UNRBA Credit Tool User's Guide

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For the Upper Neuse River Basin Association

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1.   Introduction

This document (the Guide) provides guidance for users of the UNRBA Credit Tool (the Tool). The spreadsheet-based tool is designed to assist communities in the Upper Neuse River Basin in developing tables to track implementation of best management practices (BMPs) and structural control measures (SCMs) designed to reduce Nitrogen and Phosphorus loading to Falls Lake. This Tool is not compatible with Cloud-based versions of Microsoft Excel, and users should be using Microsoft Excel version 2010 or later.

The Guide is composed of three sections, including:

> Section 2. Purpose and Overview
> This section describes the purpose of the UNRBA Credit Tool and provides an overview its structure. A summary of instructions for using the Tool are also provided.

> Section 3. General Guidance
> This section provides guidance that is applicable to any tab of the Tool. Common features and data requirements applicable to multiple tabs are described in this section.

> Section 4. Specific Requirements for Input and Calculation Tabs
> This section describes data entry requirements that are practice specific.

> Section 5. Download the UNRBA Credit Tool
> This includes a link for downloading the Tool and this Guide.

Note that the credit and cost calculations and generation of summary tables in the Tool will not function if **required information** is not entered or selected. This includes

> 1) On the Jurisdiction Data tab, the reporting period, financing period, and financing rate must be entered.
> 2) On the data entry tabs that describe the nutrient reduction practices, the county and subwatershed must be selected, the construction and annual maintenance costs must be entered, and all practice information must be entered. Please review the individual practice standards for more information on credit methodology and data requirements.
> 3) On the Overall Progress tab, the user must click the Update Results Tables button.

2.   Purpose and Overview

The UNRBA Credit Tool has been developed for jurisdictions in the Falls Lake Watershed. The Tool calculates and tracks the amount of total nitrogen and total phosphorus load reductions (credits) achieved through implementation of nutrient reducing measures. The Tool accounts for delivery of nutrients to Falls Lake based on subwatershed-scale delivery factors. The Tool has been designed as a cumulative database to track credits from the implementation of nutrient reducing practices in the Falls Lake watershed. Users can modify the reporting start and end dates on the *Jurisdiction Data* tab to generate reports for different periods (i.e., annual reports or multiyear reports) using the same database.

User Guidance:
- Instructions
- Subwatershed Map

Input and Calculations:
- Jurisdiction Data
- Imported SCMs
- Imported Land Changes
- Buffers
- IDDE
- Cattle Exclusion
- Miscellaneous

The Tool has been designed to import data from existing credit calculation tools that operate at the site level. Two versions of the Jordan Falls Stormwater Nutrient Accounting Tool (JFSNAT versions 2 and 3), Stormwater Nitrogen and Phosphorus (SNAP) Tool (the renamed version of JFSNAT version 4) as well as the Wake County Stormwater Design Tool (WC) can be imported into the UNRBA Credit Tool. Three nutrient reducing measures that cannot be simulated in the site level tools listed above have been coded directly into the UNRBA Credit Tool. The crediting methodology for these practices (buffer improvement in developed areas, cattle exclusion, and illicit discharge detection and elimination (IDDE) are based on practice standard documents developed by the UNRBA and approved by DWR. The Tool has also been set up to allow the user to account for miscellaneous projects that do not correspond to the other tabs in the Tool.

Reporting:
- Overall Progress
- Credit Summary – This Period
- Administrative – Credits Earned
- Pollutants – Credits Earned
- Administrative – Credits Lost
- Pollutants – Credits Lost

Figure 1. Structure of the UNRBA Credit Tool

The UNRBA Credit Tool is composed of three types of tabs (Figure 1). Tabs colored gray provide guidance to the user. Tabs colored blue are used for data entry and calculation. Tabs colored green provide reports and summaries. A "cheat sheet" for using the UNRBA Credit Tool is provided on the next page. More detailed information is provided in Section 3 and Section 4.

The UNRBA Credit Tool and this User Guide are available for download at https://www.unrba.org/nutrient-credit-program. Any updates to the Tool or status of approval for practices developed by the UNRBA will be maintained here. Additional information regarding development of subwatershed delivery factors, status of practice approval, and links to the DEMLR Stormwater Program documents are also available at this address.

Brief Instructions for using the UNRBA Credit Tool

1. Acquire all files related to the practice(s) for which you are tracking credits. Files may include
   a. Existing site-level credit calculation tools arranged in folders by model type and version; these may include the Jordan Falls Stormwater Nutrient Accounting Tool (JFSNAT versions 2 or 3), the Stormwater Nitrogen and Phosphorus (SNAP) Tool (the renamed version 4 of JFSNAT) or the Wake County Stormwater Design Tool (WC), and
   b. Relevant practice standards or crediting documents.
2. Open the UNRBA Credit Tool spreadsheet and enable all content and macros. This Tool is not compatible with Cloud-based versions of Microsoft Excel, and users should be using Microsoft Excel version 2010 or later. Fill out, or select, the information on the *Jurisdiction Data* tab. **The data inputs on this tab are required for estimating costs and summarizing credits.**
3. Navigate to the tab that corresponds to the type of practice(s) you are tracking credits for. Stormwater control measures, including soil improvement, should be simulated first in a site-level tool such as SNAP, JFSNAT, or WC. All SNAP, JFSNAT, or WC files should be organized into separate folders by model type and versions (i.e., JFSNAT version 3 files should be in a different folder than JFSNAT version 2 files).
   a. For stormwater control measures, navigate to the *Imported SCMs* tab. In cell C2, select the model type and version that corresponds with the files being imported. Click on the button: Read New Files and Update Results. Navigate to and **select the folder** that contains the project files (no other file types can be in this folder). The UNRBA Credit Tool will batch import data from multiple files at once as long as they are organized by model type and version in the selected folder. After the data import is complete, enter data and information in the *Imported SCMs* tab moving from left to right across the tab. Next, navigate to the *Imported Land Change* tab and enter data in the blue cells moving from left to right. **Missing information in blue cells may cause errors in the credit and cost estimates.** The user may override default data, or enter data when default data is not available, into yellow cells. Correct data entry errors indicated by red cells.
   b. For practices that are not simulated in a site level tool, navigate to the appropriate tab. *Buffers*, *IDDE*, and *cattle exclusion* each have their own calculation tab. A separate tab called *Miscellaneous Practices* may be used to track credits for practices or actions that do not correspond to another tab or that require running a site level tool twice (e.g., adding a floating wetland island). Enter data in the blue cells moving from left to right. **Missing information in blue cells may cause errors in the credit and cost estimates.** The user may override default data, or enter data, into yellow cells. Correct data entry errors indicated by red cells.
4. Navigate to the tab *Overall Progress* and click on the button: **Update Results Tables**.
5. Review the credit summaries generated on the six reporting tabs. These tabs summarize progress towards nutrient reduction targets, implementation costs, and nutrient credits by individual practice, practice type, practice category, and model program group.

3.   General Guidance

The UNRBA Nutrient Credit Tool has some characteristics and guidance that apply to all tabs. This section of the User's Guide describes the user guidance tabs, the general structure and commonalities of the Input and Calculation Tabs, and instructions for updating the Reporting Tabs. Additional guidance regarding pop-up boxes, comments, BMP or SCM classification, and safety factors are also included in this section.

User Guidance Tabs

The two User Guidance sheets are the "Instructions" and "Subwatershed Map" tabs.

Instructions
The *Instructions* tab includes general instructions for the user and a brief description of the tabs in the Tool (Figure 2).

Subwatershed Map
This sheet provides a map of the Falls Lake Watershed and the subwatersheds that are used to assign nutrient delivery factors for estimating the amount of nutrient loading that reaches Falls Lake.

