United States Army Corps of Engineers

Albuquerque and Omaha Districts

Colorado Mitigation Procedures

Version 1 (COMP v1)

– May 2019 –

Updates and Revisions

- COMP May 2019 - regulatory direction for wetland and stream mitigation; stream debit and credit calculator based on functional loss and improvement assessed using existing qualitative methods.

- This procedure was originally adapted from similar methodologies used in other Corps Districts that have been in effect for several years. The document is based on the Wyoming Stream Mitigation Procedures version 2, USACE Wyoming Regulatory Office.

This procedure can be updated and revised as necessary in the future:

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Cover Photo: US-36 Wetland Mitigation Area, Boulder County, Colorado. Colorado Department of Transportation. 2018.

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1.0 Introduction

The practice of using compensatory mitigation to minimize unavoidable losses of aquatic resources is an important component of the U.S. Army Corps of Engineers (Corps) Clean Water Act Section 404 Regulatory Program. This document describes the method for quantifying wetland and stream losses (debits) and compensatory mitigation (credits) for DA-permitted projects in Colorado, and is not intended to be a comprehensive guide for addressing compliance with the 2008 final Mitigation Rule on compensatory mitigation for losses of aquatic resources.

1.1 Applicability and Use

The intent of this COMP is to establish a procedure for quantifying compensatory mitigation debits and credits that will provide predictability and consistency. This COMP and associated assessment methods are not intended for use as project design criteria. Nothing in this COMP should be interpreted as a guarantee that a project that follows the procedure described herein will be approved. Since a particular project may warrant alternative mitigation requirements, each resource and proposed project is evaluated on a case-by-case basis. The Corps will rely on 33 CFR 332.3 when approving mitigation and nothing in this document is meant to abridge or replace any existing laws, regulations, or formal guidance.

The district engineer must determine the compensatory mitigation to be required in a DA permit, based on what is practicable and capable of compensating for the aquatic resource functions that will be lost as a result of the permitted activity. Compensatory mitigation requirements must be commensurate with the amount and type of impact that is associated with a particular DA permit. Aquatic resource enhancement and restoration projects that require a DA permit must result in a net increase in aquatic resource functions and services.

Prospective permittees and their agents are encouraged to seek the advice of their local Colorado Corps Regulatory Office and other regulatory agencies during the planning and design of projects and mitigation measures. Questions regarding use of this procedure for specific projects must be addressed to the Corps project manager handling the specific permit action.

The following points are noted:

- If the district engineer determines that compensatory mitigation is necessary to offset unavoidable impacts to aquatic resources, the amount of required compensatory mitigation must be, to the extent practicable, sufficient to replace lost aquatic resource functions. In cases where appropriate functional or condition assessment methods or other suitable metrics are available, these methods should be used where practicable to determine how much compensatory mitigation is required.

- This COMP does not affect sequencing (e.g., avoidance, minimization, mitigation) or any requirements of the Clean Water Act Section 404(b)(1) Guidelines or other applicable regulation. Such requirements shall be evaluated during permit analysis. Mitigation is a sequential process of avoidance, minimization, and compensation. Compensatory mitigation is not considered until after all appropriate and practicable steps have been taken to first avoid and then minimize adverse impacts to the aquatic ecosystem.

- The interim approved stream assessment methodology for quantifying stream mitigation credits and debits in the Albuquerque and Omaha Districts of Colorado is the Colorado

Stream Quantification Tool and Debit Calculator (CSQT), which includes field data collection methodologies, as well as workbooks to calculate functional lift and loss at mitigation and impact sites, respectively. The CSQT workbook and Debit Calculator workbook rely on the same User Manual, which provides guidance for how to enter data into the workbooks and outlines field data collection methods.

- Other appropriate function-based methods may be used to calculate functional loss and quantify stream debits and credits in place of the CSQT, if prior approval is obtained from the Corps.

- Quantification of wetland compensatory mitigation debits may be calculated using the Corps Quality Management System (QMS) Document 12501: SPD Standard Operating Procedure for Determination of Mitigation Ratios, found at:

  https://www.spd.usace.army.mil/Portals/13/docs/regulatory/qmsref/ratio/12501-SPD.pdf

  Determination of the amount and type of compensatory mitigation is at the discretion of the Corps, and this tool helps inform that decision.

