# Tennessee Department of Environment and Conservation
# Proposed Final Version of the 2020 List of Impaired Waters
# Summary of Public Comments and Departmental Responses

(Note: Comments submitted during the public review period in regard to topics not directly related to the 2020 List of Impaired Waters are not included in this document. These topics include comments about the economic impact of listings, NPDES permit limits, the TMDL process in general, or a specific TMDL. Comments about water quality standards have only been included if related to a specific assessment. In some instances, public comments have been summarized in order to group similar observations by multiple reviewers.)

## General Comments

**General Comment 1:** ***How can the public access the data used by TDEC in assessments?***

**Response:** Most of the department's data are public facing in the Waterlog database, which can be accessed on our website: https://www.tn.gov/environment/program-areas/wr-water-resources/water-quality/water-resources-data-map-viewers.html

**General Comment 2:** ***TDEC should not create a proposed final 2020 List of Impaired Waters to submit to EPA until the additional concerns, data, information or studies cited by the commenter(s) are used to reassess the stream of particular interest to the commenter. There are important economic or developmental ramifications to the current assessment.***

**Response**: The draft 2020 List is different from the 2018 version in that it incorporates the results of the Group 5 and Group 1 reassessments. In several instances, commenters submitted or referenced additional studies on February 14 they feel should be used to reassess Group 2 or Group 3 waterbodies prior to submission of a proposed final version to EPA.

Commenters should note that TDEC had previously published a public notice requesting Group 2 water quality data. This public notice was issued in April 2019.

In order to provide the maximum amount of public review of the List of Impaired Waters, but still meet the federal statutory deadline for state submission of April 1, 2020, the department published the public notice on November 15, 2019, set the public hearing for January 2, 2020, and established the deadline for submitting comments on February 14. Many of these comments were received on February 14. This schedule, while benefiting the public, only left the department with a little over a month to summarize comments, prepare and finalize responses, and coordinate with EPA.

Some of the reports/surveys/models cited by commenters are in the possession of the department and some are not. Given the critical time constraints and the magnitude of some of the specific reassessments requested, we do not have adequate time to compile, analyze and reassess data for these waterbodies.

Additionally, we do not think reassessment efforts would be improved by haste and have serious doubts that EPA would approve such a process. We agree with the commenters that these are critically important assessment decisions, but that logic argues for a more deliberate approach. We invite the commenters to submit the data they cited in their comments, but we prefer to stick to the published watershed cycle on these very important waterbodies.

**General Comment 3:** ***Having a pollutant source for an impaired stream identified as "Discharges from an MS4 Area" or "Urban Runoff" triggers requirements under the MS4 permit.***

**Response:** We do not agree. Requirements under the Municipal Separate Storm Sewer System program are triggered by the applicable permit, rather than by TDEC's identification of sources in the draft 2020 List of Impaired Waters. Comments about these requirements would be most appropriate during the MS4 permit renewal process.

**General Comment 4:** ***A publication written by USGS documented that habitat alteration of a stream was a much more important cause of loss of biointegrity than nutrients.***

**Response:** We are familiar with the publication in question. The streams researched in this case study were channelized and otherwise significantly altered by agricultural activities. The department does not dispute that habitat quality plays an important role in biointegrity scores, but state and federal law require our water quality assessment efforts to identify all parameters violating water quality criteria, including nutrients. We do not believe USGS is advocating ignoring other pollutants.

**General Comment 5:** ***Tennessee's water quality criterion for nutrients is subjective and thus is implemented subjectively by the department.***

**Response:** It is true that the criterion for nutrients is narrative rather than numeric. However, it's important to note that EPA approved the nutrient criterion as currently written. Although historical nutrient assessments have been appealed to Region 4, EPA has never disapproved any of our proposed listings or delistings on any basis, including allegations that we misapplied our criteria.

The department would prefer- and recommended during the last triennial review – that the narrative criterion be modified to be more specific as to the factors utilized in the assessment process, but these efforts failed in the face of significant opposition. Ironically, opposition to making the criterion more specific has at times come from commenters who then suggest implementation is subjective.

Since the authority to promulgate water quality criteria resides with the Tennessee Board of Water Quality, Oil and Gas, the department's responsibility is to apply the existing nutrient criterion as consistently as possible. Guidance, plus written policies like the Consolidated Assessment and Listing Methodology (CALM), assist staff in the development of non-subjective measures. These documents are available for reference on the department's website.

**General Comment 6:** ***Tennessee's fish and aquatic life protection narrative water quality criterion for nutrients can be violated two ways: (1) the growth of algae is stimulated to the point it interferes with habitat, or (2) biointegrity is impacted.***

**Response:** We agree, but there is also a third way. If nutrients in a waterbody cause or contribute to harm in a downstream waterbody, that is also a violation.

**General Comment 7:** ***Tennessee should consider ratios of total nitrogen to total phosphorus in assessing water quality.***

**Response:** TDEC thanks the commenter for this suggestion. TDEC very seldom samples for total nitrogen, preferring to analyze for the various forms of nitrogen, such as nitrate+nitrite, ammonia, and total kjeldahl nitrogen.

**General Comment 8:** ***The department's Consolidated Assessment and Listing Methodology states that a stream meeting the biointegrity criterion based on TMI score should not be assessed as impaired due to siltation.***

**Response:** That's not exactly what the CALM says. Here is the actual passage from page 35 of the document:

> *Ecoregions vary in the amount of silt that can be tolerated before aquatic life is impacted. Through work at reference streams, staff found that the appearance of excessive sediment/silt is often, but not always, associated with loss of biological integrity. Thus, for water quality assessment purposes, it is important to establish whether or not aquatic life is being impaired. For those waterbodies where loss of biological integrity can be documented, the habitat assessment can determine if this loss is due to excessive silt deposits.*

Departmental biologists have learned through experience that methods like a Semi Quantitative Single Habitat survey (SQSH) which targets riffles may dramatically underestimate impacts from silt, which due to scour tends to accumulate in pools rather than riffles. That is why the passage cited clearly states that excessive silt is not always associated with loss of biological integrity.

The commenter is additionally reminded that suspended solids has its own "free from" criterion in Rule 0400-40-.03(3)(c).

**General Comment 9:** ***Treated effluent discharged from well operated sewage treatment plants actually improves, rather than impacts streams.***

**Response:** Streams that do not violate water quality criteria, including those with domestic wastewater discharges, are in no danger of being listed as impaired.

**General Comment 10:** ***TDEC's selection methodology for reference streams is scientifically flawed and causes nutrient impacted streams to be under represented in the Draft List.***

**Response:** Reference streams are least-impacted waters that must also be representative of the subecoregion they are in. The commenter is correct that in some regions in Tennessee, the reference condition includes higher concentrations of nutrients compared to other areas of the state. However, the value of even these reference streams for setting attainable regional goals is important.

The commenter is reminded that EPA not only approved the reference stream approach to clean water goalsetting, they recommended this approach to states. EPA approved the nutrient criteria Tennessee developed based on the reference stream approach and took the unusual step of placing two TDEC employees, Dr. Sherry Wang and Greg Denton, on its

National Stream Nutrient Criteria Work Group. TDEC considers this validation of the work we did.

We are always open to recommendations of new reference streams as many historical stations have been lost due to new pollutant sources or habitat alteration.

**General Comment 11:** ***TDEC has misapplied EPA guidance in setting nutrient criteria.***

**Response:** This is a water quality standards comment rather than an assessment comment. Please see the previous response.

**General Comment 12:** ***In setting regional total phosphorus and NO2+NO3 goals, TDEC used the 90$^{th}$ percentile of reference data rather than the more protective 75$^{th}$ percentile. By making this choice, TDEC deliberately decided to be less protective than Tennesseans deserve.***

**Response:** This is a water quality standards comment rather than a water quality assessment comment and was submitted in previous listing cycles. This was the department's response at that time and has not changed:

> TDEC's goal in criteria setting is to be appropriately protective. The commenter is directed to the 2001 study entitled "Development of Regionally-based Interpretations of the Narrative Nutrient Criterion" for an explanation for how these protection levels were selected. https://www.tn.gov/content/dam/tn/environment/water/documents/nutrient_final.pdf
>
> As part of the study, TDEC ground-truthed the 75$^{th}$ and 90$^{th}$ percentiles to see which concentration level most accurately predicted biological harm. The conclusion of that work was that the 75$^{th}$ percentile of the reference condition was an inaccurate predictor of biological harm and thus overly-protective. The 90$^{th}$ percentile was found to be more accurate.
>
> Tennessee's regional approach was (1) based on methods suggested by EPA, (2) peer reviewed by national experts, (3) promulgated as rule in an open process that incorporated public review and comments, and (4) approved by EPA.

**General Comment 13:** ***The commenter is concerned with the reference stream approach for dissolved oxygen criteria, but believes TDEC has applied the criterion properly in the stream of concern to them.***

**Response:** This is a water quality standards comment rather than an assessment comment, but TDEC notes that the criterion for dissolved oxygen is 5 mg/L in most parts of the state. In some of the other areas of the state like the Blue Ridge Mountains, the criterion is actually set higher. These more stringent criteria were based on the reference stream approach the commenter objects to.

