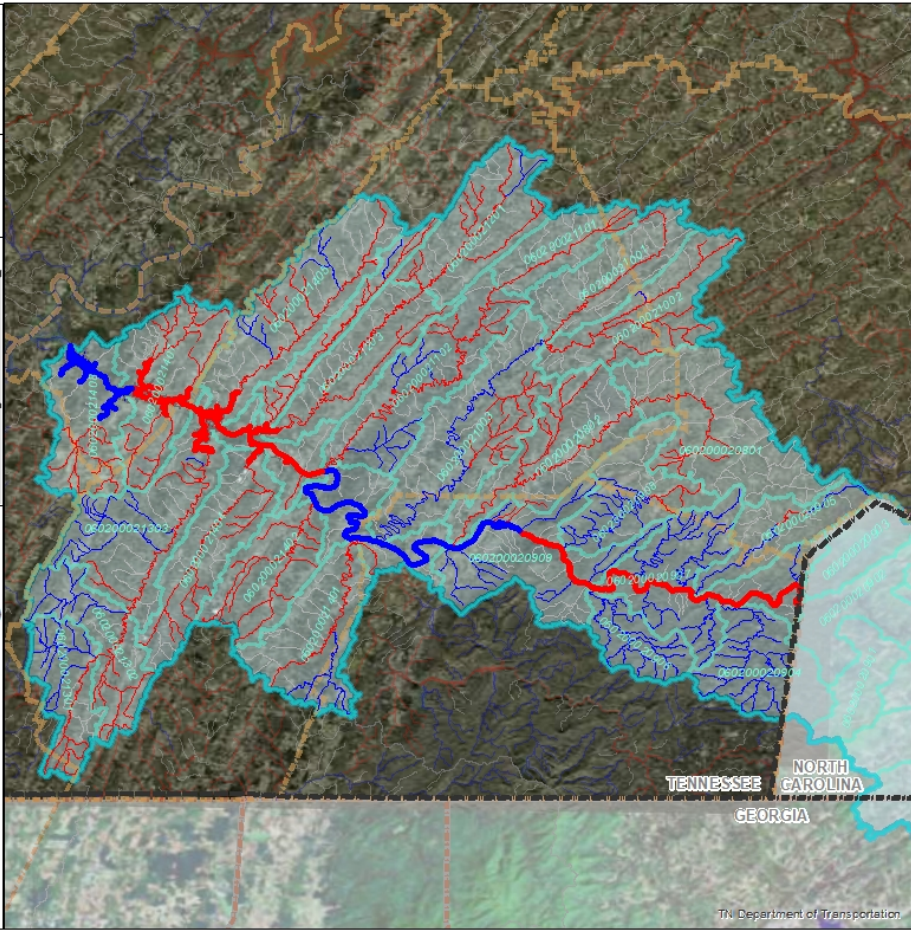
LEGEND

- Hiwassee River
- Hiwassee Watershed (8-Digit Hydrologic Unit Code)
- 12-Digit HUC Watersheds
- County Boundaries
- State Boundaries

TDEC 2016 Stream Assessment

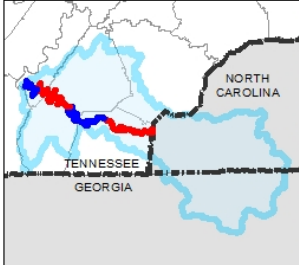
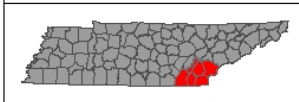
- Fully Supporting
- Not Supporting
- Not Assessed

