Lower French Broad River Improvement Taskforce (BRIT)

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Mission Statement:

BRIT aims to protect the diverse landscape of the Lower French Broad River watershed which is home to 131 rare plant and animal species by removing these species from the endangered species list. BRIT also strives to enhance the recreational opportunities available in the Lower French Broad River watershed such as rafting and fishing which bring in ecotourism from around the world. We hope to achieve our goals through engagement of stakeholders, utilization of current technology, and effective planning. We hope to reach our goal of removing these species from the endangered species list and increasing ecotourism by 2040.

Background:

The Lower French Broad River watershed is located in Eastern Tennessee and made up of 25 subwatersheds and crosses 5 counties. The topography of the French Broad contains sinkholes, springs, streams, and caves. The watershed covers 2100 Sq Km and is dominated by the forested land cover of the Great Smoky Mountains in the Southern region, but also includes agriculture, urban areas, and the 210 mile French Broad River in the Northern region. Since a large amount of the watershed is covered by mountains, the watershed is not likely to be overused for development and agriculture. However, with the amount of tourism that the Great Smoky Mountains attract, environmental issues such as invasive species being brought in and air pollution have caused adverse effects. There are 10 dams spread throughout the watershed with structures at least 20 feet high. One state designated natural area is present in the watershed, Roundtop Mountain which covers 237 acres. The Lower French Broad River is home to 131 rare plant and animal species, including 10 mussel species, 9 fish species, and 15 mammal species. Several of these species are endangered such as the Lake Sturgeon and Oyster Mussel (Tennessee Department of Environment and Conservation, Division of Water Pollution Control, 2008). Other recreational activities are centered around the French Broad River, such as guided canoeing and rafting trips and fishing for largemouth bass, trout, and catfish (Blue Ridge National Heritage Area, 2018)..