**General Comment 14:** ***When TDEC receives a "greater than" result for a pathogen sample, the agency doesn't really know how high the result really was. Performing follow-up dilutions would help solve this problem.***

**Response:** We often do request dilution when samples are from waters likely to have significantly elevated pathogens. But the blanket approach advocated by the commenter has a clear downside: if a diluted sample has low pathogen level, the result is reported as <100 cfu. "Less than" results cannot be used to calculate geometric means, which also impacts our ability to accurately apply criteria.

The commenter should also be aware with the very short holding times associated with pathogen samples, each can be run only once, not multiple times at various dilutions.

Additionally, such an approach would dramatically raise laboratory costs. In the calendar year 2019, the division sent 4,095 *E. coli* samples to the laboratory (including QA/QC samples). At a cost per analysis rounded to $30, the cost to the program budget was $122,885. Running duplicates for each pathogen sample – even at only one additional dilution - would double these analytical costs.

**General Comment 15:** ***When TDEC receives a "greater than" result for a pathogen sample, which is frequently reported as ">2019 cfu," the agency cannot tell if the fish and aquatic life pathogen criterion (2880 cfu) is being met.***

**Response:** The commenter is correct, but is referred to the previous response. For additional perspective, less than 3% of all *E. coli* samples in 2019 were reported as "greater than."

**General Comment 16:** ***TDEC should consider using a more conservative criterion for streams actively used by the public for contact recreation.***

**Response:** This is a water quality standards comment rather than an assessment comment. As the commenter may be aware, Exceptional Tennessee Waters and lakes have a lower single sample maximum *E. coli* criterion than do other waters. Revising this

approach as envisioned by the commenter would need to be promulgated in Rule by the Tennessee Board of Water Quality, Oil and Gas. It's not something TDEC can just decide to do on its own.

**General Comment 17:** ***TDEC assessed multiple streams (list provided by commenter) as being impacted by pollutants from "Municipal Point Source Discharges." Is TDEC referring to MS4 outfalls in this source category?***

**Response:** Thank you for the opportunity to clarify. TDEC uses EPA's recommended categories found in the ATTAINS database to identify sources and the one cited by the commenter is specifically intended for municipal sewage treatment plant outfalls.

**General Comment 18:** ***TDEC assessed multiple streams (list provided by commenter) as being impacted by pollutants from "Urban Runoff." Is TDEC referring to MS4 outfalls in this source category?***

**Response:** Thank you for the opportunity to clarify. TDEC uses EPA's recommended categories found in the ATTAINS database to identify sources and the one cited by the commenter is specifically intended for nonpoint source urban runoff.

**General Comment 19:** ***The commenter would like a personal response from the department.***

**Response:** During the public review process, it is important that comments be addressed in a public forum so that other participants may benefit from the comments submitted by others and TDEC's response. Staff can be contacted if additional elaboration regarding responses is needed or desired.

Any commenter who feels their concerns were not adequately addressed by TDEC may also seek EPA's assistance in their role as approver of the List.

**General Comment 20:** ***TDEC is too slow in developing TMDLs.***

**Response:** This is not a comment specifically about the assessment process.

**General Comment 21:** ***It should be easier for the public to tell what has changed from a previous list to a new version.***

**Response:** TDEC appreciates this suggestion. It is our understanding that EPA is developing new reporting tools in the ATTAINS database that will make this task easier to accomplish.

**General Comment 22:** ***How often does TDEC update the public-facing mapviewer with new water quality assessments?***

**Response:** This update is done following the assessment of a new watershed Group, so usually once per year.

**General Comment 23:** ***When does the public get to comment on assessment changes in odd numbered years?***

**Response:** These mid-cycle watershed group assessments will be included in the List published in even-numbered years.

**General Comment 24:** ***How are delistings identified for the public?***

**Response:** Appendix A contains a rationale for every parameter that is being delisted.

**General Comment 25:** ***Does TDEC put biological data on its dataviewer? Are data from other agencies or the regulated community on the dataviewer?***

**Response:** Biological data are not yet public facing, but we are working to accomplish this. When completed, biological data from other entities will be public facing, if appropriate TDEC QA/QC review measures are passed.

TDEC does not place other Agency or regulated community chemical data on its dataviewer, other than DMR data from dischargers. The commenter can contact these other entities for their data. Some biological data, such as taxa lists, are available on EPA's database, WQX.

**General Comment 26:** ***TDEC does not identify all sources of a pollutant.***

**Response:** The commenter is correct. TDEC does not identify all of the possible sources of a pollutant during the assessment and listing process. Staff lists the most significant potential sources that can be identified during the sampling event or as part of the assessment process. The TMDL process is designed to provide a more in depth source analysis and determine the percent of pollutant contribution by each source. In order to

provide more clarification, TDEC will modify the column header on the 2020 Tennessee List of Impaired and Threatened Streams from Source_Name to Potential_Source_Name.

## Specific Comments

**Specific Comment 1:** ***Goose Creek (TN05130108002-0200) is identified as being in Smith County when it is actually only in Wilson and DeKalb counties.***

**Response:** The commenter is correct and we will make this revision.

**Specific Comment 2:** ***Rock Creek in Claiborne County (TN05130101015_0710) is assessed as impacted by silt from Highway/Road/Bridge/Infrastructure Construction. Is this correct?***

**Response:** The silt impacting this stream was due to haul roads for individual coal mines rather than from county, state, or federal highway construction projects. Rock Creek is a tributary to Straight Creek. (See next comment.)

**Specific Comment 3:** ***Straight Creek in Claiborne County (TN05130101015_0700) is assessed as impacted by silt from Highway/Road/Bridge/Infrastructure Construction. Is this correct?***

**Response:** The silt impacting this stream was due to haul roads for individual coal mines rather than from county, state, or federal highway construction projects. Straight Creek is a tributary to Clear Fork. (See next comment.)

**Specific Comment 4:** ***Clear Fork in Claiborne and Campbell counties (TN05130101015_2000) is assessed as impacted by silt from Highway / Road / Bridge / Infrastructure Construction. Is this correct?***

**Response:** The silt impacting this stream was due to haul roads for individual coal mines rather than county, state, or federal highway construction projects.

**Specific Comment 5:** ***Bennett Fork in Claiborne County (TN05130101046_0200) is assessed as impacted by silt from Highway/Road/Bridge/Infrastructure Construction. Is this correct?***

**Response:** The silt impacting this stream was due to haul roads for individual coal mines rather than county, state, or federal highway construction projects.

**Specific Comment 6:** ***Drivers Branch in DeKalb County (TN05130108004_0110) is assessed as impacted by silt from Highway/Road/Bridge/Infrastructure Construction. Is this correct?***

**Response:** The assessment is correct. The headwaters of Drivers Branch were buried by construction debris from the widening of U.S. Highway 70 between Smithville and Dowelltown.

**Specific Comment 7:** ***The draft 2020 List of Impaired Waters identifies a segment of Percy Priest Reservoir (TN05130203003_2000) as being threatened by phosphorus. The Division should provide a rationale for this listing. The commenter will consider the assessment to be "subjective and without merit" if this rationale is not provided.***

**Response:** The commenter is correct that the upper portion of Percy Priest Reservoir is currently listed as "threatened." According to EPA guidance, threatened waters are those where a documented trend indicates that water quality standards will be violated before the next Listing cycle. This assessment was consistent with TDEC's published CALM and was reviewed and approved by EPA in 2017.

In regard to a rationale, the following was provided in the Department's responses to comments on this topic in 2016:

> The commenter is correct that excessive algal biomass due to elevated nutrients caused water quality and water treatability problems in J. Percy Priest in the summer of 2016. Corps of Engineers measurements of chlorophyll *a* at a depth of 5 feet in the East Fork Stones River embayment measured 39 ug/L in June, 17.2 ug/L in August, & 17.4 ug/L in September. Equivalent data in the West Fork Stones River embayment measured 29.7 ug/L in June, 16 ug/L in August, & 30.7 ug/L in September.
>
> Secchi disk transparency measurements at these stations ranged between 0.6 and 0.9 meters.

According to Carlson's Trophic State Index, chlorophyll *a* levels over 20 ug/L and secchi disk levels below 2 meters indicate eutrophic conditions. Chlorophyll *a* levels over 50 ug/L and secchi disk levels less than 0.5 meters indicate hypereutrophic conditions.

These documented biomass levels and water treatment issues indicate that the designated uses of domestic water supply and recreation are not fully supported. We will assess the section of J. Percy Priest Reservoir upstream of Jefferson Pike (Hwy 266) as "threatened." We will continue to follow the Corps 2017 data to see if this assessment needs to be maintained or revised.

As Percy Priest Reservoir is within a Group 2 watershed, it will be reassessed in 2020. While we are happy to explain a historical assessment decision, we think it would be more fruitful to take a fresh look at the water column profile data collected each year by the U.S. Army Corps of Engineers. We consider these data, which go back multiple years, to be our best opportunity to establish biomass trends in Percy Priest Reservoir.

**Specific Comment 8:** ***Percy Priest Reservoir (TN05130203003_1000 & 2000) is located in an area that is naturally very high in phosphorus.***

**Response:** We agree. However, there are many anthropogenic (man-induced) sources of nutrients as well. Much of the watershed in this rapidly developing area has been disturbed, either for development or agricultural uses. This land disturbance, plus point source dischargers, has certainly contributed to the pollutant loading to the lake.