Jurisdiction Data
This sheet includes some basic data, such as the Jurisdiction Name, and the TN and TP Stage I and Stage II targets. On this sheet, the user also identifies the reporting year and the financing rate, which are used to determine estimated annual costs for each practice. This sheet also includes a button that allows the user to clear all BMPs currently stored in this file.

BMP Entry
There are six sheets designed for data entry of particular classes of BMPs, including the following:

JFSNAT or WC BMPs
The UNRBA Nutrient Credit Tool has been designed to read in data from the Jordan Falls Stormwater Nutrient Accounting Tool (JFSNAT versions 2 through 4) and the Wake County Stormwater Design Tool. Use the button on this tab to read in files, and then provided additional information for each practice in the remaining cells.

JFSNAT or WC Land
This tab uses data from the JFSNAT Tool or the Wake County Hybrid Tool to evaluate the impacts of land use change that occur on projects recorded in these site-level tools. The user adds additional data regarding the details of these land use changes on this sheet, and the UNRBA Credit Tool calculates the change in nutrient load associated with the land use change.

The remaining four BMP sheets require data entry to calculate the benefits of BMPs that are not run in the site-level tools. These sheets are consistent with nutrient credit practice standards developed by the UNRBA and approved by DWR:

Buffers: Accounts for nutrient credits resulting from Buffer Improvement in developed areas.

Instructions | Subwatershed Map | Jurisdiction Data | Imported SCMs | Imported Land Changes | Buffers | IDDE | Cattle Exclusion | Miscellaneous | Overall Progress | Credit

Figure 2. Instructions Tab

Subwatershed Map

This static map (Figure 3) is for guidance only, and identifies the subwatersheds within the Falls Lake watershed. Each of these subwatersheds is associated with nitrogen and phosphorus delivery factors that affect the delivery of nutrients to Falls Lake. The delivery factors are included in the Tool's calculations; i.e., the calculated nutrient credits reflect the delivery factor associated with the subwatershed in which the BMP or SCM is located. The Task 1.1, Watershed Trapping Analysis memo available at https://www.unrba.org/nutrient-credit-program describes the analyses and results for the delivery factors in the Falls Lake watershed. In the specific practice calculation tabs, the user will be asked to select a subwatershed for each BMP. This map is provided for reference.
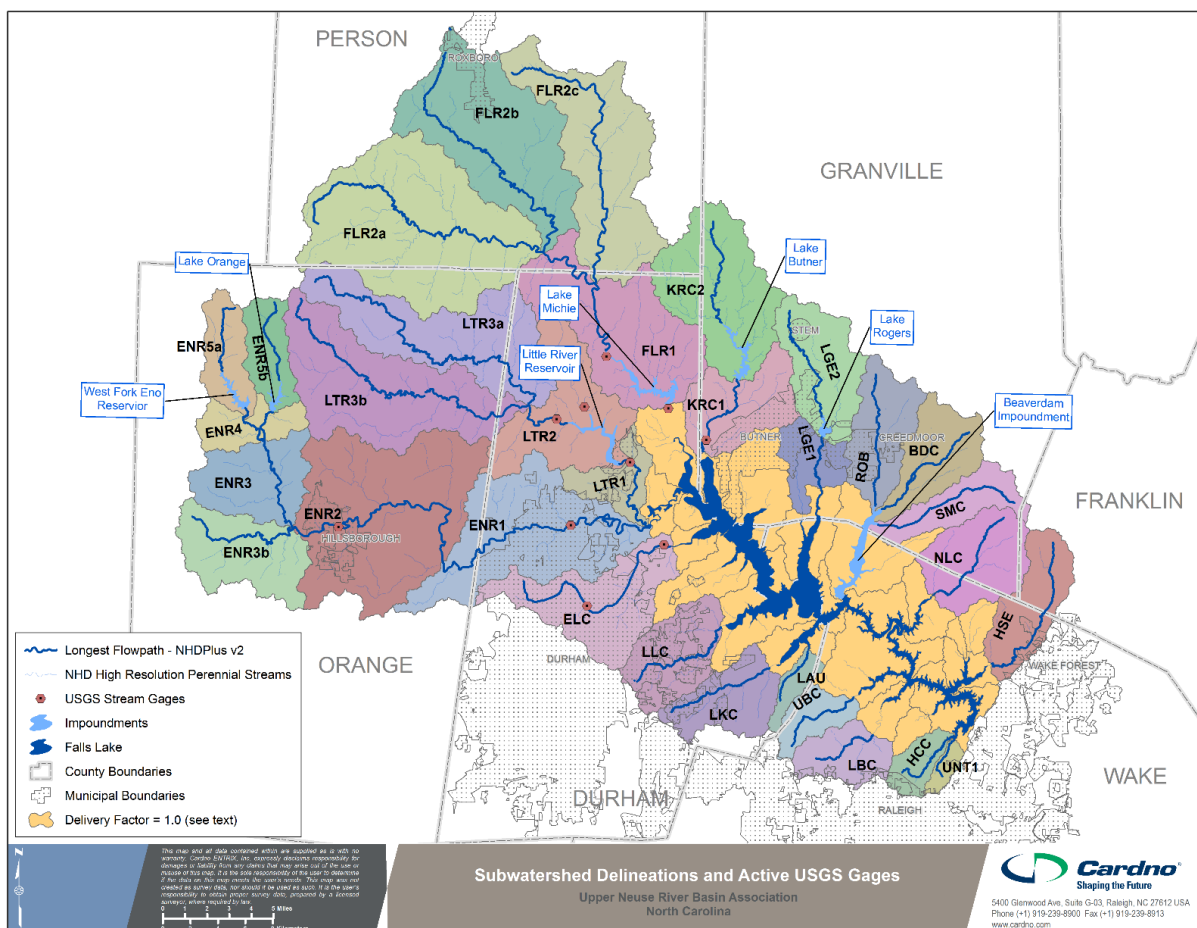

Figure 3. Subwatershed Map included in the Tool

General Structure of the Input and Calculation Tabs

Of the seven Input and Calculation tabs, six are very similar in structure, and are designed for input and calculation of credits for specific practices. The other (and first) input sheet (*Jurisdiction Data*) includes jurisdiction-specific data that are **required for calculations** throughout the remainder of the spreadsheet. This tab and the practice specific cells for the Input and Calculation tabs are described in Section 4.

The six Input and Calculation tabs with similar structures include the following:

- *Imported SCMs* and *Imported Land Change.* These two tabs are designed to work with the SNAP, JFSNAT, and Wake County (WC) Stormwater Design tools. The *Imported SCMs* tab imports and reports information on structural stormwater control measures that have been simulated in site-level crediting tools. The *Imported Land Change* tab imports and reports information about land use conversions associated with the projects for BMPs read into the *Imported SCMs* tab. Available data from these site-level tools is imported into these tabs, and the user enters additional information about each practice which is incorporated into the reporting for the individual SCMs. **Users must enter information in blue cells on both tabs.**
  - The *Imported SCMs* tab credits individual SCMs that are recorded in the SNAP, JFSNAT, or Wake County Stormwater Design tools.
  - The *Imported Land Change* tab credits (or takes away credit for) land use changes that accompany construction of these SCMs.
- *Buffers, IDDE, and Cattle Exclusion.* These three tabs are each designed to calculate credits from practices that were developed by the UNRBA and approved by the North Carolina Department of Environmental Quality – Division of Water Resources (DWR). Nutrient credits from these practices cannot be calculated using SNAP, JFSNAT, or Wake County Stormwater Design tools. These sheets require input from the user to characterize the specific elements of each BMP.
- *Miscellaneous Practices.* Similar in structure to the tabs for *Imported SCMs* and the *Buffer*, *IDDE* and *Cattle Exclusion* tabs, this tab allows the user to input practices that cannot be categorized or simulated on one of the other tabs. Miscellaneous practices may include
  - Non stormwater practices with approved credits that were not developed by the UNRBA and were therefore not directly coded into this Tool.
  - Individual projects or actions that are not associated with a practice type.
  - Practices that require running a site level tool twice to calculate the difference in loading before and after an upfit (e.g., retrofitting an existing wet pond with floating wetland islands).

