



Department of  
**Environment &  
Conservation**

# 2019 Tennessee Stream Mitigation Guidelines

Vena Jones



# Agenda for Today

- Highlights from the new rules
- Process to develop the Stream Mitigation Guidelines
- Highlights from the 2019 Stream Mitigation Guidelines
- Overview of the TN Debit Tool
- Compensatory Mitigation webpage
- Questions



DWR-NR-G-01-Stream Mitigation Guidelines-05202019



TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION  
DIVISION OF WATER RESOURCES  
NATURAL RESOURCES UNIT

2019

# ACKNOWLEDGEMENTS-2019 SMG, TN SQT and Debit Tool



**US Army Corps  
of Engineers** ®



**USDA NRCS**  
U.S. Department of Agriculture  
Natural Resources Conservation Service



Jimmy Smith, Jonathon Burr, Joshua Frost, Tammy Turley, Will Harman, Cidney Jones, Eric Somerville, Debbie Arnwine, Greg Jennings, Jason Zink, Travis Wiley, Caitlin Elam, Peyton Abernathy, Mark McIntosh, Robert Wayne, Robby Baker, Will Worrall, Ryan Evans, Tim Wilder, Dan Bacon, Kelly Laycock, Terry Horne, West TN River Basin Authority, Memphis District COE, Robb Todd, Robbie Sykes, Stream Design Review Group, Ashley Monroe, and Kim Pilarski-Hall

# Why Update the Stream Mitigation Guidelines?

- **Improve** explanation of **what** activities **constitute a loss of resource value** and when is mitigation required.
- Provide a **quantitative and scientifically defensible** framework for how the amount of mitigation required to ensure no net loss will be evaluated.
- **Modernize** what type of activities are eligible for offsetting lost resource value.
- Provide mitigation **site selection** evaluation guidance.
- Improve **performance standards and monitoring**.

**Inform us on how to calculate debits and credits.**

# 2004 TN Stream Mitigation Guidelines

- Ratio Based
  - Broad ranges of ratios for credits
  - Describes **activity based crediting-pattern, profile, and dimension**
- Narrative Criteria
  - Does not require baseline information
  - Subjective
  - Creates **crediting drift**
  - Debits
    - Encapsulation 1:1
    - Riprap 0.75:1 for double bank



# 2012 Draft Stream Mitigation Guidelines

Realized deficiencies in the 2004 mitigation guidelines;  
qualitative/subjective

- Wanted to be consistent with USACE requirements
- Wanted to align state guidelines with the 2008 Final Rule to the extent practical for TN
- Wanted to establish **functional lift**
- Move away from linear footage/ratio based system

## Shortcomings

- Received significant comment on efficacy of functional assessment parameters and methods
- Division lacked capacity to create a robust functional assessment

# Strategic Planning for Guidelines Updates

- Engage our stakeholders
- Evaluate potential assessment methods
- Establish parallel pathways
  - Education and outreach
  - Incremental and iterative document development
  - Data gathering
  - Tool development
  - Tools to policy



# Long Term Goals

- **Update**
  - Stream Mitigation Guidelines
  - *TDEC rules* on mitigation
- **Develop Tools**
  - Stream functional assessment to capture function lift of compensatory mitigation
  - Companion debit calculator

# Short Term Goals

- **Streamline Process**
  - Bring consistency
    - Banking templates
    - Land Use Protection documents
    - Checklists
    - Mitigation crosswalk
- **Communicate changes**
  - Series of joint education and outreach events over several years
  - Training, webinars and workshops

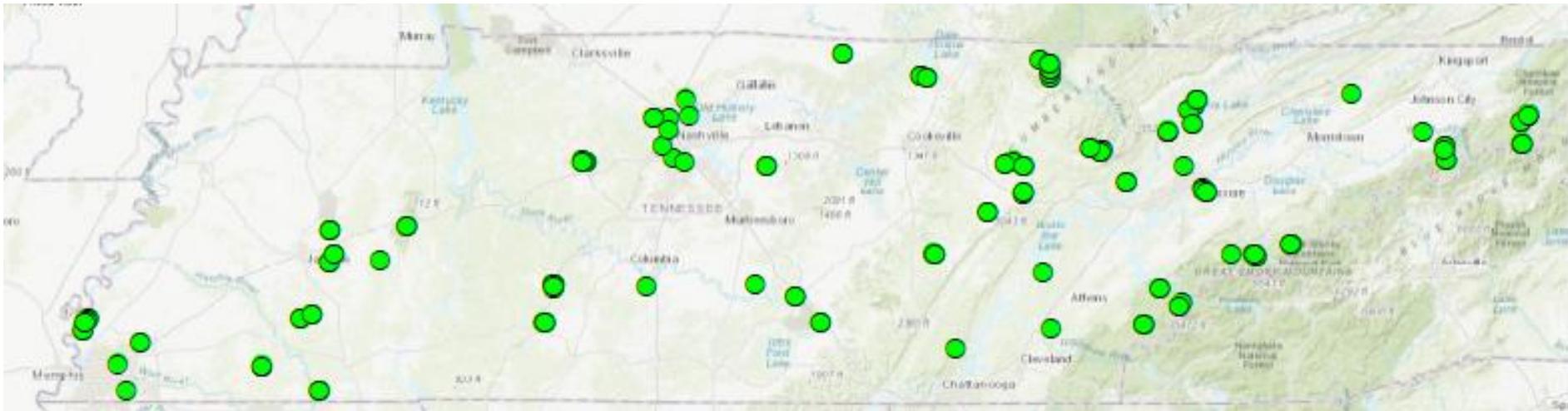
# Develop Tools: Build Consensus and Foundation

- *Measurable. Transparent. Predictable. Repeatable*
- Partner with USACE and IRT to develop/adopt functional assessment guidance tools
- Based on known stream functions
- Inherent relationships in stream channel metrics
- Incorporate TDEC biological and water quality data
- Regionalize as information becomes available



# Develop Regionalized Data From Across TN

- Over 120 sites across the state with multiple levels of data.
- Over 60% of those sites have reference data for all five stream categories



# Streamline Process & Communicate Change

- TDEC and the USACE developed a series of workshops, delivered across the state for all stakeholders focused on small changes, introduce concepts on big changes and keep an open line of communication. Three years of “Joint Education Outreach Events” from 2015-2018.