Even if the violations of water quality standards were entirely due to natural sources, that does not argue for the authorization of increasing discharges of the same pollutant. Regardless of source, the 2020 List of Impaired Waters is a compilation of waters that violate, or appear likely to soon violate, water quality criteria. Percy Priest Reservoir is in a Group 2 watershed, so it will be reassessed in 2020.

**Specific Comment 9:** ***Dye studies prove that effluent from a sewage treatment plant in the watershed of Percy Priest Reservoir (TN05130203003_1000 & 2000) remains in the metalimnion and cannot be considered a source for the excess biomass in the epilimnion and the resulting strong stratification of the lake.***

**Response:** We thank the commenter for this observation, but note that as the upper part of the reservoir is considered "threatened" rather than impaired, no sources of pollutants are currently identified. We additionally note that this frequently observed strong stratification of the water column - also documented by the commenter - is an important

indicator of organic enrichment, regardless of source. The Group 2 waterbodies will be reassessed in 2020.

**Specific Comment 10:** ***The commenter collected phosphorus samples in middle and upper levels of Percy Priest Reservoir and documented low levels. The lake should no longer be considered threatened.***

**Response:** Phosphorus is readily taken up by algae, so the results of water column sampling might be misleading. TDEC considers the measurement of response variables such as chlorophyll *a*, light transmission, diel dissolved oxygen swings, and pH levels to be superior methods to gage nutrient impacts in lakes.

We noted with interest that in the commenter's Percy Priest Lake nutrient data, the primary nitrogen forms were either ammonia in the lower depths or total kjeldahl nitrogen, rather than the oxygenated forms, NO2+NO3. Could this be an indication of water column oxygen issues in the reservoir?

**Specific Comment 11:** ***Rock Spring Branch (TN05130203010_0310) near Smyrna is assessed as impacted by silt and habitat alteration, with an identified source of Highway/Road/Bridge/Infrastructure. Is this correct?***

**Response:** This stream was previously impacted by a road widening project. However, a more long-term impact has been the placement of a sewer line that helped "sink" the stream. Both of these are construction of infrastructure covered by the source category.

**Specific Comment 12:** ***Puckett Creek (TN05130203015_0100), Sinking Creek (TN05130203018_0100), and Bear Branch (TN05130203023_0310) in Rutherford County should be reassessed.***

**Response:** The Stones River watershed will be reassessed in 2020. We are currently in the process of compiling all the available data in order to reconsider use support status. We request that the commenter submit the data they referenced in this comment, including taxa lists, so that these results can be reviewed and incorporated into the assessment process.

**Specific Comment 13:** ***The most downstream segment of the West Fork Stones River (TN05130203018_1000) is identified as being impacted by pathogens. The Draft 2020 List identified two sources of pathogens: Failing Collection Systems and Urbanized High Density Area. The Division previously agreed to remove Failing Collection System as a***

***source, but has now re-added it. Additionally, municipal urban runoff should be not be cited, as the pathogen source is likely animal rather than human.***

**Response:** At the time this comment was originally made, data were being stored in EPA's Assessment Database (ADB). The commenter is correct that the Department previously removed collection system failure as a source in response to this comment. However, in converting the Group 2 data from the old ADB system to EPA's new ATTAINs database, the retrieval inadvertently captured the old assessment information for this segment. We thank the commenter for catching this retrieval issue and regret the confusion it may have caused.

While preparing to respond to this comment, staff reviewed the most recent pathogen data collected at the historical ambient monitoring station at Mile 6.2 of the West Fork Stones River. Ambient monitoring stations are sampled multiple times each year, unlike other stations which may be collected only during the watershed five year monitoring cycle.

Here is our ATTAINS summary of these recent pathogen data:

> 2017-2019 TDEC chemical station at mile 6.2 (Nices Mill). One out of 20 E. coli observations over 941 cfu. July-August 2017 geo mean of 5 observations = 120 cfu.

As a Group 2 watershed, the West Fork of the Stones River will be reassessed in 2020. Once we are certain we have all readily available data, we will see if this segment of the river could be delisted for *E.coli*. In the meantime, we agree with the commenter that "pasture grazing" should be added as an additional source of pathogens to this segment. We will make this change in the proposed final version of the List.

**Specific Comment 14:** ***Data collected by the commenter indicate the most downstream segment of the West Fork Stones River (TN05130203018_1000) is meeting the fish and aquatic life biointegrity criterion and should be delisted.***

**Response:** This segment is neither currently assessed nor listed as impacted for fish and aquatic life.

**Specific Comment 15:** ***The West Stones River (TN05130203018_2000) is located in an area that is naturally very high in phosphorus.***

**Response:** We agree. As stated previously in regard to J. Percy Priest Reservoir, there are many anthropogenic (man-induced) sources of nutrients as well. Much of the watershed in this rapidly developing area has been disturbed, either for development or agricultural

uses. This land disturbance, plus point source dischargers, has certainly contributed to the pollutant loading to the river.

Even if the violations of water quality criteria were entirely due to natural sources, that does not argue for the authorization of increasing discharges of the same pollutant. Regardless of source, the 2020 List of Impaired Waters is a compilation of waters that violate, or appear likely to soon violate, water quality criteria. The West Fork Stones River is in a Group 2 watershed, so it will be reassessed in 2020.

**Specific Comment 16:** ***Data collected by the commenter indicate segment (TN05130203018_2000) of the West Fork Stones River is meeting the fish and aquatic life biointegrity criterion.***

**Response:** As a Group 2 watershed, the West Fork Stones will be reassessed in 2020. We are currently in the process of compiling all the available data in order to reconsider use support status. We request that the commenter submit the data they referenced in this comment, including taxa lists, so that these results can be reviewed and incorporated into the assessment process.

**Specific Comment 17:** ***The Department has assessed the two downstream segments of the West Fork Stones River (TN05130203018_1000 & 2000) as impacted by siltation, which is incorrect.***

**Response:** As stated previously, Segment 1000 of the West Fork Stones River is currently assessed as supporting the fish and aquatic life use. As a Group 2 watershed, the West Fork Stones River will be reassessed in 2020. We are currently in the process of compiling all the available data in order to reconsider use support status. We request that the commenter submit the data referenced in this comment, including taxa lists, so that these results can be reviewed and incorporated into the assessment process.

**Specific Comment 18:** ***The Department has assessed West Fork Stones River Segment 2000 as impacted by nutrients (total phosphorus and nitrate+nitrite), which is incorrect.***

**Response:** As a Group 2 watershed, the West Fork Stones will be reassessed in 2020. We are currently in the process of compiling all the available data in order to reconsider use support status. We request that the commenter submit the data referenced in this comment, including taxa lists, so that these results can be reviewed and incorporated into the assessment process.

**Specific Comment 19:** ***The commenter has prepared an assimilative capacity study of the West Fork Stones River that indicates that a source named as contributing pollutants actually helps water quality in the river.***

**Response:** The department just recently received this document, so it would be premature to respond regarding its applicability to the current assessment. As a Group 2 watershed, the West Fork Stones River will be reassessed in 2020. We are currently in the process of compiling all the available data in order to assess use support status.

**Specific Comment 20:** ***Did TDEC utilize pathogen data collected by Metro Nashville to assess the State Scenic River section of the Harpeth River?***

**Response:** Yes. We appreciate their willingness to share data.

**Specific Comment 21:** ***In Appendix A, TDEC states that moving the discharge point of the sewage treatment facility improved conditions in Lynnwood Creek (TN05130204016_0100). Moving the discharge would not improve habitat. Further, Lynnwood STP always discharged into the Harpeth River.***

**Response:** We will revise the rationale for this segment in Appendix A.

**Specific Comment 22:** ***Failing septic tanks should be added as a source of pathogens to Lynnwood Creek.***

**Response:** We will investigate this possibility prior to the next assessment cycle. TDEC considers the source "urban runoff" to encompass all pathogen sources within an urban area, including houses that may not have connected to available sewer lines.

**Specific Comment 23:** ***A commenter believes that nitrogen should be added to the causes assigned to multiple sections of mainstem Harpeth River.***

**Response:** This comment was previously made in 2014. Here was TDEC's response at the time, which is still our position.

> When assessing this watershed, we looked at nutrient levels carefully. Clearly, nitrate+nitrite levels in the Harpeth are not of the same magnitude as total phosphorus. It appears to us that the commenter applied the division's regional numeric interpretation (0.92 mg/L) of the narrative nutrient criterion as if it was an

acute, not to be exceeded criterion. According to our guidance, the regional number is more like a chronic criterion to be compared to average nutrient levels.

We consider the nutrient of concern in the Harpeth River to be primarily total phosphorus.

Additionally, the commenter appears to have compared total nitrogen levels in the Harpeth to TDEC's regional goals for nitrate+nitrite, which is not a valid comparison. If the commenter was actually comparing total nitrogen concentrations to EPA's national criteria, they should be mindful that Tennessee promulgated alternate criteria, an approach EPA recommended and has approved.