  All credits entered into or calculated by the UNRBA Credit Tool require approval by DWR regardless of whether or not they covered under an approved practice standard.

These six input tabs have a common structure, and many fields in common. Each tab includes the following sections, and each section is delineated with a title, a change in color of the headers, and a border (See Figure 4 for an example):

1) **Tracking Information**

The Tracking Information section includes basic data regarding practice implementation dates and other administrative information. It includes the following fields:

- **Unique ID:** A unique code or tracking number assigned by the jurisdiction to track an individual practice; this ID may be derived from site-level tools or user defined depending on the practice.

- **County:** County imported from the SNAP, JFSNAT, or WC file where the practice is located. Note that the user can override or provide a missing county using User-Entered County.

- **User-Entered County:** County where the *practice is located*. Note that this does not necessarily have to be the same county as the reporting jurisdiction, to allow for trading or cooperative agreements to achieve target nutrient reduction goals. Select the County from a pull-down menu.

- **Date Approved**: Date when the practice was accepted by a regulatory agency. This is the date when credits will go into effect.

- **Latitude and Longitude**: Location of the practice imported or entered by the user. Note that the *Imported SCMs* and *Imported Land Change* tab includes an option for the user to override the imported coordinates if more specificity is desired.

- **Subwatershed:** Select the subwatershed where the practice is located from a pull-down menu. Note that the **County must be selected** to filter the selection list, or no options will appear in this cell.

- **Municipally Owned?**: Yes/No question for use by municipalities to identify practices that they are responsible for. Select yes/no.

- **Has Practice Been Decommissioned?** Yes/No question indicating if this practice has been removed or declared ineffective.

- **Date Decommissioned**: This date only needs to be entered if the cell is blue (it will appear as black hatched if the practice has not been decommissioned). Credits will not be counted after the date decommissioned.

- **Is Maintenance Up to Date?:** Yes/No question indicating if practice has been maintained. The cell will turn red if the maintenance is not up to date. Note, however, that a red maintenance cell does not affect any calculations in the tool and is only designed to assist the user.

2) **Cost Information**

The Cost Information section is essentially the same in each tab, and requires information to estimate annualized costs for each practice. The fields include the following:

- **Default and Override Financing Period:** The Default Financing Period (a grey cell) is equal to the financing period entered on the *Jurisdiction Data* tab. Adjacent to this cell will be a yellow cell that allows the user to override the financing period for an individual practice. This is to allow some flexibility for unique financing arrangements for different BMPs or SCMs.

- **Default (and Override) Interest Rate**: The Default Interest Rate (a grey cell) is equal to the rate entered on the *Jurisdiction Data* tab. Adjacent to this cell will be a yellow cell that allows the user to override the interest rate.

- **Construction Cost:** Enter the cost of constructing the practice ($).

- **Estimated (and Actual) Operation and Maintenance ($/yr):** For some SCMs, an estimated O+M cost is provided, but for others a default was not available. Using the yellow override cell, the user must enter an actual or forecasted annual maintenance cost for the practice.

- **Estimated Annualized Cost ($/yr):** The Tool estimates the annualized cost based on the annualized construction cost (given the interest rate and payment period) and the estimated or actual annual maintenance cost.

3) **Practice Design Information and Nutrient Reduction**

Each of the Input and Calculation tabs has two or more sections that describe the practice design and calculate the nutrient credits. While there is some information in common between the different sheets, there are also several differences. Section 4 of this Guide describes the required information for this section on each tab.

4) **Total Credits and Credit Sharing**

This section reports the total credits available for a practice, and allows for partial credit for practices that are shared with another jurisdiction (or part of a retrofit). The fields in this section include the following:

- **Delivered TN or TP Reduction:** These cells (grey) are the calculated TN and TP reductions to Falls Lake that account for the subwatershed delivery factors. These values represent the total potential credit earned for a practice.

- **Is the Practice Shared (or Part of a Retrofit Project)?:** Yes/No question. Indicate "Yes" if 1) another municipality claims a portion of the credit for this BMP or SCM or 2) this is an existing structural practice that is part of a retrofit project. (Note that the retrofit option is only applicable to the *Imported SCMs* tab.)

- **Name of Other Municipality Sharing Credit (or Retrofit)**: Drop-Down menu, only appears blue if the practice is shared or part of a retrofit project. (Select "Retrofit/NA" from the drop down menu if credits are adjusted for a reason other than sharing such as retrofits; this option is only applicable on the *Imported SCMs* tab).

- **%TN or %TP Claimed**: These cells only appear blue (i.e., need to be completed) if the practice is shared or part of a retrofit project. Enter the % of the credit that your jurisdiction is claiming for each nutrient. Enter "0" if this practice is an existing, fully functioning practice that is part of a retrofit project. This will negate the credits for this individual practice. If the existing practice was improved such that partial credit should be awarded, enter the amount of partial credit.

5) Final Crediting (Total Credits and Credits During this Reporting Period)

This section takes the total credits claimed for a practice, and then assigns the credits into "Before" or "During" the reporting period. This allows the Tool to function as a cumulative database that can be used to generate reporting tables for varying periods. Fields are as follows:

- **Total TN or TP Credit Initially Claimed:** Calculated by multiplying the Delivered TN or TP Reduction by the corresponding %TN or TP claimed.

- **TN or TP Credit Before Reporting Period:** With the exception of Buffers (discussed in the Buffers Section below), this value is determined based on the Start Date (of the reporting period entered on the *Jurisdiction Data* tab), the Date Approved for each practice, and the Date Decommissioned if applicable. TN or TP credit is awarded Before the Reporting Period if a practice was approved (but not decommissioned) before the Start Date on the *Jurisdiction Data* tab. Credits earned Before the Reporting Period will be accounted for on the *Overall Progress* reporting tab, but they will not show up on the other reporting tabs that list the individual practices and credits. Expand the reporting period to list these credits.

- **TN or TP Credit During Reporting Period:** With the exception of Buffers, the TN or TP Credit is based on dates of approval and decommissioning if applicable. These credits are to specify new practices or projects that were added in the reporting period (older credits are accounted for separately as Before the Reporting Period). This allows the user to isolate credits from newer projects or practices (Table 1):

  o If a practice is approved before the reporting period begins and is not decommissioned (or decommissioned outside of the reporting period), no credit is given <u>during</u> the reporting period. These credits are accounted for separately Before Reporting Period.

  o If a practice is approved before the reporting period begins and is decommissioned during the reporting period, *negative* credit is assigned during the reporting period (this is a "credit lost").

  o If a practice is approved during the reporting period and not decommissioned (or decommissioned after the reporting period), the credit is recorded during the reporting period.

  o If a practice is both approved and decommissioned during the reporting period, no credit is recorded during the reporting period.

Table 1. Accounting for Credits Before or During the Reporting Period

Approval Relative to Reporting Period	Decommission Date Relative to Reporting Period	Inclusion in Overall Progress of Credits	Inclusion in Reporting Period Summaries
Before	Not decommissioned or after reporting period	Yes – credits earned before reporting period	No
Before	Before	No	No
Before	During	Yes – credits lost during reporting period	Yes – credits lost
During	Not decommissioned or after reporting period	Yes – credits earned during reporting period	Yes - credits earned
During	During	Yes – credits earned during reporting period and credits lost during reporting period	Yes – credits earned and credits lost
After	Not Decommissioned or After	No	No

Figure 4. Example Structure of Practice Tabs

Reporting Tabs

The UNRBA Credit Tool is a cumulative database that summarizes changes in nutrient credits during a specified reporting period using six reporting tabs. Specify the reporting period by entering the start and end dates on the *Jurisdiction Data* tab. To populate these summaries, go to the Overall Progress tab, and click on the "Update Results Tables" to summarize the practices that have been implemented or decommissioned during the specified reporting period. Reports for different periods may be generated using the same tracking tool file simply by changing the start and end dates on the *Jurisdiction Data* tab. Figures 5 through 8 show screen captures for the reporting tabs.