 **US Army Corps  
Of Engineers**  
Water and Marine District



### Permittee-Responsible Mitigation Guidance May 26, 2016 (Draft)

This Permittee-Responsible Mitigation (PRM) document has been developed to provide guidance on the required elements of a compensatory mitigation (CM) plan that is compliant with 33 CFR 332. This guidance document is applicable to all type of permittee-responsible compensatory mitigation, including on-site and off-site mitigation. As stated in 33 CFR 332.3(c)(3)(iii) and 230.93(c)(3)(iii), the level of information and analysis contained in a mitigation plan must be commensurate with the scope and scale of the authorized impacts and functions lost. Please provide the following information with the submittal of a permittee-responsible mitigation plan:

#### A. Basic Information

- 1. Permit Number:** Provide the permit number for which PRM is proposed as well as other past or current permits from state or federal agencies.
- 2. Applicant:** Provide contact information for the applicant, landowner(s), and agent(s).
- 3. Agent:** Identify consultants or experts to be involved in design of the compensation site, and list their qualifications and experience in designing and implementing mitigation projects.
- 4. Impact Site:** Identify the resource type(s) and amount(s) of waters of the U.S. and waters of the State, to be impacted by the project for which PRM is proposed. Please specify whether impacts will be temporary or permanent. For temporary impacts, please include an estimated schedule outlining when restoration of the temporary impacts would occur.
  - a. List the impact site(s) location from the nearest intersection of roads. List the nearest town, county, state, HUC-8 watershed, HUC-12 watershed, EPA scoreline (Level III) and provide the impact site(s) coordinates in decimal degrees (NAD 83) and any associated available shapefiles relating to the proposed impact site.**
  - b. Describe and quantify the aquatic resource type and functions that will be lost at the proposed impact site (e.g. TN SQT Overall Existing Condition Score, TRAM, etc.). Please fill out applicable items 6(a), (b), (c), (d)(ii), (iv)-(vi) in the "Baseline Information" section for proposed stream relocations.**
  - c. Describe existing aquatic resource concerns in the watershed (e.g. flood storage, water quality, habitat, etc.) and how the impact site currently contributes to overall watershed/regional functions.**

#### B. Components of a Compensation Mitigation (CM) Plan

- 1. Executive Summary:** Provide a brief, narrative overview of the mitigation plan (approximately one page). The narrative should summarize the amount, aquatic resource type (e.g. Cowardin, HGM, ecological, and/or Rosgen stream classification), and functional capacity of both the aquatic resources proposed for impact and those proposed to be established, restored, enhanced, or preserved.

Permittee-Responsible Mitigation Guidance  
May 26, 2016 (Draft) 1

## Tennessee Stream Quantification Tool Version 0.9

January 17, 2018  
Public Notice Webinar

Vena Jones, TDEC  
Will Harman, Stream Mechanics  
Cidney Jones, Ecosystem Planning and Restoration

# Communicate Change- In the Classroom

- Provided webinars with national experts
- In house workshops
- Conferences
- Seminars