**Specific Comment 24:** ***If TDEC had adopted EPA's national criterion of 0.73 mg/L for total nitrogen, the Harpeth River would be listed for that pollutant.***

**Response:** As stated previously, EPA actively encouraged states to research and promulgate nutrient criteria based on local conditions in "least-impaired" streams. That is the approach taken by Tennessee and many other states.

**Specific Comment 25:** ***TDEC should not delist Harpeth River segment TN05130204016-2000 for pathogens based on results collected at mile 85.5 (upstream Spencer Creek). One of the results was >2420 cfu, while another one measured 641 cfu.***

**Response:** We appreciate this comment, but do not agree. TDEC staff collected monthly *E. coli* samples from July 2016 to June 2017. The commenter is correct regarding the specific results of two samples collected at this station. However, we must add that nine other samples were less than 200 cfu. Only one result was over the single sample maximum and our rules allow us to give rain event samples less weight.

**Specific Comment 26:** ***Appendix A did not include a rationale for the delisting of Harpeth River segment TN05130204016-2000 for pathogens.***

**Response:** The commenter is correct and we regret this oversight. We will amend Appendix A to include this information.

**Specific Comment 27:** ***TDEC should consider sampling pathogens at Station HARPE089.1WI.***

**Response:** We appreciate this recommendation. The commenter should note that TDEC has recent Harpeth River pathogen data collected at both mile 85.5 and mile 89.7.

**Specific Comment 28:** ***An Unnamed Trib to West Harpeth River (TN05130204013_0400) is assessed as impacted by silt, with an identified source of Highway/Road/Bridge/Infrastructure. Is this assessment correct?***

**Response:** This stream was assessed as impacted by silt during the construction of State Route 840. We consider it likely that water quality in this stream has improved, but a follow-up survey needs to be done. Any assistance the commenter could provide would be appreciated.

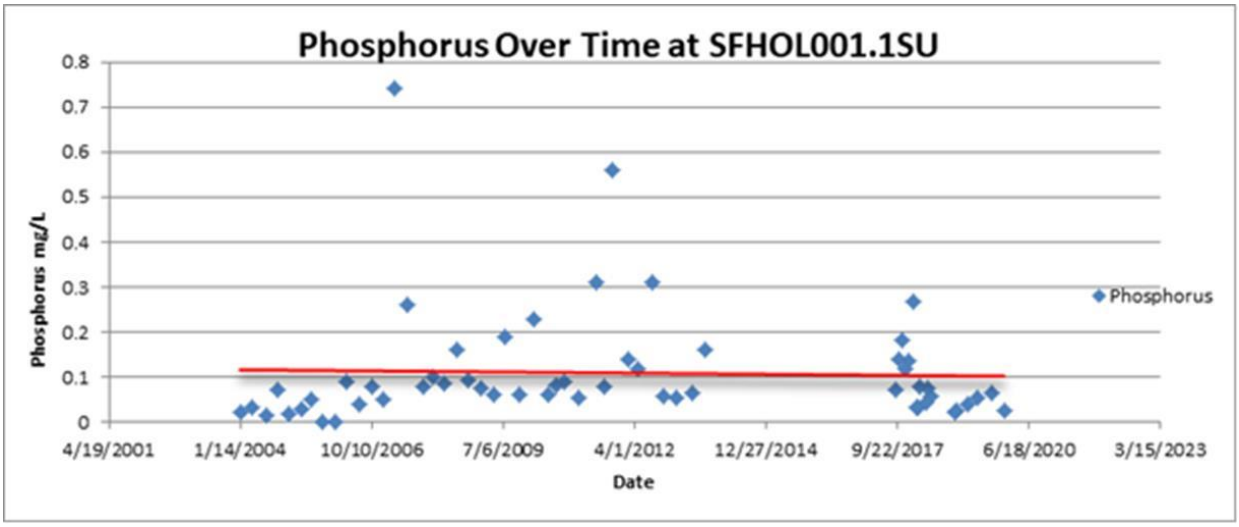
**Specific Comment 29:** ***TDEC should schedule additional sampling of pathogens in the Harpeth River headwater areas around Eagleville.***

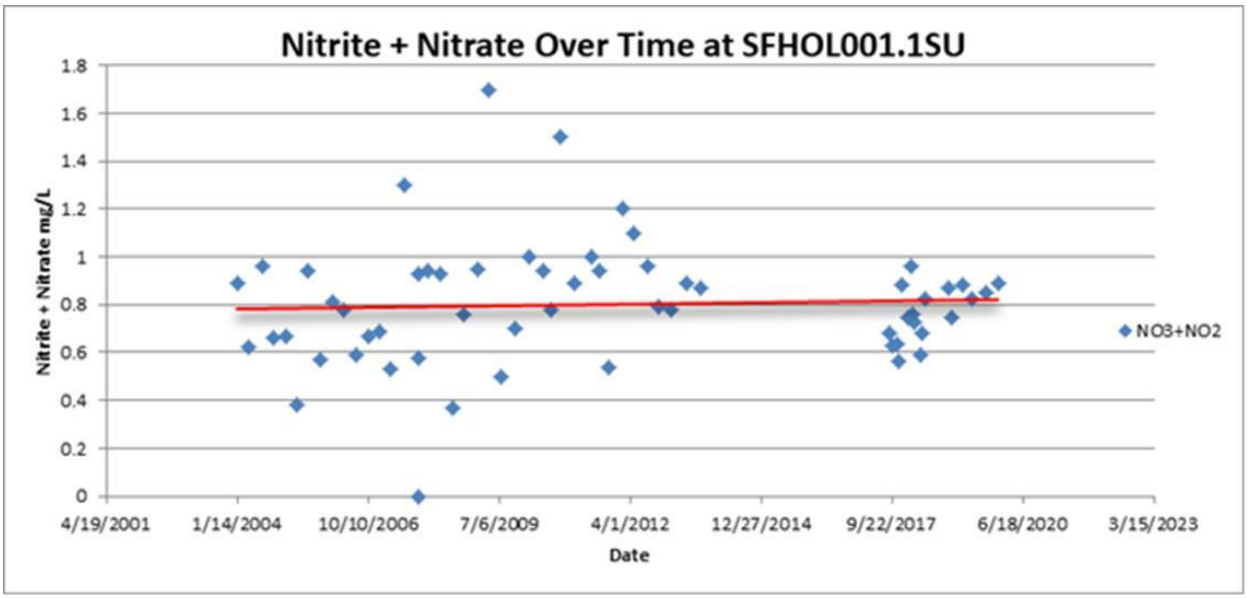
**Response:** We appreciate this recommendation.

**Specific Comment 30:** ***Phosphorus concentrations in South Fork Holston River segment TN06010102001_1000 are lower than previously documented. None of the 2019 total phosphorus observations were over 0.09 mg/L at the stations at mile 1.1 and 1.4.***

**Response:** We acknowledge the appearance of reduced concentrations in 2019, but we are not sure that constitutes a trend. In a previous response, we reminded commenters about EPA's requirement that we consider "all readily available data." In a later response we will address the regional total phosphorus goal for this waterbody.

The station with the longest and most consistent sampling history is our ambient monitoring site at Ridgefield Bridge. Following are graphs of both total phosphorus and nitrate+nitrite results over time at this station.




(Note: the gap in sampling from 2014 to 2017 was due to the alternate sampling at the station at mile 1.4, Tilthammer Shoals)

There is no obvious trend in these levels that we can see, but we do acknowledge that recent concentrations have helped slow the previously noted steady increases in these levels. If nutrient levels are in fact decreasing, that's a welcome sign, but we have learned from experience that slight differences from year to year may be due to flow levels and other factors.

If phosphorus loadings to the South Fork Holston have not decreased, we consider it unlikely that water concentrations have significantly decreased.

**Specific Comment 31:** ***Commenters agree that South Fork Holston River Segment 1000 is impaired, but the data do not support the listing of total phosphorus as a cause. Total phosphorus should be delisted.***

**Response:** The department thanks the commenters for the submission of additional information. This segment of the South Fork Holston River is already listed for total phosphorus, an action that took place in 2016. In 2017 and 2018, TDEC explained its weight-of-evidence approach to assessing nutrient impairment, consistent with its published CALM. These factors in general include nutrient concentrations, population dominance by taxa tolerant to excess nutrients, exaggerated diel dissolved oxygen swings, and visual documentation of algae.

TDEC is also working on a diatom index in conjunction with EPA and several other states.

So in 2020, can the river be delisted for this pollutant? The basis for such a delisting would be that the water quality standard for total phosphorus is now being met. In order to do that, the stream would have to improve.

This portion of the South Fork Holston is a Group 3 watershed, thus is scheduled to be formally reassessed in late 2020/early 2021. In the meantime, the biological results and observations the department collected in 2019 are instructive.

The following table provides the results of biological surveys performed by the department in 2019, surveys that were observed by representatives of the commenters.