1) *Overall Progress* compares the net credits to the load reduction targets entered on the *Jurisdiction Data* tab. Credits entered from other files, and credits gained or lost before or during the reporting period are included in this summary. The BMPs entered on previous sheets will not be reflected on this tab or the remaining tabs until the user clicks the "Update Results" button on this tab.

2) *Credit Summary* summarizes the net credits (gained minus lost) for the Model Program Groups and Categories. Total treated area, nutrient credits claimed, and annualized costs are included in this tab. The costs reflected on this tab represent the average estimated cost in $/year for the practices implemented during the period. The costs may include practices that have been decommissioned or credits that have not yet been released (e.g., buffers). As a

result, the costs may appear elevated for some categories. For credits shared with another entity, costs may also appear elevated: the costs are the total costs entered by the user, and the credits are the fraction of credits claimed. User's may choose to enter only their share of the costs in the practices tab to better reflect their costs and credits.

3) *Administrative-Credits Earned* lists each individual practice by Unique ID that was implemented during the reporting period. The location, approval date, decommission date, and costs are listed for each practice.

4) *Pollutant-Credits Earned* lists each individual practice by Unique ID that was implemented during the reporting period. The Model Program Group, BMP Category, BMP Type, and nitrogen and phosphorus credits are listed on this tab.

5) *Administrative-Credits Lost* lists each individual practice by Unique ID that has lost credits during the reporting period. The location, approval date, decommission date, and costs are listed for each practice.

6) *Pollutant-Credits Lost* lists each individual practice by Unique ID that has lost credits during the reporting period. The Model Program Group, BMP Category, BMP Type, and nitrogen and phosphorus credits lost are listed on this tab.

Update Results Tables	**Please press the button to the left to update results.** **Values will be inaccurate if they are not updated.**	
Summary of Overall Progress for Reporting Period from 1/1/2006 to 5/13/2017		
Time Period	**TN Credit (lbs/yr)**	**TP Credit (lbs/year)**
Credits Recorded in Other Files	500.00	50.00
Net Credits Before Reporting Period		0.00
Credits Earned During Reporting Period	13.1	4.42
Credits Lost During Reporting Period	9.64	2.20
Net Credits At End of Reporting Period	**503.50**	
Stage 1 Target	1,000	
% Stage 1 Target Met This Period	0.4%	
% Stage 1 Target Met to Date	50.4%	
Credits Beyond Stage 1 Target	0.00	

The user must click this button to generate the reporting tables.

Figure 5. Overall Progress Tab

Summary of Net Credits Earned by BMP Category from 1/1/2006 to 5/13/2017

BMP Category	Total Area Treated (ac)	Projected Annual Cost ($/yr)	TN Credit (lbs/yr)	TN Credit Unit Cost ($/lb)	TP Credit (lbs/yr)	TP Credit Unit Cost ($/lb)
Stormwater						
Level Spreader-Filter Strip	1.45	$6,110.07	7.53	$811.32	2.65	$2,308.42
Wet Pond	2.00	$11,300.72	4.57	$2,475.35	0.46	$24,485.74
Treatment Swale	0.70	$279.19	1.02	$274.37	1.30	$214.32
Stormwater Total	*4.15*	*$17,689.98*	*13.11*	*$1,348.95*	*4.41*	*$4,010.36*

Figure 6. Credit Summary by BMP Category

Administrative Data for Practices Implemented (Credits Earned) or Credits Released for the Reporting Period from 1/1/2006 to 5/13/2017

Unique ID	BMP Type	County	Subwatershed	Date Approved	Date Decommissioned	Projected Capital Cost ($)	Projected or Actual Annual O&M Cost ($/yr)	Projected Annual Cost ($/yr)
Test Site 1 Wet Pond-Catchment 1 BMP 1	Wet Pond per MDC	Wake	Falls Zone HCC	1/20/2016		$50,000.00	$5,656.00	$9,615.73
Test Site 2-Catchment 1 BMP 1	Wet Detention Pond	Orange	Falls Zone ENR1	2/21/2014	5/13/2017	$10,000.00	$5,542.60	$1,684.98
Golden Goose-Catchment 1 BMP 1	Level Spreader, Filter Strip	Franklin	Falls Zone HSE	3/22/2011		$60,000.00	$1,000.00	$5,751.68

Figure 7. Table of Administrative Data

Pollutant Removal Data for Practices Implemented (Credits Earned) or Credits Released for the Reporting Period from 1/1/2006 to 5/13/2017

Unique ID	BMP Model Program Group	BMP Category	BMP Type	Area Treated (acres)	Primary Land Use Treated	TN Credit During Reporting Period (lb/yr)	TP Credit During Reporting Period (lb/yr)
Test Site 1 Wet Pond-Catchment 1 BMP 1	Stormwater	Wet Pond	Wet Pond per MDC	1.00	Residential	1.88	0.12
Test Site 2-Catchment 1 BMP 1	Stormwater	Wet Pond	Wet Detention Pond	1.00	Commercial/Industrial	2.68	0.34
Golden Goose-Catchment 1 BMP 1	Stormwater	Level Spreader-Filter Strip	Level Spreader, Filter Strip	1.15	Institutional	7.04	2.56
Wake Example-Catchment 1	Stormwater	Level Spreader-	Level Spreader,	0.30	Mixed	0.50	0.09

Figure 8. Table of Pollutant Data

Links to BMP and SCM Crediting Documents

The UNRBA Credit Tool summarizes nitrogen and phosphorus credits from many types of practices that have approved crediting methods in North Carolina. The user is encouraged to reference the applicable documents when entering information into the Tool. Structural Control Measures (SCMs) are permitted and approved through the Stormwater Program of the Division of Energy, Mineral and Land Resources (DEMLR). Crediting information and minimum design criteria for SCMs are available online at https://deq.nc.gov/sw-bmp-manual.

Best management practices outside of the DEMLR Stormwater Program are approved by the Division of Water Resources. Several practices have been developed by the UNRBA and approved by the Division for compliance with nutrient reduction requirements. Practice standard documents for these practices are available online at https://www.unrba.org/nutrient-credit-program: soil improvement, IDDE (remedying illicit discharges), cattle exclusion, and buffer improvements in developed areas. Note that credits for cattle exclusion may not be claimed until a trading framework has been developed for the exchange of credits between parties affected by the Falls Lake Nutrient Management Strategy Agricultural Rule and parties not affected by the Agricultural Rule.

As additional practices are developed and approved by DWR, the agency will make available online the practice standard documents. These practices may be entered into the UNRBA Credit Tool as Miscellaneous Practices.

Pop-up Guidance

Throughout the tool, guidance is provided in the form of pop-up messages, as well as comments (mouse over) that apply to entire columns (Figure 9). When using the tool, look for these messages, as they provide guidance or explanation for data needed by the Tool. The user is encouraged to refer to the individual practice standard documents for additional information about the crediting methods and required information.

Figure 9. Example Pop-Up Guidance for Buffer Decommissioning

Color Coding

Cells throughout the Tool are color coded, with the following (See Figure 10 for an example):

- **Grey** cells are calculated values. The user should not enter values in these cells.
- **Black Hatched** cells indicate that no data should be entered in this cell for a particular BMP based on other characteristics entered, i.e., black hatched cells are not applicable.
- **Blue** cells require input by the user. Skipping these cells may cause errors or incomplete data.
- **Yellow** cells are optional user values. Examples include overriding a default value such as a default cost or concentration.
- **Red cells** indicate a warning for characteristics such as out of date maintenance or a design flaw.
- **Green** cells are final reported values, which are included or summarized in the final reports.