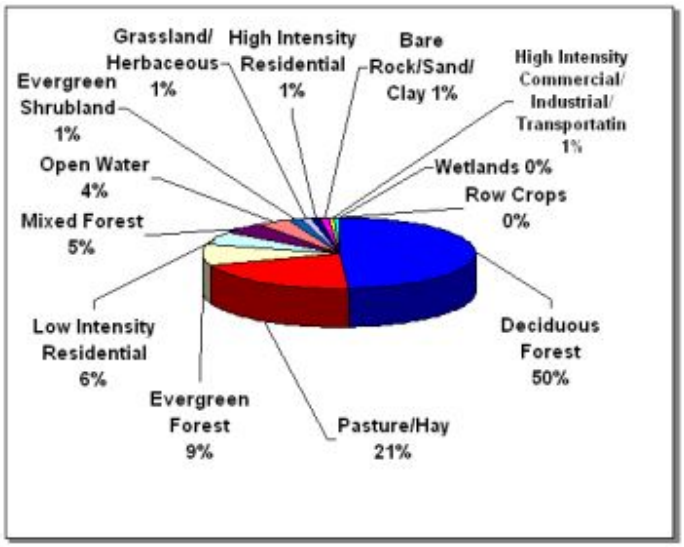

Fig 1: Pie chart showing land

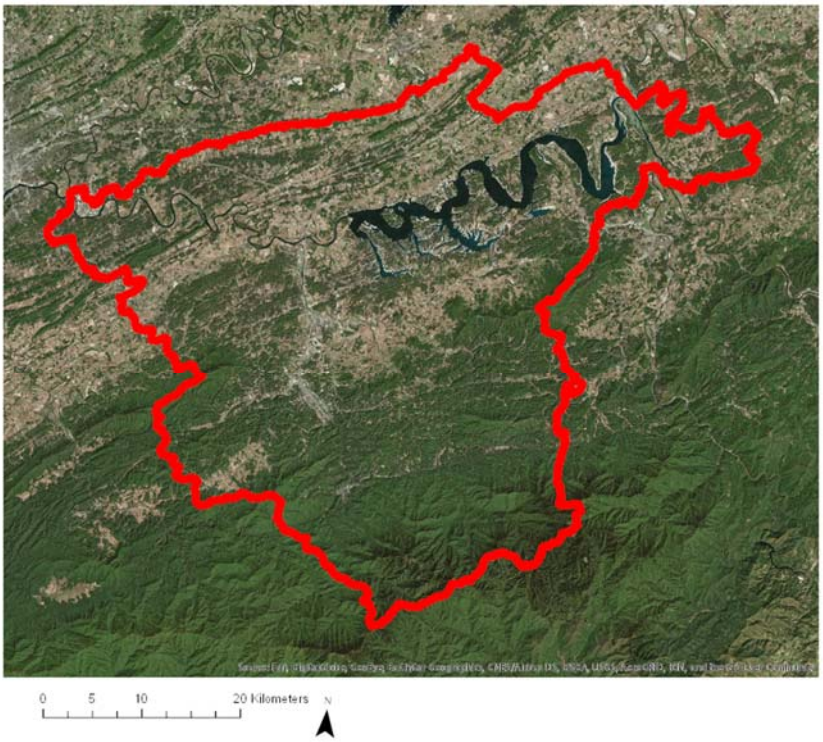

Fig 2: Shows the Boundary of

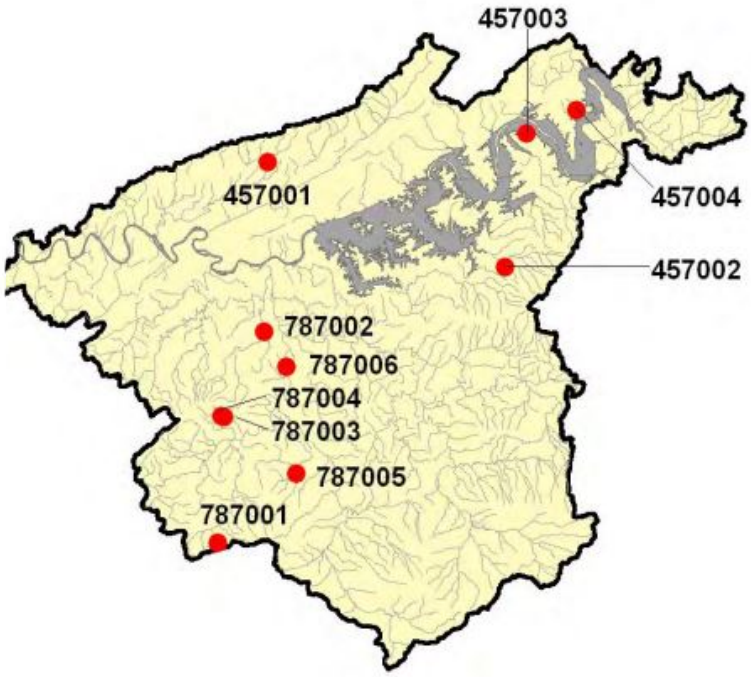

Fig 3: Shows the dams in the

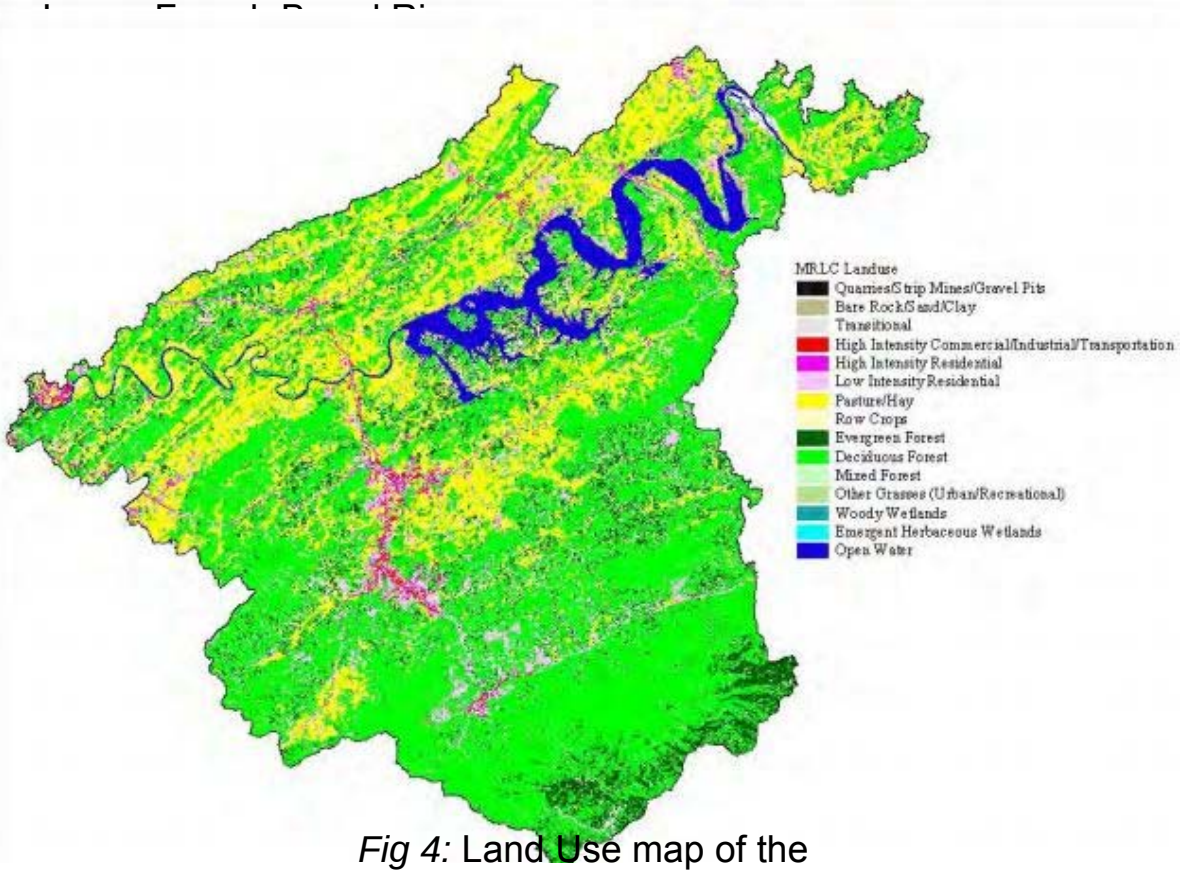

Fig 4: Land Use map of the

Current Policies:

The Tennessee Department of Environment and Conservation began using a watershed approach for water management in 1996. This also provided a framework for a community based approach, including elected officials, experts, and citizens in the planning process. The watershed approach utilizes a large amount of state and federal regulations such as water quality standards, the National Pollutant Discharge Elimination System, Total Daily Maximum Loads, the Clean Lakes Program, the Nonpoint Source Program, and the Groundwater Program. The National Pollutant Discharge Elimination System (NPDES) is a permit program that regulates point source discharge affecting waterways. This program is run by the Environmental Protection Agency (EPA) and was authorized by the 1972 Clean Water Act. Total Daily Maximum Loads (TMDL) calculates the amount of pollutants that are entering a waterway. This is calculated by adding the sum of the wasteload allocations, the sum of load allocations, and a margin of safety. TMDL's are regulated by the EPA (EPA). Some areas within the Lower French Broad River watershed are designated as State Scenic Rivers, helping to preserve rivers under the management of the National Park Service (United States Congress, 1968). These scenic rivers include Tuckahoe Creek and sections of the French Broad River.