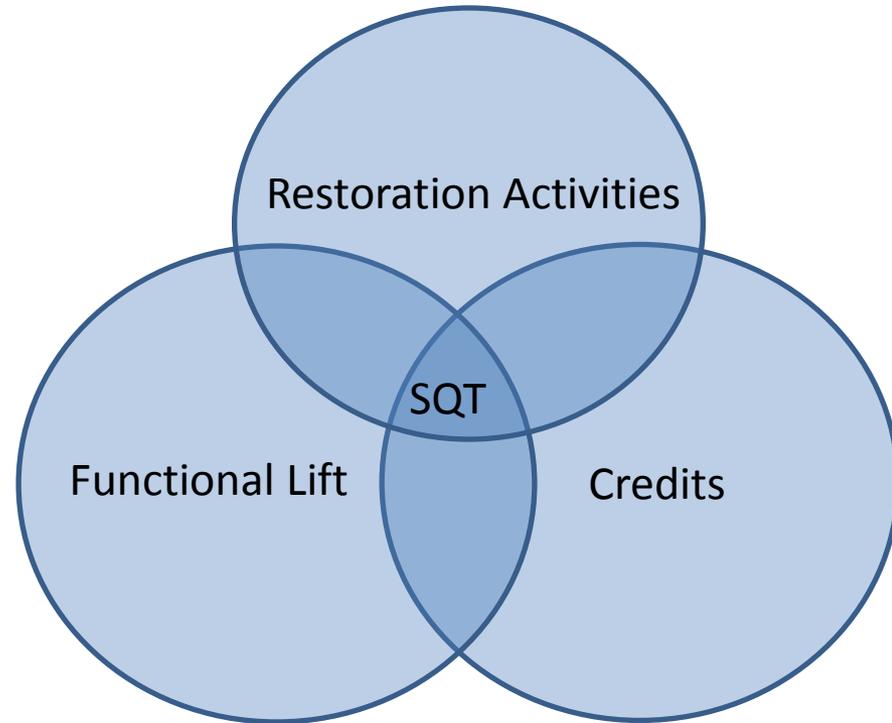


# Communicate Change- Field Training



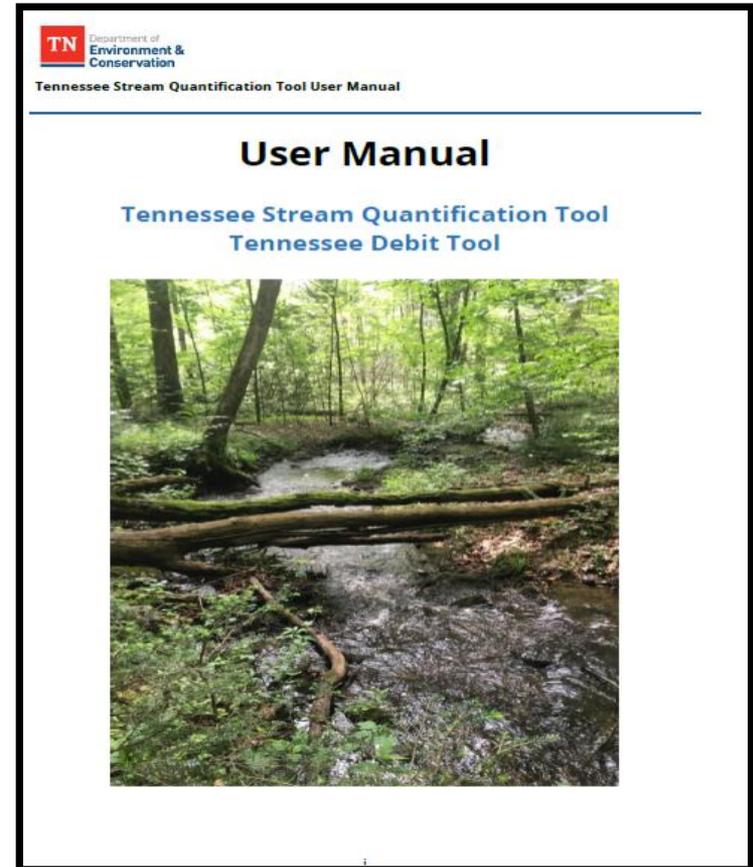
# Preferred Quantitative Method

- Benefits of the Stream Quantification Tool
- Determine numerical existing condition score for impact sites.
- Determine numerical difference between existing and proposed conditions of a stream for mitigation (functional lift).
- Links restoration activities to function-based parameters.
- Incentivize high-quality stream mitigation.
- Inform stream mitigation site selection
- Developing success criteria and a monitoring plan.



# TN Stream Quantification Tool

The basic framework, underlying logic, and technical aspects of a Functional-Foot methodology is laid out in detail in the recently published *Tennessee Stream Quantification Tool*, available on the Division's mitigation web site.



# Develop Tools: The TN SQT

- TN SQT User Manual
  - How to use the SQT Workbook.
- Rapid Data Collection Methods Manual
  - How to rapidly collect data without surveying equipment.
- Detailed Data Collection and Analysis Manual
  - Explains thorough data collection.
- Science Support and Rationale (Coming Soon)

## User Manual

Tennessee Stream Quantification Tool  
Tennessee Debit Tool



## Rapid Data Collection Methods

Tennessee Stream Quantification Tool  
Tennessee Debit Tool



## Data Collection and Analysis Manual

Tennessee Stream Quantification Tool  
Tennessee Debit Tool



# Update: Tools into Policy

- **Stream Mitigation Guidelines**-interprets rules, establishes performance standards, align with USACE
- **Aquatic Resource Alteration Rules**- defines mitigation requirements
- **Water Quality Standards**- ensures all features maintain classified uses, flow, and use quantitative methods



# ARAP Rules – Mitigation

- any appreciable permanent loss of resource values associated with the proposed impact is offset by mitigation sufficient to result in no overall net loss of resource values from **existing conditions**
- Mitigation for impacts to streams must be developed in a scientifically defensible manner approved by the Division that **demonstrates a sufficient increase in resource values** to compensate for permitted impacts.
- At a minimum, all new or relocated streams must include a vegetated riparian zone, demonstrate lateral and vertical channel stability, and have a natural channel bottom.
- All mitigation watercourses must **maintain or improve** flow and classified uses after mitigation is complete.

# ARAP Rules - Mitigation

- **Existing Conditions-** means the biological, chemical, bacteriological, radiological, and physical conditions of a stream or wetland at the time the project is proposed as **measured by a quantitative assessment tool** or other defensible scientific method as approved or determined by the Division.
- Because all streams and wetlands serve important functions, the determination of existing conditions shall ensure at least **minimal protection** for all streams and wetlands notwithstanding prior degradation
- The Division will evaluate resource value compensation through the use of an appropriate **quantitative assessment** or other defensible scientific method
- Mitigation for impacts to Tennessee streams and wetlands shall occur in Tennessee.

# Rules-Minimum Existing Condition Score

- Minimum Mitigation Requirement : ***“Because all streams and wetlands serve important functions, the determination of existing conditions shall ensure at least minimal protection for all streams and wetlands not withstanding prior degradation”***

Even currently degraded streams (including many in urban areas) have resource values outside of those addressed in the functional quantification evaluation that must be offset if lost.

Therefore the *Guidelines* establish a **minimum Existing Condition Score** for all streams, to ensure overall net mitigation is sufficient to maintain classified uses and water quality standards.