Figure 10. Example Use of Color Coding on the IDDE Tab

Classification of BMPs and SCMs in the Tool

The Tool classifies BMPs and SCMs according to

1) Model Program Group (e.g., stormwater versus ecosystem)
2) Category (e.g., bioretention versus infiltration device)
3) Type (e.g., bioretention with or without internal water storage)

On some sheets in the tool, the user is required to provide information regarding the category or type of BMP or SCM, while on other sheets, the information is imported from site-level tools or derived from other information. Specific data entry requirements are described for each tab in Section 4 of this document. Table 2 provides the general guidance used to classify BMPs or SCMs in the Tool. The user can override these designations as needed. The Type is the specific design used for a BMP or SCM and can include a wide range of practices.

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Table 2. Classification of BMPs and SCMs in the UNRBA Credit Tool

Model Program Group	Applicable Categories of BMPs or SCMs[1]	
Stormwater	Bioretention	New Development
	Dry Pond/Detention	Permeable Pavement
	Sand Filter	Wet Pond
	Level Spreader-Filter Strip	Rainwater Harvesting
	Proprietary Devices	Redevelopment
	Impervious Surface Removal	Regional/System
	Other Land Use Change - Stormwater	Retrofit
	Green Roof	Soil Improvement
	Impervious Disconnection	Treatment Swale
	Infiltration	Stormwater Wetland
Ecosystem	Land Conversion or Improvement	Stream Restoration
	Buffer Improvement	Wetland Restoration
Wastewater	Remedying malfunctioning Sand Filter System (Sand Filter)	
	Remedying malfunctioning Septic System (Septic)	
	Regional/System	
Illicit discharge detection and elimination (IDDE)	Laundry wash water and rinse water	Sewer Exfiltration
	Mobile Car Wash	Dry Weather SSO
	Floor Drain	Wet Weather SSO
	HVAC Coil Cleaning	Other
	Sanitary Connection	
Programmatic	Stormwater Program	Street Sweeping
	Gross Solids Capture	Source Control
Other	Cattle Exclusion	

1. Types of BMPs or SCMs include more specific information about the design variants for the practice. The list of practice types is filtered in the Tool based on selected category.

Factors of Safety

For most of the practices summarized in the UNRBA Credit Tool, the factors of safety on the credit calculations are implicit in the methodology. The exceptions are IDDE and Miscellaneous Practices. Table 3 summarizes the safety factor approach for each practice.

Table 3. Summary of Safety Factor Approaches for Practices in the UNRBA Tool

Practice	Type of Safety Factor (Implicit or Explicit)	Data Entry
Cattle Exclusion	Implicit – the safety factors depend on the post-exclusion stocking densities. These are already factored into the percent mass reductions as described in the Cattle Exclusion practice standard	Not applicable
Buffer Restoration	Implicit – several factors are applied to deal with site uncertainties, and the default credits are conservative relative to published data. The credit calculation for this practice uses gross percent removal efficiencies as a substitute for specific published data on buffer restoration practices in developed areas.	Not applicable
IDDE	Explicit – needs to be entered into the UNRBA Credit Tool	Default is 20% reduction in credit. User may adjust using the override cell pending approval by DWR.
Miscellaneous Practices	Explicit – needs to be entered into the UNRBA Credit Tool	User is required to enter the factor of safety based on consultation with, and approval by, DWR. No default is available for this practice.
Measures read in from site level tools.	Implicit – each practice that may be read in from SNAP, JFSNAT, or WC tools has already accounted for the safety factor. This includes soil improvement which is entered as Custom BMP. For practices that may be developed in the future where the safety factor was not accounted for, the user may override the Default Adjustment Factor of 1 to account for safety factors or other factors as needed.	Not applicable

4.   Specific Requirements for Input and Calculation Tabs

With the exception of the *Jurisdiction Data* tab, the Input and Calculation tabs have a very similar form and structure which was described in Section 3. This section describes the *Jurisdiction Data* tab and the specific elements of the Input and Calculation tabs.

Jurisdiction Data Tab

On *Jurisdiction Data* tab, the user enters data that is not specific to any particular practice, such as the reporting period, a default interest rate, financing period, and target nutrient reductions. This tab stores data that are used throughout the Tool (Figure 11). The user should note the following:

- The "Start of Reporting Period" and "End of Reporting Period" are used to select the range of dates for which practices will be included in the reports. Note that practices can be included in the tool for periods both before and after this period. Practices that are implemented before the start of the reporting period will simply be summed to reflect progress before the reporting period, while those implemented after the reporting period will not be included on the reporting tabs unless the reporting period is expanded to include them.

- The finance and interest rates will apply to all practices in the Tool (including practices entered previously). If you have practices entered previously, and want to use a different finance rate or financing period, either enter practice specific values on each practice tab <u>or</u> save a new version of the Tool and enter previous credits as "Credits Recorded in Other Files."

- The "Credits Recorded in Other Files" allows the user to provide a sum of credits that are not included in this file. Note that the Tool assumes that credits from other files are from before the reporting period began. This cell can be left blank if no credits are recorded in other files.

- The "Target Delivered Nutrient Reductions" are Stage 1 and Stage 2 TN and TP Reductions for the municipality.

- This tab includes a "Clear Data-Only if Starting Over" button, which can be used to clear all previous data contained in the spreadsheet. **Users should save a copy of the workbook before "Clear Data" is used.** The Tool is designed to be cumulative, so that BMPs from before or after the reporting period are stored in a single file. Thus, when new BMPs are entered or read in, they are added to a long tally of practices implemented by a jurisdiction over time. Pressing this button creates a "clean slate" that deletes all BMPs and SCMs entered previously.

Figure 11. Example Jurisdiction Data

Imported SCMs Tab

This sheet reads in SCM data from the SNAP, JFSNAT, or Wake County site-level tools. Note that SCM upfits (e.g., adding a floating wetland island to an existing wet pond would need to be tracked in the *Miscellaneous Practices* tab and not imported from a site level tool. Additional instructions regarding SCM upfits are provided in the section below that describes the *Miscellaneous Practices* tab). Thus, some of the special features on this sheet deal with reading these data in. In addition, there are some other unique fields and calculations on this tab.

1) **Importing data from SNAP, JFSNAT, or Wake County Stormwater Design spreadsheets**

- Before you begin, assemble the spreadsheets you would like to load into the Tool. If they are all from the same model type and version (e.g., all from JFSNAT version 2), place them in a single folder. If you have files from different versions, **place each version in a separate folder**. Do not store any other files or file types in these folders (.doc, .pdf, etc.). Also, ensure that files that have already been imported do not remain: they will be imported each time the folder is read.

- At the top of this sheet, select the specific type and version of the files you are importing using the pull-down menu (Figure 12). Note that if you have files from different types and versions, you must import these separately.