**Results of 2019 TDEC Biological Surveys in Vicinity of Segment 1000**

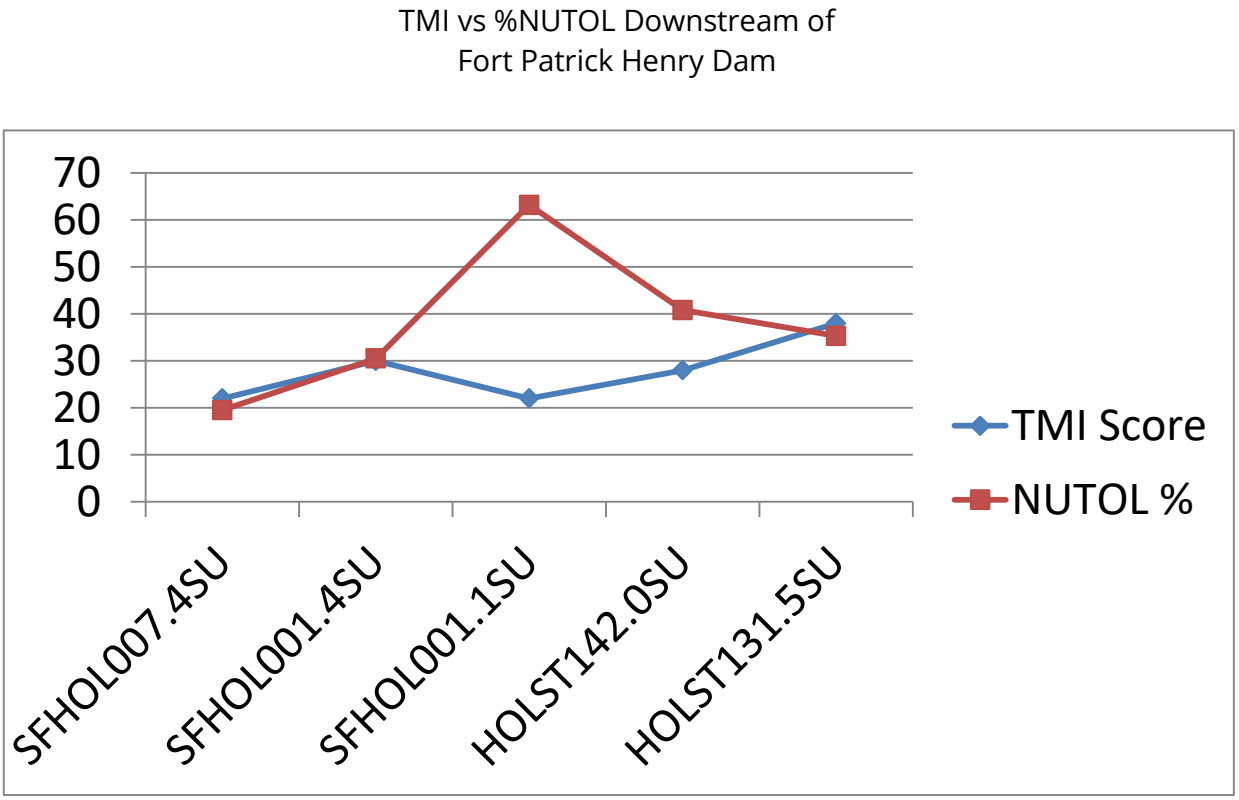
**Note: the station at Holston River mile 142 is just downstream of this segment**

| Station | Location | EPT Taxa | Total Taxa | % Nutrient Tolerant Taxa | Tennessee Macrobenthic Index Score |
|---|---|---|---|---|---|
| | | | | | |
| SFHOL007.4SU | d/s Fort Patrick Henry dam near Holston Hills | 1 | 17 | 19.5 | 22 |
| | | | | | |
| SFHOL001.4SU | Tilthammer Shoals | 7 | 34 | 30.5 | 30 |
| | | | | | |
| SFHOL001.1SU | Ridgefield Bridge | 8 | 25 | 63.2 | 22 |
| | | | | | |
| HOLST142.0SU | Golf Course d/s North Fork Holston Confluence | 9 | 36 | 40.8 | 28 |
| | | | | | |
| HOLST131.5SU | Goshen Valley Road | 12 | 33 | 35.3 | 38 |
| | | | | | |

Nutrient tolerant scores (NUTOL) are relatively low directly downstream of Fort Patrick Henry Dam, but then rise dramatically downstream of the dischargers.

The lowest TMI score – and highest NUTOL score – occurred at mile 1.1. At this station, almost two-thirds (63.2%) of the individuals were classified as nutrient tolerant. Observing that the TMI scores clearly go down as NUTOL scores go up is in contrast to the commenter's position that biological impacts are unrelated to nutrients.

Here is an illustration of TMI and NUTOL data documented in the table:




The commenters should also note that at each station in Segment 1000 last summer, high levels of algae were observed by trained field staff. These observations were consistent with previous observations that helped lead to Segment 1000 being listed for total phosphorus in 2016.

The department's results from the collection of diatoms, which are not yet available, plus the application of a diatom index currently in development, will shed additional light on this assessment.

**Specific Comment 32:** ***Commenters note that TMI scores are lowest near the Fort Patrick Henry dam, but steadily improve downstream of the dischargers. Additionally, the scores for the percentage of individuals classified as tolerant to nutrients are similar at each station.***

**Response:** Please see the previous response, especially the table of biological results.

Additionally, we noted that while biointegrity at Station 1.4 scored a TMI of 30, the biota was dominated by black fly larvae (20 percent of total individuals). While black flies are not a desirable taxon, their presence artificially increased the TMI score by inflating the "Percent clingers" metric. And while black flies are not formally classified as nutrient tolerant, they are dependent on phytoplankton.

In contrast, the biota at Mile 1.1 was dominated by *Cheumatopsyche*, a very nutrient tolerant taxon (39% of total individuals). This genus is commonly noted in organically enriched streams in Tennessee. Considering that a single very nutrient tolerant taxon provided over a third of the individuals documented at mile 1.1, TDEC does not concur that the biota improved immediately downstream of the dischargers. After the significant influx of the much cleaner North Fork Holston River, biointegrity did improve.

**Specific Comment 33:** ***Commenters note the agreement between the commenter's total phosphorus data in Segment 1000, which averaged 0.045 mg/L and TDEC's total phosphorus data, which averaged 0.046 mg/L.***

**Response:** The averages the commenter referred to were calculated from data collected between February 2018 and December 2019 at the station at mile 1.1. (We actually calculated an average of TDEC's data of 0.047 mg/L). TDEC followed its traditional grab sample approach while the commenter's consultant collected 24-hour composites.

TDEC is gratified that the different sampling approaches employed by the commenter and TDEC resulted in exactly the same total phosphorus averages over this two year period. We consider this validation that TDEC's grab sample approach is representative and free of sampling bias. Our approach has the added advantage of being consistently-applied statewide and backed by a QSSOP that EPA has reviewed and approved.

Additionally, our historical approach is much less labor and resource intensive, which is important, given that TDEC has over 60,000 miles of streams to monitor and assess statewide.

Regarding the assessment of the South Fork Holston, TDEC is unable to disregard the additional data collected in this segment at this and other stations within the five-year period EPA considers "all available data."

In fact, TDEC's data collected at both mile 1.1 and mile 1.4 have total phosphorus concentration averages around twice as high as the recent levels cited by the commenter. These data are provided in the following Tables:

**TDEC Total Phosphorus Concentrations**
**at South Fork Holston River Mile 1.1***

| Date | Total Phosphorus Concentration (mg/L) |
|---|---|
| | |
| 12/12/2019 | 0.0246 |
| 9/9/2019 | 0.0663 |
| 5/29/2019 | 0.0554 |
| 3/13/2019 | 0.0397 |
| 12/19/2018 | 0.0255 |
| 11/29/2018 | 0.0225 |
| 6/7/2018 | 0.0561 |
| 5/15/2018 | 0.0764 |
| 4/30/2018 | 0.0418 |
| 3/15/2018 | 0.0785 |
| 2/28/2018 | 0.0343 |
| 2/20/2018 | 0.0336 |
| 1/23/2018 | 0.268 |
| 12/13/2017 | 0.135 |
| 11/16/2017 | 0.118 |
| 11/1/2017 | 0.181 |
| 10/2/2017 | 0.14 |
| 9/5/2017 | 0.0719 |

The average total phosphorus concentration during this time period is 0.082 mg/L

**TDEC Total Phosphorus Concentrations**
**at South Fork Holston River Mile 1.4***

| Date | Total Phosphorus Concentration (mg/L) |
|---|---|
| | |
| 6/13/2019 | 0.0563 |
| 5/9/2019 | 0.0543 |
| 4/10/2019 | 0.085 |
| 3/12/2019 | 0.0271 |
| 2/5/2019 | 0.0469 |
| 1/9/2019 | 0.031 |
| 12/3/2018 | 0.0419 |
| 10/29/2018 | 0.0396 |
| 9/13/2018 | 0.0644 |
| 8/6/2018 | 0.143 |
| 7/5/2018 | 0.135 |
| 9/5/2017 | 0.0762 |
| 4/12/2017 | 0.08 |
| 1/12/2017 | 0.28 |
| 10/6/2016 | 0.22 |
| 7/7/2016 | 0.3 |
| 5/19/2016 | 0.22 |
| 2/22/2016 | 0.057 |
| 10/20/2015 | 0.074 |
| 7/7/2015 | 0.1 |
| 4/29/2015 | 0.046 |
| | |

- South Fork Holston RM 1.1 (Ridgefield Bridge) is an ambient station measured quarterly every year while RM 1.4 (Tilthammer Shoals) is a watershed station sampled monthly for one year every five years.