- Use of the Functional Assessment of Colorado Wetlands (FACWet) Method will generally be required for all proposed projects where impacts to wetlands will be 0.5 acre or greater, unless unique conditions warrant use on a case-by-case basis. FACWet be will used as a tool to assist in determining wetland functions potentially impacted, assess the ability of mitigation plans to replace impacted functions and to assess the success of mitigation wetlands. The latest version of FACWet can be found at:

  https://www.codot.gov/programs/research/pdfs/2009/facwet

- When this COMP is used in the establishment of a mitigation bank and ILF sites, the Corps will evaluate the appropriate application and integration of this document with other aspects of the mitigation banking instrument, such as monitoring and performance standards in compliance with the 2008 Mitigation Rule Requirements.

- In addition to the requirements set forth in this document, other Federal, State, Tribal, or local agencies within Colorado may require additional or separate mitigation under their own authorities.

- Complex and/or controversial aquatic resource impacts may require additional information to complete an appropriate evaluation of the proposed impacts. The Corps reserves the right to request additional assessment of stream and/or wetland function on a case-by-case basis.

- The COMP is subject to periodic review and modification. This document will be reviewed within 2 years after implementation and thereafter, as warranted. Necessary modifications or updates will be released to the public as a new version of the COMP. The version of the COMP utilized for an approved permit, mitigation bank or ILF is the document used for reference and compliance for the life of the required mitigation. The referenced web links in this document may change over time. Please contact the Corps if a web link is no longer valid.

2.0 Wetland Compensatory Mitigation

Compensatory mitigation is defined as restoration (re-establishment or rehabilitation), establishment (creation), enhancement, and/or in certain circumstances preservation of aquatic resources for the purpose of offsetting unavoidable adverse impacts which remain after all appropriate and practicable avoidance and minimization has been achieved. Mitigation may be required for projects with permanent adverse effects to wetlands. These procedures are intended to standardize calculation of wetland mitigation debits and credits.

2.1 Wetland Debits

A debit is a unit of measure (e.g. a functional or areal measure or other suitable metric) representing the loss of aquatic functions at an impact or project site. The measure of aquatic functions is based on the resource impacted by the authorized activity. Wetland debits will be determined from areal extent of loss calculated at an impact site in acreage, in combination with additional factors that may affect aquatic resource function. The amount of proposed impacts should be characterized for each resource type by acreage and duration of impact (i.e., temporary or permanent). Additional variables such as temporal loss, the difficulty of restoring the aquatic resource type, and the distance from the impact site also would affect how much compensatory mitigation would be required for specific projects. Final compensatory mitigation ratios, as applicable to DA permits, will generally be determined by the Corps districts using the Corps Quality Management System (QMS) Document 12501: SPD Standard Operating Procedure for Determination of Mitigation Ratios, found at:

https://www.spd.usace.army.mil/Portals/13/docs/regulatory/qmsref/ratio/12501-SPD.pdf

While not required, applicants may use this procedure as a planning tool to estimate Corps compensatory mitigation requirements early in the project design process.

2.2 Wetland Credits

A credit is a unit of measure (e.g. a functional or areal measure or other suitable metric) representing the accrual or attainment of aquatic functions at a compensatory mitigation site. The measure of aquatic functions is based on the resources restored, established, enhanced or preserved. Wetland credits will be determined based on proposed activity at a mitigation site. Documentation of a higher probability of success and higher functional lift for certain mitigation activities may be required as supported by a suitable functional assessment. The following methods of compensatory mitigation are defined at 33 CFR 332.2 and include:

• Establishment (creation): manipulation of the physical, chemical or biological characteristics present to develop an aquatic resource that did not previously exist at an upland site. Establishment results in a net gain in aquatic resource area and functions.

• Re-establishment: the manipulation of the physical, chemical, or biological characteristics of a site with the goal of returning natural/historic functions to a former aquatic resource. Re-establishment results in rebuilding a former aquatic resource and results in a gain in aquatic resource area and functions.

• Enhancement: the manipulation of the physical, chemical, or biological characteristics of an aquatic resource to heighten, intensify, or improve a specific aquatic resource function(s). Enhancement results in the gain of selected aquatic resource function(s), but may also lead to a decline in other aquatic resource function(s). Enhancement does not result in a gain in aquatic resource area.

• Rehabilitation: the manipulation of the physical, chemical, or biological characteristics of a site with the goal of repairing natural/historic functions to a degraded aquatic resource. Rehabilitation results in a gain in aquatic resource function, but does not result in a gain in aquatic resource area.

