

Stream Mechanics / EPR's Response to SCMA Comments
Provided to the SCMA
12/22/2020

We appreciate the South Carolina Mitigation Association's (SCMA) thorough review of the draft South Carolina (SC) Stream Quantification Tool (SQT). This document details our response to the letter sent to the SC Department of Natural Resources (DNR) reviewing the draft SC SQT on December 15th, 2020. The following comment about the price comparison is the most critical response to review. This is very important to understand. Please reach out to Will Harman should questions arise: wharman@stream-mechanics.com.

Hypothetical Credit Equivalent Scenario (Price Comparison)

On page 2, SCMA compared the SQT to the current SOP guidelines using a hypothetical example for the purposes of comparing costs. They are trying to compare SOP credits to SQT credits using only the SOP generated debits. This is an apple to oranges comparison, but one that is common in states starting the regionalization process. To compare apples to apples, SQT credits must be compared to SQT generated debits, where credit calculations and debit calculations use the same methodology. This is why we have a debit tool. If unfamiliar with the debit tool and interested in learning more, debits tools/calculators are available for MN, TN, and CO at this time: <https://stream-mechanics.com/stream-functions-pyramid-framework/>.

Here's what the SCMA did, as we understand it:

- 1) Debit Determination Method = Current SOP: Credit method equals Current SOP
- 2) Debit Determination Method = Current SOP: Credit method equals SQT. Then they compared SOP generated credits to SQT generated credits.

To put it another way, this is like comparing the dollar to the Euro without an exchange rate. So, their result of the SQT causing credits to be much more expensive is spurious. The IRT would not create a policy where debits are calculated using the existing method and credits using a new method. The credit method must follow the debit method to create parity between the two.

A correct analysis approach is as follows:

- 1) Debit Determination Method = Debit Calculator with SQT: Credit method equals SQT.

Applying the correct approach, the total number of debits and credits is less than what is currently used. Why? Because the SQT uses a 0 to 1 scale. A mitigation site cannot create credits that exceed the stream length. The same is true on the debit side. So, the number is lower. This means that the cost/debit and the cost/credit will be higher than what is currently used. So, they are correct about that. **However, the total cost for a mitigation site will not change significantly (higher cost/credit multiplied by fewer credits).**

Policy Consideration for the IRT/Corps to consider:

We recognize that once the SQT and Debit Tool are implemented, there will be existing debits on the market that used the current SOP. Our recommendation is that the credit methodology uses the current

SOP for those existing debits, not the SQT. Then, new projects that use the Debit Calculator should apply a credit method that uses the SQT. This will ensure parity between debit and credit calculations.

General Notes (comments from EPR & Stream Mechanics in red)

- Regarding planted pine (re: engineered loblolly cultivars, not native loblolly):
 - o Planted pine is overwhelmingly dominated by genetically engineered loblolly cultivars, rather than native loblolly. The SQT appears to treat loblolly cultivar crop as a naturally functioning forest. SCMA suggests that silviculture activities can contribute to in-stream sedimentation on every rotation. This reoccurring activity can significantly impair the function of a riparian buffer (and watershed) and suppresses the objective of achieving a late successional forest. SCMA suggest that the SQT categorize planted pine as a nonnative species and significant stressor to streams in the geomorphology category (riparian vegetation section) and hydrology category (land use coefficient).
 - o This is already addressed in the land use coefficient table as “tree farm.” The value is currently 65, which is much higher than the 55 value assigned to forested communities.
 - o The Steering Committee could consider characterizing planted pine as non-native tree species and make average DBH and tree density for native species only. We encourage further discussion with the Steering Committee on this matter.
 - o The removal of planted pine within stream buffers, to be replanted with native species, appears to reduce the potential credit, as the native, young plantings provide less credit than mature loblolly pine. SCMA recommends treating mature pine plantation as a row crop, and not a mature forest.
 - Functionally, planted loblolly pines are still trees. But we understand the concern with the fast-growing loblolly pine. This concern would be addressed if the tree metrics are only applicable to native species. This is a species composition question while the vegetation metrics in the SQT focus more on structure. The land use value for “tree farms” is different than for row crops, so we do not support equating tree farms to row crops since land use coefficients are intended to capture function associated with reach runoff. However, in the user manuals we could make explicit that since the trees in silviculture activities will be cut, timing of vegetation assessment is critical. We encourage further discussion with the Steering Committee on this matter.
- SCMA request clarification related to the application of the SQT to in-channel enhancement activities (i.e., the addition of large woody debris, brush toe, etc.).
 - o More information is needed on this concern. We provide more clarification in the data collection and analysis manual. For example, reaches must be delineated based on restoration approach (e.g. restoration or enhancement). There is also a LWD field manual that might be helpful.

Buffer Width (there were several notes on buffer width, so we grouped them together)

- Recent feedback from the IRT encourages buffering and encumbering lands beyond the limit that generates stream credits under the current Standard Operating Procedure (SOP). SCMA suggest that the draft SQT does not incentivize this conservation practice.