- Next click the button at the top of the sheet labeled, "Read New Files and Update Model Results." This will bring you to a screen to select the folder that contains your files of a single

model type and version. Navigate to the **Folder** (not each file) where the files are stored (Figure 12).
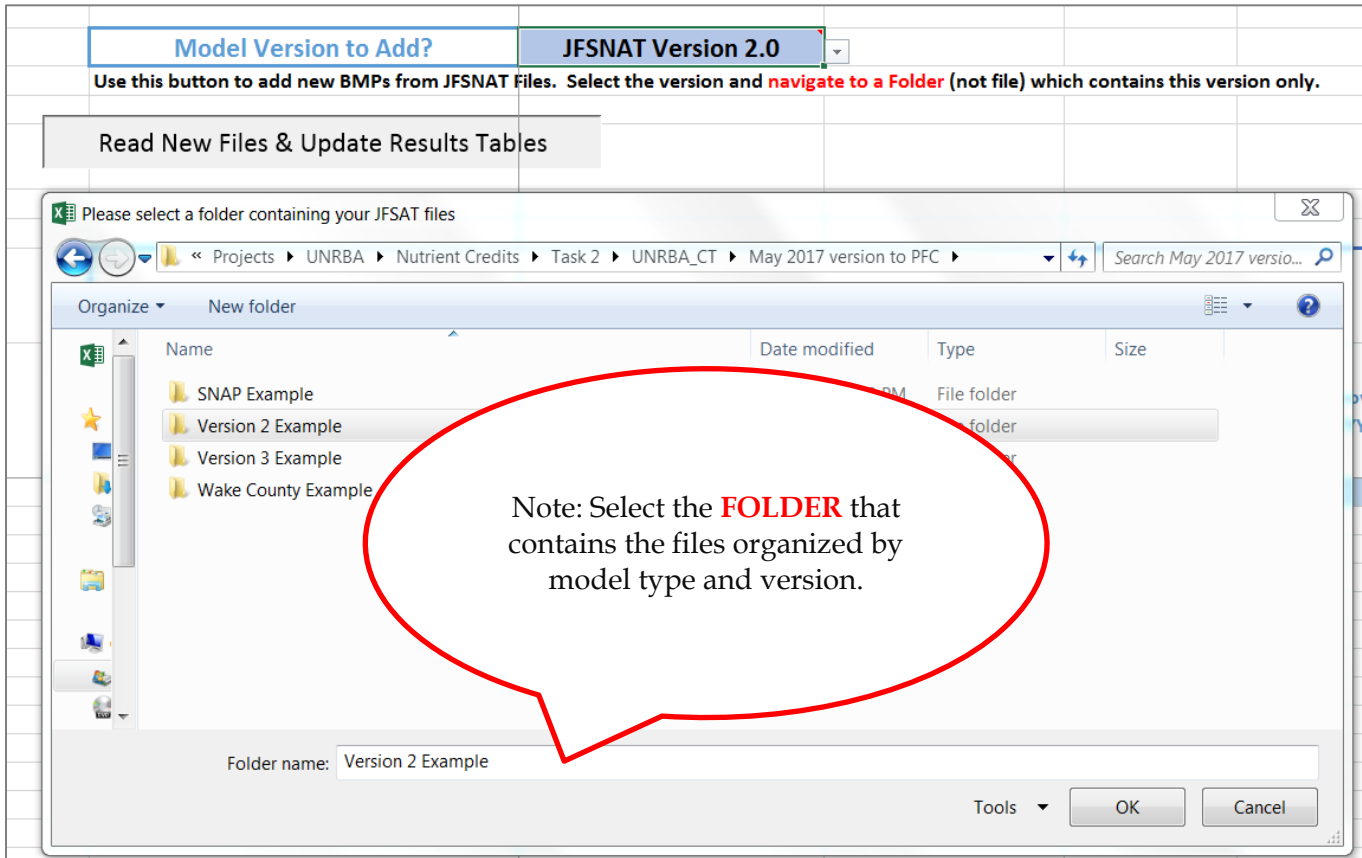
Figure 12. Navigating to the Folder

- Selecting the folder of files will populate the available information in the UNRBA Credit Tool. Note: Please do not import files multiple times, as these BMPs will be recorded in the Tool more than once. As new site-level project files are created, they should be stored and imported separately from files already imported.

2) **Tracking Information and Cost Information**

This tab is similar to other tabs with regard to Tracking and Cost Information, with three exceptions:

- First, some the fields, such as County and Subwatershed, are available from some of the model types and versions, but not others. As a result, there are two cells for some of these fields, an "Imported" field and an "Override" or "User Supplied" field (See Figure 13). If the SNAP, JFSNAT, or Wake County tool you selected results in a "0" value for these fields, please select or enter a value in the "Override" cell.

Imported Project Subwatershed	Override Project Subwatershed
0	Falls Zone KRC2
0	Falls Zone ENR1
Falls Zone Direct	
0	Falls Zone HCC
0	Falls Zone HCC

Figure 13. For subwatersheds with a value of 0, the user would select the Project Subwatershed from the drop down menu in the Override column.

- Second, the Tool makes an estimate of Operation and Maintenance cost on this sheet for some practices, using the assumptions in Table 4. For practices without estimated O&M, or to override these estimates, the user may enter a value in the Override cell. For a more complete description of the assumptions and constraints associated with these estimates, refer to the source listed in Table 4 for each BMP or SCM.

- Third, this tab allows the user to adjust credits associated with individual SCMs that were onsite prior to a retrofit project, or are part of a shared project. For these projects, see the following columns:

  o **Is the Practice Shared or Part of a Retrofit Project?:** Yes/No question. Indicate "Yes" if 1) another municipality claims a portion of the credit for this BMP or 2) this is an existing structural practice that is part of a retrofit practice.

  o **Name of Other Municipality Sharing Credit (or Retrofit)**: Drop-Down menu, only appears blue if the practice is shared or part of a retrofit project. Select "Retrofit/NA" from the drop down menu if credits are adjusted for a reason other than sharing.

  o **%TN or %TP Claimed**: These cells only appear blue (i.e., need to be completed) if the practice is shared or part of a retrofit project. Enter the % of the credit that your jurisdiction is claiming for each nutrient. Enter "0" if this practice is an existing practice that is part of a retrofit project. This will negate the credits for this individual practice. Marginal adjustments may also be made for improvements to existing SCMs based on consultation with DWR.

Table 4. Assumptions for Calculating Annual Operation and Maintenance Costs (ax+b) for Some SCMs

SCM Category	Variable ("x" in the equation)	Slope (a)	Intercept (b)	Note	Source
Bioretention	Impervious Drainage Area to SCM (ac)	1644	2466	Based on studies conducted by Dr. Bill Hunt at NCSU	http://durhamnc.gov/695/BCE-As-Builts-BMC-Maintenance-Programs
Treatment Swale	Impervious Drainage Area to SCM (ac)	1644	2466	Applied Bioretention Calculations	http://durhamnc.gov/695/BCE-As-Builts-BMC-Maintenance-Programs
Green Roof	Impervious Drainage Area to SCM (ac)	11123		Average and high and low values, with an inflation adjuster (3%/yr for 10 years)	http://greenvalues.cnt.org/national/cost_detail.php
Stormwater Wetland	Surface Area of SCM (ac)	317.01	2182.5	Assumes the wetland surface area is 5% of the contributing drainage area.	http://durhamnc.gov/695/BCE-As-Builts-BMC-Maintenance-Programs
Permeable Pavement	Impervious Drainage Area to SCM (ac)	78952	.	Used average cost/sf for porous asphalt (0.19) times an inflation factor (3%/yr for 10 years)	http://greenvalues.cnt.org/national/cost_detail.php
Wet Pond	Surface Area of SCM (ac)	318.54	2758.8	Assume the pond surface area is 3% of the contributing drainage area.	http://durhamnc.gov/695/BCE-As-Builts-BMC-Maintenance-Programs
Sand Filter	Impervious Drainage Area to SCM (ac)	2266	3390	Applies the data for a "Closed Sand Filter"	http://durhamnc.gov/695/BCE-As-Builts-BMC-Maintenance-Programs
Rainwater Harvesting	Volume of SCM (gallons)	0.3188	1566.5	Assume volume is equal to the volume of runoff from a 2" storm.	http://durhamnc.gov/695/BCE-As-Builts-BMC-Maintenance-Programs

3) Practice Design Information and Nutrient Reduction

Most of the design information and nutrient reductions on this tab are calculated or read in from another tool, and are consequently grey in color. However, there are elements that the user may need to supply, as follows:

- **BMP Type and Category:** SNAP, JFSNAT, and the WC tools include the BMP Type, and BMP Category can be determined from the Type in most cases. If the user has selected a "Custom BMP" from one of the site-level tools, then the BMP will not be categorized automatically. In these cases, the Yellow cells allow the user to enter the BMP Type and select BMP Category from a drop-down list. All practices read into the *Imported SCMs* tab are assigned to the Stormwater model program group.