# Significant Changes -Assessment

- Movement from a **qualitative, narrative, more generalized evaluation** of lift and loss (e.g. ratio-based categories of credits and debits), to a more **quantitative, data-driven, site-specific assessment** of lift and loss (e.g. functional-foot calculation of credits and debits)
- **Approved** quantitative assessments base credits on the actual lift produced, regardless of the type or extent of “work”

# Factors Used to Determine Loss

- Temporal Loss : Should complete mitigation prior to or concurrent with impacts, and the Division may “*account for temporal loss of resource value*” with additional required mitigation.
- Proximity: “*Mitigation should occur as close to the impact location as practical*”. Guidelines propose multipliers for proximity, based on existing USACE methodology.
- Unique or Exceptional Waters: Not all standard mitigation practices may be adequate to address sites with special resource value.

# Requirements

- Stream Fill and Replacement (relocation) projects
  - Minimum requirements based on scale and current condition
- 12-point Mitigation Plan
  - Matches USACE requirements (level of detail based on scale)
- Permittee-Responsible Mitigation vs. Third-Party Providers
  - Most of the same standards apply (based on scale & complexity)
- Performance Standards and Monitoring Requirements
  - Most align with USACE requirements, see joint guidance document
- “Commonly Encountered Variants” (Frequently Encountered Scenarios) - section expanded with more examples

# Clarification

- Preservation Crediting
  - Allowed under certain circumstances – may be credited up to 10% of the Existing Condition Score
- Urban Mitigation Sites
  - May be incentivized up to 15% additional credits (TDEC only)
- Perpetual Site Protection



# Stream Relocations that Offset Themselves

- Meet the minimum requirements in rule
- Proposed condition must meet or exceed existing condition
- Demonstrate success through monitoring
- Laterally and vertically stable
- Riparian vegetation
- Natural substrate
- **Maintain** status as a stream (**flow**)
- **Maintain use support** if supporting

No additional credit is generated AND no additional loss is debited

# Stream Relocations that Generate Credit

- Relocation must demonstrate they meet requirements from previous slide AND
- Demonstrate a **sufficient increase in resource values** to compensate for permitted impacts

- Must meet the minimum expectations of a credit generating compensatory mitigation project
- Functioning in the “Big 4” Stream Functional Categories of the TN SQT
  - Floodplain Connectivity
  - Riparian Vegetation
  - Lateral Migration
  - Bedform Diversity

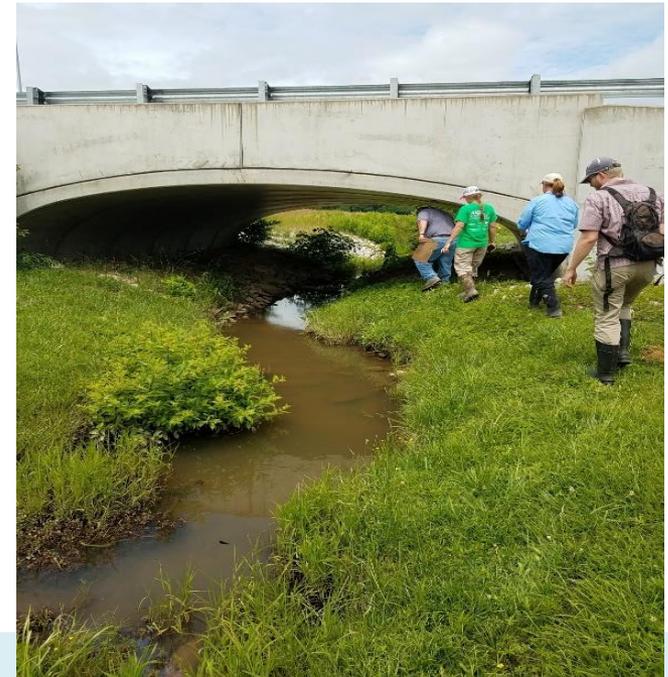
# How can we quantify functional loss?

# Develop- TN Debit Tool a Companion to TNSQT

- Impacts to Waters of the State and WOTUS range from minimal to significant
- Debit Tool determines the amount of loss based on specific impact type and existing stream condition (ECS)
- Objective, consistent, transparent method for evaluating debits, or amount of compensatory mitigation required for impacts



SIGNIFICANT



MINIMAL

# Impact Severity Tiers

Impact Tier	Road Crossings		Impact Factor	Percent Loss
	Description of Resource Value Loss	Impact Type		
6	Total permanent loss of all resource value (stream function). complete elimination of all stream resource value (function). Total loss of existing and potential function.	<u>Stream Length Loss:</u> filled for relocation or stream length loss due to culverts, fill, channelization, or similar.	0	100%
5	Significant permanent loss of resource value (stream function). Affects biology, water quality, floodplain connectivity, bedform and habitat and large woody debris, eliminates riparian vegetation, limits planform and lateral migration. Removal of all aquatic functions except for hydrology.	<u>Pipe or 4-Sided Box Culvert:</u> Includes wingwalls, any energy dissipation device, u-shaped endwalls. All components attached to the pipe structure itself. Does not include riprap.	0.1	90%
4	Permanent loss of most of resource value (stream function). Impacts to riparian vegetation, lateral migration, bed form diversity, and floodplain connectivity. Limitations to planform and large woody debris. Significant impacts to water quality and macroinvertebrate and fish communities.	<u>3-Sided Box Culvert, Arch Culvert, Single or Multi-Span Bridges with Bents and/or Abutments:</u> includes wingwalls and all components attached to the crossing structure. These box culverts (bents, abutments or similar) affect the channel walls, have footers that were dug into bank/bed interface, or otherwise disrupted or disturbed the natural channel wall during and/or after construction. Riprap (not to exceed the length of the culvert) may be placed along banks beneath the crossing in association with these structures. Riprap along bents and abutments (or similar) is permissible. Riprap lining the bed in conjunction with these culverts would make the impact a Tier 5.	0.34	66%