0 2.5 5 10 Miles



TN Department of Transportation

HIWASSEE RIVER and
HIWASSEE RIVER EMBAYMENTS
BRADLEY, HAMILTON, MCMINN,
MEIGS, MONROE and POLK
COUNTIES, TN



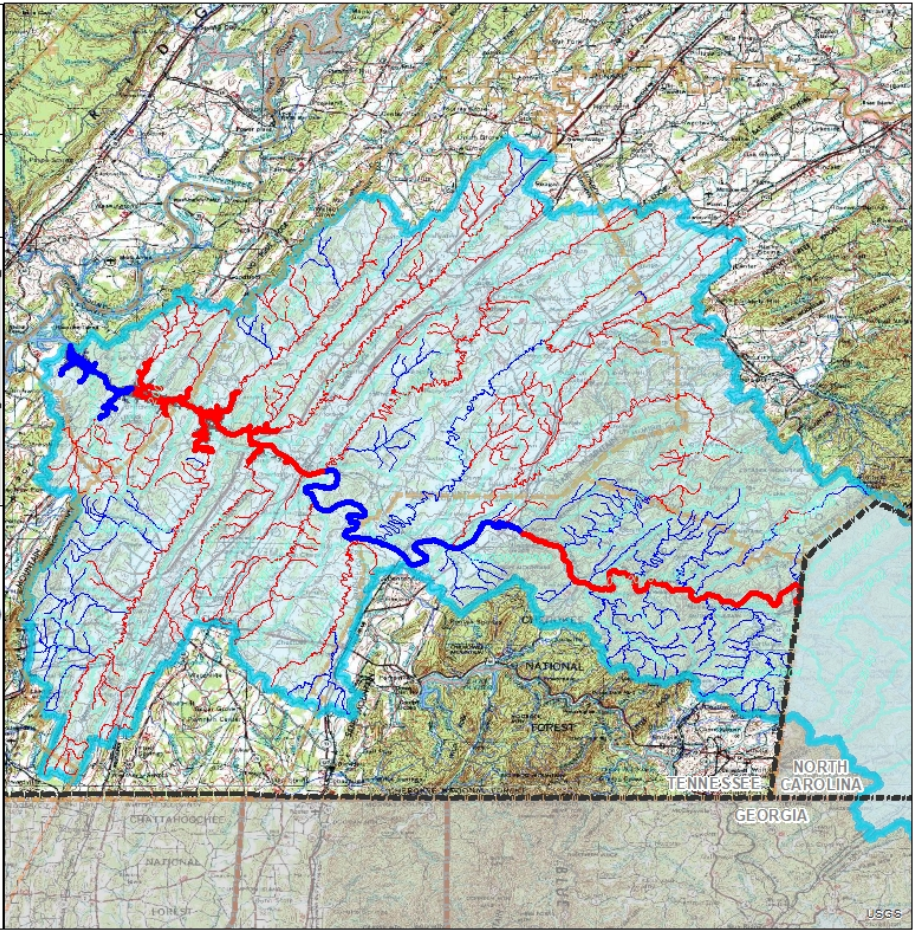
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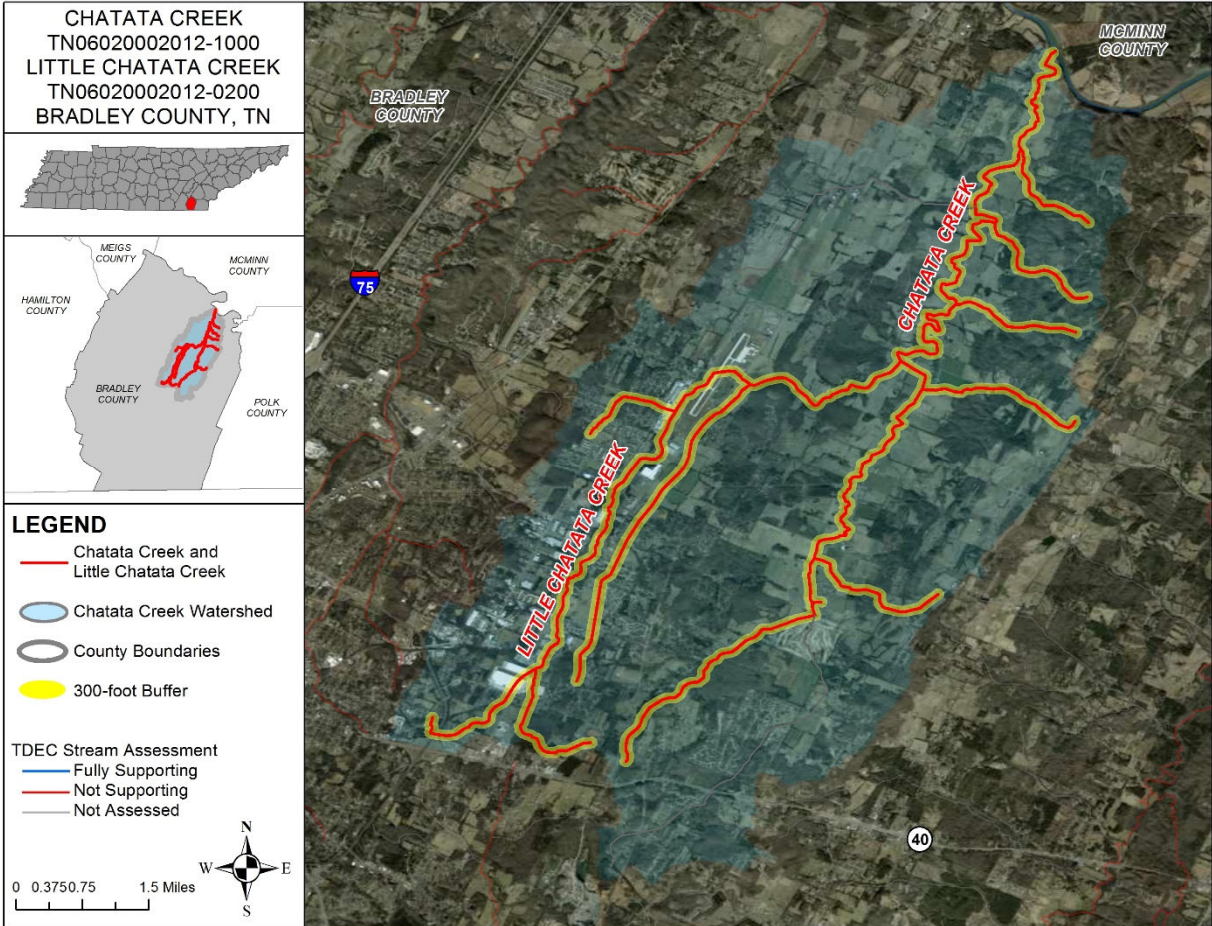
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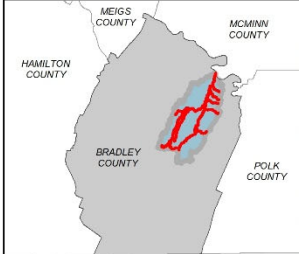
- Fully Supporting
- Not Supporting
- Not Assessed

0 2.5 5 10 Miles





CHATATA CREEK
 TN06020002012-1000
 LITTLE CHATATA CREEK
 TN06020002012-0200
 BRADLEY COUNTY, TN



- LEGEND**
- Chatata Creek and Little Chatata Creek
 - Chatata Creek Watershed
 - County Boundaries
 - 300-foot Buffer

- TDEC Stream Assessment**
- Fully Supporting
 - Not Supporting
 - Not Assessed