- **Adding Custom BMP Categories:** The user may wish to define a "Custom" BMP category (for use in summing credits from custom BMPs in the reporting tables). If a BMP category other than the options listed in the Stormwater Model Program group (See Table 2) are desired, enter them in the "Custom BMP Category" table located above the section called *Practice Design Information and Nutrient Reduction*. Then, these categories will appear in the drop-down list under "BMP Category (if not imported)".

Figure 14. Custom BMPs on the Imported SCMs Tab

- **Practice Notes:** An optional cell to enter notes or description.

- **Primary Land Use Treated:** Select the primary land use that drains to the SCM from a pull-down list.

Imported Land Change Tab

This tab accounts for the pollutant increase or decrease that results from land conversion associated with projects recorded in either a SNAP, JFSNAT, or Wake County Stormwater Design (WC) tool. The tab is similar to the "Imported SCMs" tab, except that the benefits (or debits) of land conversion are summarized as a single value for each site, while that site may have several SCMs. The Unique ID default from the site level tool is the site name, plus the word "Land." This sheet becomes populated with most of its data from the files that are loaded using the button on the "Imported SCMs" tab. There are some unique data requirements on this tab:

- **Land Use Change Type**: The user is asked to select the Type of land use change from a pull-down menu, with the following choices:
  - Land conversion to grass
  - Land conversion to trees
  - Land conversion to wetlands
  - Land improvement (bare patches -> vegetation)
  - Reforestation
  - Impervious Surface Removal
  - Other Land Use Change - Ecosystem
  - Other Land Use Change – Stormwater

  Most of these choices are self-explanatory, but it is important to note that land use changes are further classified in either the "Ecosystem" or "Stormwater" model program group. The land conversions listed and the reforestation are "Ecosystem." Impervious Surface Removal is "Stormwater." If a different type of land use change occurs, the user must decide whether this change should be in the "Ecosystem" or "Stormwater" model program group.

- **Area of Land Converted:** Estimate the total area of land that changed use. This value is not used for calculation, but is stored for future reference. The user may reference the Watershed Characteristics tab of JFSNAT, the Land Cover Characteristics tab of SNAP, or the drainage area tabs (DA) of the WC file to determine the area of land converted.
- **Primary Pre-Developed Land Use:**
  Indicate the primary land use during the pre-developed site condition using a pull-down menu.

Buffers Tab

The buffers sheet has some unique categories, and requires more data entry than most of the practices due to the complex nature of the crediting methodology. There are two "parts" to the buffer credit, including a "Land Conversion Credit" and a "Runoff Treatment Credit." Each part requires a separate SNAP or JFSNAT file run. The user enters data for buffers into the UNRBA Credit Tool; it does not automatically import this information.

Note that credits for buffer improvement in developed areas may not be claimed until the practice standard has been approved by DWR.

Each part of the buffer credit has a separate section in the UNRBA Credit Tool for the user to enter data from the appropriate SNAP or JFSNAT file.

The following inputs or selections are required for the *Buffers* tab.
- Decommissioning Buffers
  An important distinction between decommissioning buffers and decommissioning other practices is that buffers cannot be decommissioned in "Zone 1" (closer to the stream) due to regulations. However, "Zone 2" can be decommissioned if the buffer improvement project was originally developed under the DWR-approved buffer improvement practice standard. For certain entities, such as local governments, this practice standard does not require a permanent easement. If the local government chooses, Zone 2 can be decommissioned for other purposes. However, a decommissioned buffer will no longer earn credits. The UNRBA Credit Tool removes all credits associated with a buffer improvement project after the decommission date. If part of a buffer is decommissioned, but the remaining buffer is still eligible for credit (e.g., the Zone 1 portion), the user will need to record the old buffer project as decommissioned, and then reenter the remaining portion as a new buffer project.

- Land Conversion Credit
  The Land Conversion Credit (in purple on the sheet) requires user-entered data from a SNAP or JFSNAT file that simulates the pre- and post-land uses for the project (Figure 15). For this part of the credit, the area of the buffer is included in the pre- and post-development areas that are entered into the "Watershed Characteristics" or "Land Cover Characteristics" tabs of the JFSNAT or SNAP file, respectively. The user needs to open the file used to calculate the land conversion part of the credit and enter the four values (Pre- and Post-Developed TN and TP loads).
  - The Pre-Developed Loads come from the "Total Nitrogen (or Phosphorus) Load Leaving Site (lb/yr) for Whole Site Pre-Development Conditions" on the "Overall Summary" Tab of the SNAP or JFSNAT file.
  - The Post-Developed TN and TP loads come from the "Total Nitrogen Load Leaving Site (lb/yr) for Whole Site Post-Development Conditions" on the "Overall Summary" Tab of the SNAP or JFSNAT file. Use the "w/o BMPs" column in JFSNAT or "without SCMs" column in SNAP.

Land Conversion Credits (From Land Conversion Credit Calculation Step - Includes Area of Buffer)					
Pre-Developed TN Load (lb/yr)	Pre-Developed TP Load (lb/yr)	Post-Developed TN Load (lb/yr)	Post-Developed TP Load (lb/yr)	Land Conversion TN Reduction (lb/yr)	Land Conversion TP Reduction (lb/yr)
				0	0
				0	0
				0	0
				0	0
				0	0

Figure 15. Land Conversion Credit Entry for Buffers

- Runoff Treatment Credit
The Runoff Treatment part of the credit (Figure 16) is calculated using two pieces of information from a second JFSNAT or SNAP file. This file will only include the area draining to the buffer (**not the area of the buffer itself**). The user will then record TN and TP load to the buffer on this sheet in the orange colored cells using the "Total Nitrogen (or Phosphorus) Load Leaving Site (lb/yr) for Whole Site Pre-Development Conditions" on the "Overall Summary" Tab of the SNAP or JFSNAT file.   Post-development loads from SNAP or JFSNAT are not used for this part of the crediting: treatment through the buffer is calculated in the UNRBA Credit Tool as described in the Buffer Improvement practice standard.

TN Load to the Buffer (lb/yr)	TP Load to the Buffer (lb/yr)	Stream Type	Is Stream Incised?	Existing Fully Functional Buffer Width (ft)	Post-Construction Total Buffer Width (ft)	% of Buffer that is Enhanced (vs. Restored)	Flow Type	Diffusion Structure?
100	50		Yes		200		Concentrated	No
100	50		Yes		200	50%	Concentrated	No
100	50		Yes		200	50%	Concentrated	No

Figure 16. Runoff Treatment for Buffers

- **Other Data from the Buffer Improvement Practice Standard for Runoff Treatment**

The guidance provided in the Buffer Improvement practice standard will provide more detail on these elements. However, the required information is listed here:

- o **Stream Type:** Identify if the stream is Perennial, Intermittent, Ephemeral, or a Qualified Ditch.

- o **Is the Stream Incised?** Answer Yes/No

- o **Existing Fully Functional Buffer Width (ft)**: Indicate the width of the *Existing* (i.e., before the buffer improvement) buffer width. Note that *Fully Functioning* means that the buffer will not be enhanced, and is greater than 20' in width. (Buffers less than 20' wide are not considered "Fully Functioning." This area will be considered enhanced and should be entered in the UNRBA Credit Tool as described below.)

- o **Post Construction Total Buffer Width (ft)**: Total Width (including pre-existing buffer) after construction is complete.