# Impact Severity Tiers

Name:

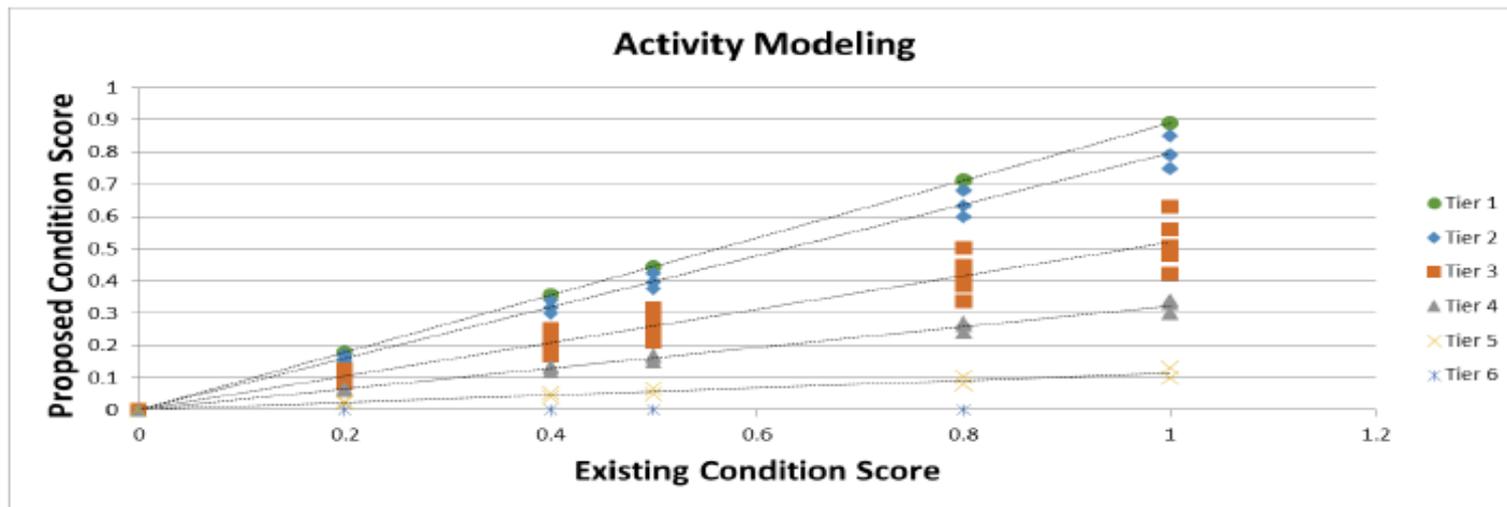
TN SQT DEBIT TOOL v1.0

Date:

Impact Severity Tiers	Impact Factors	Percent Functional Loss
Tier 0	1.00	0%
Tier 1	0.89	11%
Tier 2	0.8	20%
Tier 3	0.52	48%
Tier 4	0.32	68%
Tier 5	0.12	88%
Tier 6	0.00	100%

## Proposed Impact Factors and Activity Modeling:

The graph below represents combined data from modeling individual activities and the impact these actions have on stream resources. The table has established tiers, percent functional loss and the impact factors used to determine debits. The Impact Factors were developed from linear regression equations of modeled impact scenarios using a simplified version of the SQT. Each impact type was described in detail and evaluated for stream functional loss by the proposed activities. Using a simplified SQT, an individual impact factor was developed for each impact type. These types were grouped based on % functional loss (in clusters) and graphed in "tiers". A trendline was drawn and the slope of that line became the combined impact factor representing all activities within a given tier.



**Table 1:** Impact Severity Tiers and descriptions. \*Function-based parameters being impacted are in bold.

Tier	Functional Loss Description (Impacts to stream resource values)*
0	No appreciable permanent loss of stream functions individually or cumulatively at any scale.
1	Minimal loss of stream functions. Impacts to <b>reach runoff, lateral migration and/or riparian vegetation</b> . Minor impacts to water quality, and macroinvertebrate and fish communities. <b>Activities in this tier represent an 11% functional loss.</b>
2	Partial loss of stream functions. Impacts to <b>reach runoff, lateral migration, bed form diversity, and riparian vegetation</b> . Minor impacts to water quality, and macroinvertebrate and fish communities. <b>Activities in this tier represent a 20% functional loss.</b>
3	Permanent loss of some of stream functions. Impacts to <b>reach runoff, floodplain connectivity, lateral migration, riparian vegetation, and bed form diversity</b> . May also include impacts to <b>large woody debris</b> . Minor impacts to <b>water quality and moderate impacts to macroinvertebrate and fish communities</b> . <b>Activities in this tier represent an 48% functional loss.</b>
4	Permanent loss of most stream functions. Impacts to <b>reach runoff, floodplain connectivity, lateral migration, riparian vegetation, and bed form diversity</b> . May also include impacts to <b>plan form and/or large woody debris</b> . Significant impacts to <b>water quality and macroinvertebrate and fish communities</b> . <b>Activities in this tier represent an 68% functional loss.</b>
5	Permanent loss of most of stream functions. Removal of all aquatic functions except for hydrology. <b>Activities in this tier represent an 88% functional loss.</b>
6	Total and permanent loss of all stream functions. <b>Activities in this tier represent a 100% functional loss.</b>

# Impact Severity Tier 0

- Vegetative bank stabilization



# Impact Severity Tier 1

- Span bridge
- Half bank riprap



# Impact Severity Tier 2

- Span bridge w/ pier in stream
- Single bank riprap, gabion baskets, Turf Reinforced Mat