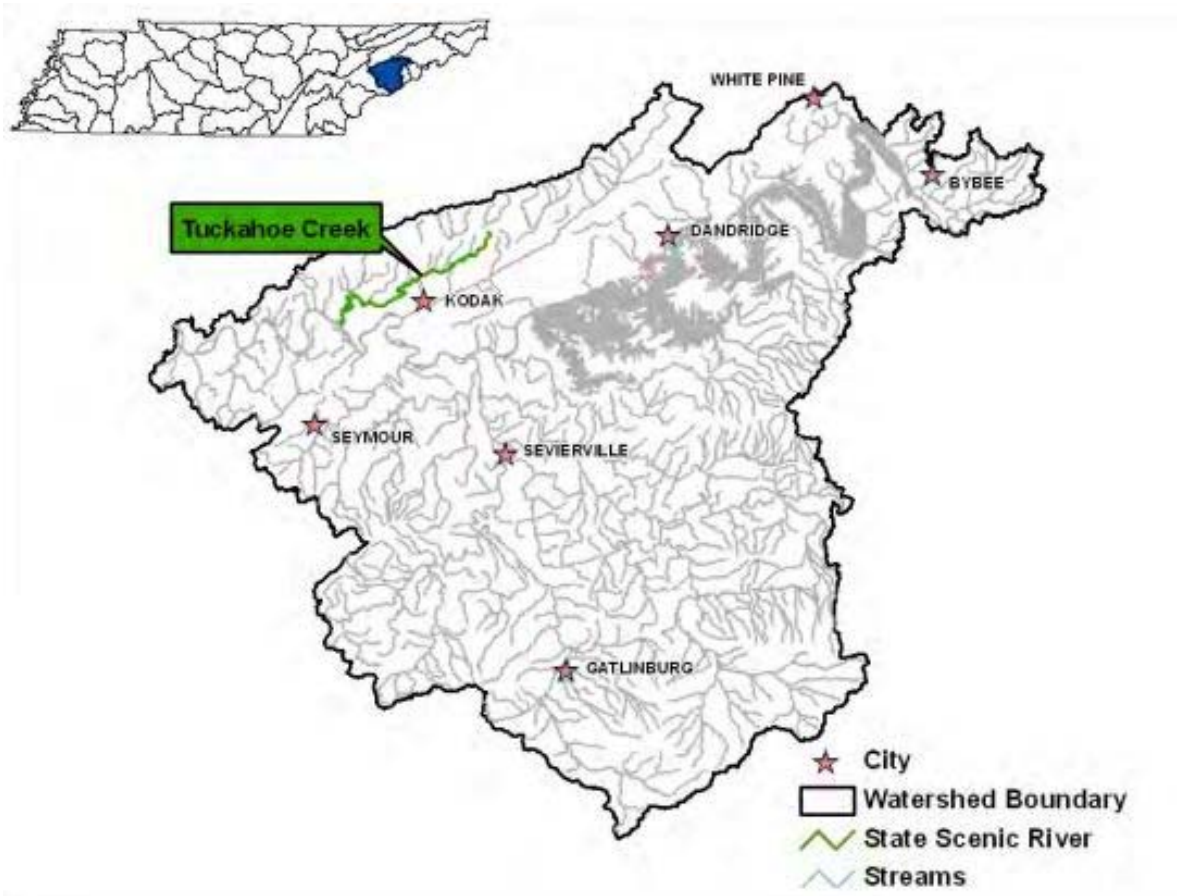

Fig 5: Map of the State Scenic

Problem 1: Insufficient Data for Water Assessment

In 1996, Tennessee began the watershed approach to water quality protection. In this approach, water quality is assessed in year three of the watershed cycle, following one to two years of data collection. This assessment is used in the 305 (b) Report and 303(d) list as required by the Clean Water Act. The 305(b) report documents the condition of the State's waters and is used to make decision based on the water quality and monitor progress made. Then the EPA uses this information to make a national assessment of the nation's water quality. The 303(d) list is a compilation of the waters of Tennessee that fail to support some or all of their classified uses. This does not include certain streams that already have a strategy in place or streams that cannot be accessed. With this information, Tennessee considers streams on the list to be a top priority for water quality improvement efforts.

The problem with this control system is the fact that the 303(d) list does not include streams in which the Division of Water Pollution Control cannot access. Around 42% of waters within the Lower French Broad River Watershed have insufficient and outdated water. This is because only 7% of this watershed is residential and many areas are hard to access with a lack of people to monitor the water quality. Since there is not enough data, there is a lack of water quality information available for the stream and therefore is not able to be properly assessed and put on the list. This also affects the 305(b) report to the EPA since it is not truly reflecting the entire watersheds area.