- o **Flow Management:** There are a series of questions regarding flow through the buffer, including whether the flow is concentrated, the slope of the buffer (%), and if a diffusion structure is present. These data points are used to determine if there is a design problem with the buffer (e.g., the slope is too steep). If there is a design problem, then the cells that contribute to that problem will be highlighted red.

- o **% of Buffer That is Enhanced:** This value is defined by the Buffer Mitigation Rule, and includes both buffer area that is enhanced through additional plantings or other improvements, and existing buffer <20' wide.

- **Credit Release Schedule (First 5 Years)**

The Buffer Improvement practice standard identifies a default five-year schedule over which the credits are "released" after the as built is approved (50% upon approval of as built, and 10% each following year for five years). However, if vegetation targets are not met during this period, an alternative release schedule will need to be entered by the user. If this is the case, answer "No" to the question "Has the Vegetation Density Target Been Met in Every Year of the First Five Years." Then, enter the credit release schedule that has been agreed upon.

- **Adjustments and Releases (Years 6 to 10)**

These cells can be used for two purposes. If full credit has not been reached by year five (e.g., only 80% credit was released by the time year 5 arrived), these cells can be used to

add the additional credit as it is earned through meeting vegetative targets. On the other hand, penalties can also be assessed for not meeting vegetative targets in years 6-10. When this happens, a negative value should be entered in the year where credit was removed. For example, if a buffer credit was reduced from 100% to 90%, enter "-10% "in the year that the penalty was assessed.

- **Adjustments and Releases Beyond 10 Years**

    Any buffer improvement projects that are not meeting vegetation targets 10 years after planting should be removed from the active UNRBA Credit Tool and imported on the Jurisdiction Data tab under "Credits Recorded in Other Files." Credit adjustments associated with not meeting vegetation density targets should be reflected in the value entered into this cell. This change in credit will not be reflected in the *Pollutants – Credits Lost* tab.

IDDE Tab

This sheet tracks nutrient credits resulting from illicit discharge detection and elimination (IDDE). It has unique traits used to characterize both the concentration and flow of the discharge that is corrected.   The type of discharge, grouped into one of 6 categories, determines which fields are necessary to calculate the credits. The IDDE sheet uses "blocking" to indicate fields that are not applicable. For example, the screen capture below shows that the "Average Annual Flow Before Repair" is the only active (blue) cell for the type of discharge selected in Figure 17. Other cells are blacked out because they are not applicable to this type of discharge; they are necessary for other types.   A summary of the Discharge Types and the fields needed to calculate them is provided in Table 5. Users are strongly encouraged to reference the IDDE practice standard document when entering information on IDDE practices.

Figure 17. The IDDE Tab Uses Black Hatched Cells to "Black Out" entry cells that are not needed for a particular discharge type.

Table 5. Fields Needed to Calculate Nutrient Credits for Illicit Discharges

Discharge Type[1]	Concentration Fields	Flow Fields
Near Continuous Discharge (eliminated flows and loads)	Default or Override TN and TP Concentrations depending on the source of the discharge	Average Annual Flow Before Repair Flow After is zero
Sewer Exfiltration (reduced flows and loads)		Average Annual Flow Before Repair Average Annual Flow After Repair
Frequent Localized Event (reduced number of events)		Average Flow Rate per Event (gallons/hour) Average Event Duration (hours) Average Frequency Before Repair (Events/year)
Rare Localized Event	Default or Override TN and TP Concentrations depending on the source of discharge Default or Override % Flow as Stormwater if source is a wet weather SSO	Total Discharge Volume over monitoring period (gallons) Monitoring Period (years)
Systemwide Event	Default or Override TN and TP Concentrations depending on the source of discharge	Average Event Volume (gallons/event) Average Frequency Before Repair (events/year) Average Frequency After Repair (events/year)
Other Illicit Discharge	Override TN/TP Concentration	Override Flow Reduction (gallons/year)

[1]All discharge types require identifying a "Source of Discharge" such as "Sanitary Connection" or "Laundry and Washwater."

- **TN and TP Reduction Calculations**

For IDDE, the nutrient credits are based on the change in loading before and after the correction is made. For this practice, a default factor of safety of 20% is applied to credits. This factor may be adjusted based on consultation with DWR.

For the Sewage Exfiltration type of discharge, a Land Attenuation Factor is needed. This accounts for attenuation of these nutrients as they flow to the stream. If the "TN and TP Attenuation" cells are blue, values must be entered. See the IDDE practice standard for more information.

Cattle Exclusion Tab

In addition to the site information common across practices (Section 3), additional site information is needed for Cattle Exclusion. Users should reference the Cattle Exclusion practice standard document for descriptions of these characteristics:
1) Pasture Area (acres)
2) Pre-exclusion Stocking Rate (au/acre/year)
3) Post-exclusion Stocking Rate (au/acre/year)

These site characteristics are used to populate the pre-project nutrient loading rates and the removal efficiencies associated with cattle exclusion. These values are then used to calculate the nutrient credits for this practice.

Note that credits for cattle exclusion may not be claimed until a trading framework has been developed for the exchange of credits between parties affected by the Falls Lake Nutrient Management Strategy Agricultural Rule and parties not affected by the Agricultural Rule.

Miscellaneous Practices Tab

The Miscellaneous Practices tab is used to track credits for practices that cannot be categorized or simulated on one of the other tabs. Miscellaneous practices may include the following:
- Non stormwater practices with approved credits that were not developed by the UNRBA and were therefore not directly coded into this Tool.
- Individual projects or actions that are not associated with a practice type.
- Practices such as floating wetland islands that require running a site-level tool twice to calculate the difference in loading (i.e., before and after an upfit).

All credits entered into or calculated by the UNRBA Credit Tool require approval by DWR regardless of whether or not they covered under an approved practice standard.

In addition to the site information common across practices (Section 3), additional site information is needed to calculate and summarize credits:

- **BMP Model Program Group and Category**

  In all of the other input and calculation tabs, practices are assigned to a Model Program Group automatically. The Miscellaneous tab can include a wide variety of practices, so

this assignment is not automatic. The user needs to select the Model Program Group on this tab. Based on the Model Program Group, a drop-down menu will appear for the user to select the "BMP Category." This drop-down list will include any custom categories added:

- o **Additional BMP Categories**

    To include Miscellaneous Practices in the reporting tables by Model Program Group and BMP Category, the user can assign additional BMP Categories. The yellow table at the top of this sheet (see Figure 18) allows the user to define up to three BMP Categories under each BMP Model Program Group that correspond with Miscellaneous Practices. Enter the name of the new category in the row corresponding to the Model Program Group.

BMP Model Program Group	BMP Category 1	BMP Category 2	BMP Category 3
Stormwater	1	2	3
Ecosystem			
Wastewater			
Programmatic			
Other			
Note: IDDE is a separate program group. Please use the IDDE sheet to enter any IDDE practices.			

Figure 18. Custom BMP Categories in the Miscellaneous BMP Tab

- **Load Reduction Calculations**

    The user enters the flow (gallons/year) and nutrient concentration (mg/L) data for the Pre-Practice and Post-Practice conditions on this tab. The load reduction is calculated as the difference in pre- and post-practice loads. Alternatively, the user can enter pre- and post nitrogen and phosphorus loads directly in the override cells.

- **Factor of Safety**

    The factor of safety for miscellaneous practices needs to be entered by the user. Consult with DWR to determine the appropriate value.

5.   Download UNRBA Credit Tool

The UNRBA Credit Tool and this User Guide are available for download at https://www.unrba.org/nutrient-credit-program. Any updates to the Tool or status of approval for practices developed by the UNRBA will be maintained here. Additional information regarding development of subwatershed delivery factors, status of practice approval, and links to the DEMLR Stormwater Program documents are also available at this address.