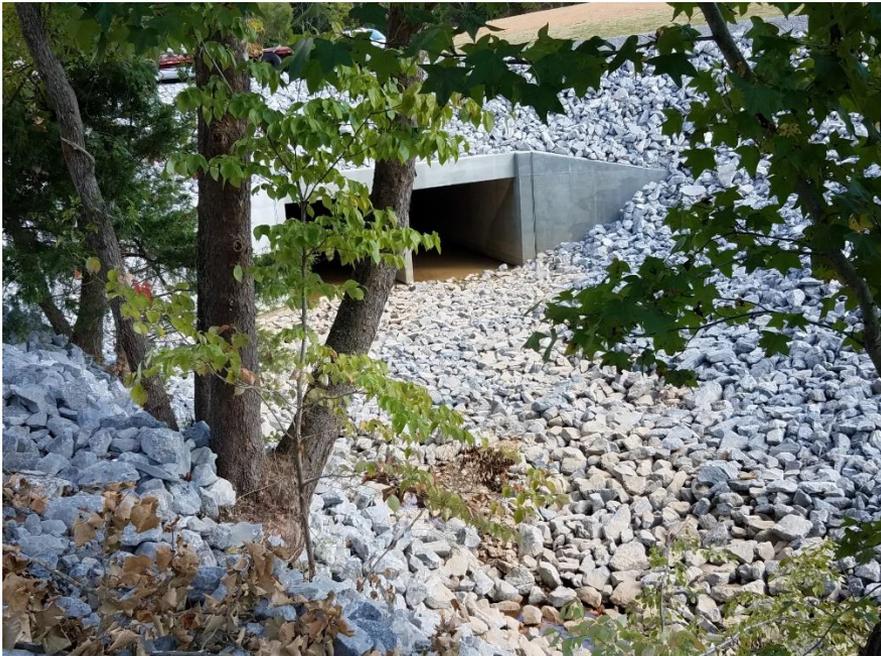
# Impact Severity Tier 3

- Bottomless culvert
- Double bank riprap
- Grade control



# Impact Severity Tier 4

- Bed and bank armoring
- Bottomless culvert w/ impact to channel walls



# Impact Severity Tier 5

- Box or pipe culvert
- Channelization



# Debit Tool –Creating a Companion to the SQT

- Spreadsheet based **calculator** and written guidance
- **Existing Condition Score (ECS)**
  - Option 1: Applicant completes ECS field assessment for all parameters
  - Option 2: Applicant completes ECS field assessment for some parameters
  - Option 3: Standard Existing Condition Score
    - Applicant uses standard ECS (1.0, 0.8, or 0.32)
  - No **ECS** can be lower than 0.4, except for relocations
- **Impact Severity Tier**
  - Applicant determines severity tier based on impact type and description
  - Tier 0 (no functional loss) to Tier 6 (100% functional loss)

# Existing Condition Scores

- Option 1 and Option 2 require field visits and stream assessment
- Option 3 does not require field visits; standard ECS used
  - ECS = 1.0: ETW/ONRWs
  - ECS = 0.8: intermittent/perennial
  - ECS = 0.32 ephemeral



# Calculating Loss

Table 3: PCS Equations.

Impact Severity Tier	PCS Equation	Percent Loss
0	$PCS = 1.0 * ECS$	0%
1	$PCS = 0.89 * ECS$	11%
2	$PCS = 0.80 * ECS$	20%
3	$PCS = 0.52 * ECS$	48%
4	$PCS = 0.32 * ECS$	68%

- PCS = Proposed Condition Score
- Existing Condition Score cannot be less than 0.4
- Existing stream length is equal to or greater than proposed stream length
- EFF – Existing Functional Feet
- PFF – Proposed Functional Feet

- Determine Existing Condition Score (ECS)
- $ECS \times \text{existing stream length} = EFF$
- $PCS = \text{Impact Severity Tier} \times ECS$
- $PCS \times \text{proposed stream length} = PFF$
- $\text{Debits} = PFF - EFF$



# Measuring Existing Condition Scores

# Reach Information and Reference Standard Stratification

## Reach Information and Reference Standard Stratification

Project Name:	
Reach ID:	
Upstream Latitude:	
Upstream Longitude:	
Downstream Latitude:	
Downstream Longitude:	
Existing Stream Type:	
Proposed Stream Type:	
Ecoregion:	
Drainage Area (sqmi):	
Proposed Bed Material:	
Existing Stream Length (feet):	
Proposed Stream Length (feet):	
Proposed Stream Slope (%):	
Proposed Flow Type:	
Data Collection Season:	
Macro Collection Method:	
Valley Type:	

- Important component of tools
- Frequent cause of errors
- Determines which reference curves to use in calculations.
- Always use pull down menu if available; do not type into the boxes.
- Unique stratification