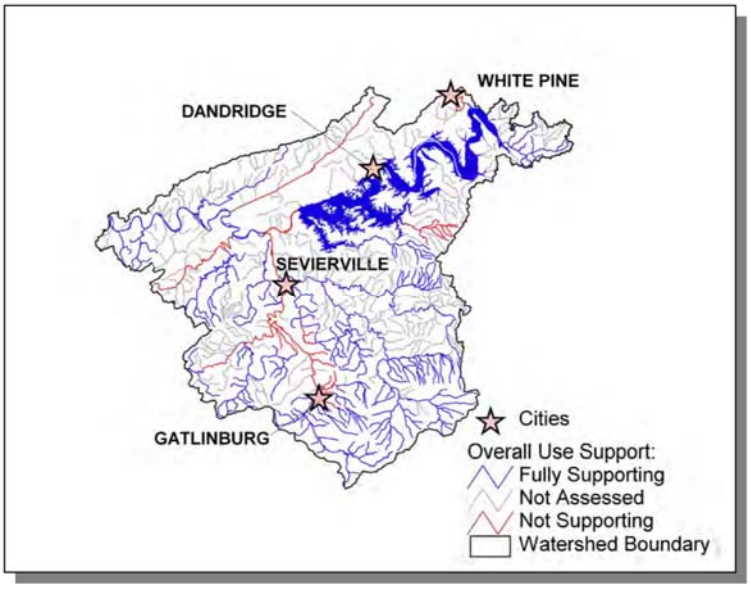

Fig 6: Overall use support and

In order to be able to effectively monitor the watershed and make a proper analysis of the water quality, the data collection needs to be updated and consistently collected. Currently, there is a plan for the assessment of the water quality using five categories recommended by the EPA.

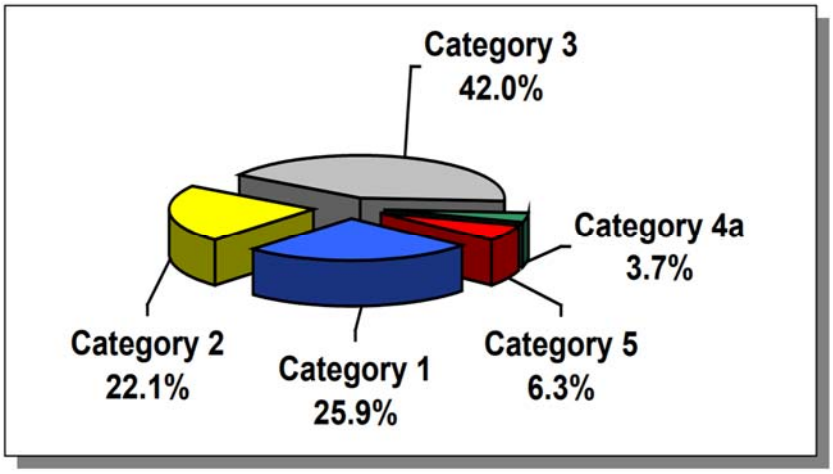

Fig 7: Water Quality

This will be followed once the data is collected, but data less than 5 years old is only monitored and only readily monitored data are considered to be able to be categorized. This also means that it takes up to 5 years of collecting data and monitoring the watershed before the data can be evaluated and changed. In order to be able to increase the amount of data collected, volunteer coordination will be needed. In residential areas and other easily accessible areas of the watershed, volunteer organizations, such as, Outdoor Knoxville, Blue Ridge National Heritage, Fly Fish Tennessee and Homeowner Associations, need to collect this information. Therefore, the 42% of unmonitored areas can be assigned to professionals that are willing to access these areas. One way to ensure this is monitored is by establishing a French Broad Water Monitoring position at the Tennessee Department of Environment and Conservation, Division of Water Pollution Control. With this change of information, the 303(d) report will be more up to date and able to improve water quality that affects the local wildlife and recreational activities in all of the watershed.

Problem 2: Nonpoint Source Pollution

Nonpoint source pollution is pollution that comes from a source that cannot easily be tracked. Hence, nonpoint source pollution does not have the same luxury as point source pollution, such as emissions from a power plant, which can be easily tracked and monitored. As a result, there is a lot of nonpoint source pollution entering the Lower French Broad River Watershed, and not a lot being done to solve the problem. This pollution is primarily coming from development, urbanization, and agriculture. The new development and urbanization leads to nonpoint source pollution due to increased runoff. This runoff is partly due to an increase in impervious surfaces. As a result, less water is absorbed back into the ground, and hence, runs off into the river, which can cause areas to go above their Total Daily Maximum Load. Another problem from development and urbanization is that they lead to an increase in erosion. This comes from increased runoff from the increase in impervious surfaces, but also development on steep slopes. The increased erosion also adds particle matter to the water. There is also the issue of riparian buffer removal. The increased development, such as roads or trails, is removing the protective layer of vegetation. Nonpoint source pollution is also coming from agriculture. Animal waste and excess nutrients run off into the water which damages the health of the water, by adding unhealthy levels of nitrogen and phosphorus. This can also make the water unsafe for recreational use, such as swimming and fishing.