The average total phosphorus concentration at mile 1.4 during this time period is 0.10 mg/L

The results for the last five years readily available on TDEC's dataviewer indicate the total phosphorus levels at the stations at mile 1.1 and 1.4 averaged 0.082 and 0.10 mg/L, respectively. Thus, we do not concur that total phosphorus concentrations in this segment average less than 0.05 mg/L. The only way to produce such an average is by considering only the most recent results.

**Specific Comment 34:** ***Commenters note some elevated total phosphorus concentrations downstream of the dam, but upstream of the dischargers.***

**Response:** We noticed these periodic elevated total phosphorus levels also. We inquired about these results with the state laboratory and lab staff checked and validated the analyses. When the Group 3 reassessments are undertaken by the department, TDEC will consider whether segment TN06010102001_2000 is impacted by nutrients. We will check to see if it is possible that the elevated phosphorus levels downstream of the dam were associated with spring or fall turnover of the lake. TDEC has observed this phenomenon in other reservoir tailwaters.

If the commenters are aware of any nutrient sources in this part of the river, we would be interested in learning about them.

**Specific Comment 35:** ***Commenters believe that data outliers should not be used to calculate means.***

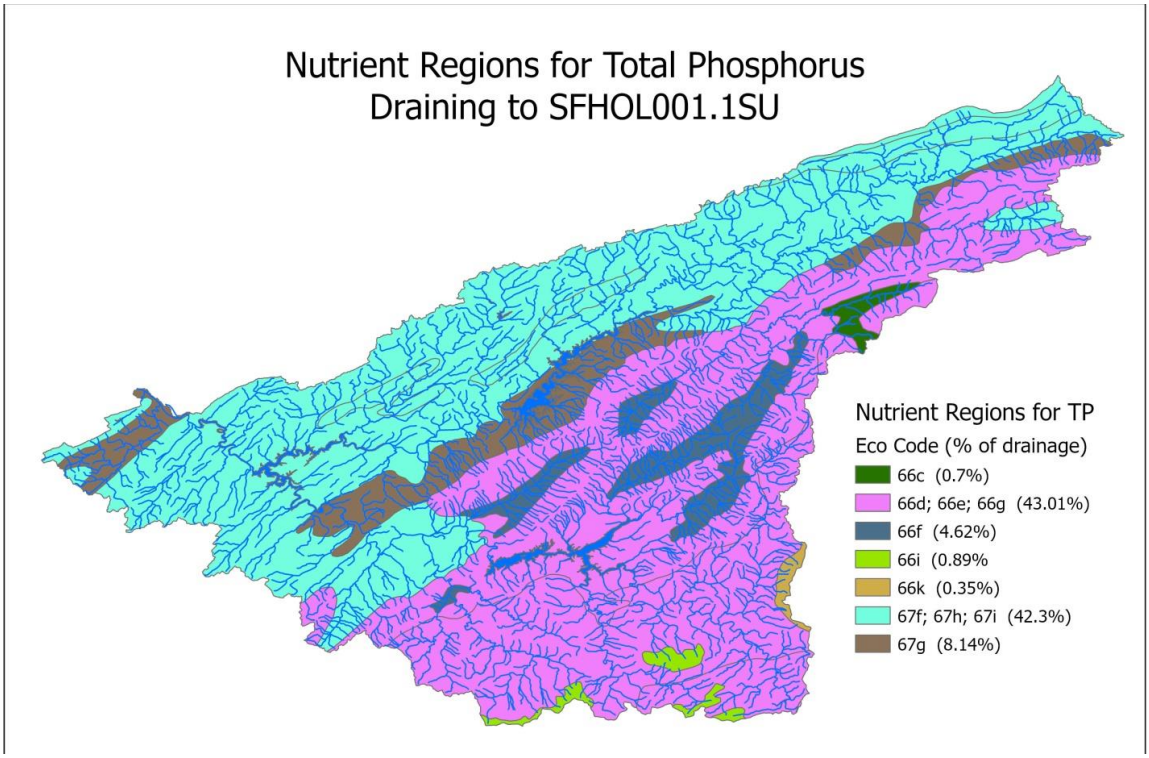
**Response:** We recognize that there are different schools of thought on this topic, but TDEC's procedure is that once the state laboratory has validated a result, we consider those data to be evidence of the natural fluctuations that occur in environmental data. In our view, outliers could not be eliminated without the danger of inherent biases.

**Specific Comment 36:** ***South Fork Holston River Segment 1000 is within Subecoregion 67g, which has a regional total phosphorus goal of 0.09 mg/L. This is the goal TDEC should use to compare nutrient concentrations in segment 1000. Current levels in the South Fork Holston are below this goal.***

**Response:** Please see the previous response in regard to what TDEC considers the average total phosphorus concentration to be in South Fork Holston River segment 1000.

As observed by the commenter, the South Fork Holston River has a large watershed. While the commenter only referred to the Tennessee portion of the watershed, we considered the additional extent of this watershed within Tennessee, North Carolina, and Virginia. In preparing our response, we consulted ecoregion coverage GIS layers in all three states and it is quickly apparent that only a very small part of this watershed is within 67g.

A map of all the subecoregions in the South Fork Holston River is provided in the next figure.

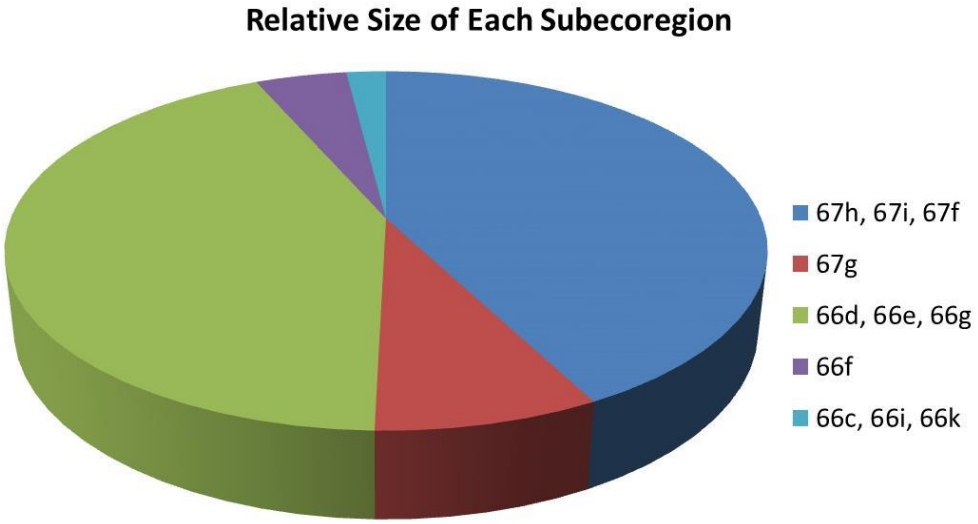



The following Table provides the watershed area of each subecoregion and the regional water quality goals for total phosphorus in each. Note that some subecoregion groups share a goal. All of these subecoregion size calculations were measured upstream from the station at mile 1.1.

**South Fork Holston River**
**Subecoregion Watershed Area and Regional Total Phosphorus Goal**

| Subecoregion(s) | Watershed Area (sq miles) | Percentage of Total Watershed Area | Regional Phosphorus Goal (mg/L) |
|---|---|---|---|
| | | | |
| 67h, 67i, 67f | 837.4 | 42.3 | 0.04 |
| | | | |
| 67g | 161.1 | 8.1 | 0.09 |
| | | | |
| 66d, 66e, 66g, | 851.9 | 43.0 | 0.01 |
| | | | |
| 66f | 91.6 | 4.6 | 0.02 |
| | | | |
| 66c, 66i, 66k | 38.3 | 2.0 | Subecoregions not found in Tennessee |

Here is an illustration of the relative size of these subecoregions:

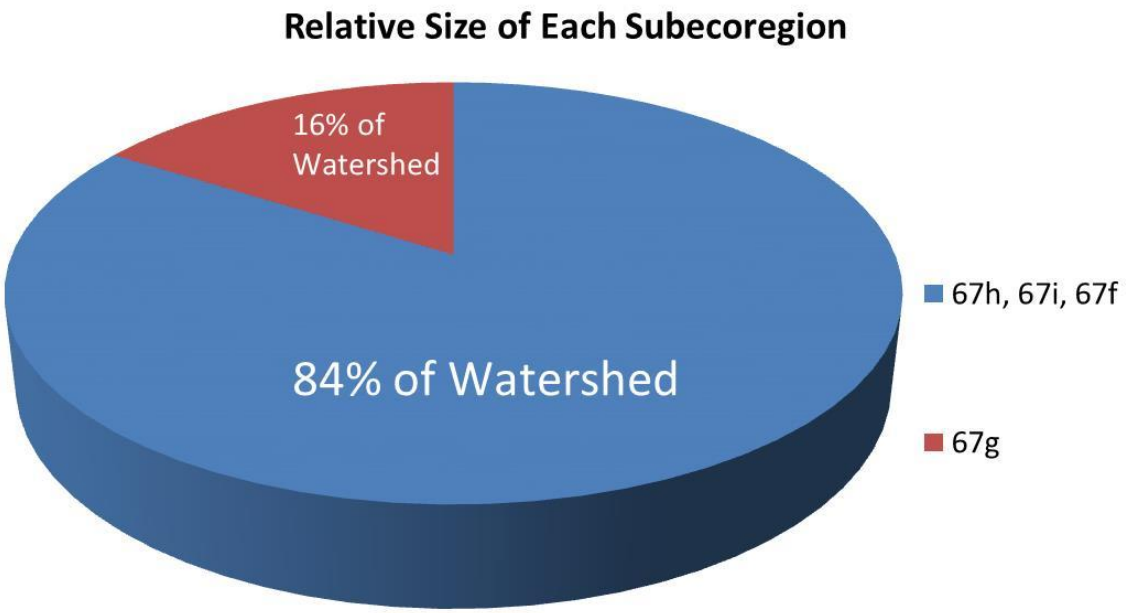



Over ninety percent of the entire watershed has a total phosphorus goal of 0.04 or less. (Two percent of the watershed is Ecoregion 66 subecoregions areas not found in Tennessee. Thus, we do not know what the total phosphorus goal for those subecoregions might be.)