- The Steering Committee previously decided to tie buffer width reference curves to the existing SOP, with some minor adjustments. We encourage further discussion with the Steering Committee on this matter.
- The buffer width metric should be standardized and not based on land use (i.e., land use outside an established buffer shouldn't penalize the establishment of the buffer).
 - This relates back to tying buffer width to the existing SOP protocol. We agree that it might be best to use a new approach and tie buffer width to valley morphology rather than land use. We encourage further discussion with the Steering Committee on this matter.
- SCMA suggest that buffer Width index values should not achieve a 1.0 index value at 300-feet in all slope scenarios.
 - This relates to the first comment above re: incentivizing larger buffers.
- The riparian buffer metric does not adequately account for silviculture activities and planted pine. SCMA suggest that weighing condition against the reference (ratio state used in hydraulics).
 - The riparian buffer must be composed of riparian vegetation, which excludes silviculture activities.

Hydrology

- SCMA recommends revisions to this factor to accommodate flow re-diversion projects (i.e., diverting flow from a ditch into a historic stream feature) and the use of the existing ditch as the 'existing' condition and the abandoned channel as the 'proposed' condition.
 - Based on our interpretation, an Applicant could implement the SQT to re-route a stream's base flow into a ditch (avoiding significant physical impacts to the existing channel) to promote silviculture practices and minimize or eliminate the requirement for mitigation.
 - Noted. We encourage further discussion with the Steering Committee on this matter. This might be best handled with policy, e.g. not allow it for mitigation projects.
 - Might be something to investigate for future SQT versions.
- Some SQTs have implemented a flow alteration metric or method. The Land Use metric should account for silviculture activities. Silviculture activities can be a major contributor to in-stream sedimentation in our state.
 - "Tree farm" is included in the land use coefficient table already. The value is currently 65, which is much higher than the 55 value assigned to forested communities.

Hydraulics

- SCMA suggest that identifying and documenting appropriate references for the 'Width/Depth Ratio State' may be difficult in specific regions of the state.
 - Noted. The reference W/D can come from the design process as well.
- SCMA suggest that the floodplain connectivity parameter for C and E stream types should be reconsidered (i.e., reference the Tennessee SQT method)
 - This parameter is included in every SQT and is essential to ensure water gets out of the channel and on the floodplain. TN has reference curves more generous to the practitioner (less floodplain required). They lump C & E channels together and the functioning range is defined by (2.4,0.70), (5.0,1.00). SC sets the 0.70 to 2.2 but the 1.00

values are higher for C and E's (7.3 & 10, respectively). The SC reference curve was based on a southeast regional dataset from SC, NC, and TN (1.0 value) and the Rosgen stream classification (0.7 value). The SC method is scientifically more defensible.

- SCMA suggest that the flow dynamics parameter may be better implemented as an optional parameter.
 - o As a required parameter, this adds the ability to capture more lift in the hydraulics functional category. Please provide more detail so we can better understand the concern. The metric opens up the ability to capture more lift in the hydraulics category in addition to BHR and ER.

Geomorphology

- SCMA suggest that LWD index values should be differentiated by ecoregion, stream type, and gradient. LWD should be regionalized to the level III ecoregion. SCMA request consideration of this parameter as a ratio state based on the reference reach, identified in conjunction with the hydraulics functional category.
 - o Exploring stratification is welcomed, but more data are needed in order to do so. Data available to us from old growth forests in SC and the southeast region is limited, which is required to determine the "functioning" index values in the reference curve. FYI the data collected by Jennings Environmental was not from old growth forests, but from forests 40-50 y.o.
- The average DBH, tree density, native shrub density, and native herbaceous cover metrics should be indexed on a ratio state based on a vegetation reference community.
 - o Which vegetation reference communities do you have in mind?
 - o Riparian vegetation metrics are only applicable in certain situations (which acts as a stratification by reference community in a way).
 - Buffer width, average DBH, and tree density will be measured at all sites.
 - Native shrub cover metric will only be used where the existing riparian vegetation community consists of pastureland, cropland, or other land uses without trees (i.e., canopy cover at project closeout will be < 20%).
 - Herbaceous cover metric will only be used at sites with a prairie piedmont vegetation community.
- High tree density should decrease the score to 0.7 not to 0.5
 - o This reference curve comes from the HGM manual. Any changes would need to be tested/verified for SC.
- SCMA suggest that the 'top-end' of the DBH metric is too restrictive. A 'working' group in Tennessee is tackling this issue in relation to the application of the Tennessee SQT.
 - o Riparian vegetation is not just about what can be restored, but also about quantifying function lost from impacts. We're interested to hear the TN working groups feedback.

Corrections Made/To be Made (thanks to SCMA for the thorough review)

- A SCMA member encountered issues with the Region and River Basin dropdowns.
 - o These are holdovers from NC and are used to stratify physicochemical and biology metrics. The status of including these functional categories in the SC SQT is currently out of scope; they were a hold over from NC.
- SCMA recommends color coding cells C18 and C19 on the 'Quantification_Tool' blue.

- Native shrub density and native herbaceous cover (cells E38 and E39 on the 'Quantification_Tool') are not functional.
 - Not all vegetation metrics are applicable. This may be the root of the issue here:
 - Buffer width, average DBH, and tree density will be measured at all sites.
 - Native shrub cover metric will only be used where the existing riparian vegetation community consists of pastureland, cropland, or other land uses without trees (i.e., canopy cover at project closeout will be < 20%).
 - Herbaceous cover metric will only be used at sites with a prairie piedmont vegetation community.