• Preservation: the removal of a threat to, or preventing the decline of, aquatic resources by an action in or near those aquatic resources. This term includes activities commonly associated with the protection and maintenance of aquatic resources through the implementation of appropriate legal and physical mechanisms. Preservation does not result in a gain of aquatic resource area or functions.

Credits will be determined based on the mitigation activity on a case-by-case basis. Functional scores may help inform an appropriate range for credit ratios for proposed mitigation activities. See Table 1 below for typical credit ratio ranges based on mitigation activity.

Table 1: Wetland Mitigation Credit Ratios

Mitigation Activity	**Credit Ratio (Work Area:Credit)**
Wetlands	
Re-establishment	1:1 - 2:1
Establishment	1:1 - 2:1
Rehabilitation of function	2:1 - 3:1
Enhancement of existing state	3:1 - 5:1
Preservation in combination with above activities, and as considered per the criteria at 33 CFR 332.3(h)	5:1-10:1*
Preservation alone	Case-by-Case as considered per the criteria at 33 CFR 332.3(h)*
Uplands	
Upland buffer enhancement and preservation	5:1-15:1*

*Total combined buffer/preservation credit typically cannot exceed 10% of the total bank credit

3.0 Stream Compensatory Mitigation

Compensatory mitigation requirements must be commensurate with the amount and type of impact that is associated with a particular DA permit. In general, activities proposing impacts greater than the minimum thresholds specified below or that fall into certain categories require evaluation using the CSQT:

1. All activities with permanent loss of 300 linear feet of stream or more (i.e., due to activities that result in reduced natural stream length like piping or channelization), except where specifically stated in this section below.

2. All activities authorized by a general permit with permanent impacts to greater than 500 linear feet of stream (i.e., other activities which impact stream function but do not necessarily result in loss of stream length or area), or require a waiver, except where specifically stated in this section below.

3. All activities resulting in permanent impacts to streams that meet one of the following criteria:

a. Projects requiring a Standard Individual Permit;

b. Nationwide Permits that require a waiver;

c. Establishment of a mitigation bank or ILF.

Projects proposing to impact ditches or canals excavated in dry land are excluded from this requirement.

Prospective permittees should contact the appropriate Corps office in early project planning stages to verify if COMP and CSQT documentation are necessary and to what degree they are applied.

The Colorado Stream Quantification Tool and Debit Calculator (CSQT) User Manual, workbooks and supporting documentation can be found on the Regional Internet Bank Information Tracking System (RIBITS) link: https://ribits.usace.army.mil

Applicants should utilize the search tool for Colorado, then Assessment Tools or contact the Denver or Pueblo Regulatory Offices. The CSQT may be periodically updated as new metrics or reference data become available, or upon written request of Interagency Review Team members. Necessary modifications or updates will be released to the public as a new versions of the CSQT and Debit Calculator workbooks. The version of the CSQT utilized for an approved permit, mitigation bank or other 404 mitigation program is the version that should be applied for the life of the required mitigation, unless a newer version is specifically requested by a permittee or sponsor and approved by the Corps.

3.1 Stream Debits

The CSQT Debit Calculator workbook will be used as a basis for the approach to debiting, and should be used to assess project impact sites and anticipated stream losses. To calculate debits, this procedure uses the existing condition of the stream and the anticipated functional loss within a given length (reach) of stream caused by the permitted activity. Existing condition and functional loss are calculated within the Debit Calculator workbook using the Quantification Tool worksheet, or Debit Tool worksheet where existing condition data are not available or the post-project condition cannot be accurately estimated. The Debit Tool worksheet may also be used if prospective permittees opt to not collect existing condition data. For step-by-step instructions on how project impacts and functional loss can be evaluated, see Appendix A: Stream Debit Calculation Guide.

Three debit options are described in this section and are available for use to calculate functional loss. To that end, not all Debit Calculator worksheets are required to complete a loss calculation. In general, debit option 1 requires the most information and effort, while debit option 3 requires the least. A summary of the options is illustrated in Table 2.