This problem can be solved by taking a few measures. First, best management practices can be implemented through new regulation, such as limiting urbanization and development to areas that will not harm the water, or by minimizing the amount of fertilizer used on farms. Instead of using chemical fertilizer, farms can improve efficiency by using livestock manure, reducing the runoff of both natural and chemical nutrients. Another way is by educating farmers. If they are informed on how they can improve efficiency by using less fertilizer or properly managing the animal waste, then they can make more money while producing less waste. This can be done by various education outreach programs. There can also be monitoring of farms to see which farms are producing the most pollution, and then fine them if they do not reduce pollution. The money can then be used for restoration efforts. Furthermore, an emphasis on ecotourism instead of development can bring in more money to the area, while allowing more people to experience the beauty of the area and reducing pollution. By implementing best management practices, educating farmers, and placing an emphasis on ecotourism, the issue of nonpoint source pollution can be mitigated,

Problem 3: Habitat Alteration

Habitat alteration is the result of changes in land use or land cover that has an impact on the local ecosystem. The alteration of stream habitat can have very severe consequences. In the Lower French Broad River, the main forms of habitat alteration are the removal of vegetation, the removal of gravel bars, dredging/ “cleaning out” the river with heavy equipment, impounding the water in ponds and lakes, draining/filling wetlands and building dams. These alterations can result in releasing of sediment which increases bed load and covers the benthic life and fish eggs at the bottom of the river. The addition of dams can also result in low dissolved oxygen levels as well as thermal and physical alterations to the river. All of these alterations hurt the natural ecosystem found in the Lower French Broad River, but the most devastating is the alterations stemming from individual landowners and developers. This group is the main cause of the previously mentioned nonpoint source pollutant problem the Lower French Broad River is seeing (discussed in Problem 2 of the report). Through agriculture and development, the Lower French River basin is seeing a large increase in runoff containing soil erosion and fertilizer which is polluting the water and changing the natural rivers composition. If left to continue, the river could see a permanent loss of biodiversity, especially in populations of rare species that inhabit the basin.

Fig 8: Douglas Dam along the

While this is a huge problem at hand for the Lower French Broad River, there are some measures that can be taken to address the problems. Some voluntary activities that could mitigate the damages done from habitat alteration are picking up litter that might enter the river or sponsoring/participating in a trash clean up day that removes trash, limbs and debris before they cause blockages in the stream. Individuals can

also participate in planting native vegetation along streams to stabilize the banks and provide habitat. Developers can avoid extensive use of culverts in streams and maintenance groups can avoid the use of heavy equipment to clean the streams. Other measure that require regulation are to restrict modification of streams by means such as culverting, lining or impounding. Also currently imposed are regulations for impacts to streams and wetlands when modifications are allowed. The best way to handle the problem of habitat alteration would be update the zoning regulations to mandate and protect riparian buffers. This will reduce the amount of fertilizer and erosion that enters the river. Another measure to mitigate the effects of the alterations would be to regulate development into designated areas to protect the natural habitat. Our goal is that all together there is a reduce the amount of habitat alteration experienced in the Lower French Broad River habitat to preserve the multitude of rare species found that inhabit this watershed.

Summary of Goals

BRIT aims to see an improvement in the monitoring and management of the Lower French Broad River basin in order to ensure the protections of the 131 rare plant and animal species present as well as to promote a safe and healthy area for recreational activities. Through constant collection of water assessment data, communities will become engaged in the health and state of the river. The Tennessee Department of Environment and Conservation, Division of Water Pollution Control can establish a water monitoring position to ensure regular collection of water assessment data. With regular water monitoring, river health and safety can be properly conveyed to the public to inform them when it is safe to enjoy recreational activities on the river. This data will also provide real-time feedback with measurements such as Total Daily Maximum Loads projecting the benefits of best management practices that reduce nonpoint source pollution to local residents. BRIT also looks to update zoning regulations to mandate and protect riparian buffers as well as condense urban growth and development to protect the natural habitats. Through these goals, RBIT anticipates that the Lower French Broad River will be able to support its abundant native species and continue to be a place for the local community to enjoy.

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