If only Ecoregion 67 is considered, the results are still similar. Here's the same table excluding the Ecoregion 66 (Blue Ridge Mountains) portions of the watershed.

**Subecoregion 67 Only**
**Watershed Area and Regional Total Phosphorus Goal**

| Subecoregion | Watershed Area (sq miles) | Percentage of Total Watershed Area | Regional Phosphorus Goal (mg/L) |
|---|---|---|---|
| | | | |
| 67h, 67i, 67f | 837.4 | 83.9 | 0.04 |
| | | | |
| 67g | 161.1 | 16.1 | 0.09 |
| | | | |




As subecoregion 67g is only 16% of the Ecoregion 67 portion of the watershed, or even less in the entire watershed (8%), we do not consider 67g to provide an appropriate goal for total phosphorus at our sampling station at mile 1.1. Over 90 percent of the watershed has a total phosphorus goal of 0.04 mg/L or less. As the commenters point out, this is the process established in the CALM for deciding which regional nutrient goal appropriately applies when the watershed contains more than one subecoregion.

**Specific Comment 37:** ***TDEC's method of visual assessment of algae in the South Fork Holston River is subjective.***

**Response:** In a sense, this is a water quality standards comment. When the Tennessee Board of Water Quality, Oil and Gas promulgated a narrative nutrient criterion, they charged the Division of Water Resources with developing methods to interpret the criterion with as little subjectivity as possible. This has not been easy and the department has been equally criticized as either being too stringent or too lenient.

In the case of algae, we consistently follow a method documented in our QSSOP for performing biological assessments. Staff attend annual quality-control workshops to help standardize the visual assessment interpretations within these guidelines. The process for assessment of algae is established on Page 7 of Section E of the Procedures Chapter I.I of the QSSOP and gives the following guidance to field staff.

a. Algae: Indicate level of algae through reach and type.

- Slight: Isolated pockets of algae, no effect on stream.

- Moderate: Algae may have limited effect on benthic community (feeding groups and/or reduced niche space.). Diurnal dissolved oxygen patterns may not be affected.

- High: Algae frequent, possible nutrient loading, probably causing diurnal DO swings and/or has significant effect on benthic community (feeding groups and/or niche space.)

- Choking: Algae covering most of stream, may form large mats or clumps. Excessive nutrient loading and significant diurnal DO swings indicated, Observable reduction of niche and probable change in biotic community structure.

The commenter should note that TDEC biological staff assessed algae as "high" at each station within Segment 1000 of the South Fork Holston.

TDEC's field biologists in the Johnson City office are some of the most experienced staff in the division and have been extensively trained on field techniques. They frequently act as trainers of newer biological staff themselves. Additionally, on July 9th, staff were accompanied in the field by the division's Fellow. The Fellow position is the highest technical position in the agency.

Additionally, the commenter is reminded that EPA reviews and must approve each revision to the QSSOP. With so much experience and training of the staff on-site, TDEC has confidence in their observations and assessments.

The QSSOP can be found on the TDEC website: https://www.tn.gov/content/dam/tn/environment/water/documents/DWR-PAS-P-01-Quality_System_SOP_for_Macroinvertebrate_Stream_Surveys-081117.pdf

**Specific Comment 38:** ***While on-site, TDEC staff said algae were most extensive downstream of the dam, rather than at other sites.***

**Response:** Please refer to the previous response. TDEC assessed algae levels as "high" at Holston River mile 142 and at South Fork Holston mile 1.1, mile 1.4, and at mile 7.4. The only site where algae were assessed as "moderate" was Holston River mile 131.5, well downstream of Kingsport.

As stated in a previous response, as part of the Group 3 reassessments, we will consider whether or not Segment TN06010102001_2000 should be listed for excessive nutrients.

**Specific Comment 39:** ***During observations of habitat quality, a rating was made of the amount of algae present, on a scale of 1 to 10 with 10 being "excessive" algae. During these collections the sites were rated in a moderate range by TDEC personnel.***

**Response:** In the first sentence above, the commenter is describing the process used by their consultant to assess algae. The second statement is incorrect. As pointed out in a previous response, TDEC staff only rated one site, well downstream in the Holston River, as having moderate levels of algae. All other sites were rated as "high."

**Specific Comment 40:** ***Does TDEC consider an algae level assessed as "high" to indicate an excessive level?***

**Response:** Yes. An algae level of "high" is associated with an elevated probability of harm to the stream. This information was part of the weight-of-evidence approach established in the CALM and was used in 2016 by TDEC to conclude that nutrient concentrations were causing violations of water quality criteria in this segment. The continued presence of high levels of algae makes it difficult to conclude that stream conditions have improved and that total phosphorus should be delisted.

**Specific Comment 41:** ***Middle Creek (TN6020001109_1000) in Hamilton County should be listed as threatened due to construction of a business that will impact water quality.***

**Response:** According to EPA, the "threatened" category is only used when data indicate that it is likely that the water quality standard will be exceeded within the next two years. TDEC does not presume that construction activities automatically impact water quality. The threatened category would not be appropriate in the case described by the commenter.

**Specific Comment 42:** ***The upper portion of Kentucky Reservoir downstream of Pickwick dam is listed as impacted by low dissolved oxygen. A commenter notes that the conditions that led to the original listing were observed during a previous hot, dry summer. The commenter provided 2019 data from the river indicating improved oxygen conditions and asks if segment TN6040001001_2000 can be delisted.***

**Response:** TDEC thanks the commenter for the data and question. We noticed that in the commenter's data, Tennessee River at river mile 190.0 near Savannah violated the dissolved oxygen criterion on September 26, 2019. Because the commenter's sampling was monthly, it is unknown how long this violation of water quality criteria may have persisted.

Kentucky Reservoir is a Group 3 watershed, thus will be reassessed in late 2020/early 2021. It would be our preference to wait until this reassessment to consider all data in the last five years. We would ask the commenter to continue providing these data. Additionally, we would like to review any continuous dissolved oxygen data, including those collected by the Tennessee Valley Authority.

**Specific Comment 43:** ***A commenter notes that chlorides levels in Sugar Creek meet the criterion of 250 mg/L.***

**Response:** The EPA chronic fish and aquatic life national criterion for chlorides is 230 mg/L.

**Specific Comment 44:** ***Data collected and supplied by the commenter indicate Sugar Creek segment TN6040003023_0200 near Mt. Pleasant is not impacted by ammonia, chlorides, and total dissolved solids.***

**Response:** The commenter should be aware that Sugar Creek segment 0200 is not currently assessed as impacted by ammonia. (An illustration of the current List for the Sugar Creek watershed appears on a following page.) However, the commenter is correct that chloride and total dissolved solids are currently assessed as impacting fish and aquatic life.

The Lower Duck River is a Group 3 watershed and is on schedule to be reassessed in late 2020 or early 2021. Given that this stream has been impacted for 35 years by unauthorized discharges from a landfill, we would prefer to wait until we have compiled all the relevant data to reassess this stream. Additionally, we are watching with interest to see if current enforcement and remediation efforts are successful in reducing pollutant loadings to this stream.

**Specific Comment 45:** ***An unnamed tributary to Sugar Creek TN6040003023_0210 near Mt. Pleasant is listed as being impacted by a "landfill." There is no landfill in this watershed.***

**Response:** TDEC thanks the commenter for pointing out that Segment 0210 is mapped in the wrong location on our assessment mapviewer. We have corrected this indexing issue and apologize for any inconvenience this might have caused.

**Specific Comment 46:** ***Data collected by the commenter in 2019 on the Unnamed Tributary to Sugar Creek TN6040003023_0210 are lower than the 2018 data at that site collected by TDEC. This proves pollutant loadings are reducing over time.***

**Response:** TDEC points out that it is difficult to have confidence in the appearance of a trend based on the limited amount of data collected in 2018 and 2019. Both the 2018 TDEC and 2019 commenter data are well above water quality criteria levels.