Table 2: Summary of Debit Options

Debit Option	Existing Condition Score (ECS)	Proposed Condition Score (PCS)
1	Assess existing condition using Quantification Tool worksheet	Estimate proposed condition using Quantification Tool worksheet
2	Assess existing condition using Quantification Tool worksheet	Use Debit Tool worksheet
3	Default score in Debit Tool worksheet	Use Debit Tool worksheet

The CSQT generates a condition score that is unitless, which is then multiplied by stream length to generate a "Functional Feet" score. This Functional Feet score serves as the basis for calculating debits, as outlined in Section G. The Quantification Tool worksheet calculates the change in condition at an impact site by comparing the difference between existing and proposed condition. Functional loss at an impact site is calculated using the following equation:

$$\Delta\, Functional\ Feet = (Proposed\ Condition\ Score \times proposed\ stream\ length) - (Existing\ Condition\ Score \times existing\ stream\ length)$$

The existing condition score is generated in the Quantification Tool worksheet using data collected via methods outlined in the CSQT User Manual, and existing stream length is the current measure of stream length (measured along stream centerline or thalweg). Typically, a basic assessment will be conducted at an impact site, however, the Corps retains the discretion to recommend that additional metrics be evaluated. If an assessment of existing condition is not conducted at an impact site, debits will be calculated in the Debit Tool worksheet using a default existing condition score. The proposed condition score is derived either by estimating changes to specific metrics based on project design in the Quantification Tool worksheet, or by using the Debit Tool worksheet to estimate impact severity, as outlined in the CSQT User Manual. The proposed stream length is the final length of stream anticipated following completion of the project.

3.2 Stream Credits

Applicants are responsible for proposing appropriate compensatory mitigation commensurate with the amount, type, and location of loss associated with a particular DA permit. Compensatory mitigation for stream impacts may include a combination of stream corridor restoration (re-establishment or rehabilitation), enhancement, establishment or preservation. Preservation will generally only be considered in combination with enhancement and restoration, and will be evaluated on a case-by-case basis. Because streams are difficult to replace through establishment, restoration and enhancement activities will provide greater certainty that permitted impacts will be successfully offset (33 CFR 332.3(e)(3)).

The condition at the mitigation site will be assessed to quantify ecological gains expected and realized from the mitigation project. Information about the existing condition of a mitigation site is useful for determining what restoration or enhancement activities would provide the greatest functional lift. Activities that may constitute restoration or enhancement of stream functions include, but are not limited to: establishment of natural riparian areas; impoundment removal;

livestock exclusion; road crossing improvements; removal of invasive vegetation and restoration of appropriate vegetation communities; improvements to in-stream channel complexity; sediment supply reduction by stabilizing eroding streambanks; improving baseflow duration; and reconnection of a stream with its floodplain.

The improvement in stream functions, or functional lift, at a compensatory mitigation site will be quantified using the CSQT workbook (see Section 3). This Functional Feet score serves as the basis for calculating credits. The Quantification Tool worksheet generates a condition score that is unitless, which is then multiplied by stream length to generate a Functional Feet score. The change in condition at a mitigation site is determined by comparing the difference between existing and proposed condition using the following equation:

$$\Delta\ Functional\ Feet = (Proposed\ condition\ score \times proposed\ stream\ length) - (Existing\ condition\ score \times existing\ stream\ length)$$

The existing condition score is generated in the Quantification Tool worksheet using data collected via methods outlined in the CSQT User Manual; and existing stream length is the current measure of stream length measured along the thalweg at the mitigation site. During initial mitigation site selection form compensatory mitigation proposals, existing condition should be measured via a basic assessment. Upon final selection of the mitigation site, or during the development of a mitigation banking instrument, the Corps will likely require additional baseline data collection based on the goals and objectives of the project. The proposed condition score is estimated using design specifications input into the Quantification Tool worksheet and later verified through as-built and monitoring data entered into the Monitoring Data worksheet. The proposed stream length is the measured length of stream following mitigation activities. For credit determination, the Functional Feet value should be based upon the most detailed level of assessment conducted at the site.

3.3 Secondary Effects

Regulatory Guidance Letter (RGL) 18-01 provides guidance to Corps district engineers on the factors they should consider when determining the amount of mitigation credit generated from the removal of obsolete dams or other structures to restore rivers and streams. RGL 18-01 guidance covers aspects of these restoration activities that are not explicitly addressed by the compensatory mitigation regulations. To address this guidance, adjustment to the change in Functional Feet value may be made to calculate a credit where secondary effects exist in the system. This adjustment can be applied as a percentage increase. The amount of credit adjustment will be determined on a case-by-case basis after evaluating a mitigation proposal involving the removal of an obsolete dam or other structure and will vary by project site. There must be a tangible connection to activities within the reach with effects elsewhere that would not occur but for implementation of those activities. Secondary effects cannot be purely speculative or in dispute.