# Existing Condition Worksheet

	A	B	C	D	E	F	G	H	I	J	
1	<b>Reach Information and Reference Standard Stratification</b>										
2	Reach ID:		Drainage Area (sqmi):					Upstream Latitude:			
3	Existing Stream Type:		Existing Bed Material:		Data Collection Season:			Upstream Longitude:			
4	Reference Stream Type:		Existing Stream Slope (%):		Macro Collection Method:			Downstream Latitude:			
5	Ecoregion:		Flow Type:		Valley Type:			Downstream Longitude:			
7	<b>EXISTING CONDITION ASSESSMENT</b>						<b>Roll Up Scoring</b>				
8	<b>Functional Category</b>	<b>Function-Based Parameters</b>	<b>Measurement Method</b>	<b>Field Value</b>	<b>Index Value</b>	<b>Parameter</b>	<b>Category</b>	<b>Category</b>	<b>ECS</b>		
9	Hydrology	Catchment Hydrology	Watershed Land Use Runoff Score		0.80	0.80	0.80	Functioning	0.80		
10		Reach Runoff	Stormwater Infiltration		0.80	0.80					
11	Hydraulics	Floodplain Connectivity	Bank Height Ratio		0.80	0.80	0.80	Functioning			
12			Entrenchment Ratio		0.80	0.80					
13	Geomorphology	Large Woody Debris	Large Woody Debris Index		0.80	0.80	0.80	Functioning			
14			# Pieces		0.80	0.80					
15		Lateral Migration		Erosion Rate (ft/yr)		0.80					0.80
16				Dominant BEHI/NBS		0.80					0.80
17				Percent Streambank Erosion (%)		0.80					0.80
18		Riparian Vegetation		Percent Armoring (%)		0.80					0.80
19				Left - Average Diameter at Breast Height (DBH; in)		0.80			0.80		
20				Right - Average DBH (in)		0.80			0.80		
21				Left - Buffer Width (feet)		0.80			0.80		
22				Right - Buffer Width (feet)		0.80			0.80		
23	Left - Tree Density (#/acre)				0.80	0.80					
24	Right - Tree Density (#/acre)				0.80	0.80					
25	Left - Native Herbaceous Cover (%)				0.80	0.80					
26	Right - Native Herbaceous Cover (%)		0.80	0.80							
27	Left - Native Shrub Cover (%)		0.80	0.80							
28	Right - Native Shrub Cover (%)		0.80	0.80							
29	Bed Material Characterization		Size Class Pebble Count Analyzer (p-value)								
30	Bed Form Diversity		Pool Spacing Ratio		0.80	0.80					
31			Pool Depth Ratio		0.80	0.80					
32			Percent Riffle (%)		0.80	0.80					
33			Aggradation Ratio								
34	Plan Form		Sinuosity		0.80	0.80					
35	Bacteria		E. Coli (Cfu/100 mL)		0.80	0.80					
36	Physicochemical		Organic Enrichment		Percent Nutrient Tolerant Macroinvertebrates (%)	0.80	Functioning				
37			Nitrogen		Nitrate-Nitrite (mg/L)	0.80		0.80			
38			Phosphorus		Total Phosphorus (mg/L)	0.80		0.80			
39	Biology	Macroinvertebrates	Tennessee Macroinvertebrate Index		0.80	0.80	Functioning				
40			Percent Clingers (%)		0.80	0.80					
41			Percent EPT - Cheumatopsyche (%)		0.80	0.80					
42		Percent Oligochaeta and Chironomidae (%)		0.80	0.80						
43	Fish		Native Fish Score Index								
44			Catch per Unit Effort Score								

# Scoring in the TN Debit Tool

- **Index Values** are averaged to get parameter Scores
- **Parameter Scores** are averaged to get functional category scores.
- **Category Scores** are multiplied by 0.2 (1/5) and summed to get the overall ECS or PCS.

Index Value	Parameter	Category	Category	ECS	ECS
1.00	1.00	1.00	Functioning	0.37	Functioning At Risk
0.00 0.95	0.48		Functioning At Risk		
0.74 0.83	0.79	0.36	Functioning At Risk		
0.20 0.00	0.10				
0.03 0.03 0.07 0.07	0.05				
0.22 0.15	0.19	0.36	Functioning At Risk		
0.69	0.69				

# Scoring and the TN Debit Tool

Not Functioning	Functioning-At-Risk	Functioning
0.0 - 0.29	0.3 - 0.69	0.7 - 1.0



- Scoring system for each stream category, parameter, measurement method, and overall score is based on a range of 0-1.0.

THE SAME SCORING SYSTEMS AS THE TN SQT

# Mitigation Guidelines

- ✓ **Improved** explanation of **what** activities **constitute a loss of resource value** and when is mitigation required.
- ✓ Provides a **quantitative and scientifically defensible** framework for how the amount of mitigation required to ensure no net loss will be evaluated.
- ✓ **Modernizes** what type of activities are eligible for offsetting lost resource value.
- ✓ Provides mitigation **site selection** evaluation guidance.
- ✓ Improves **performance standards and monitoring**.
- ✓ **Changes the currency** to Functional Feet with the use of the TN Debit Tool and the TN SQT
- ✓ This allows Credits and Debits to be evaluated using the same scientifically defensible methodology (functional-feet), as required to defend no net loss.

# Preferred Quantitative Assessment Methods

- TN Debit Tool and TN SQT – tools to calculate functional loss and functional lift in Functional Feet.
- Credits and debits evaluated using same scientifically defensible methodology to defend no net loss.
- **The currency of credits and debits has changed**

# Other scientifically defensible method

- Ensure at least minimal protection for all streams notwithstanding prior degradation
- Utilize an appropriate quantitative assessment or other defensible scientific method
- Demonstrate a sufficient increase in resource values to compensate for permitted impacts
- Result in no overall net loss of resource values from existing conditions
- Accurately evaluate both resource loss and resource lift using similar methodologies
- Is based on valid reference data, regionalized to stream type and ecologic setting where appropriate
- Accurately and precisely assess stream resource value and condition, allowing evaluation the resource function's degree of departure from reference
- Provides repeatable and consistent assessment results
- Assesses a sufficient range of conditions or metrics to evaluate overall resource function
- Allows for a consistent and accurate prediction of post-impact resource loss
- Has transparency sufficient to be subject to external review if needed

# TN Debit Tool and TN SQT Spreadsheets

- TN Debit Tool
  - Used for permitted impacts to estimate functional loss.
- TN Stream Quantification Tool
  - Calculates functional change (existing, proposed, and monitoring years)
- List of Metrics
  - List of all parameters, measurement methods, reference standards, stratification methods, and references