**Specific Comment 47:** ***Sugar Creek would provide at least a ten-fold dilution of pollutant concentrations from the Unnamed Tributary to Sugar Creek, rendering them non-toxic.***

**Response:** The 7Q10 low flow of upper Sugar Creek approaches zero, according to values derived from USGS gaging stations. Additionally, the commenter is assuming the background levels of these pollutants in Sugar Creek are zero, which is not borne out by sampling results.

**Specific Comment 48:** ***Data supplied by the commenter indicate Sugar Creek segment TN6040003023_0250 downstream of Arrow Lake near Mt. Pleasant is not impacted by ammonia, chlorides, and total dissolved solids.***

**Response:** The Lower Duck River is a Group 3 watershed and is on schedule to be reassessed in late 2020 or early 2021. Given that this stream has been impacted for 35 years by unauthorized discharges from a landfill, we would prefer to wait until we have compiled all the relevant data to reassess this stream. Additionally, we are watching with interest to see if current enforcement and remediation efforts are successful in reducing pollutant loadings to this stream.

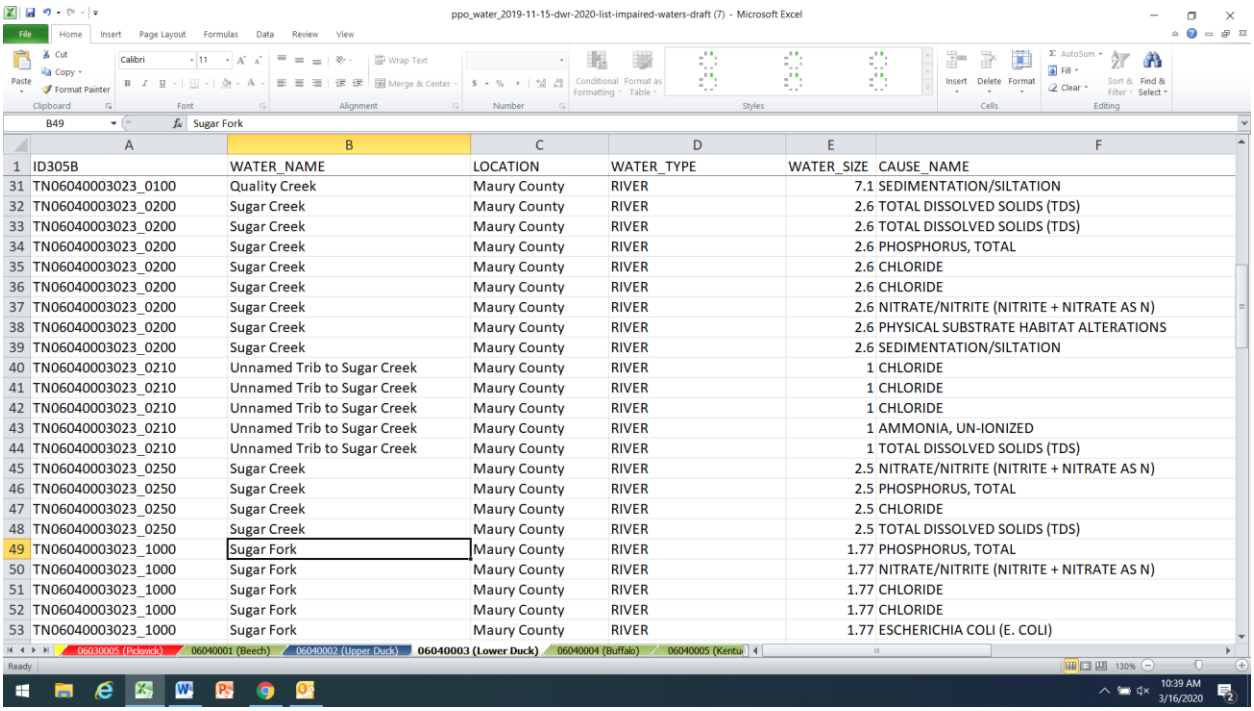
**Specific Comment 49:** ***Data reviewed by the commenter indicate Sugar Creek segment TN6040003023_0250 downstream of Arrow Lake is meeting TDEC's 10 mg/L criterion for nitrates, thus should be delisted for nitrate+nitrite (NO2+NO3).***

**Response:** The commenter has accurately cited the nitrate criterion for protection of domestic water supplies. However, the Sugar Creek use impaired by the excessive levels of NO2+NO3 is not domestic water supply protection, but rather fish and aquatic life protection.

**Specific Comment 50:** ***Data supplied by the commenter indicate Sugar Creek segment TN6040003023_0255, upstream of Arrow Lake is not impacted by ammonia, chlorides, and total dissolved solids.***

**Response:** Sugar Creek segment 0255 is not currently assessed as impacted by ammonia, chlorides, or total dissolved solids. Please see the illustration below.

## Impaired Waters List Information for Sugar Creek Watershed



| | A | B | C | D | E | F |
|---|---|---|---|---|---|---|
| 1 | ID305B | WATER_NAME | LOCATION | WATER_TYPE | WATER_SIZE | CAUSE_NAME |
| 31 | TN06040003023_0100 | Quality Creek | Maury County | RIVER | 7.1 | SEDIMENTATION/SILTATION |
| 32 | TN06040003023_0200 | Sugar Creek | Maury County | RIVER | 2.6 | TOTAL DISSOLVED SOLIDS (TDS) |
| 33 | TN06040003023_0200 | Sugar Creek | Maury County | RIVER | 2.6 | TOTAL DISSOLVED SOLIDS (TDS) |
| 34 | TN06040003023_0200 | Sugar Creek | Maury County | RIVER | 2.6 | PHOSPHORUS, TOTAL |
| 35 | TN06040003023_0200 | Sugar Creek | Maury County | RIVER | 2.6 | CHLORIDE |
| 36 | TN06040003023_0200 | Sugar Creek | Maury County | RIVER | 2.6 | CHLORIDE |
| 37 | TN06040003023_0200 | Sugar Creek | Maury County | RIVER | 2.6 | NITRATE/NITRITE (NITRITE + NITRATE AS N) |
| 38 | TN06040003023_0200 | Sugar Creek | Maury County | RIVER | 2.6 | PHYSICAL SUBSTRATE HABITAT ALTERATIONS |
| 39 | TN06040003023_0200 | Sugar Creek | Maury County | RIVER | 2.6 | SEDIMENTATION/SILTATION |
| 40 | TN06040003023_0210 | Unnamed Trib to Sugar Creek | Maury County | RIVER | 1 | CHLORIDE |
| 41 | TN06040003023_0210 | Unnamed Trib to Sugar Creek | Maury County | RIVER | 1 | CHLORIDE |
| 42 | TN06040003023_0210 | Unnamed Trib to Sugar Creek | Maury County | RIVER | 1 | CHLORIDE |
| 43 | TN06040003023_0210 | Unnamed Trib to Sugar Creek | Maury County | RIVER | 1 | AMMONIA, UN-IONIZED |
| 44 | TN06040003023_0210 | Unnamed Trib to Sugar Creek | Maury County | RIVER | 1 | TOTAL DISSOLVED SOLIDS (TDS) |
| 45 | TN06040003023_0250 | Sugar Creek | Maury County | RIVER | 2.5 | NITRATE/NITRITE (NITRITE + NITRATE AS N) |
| 46 | TN06040003023_0250 | Sugar Creek | Maury County | RIVER | 2.5 | PHOSPHORUS, TOTAL |
| 47 | TN06040003023_0250 | Sugar Creek | Maury County | RIVER | 2.5 | CHLORIDE |
| 48 | TN06040003023_0250 | Sugar Creek | Maury County | RIVER | 2.5 | TOTAL DISSOLVED SOLIDS (TDS) |
| 49 | TN06040003023_1000 | Sugar Fork | Maury County | RIVER | 1.77 | PHOSPHORUS, TOTAL |
| 50 | TN06040003023_1000 | Sugar Fork | Maury County | RIVER | 1.77 | NITRATE/NITRITE (NITRITE + NITRATE AS N) |
| 51 | TN06040003023_1000 | Sugar Fork | Maury County | RIVER | 1.77 | CHLORIDE |
| 52 | TN06040003023_1000 | Sugar Fork | Maury County | RIVER | 1.77 | CHLORIDE |
| 53 | TN06040003023_1000 | Sugar Fork | Maury County | RIVER | 1.77 | ESCHERICHIA COLI (E. COLI) |

**Specific Comment 51:** ***EPA recently approved an E. coli TMDL for the Sequatchie River watershed (TN6020004). Shouldn't the EPA category be changed for the E. coli impaired segments included in this TMDL?***

**Response:** The commenter is correct. EPA approved this TMDL after the Draft 2020 List of Impaired and Threatened Waters in Tennessee was published. The TMDL category for the following waterbodies has been changed from 5 (waterbodies that need a TMDL) to 4b (waterbodies with an EPA approved TMDL).

1. TN06020004001_0600 Unnamed Tributary to Sequatchie River
2. TN06020004001_1200 Shiloh Branch
3. TN06020004005_0100 Coops Creek
4. TN06020004007_0200 Flatwood Branch
5. TN06020004007_0600 Little Creek
6. TN06020004007_1500 Mill Branch

These waterbodies are still considered impaired, so will continue to be listed until water quality criteria are met.