**All of this supports the Stream Mitigation Guidelines**

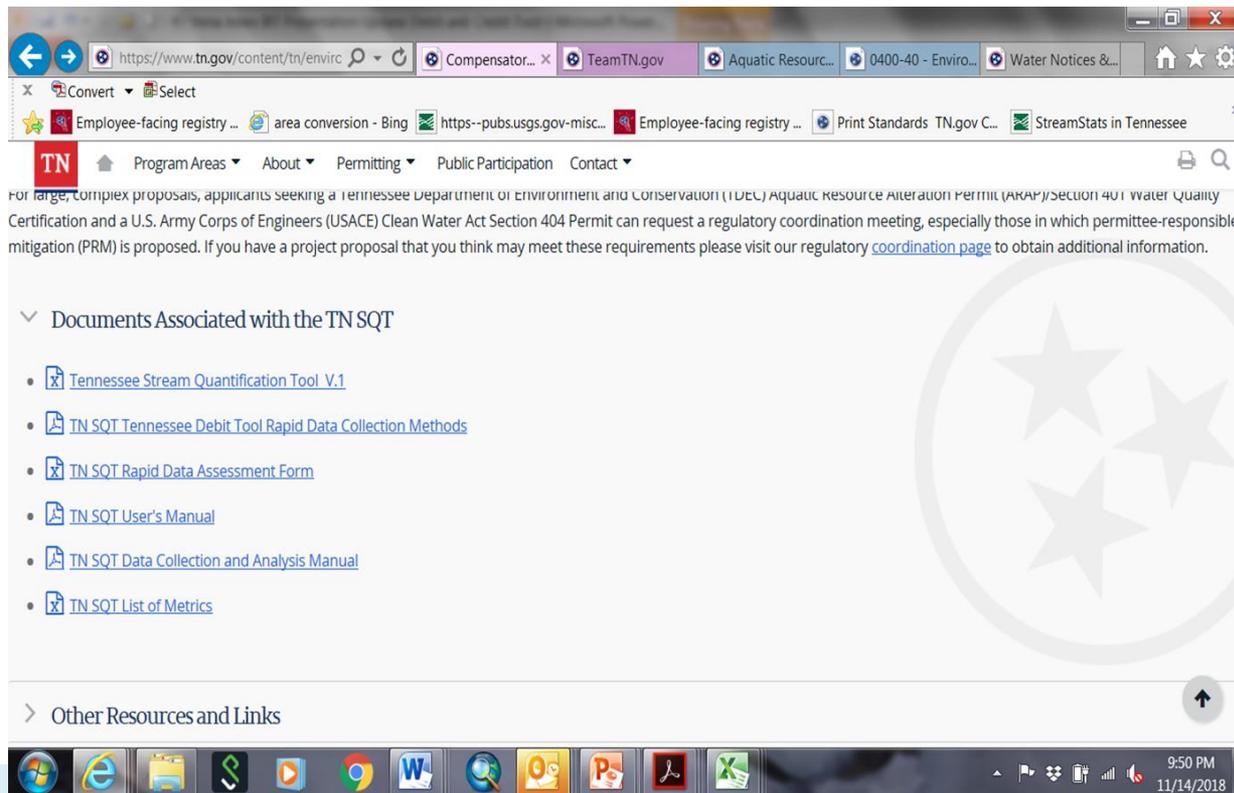
# Additional Resources on TDEC Website

- TN Stream Quantification Tool and supporting manuals
- Regional Curves – statewide by Level III ecoregion
- Stream Bank and In-Lieu Fee Draft Prospectus Checklist
- Stream Bank and In-lieu Fee Draft MBI Guidance
- Permittee-Responsible Mitigation Guidance
- Links to RIBITS, TDOT Mitigation Program
- Overview of the 2008 Federal Rule for Compensatory Mitigation
- Perpetual Protection Templates

**google :** ***TDEC compensatory mitigation***

# TN SQT – Let's Look at Actual Documents

- TN SQT documents can be found at: TDEC's mitigation website, USACE website, and the 1-mitigation folder [2019 Stream Mitigation Guidelines](#)



The screenshot shows a web browser window displaying the Tennessee Department of Environment and Conservation (TDEC) website. The address bar shows the URL <https://www.tn.gov/content/tn/envirc>. The page content includes a navigation menu with links for Program Areas, About, Permitting, Public Participation, and Contact. Below the navigation, there is a paragraph of text explaining that for large, complex proposals, applicants seeking a Tennessee Department of Environment and Conservation (TDEC) Aquatic Resource Alteration Permit (ARAP)/Section 401 Water Quality Certification and a U.S. Army Corps of Engineers (USACE) Clean Water Act Section 404 Permit can request a regulatory coordination meeting, especially those in which permittee-responsible mitigation (PRM) is proposed. Below this text, there is a section titled "Documents Associated with the TN SQT" with a dropdown arrow. This section lists several documents with icons: Tennessee Stream Quantification Tool V.1, TN SQT Tennessee Debit Tool Rapid Data Collection Methods, TN SQT Rapid Data Assessment Form, TN SQT User's Manual, TN SQT Data Collection and Analysis Manual, and TN SQT List of Metrics. At the bottom of the page, there is a section titled "Other Resources and Links" with a dropdown arrow. The Windows taskbar is visible at the bottom of the screenshot, showing various application icons and the system tray with the date 11/14/2018 and time 9:50 PM.

# Questions?

## Strategic Planning for the Future:

- Build a process for:
  - Version control of tools
  - Version updates
  - Parameter or measurement method substitutions specific to a project
  - MOU with USACE on process

[Vena.L.Jones@tn.gov](mailto:Vena.L.Jones@tn.gov)

615-253-5320

