SAVANNAH DISTRICT'S STANDARD OPERATING PROCEDURE FOR COMPENSATORY MITIGATION

(Version 3.0) **effective date October 21, 2025**

SAVANNAH DISTRICT'S STANDARD OPERATING PROCEDURE FOR COMPENSATORY MITIGATION

Contents

SAVANNAH DISTRICT'S STANDARD OPERATING PROCEDURE FOR COMPENSATORY MITIGATION

1.0. PURPOSE

1.1. Introduction: This Standard Operating Procedure for Compensatory Mitigation (SOP) contains instructions to aid applicants and mitigation sponsors in the calculation of credits associated with proposed impacts to and/or mitigation activities in waters of the U.S. as regulated under Section 404 of the Clean Water Act (CWA). The SOP is applicable in the geographic boundaries of the State of Georgia[1]. In Georgia, Section 404 of the CWA is administered by the U.S. Army Corps of Engineers, Savannah District, Regulatory Program (Savannah District).

Specifically, this document provides a methodology for both quantifying the functional impairments (i.e., mitigation credits owed), and functional improvements (i.e., mitigation credits generated) to aquatic resources in accordance with the requirements set forth in the Compensatory Mitigation for Losses of Aquatic Resources; Final Rule (2008 Rule; 33 CFR Parts 325 and 332). This SOP also provides mitigation guidance regarding the selection of mitigation, and the development and operation of commercial and permittee responsible mitigation projects.

This document immediately supersedes the credit calculations outlined in Savannah District's Standard Operating Procedure for Compensatory Mitigation (Version 1.0), dated October 27, 2021, for all complete applications (i.e., permits and mitigation plans[2]) received after the effective date of the public notice for the SOP. Mitigation requirements for permit applications determined to be complete prior to the effective date will be processed using Version 2.0 of SOP, unless the applicant requests otherwise. Mitigation guidance documents that pre-date the SOP are hereby formally rescinded, with the exception of those referenced in Section 4.0, below.

1.2. Goals: The goals for the SOP are to: 1) provide stakeholders with a consistent, repeatable, functionally-based mitigation credit assessment methodology for aquatic resources; 2) establish a transition to functionally-based credit types to facilitate in-kind replacement of aquatic resources; 3) provide stakeholders with clarity on appropriate

---

[1] This SOP may be used at the discretion of the District Engineer on a case-by-case basis for compensatory mitigation projects outside the boundaries of the State of Georgia. The application of this SOP outside of the boundaries of the State of Georgia shall be limited to scenarios where appropriate compensatory mitigation is not commercially available in the respective service area(s) for a proposed project impact.
[2] For mitigation banking instrument and in-lieu fee mitigation site proposals, the Public Notice soliciting comments on the project Prospectus will be utilized as the threshold for the determination of the applicability of the respective version of the SOP.

mitigation selection; and 4) provide mitigation sponsors with guidance on the development and operation of mitigation projects. All documents supporting this SOP have been included separately as appendices, either in their existing form or to be released at a later date, in order to facilitate future updates, as needed.

2.0. BACKGROUND

2.1. 2004 Savannah District, Regulatory Division's Standard Operating Procedure for Compensatory Mitigation (SOP): The District's 2004 SOP was developed to provide a consistent methodology for assessing wetland, stream, and open water impacts and mitigation activities. While factors based on ecological function were considered in the development of both the impact and mitigation calculations within the 2004 SOP, overall, these factors generally comprised a very small percentage (less than 50 percent) of the overall calculation of credits owed or generated. At the time it was developed, compensation ratios were not specified as an underlying goal of the 2004 SOP. Under the District's current compensatory mitigation program, credits generated using this earlier SOP are referred to as "legacy" credits.

2.2. Coordination: In October 2021, the Savannah District issued a public notice soliciting public comments on the first revision of the District SOP. During the subsequent 30-day public comment period, the Savannah District received multiple comments from Federal and State resource agencies, environmental consultants, mitigation bank sponsors, and non-profit organizations. In addition, the Savannah District participated in a number of working sessions with interested stakeholders following the public comment period, to solicit more detailed input on the SOP. In response to the receipt of the public comments and input received during stakeholder working sessions, Savannah District has made revisions, as appropriate, to the SOP (Version 2.0). As a result of the initial implementation on April 27, 2018, credits generated under the current District SOP continue to be informally referred to as "2018" credits.

3.0. APPLICABILITY

3.1. Resource and Geographic Scope: The SOP has been developed to assess the entire range of projects (both impacts and mitigation) that may occur in freshwater wetlands, streams, tidal wetlands, and open waters. The geographic boundaries of the Savannah District Regulatory Program correspond to the State of Georgia, and include the following physiographic regions and their associated numbered U.S. Environmental Protection Agency, Level III Ecoregion:

Appalachian Plateau (68 - Southwestern Appalachians) - Low mountains containing a mosaic of forest and woodland with some cropland and pasture, characterized by steep forested slopes and high velocity, high-gradient streams with local relief often exceeding 1000 feet. The Plateau Escarpment features Mississippian-age limestone, sandstone, shale, and siltstone with Pennsylvanian-age shale, siltstone, sandstone, and conglomerate, supporting mixed oak and chestnut oak on upper slopes and more mesic forests including beech-yellow poplar and sugar maple-basswood-ash-buckeye on middle and lower slopes.

Ridge and Valley (67 - Ridge and Valley) - A relatively low-lying region with roughly parallel ridges and valleys containing limestone, dolomite, shale, siltstone, sandstone, chert, mudstone, and marble with numerous springs and caves. The Southern Limestone/Dolomite Valleys feature undulating valleys and rounded ridges with oak-hickory and oak-pine forests, while the Southern Shale Valleys contain deep, acidic, moderately well-drained, slowly permeable soils formed from weathered shale materials supporting mixed forest.

Blue Ridge (66 - Blue Ridge) - Mostly forested slopes with high-gradient, cool, clear streams and rugged terrain on igneous, metamorphic, and sedimentary geology receiving over 80 inches of annual precipitation on high peaks. The Southern Crystalline Ridges and Mountains contain well-drained, acidic, brownish, loamy soils developed on Precambrian-age crystalline rocks including gneiss, schist, and quartzite, supporting Appalachian oak forests, northern hardwoods, and diverse vegetation communities including cove hardwoods and oak-pine associations.

Piedmont (45 - Piedmont) - A complex mosaic of Precambrian and Paleozoic metamorphic and igneous rocks with moderately dissected irregular plains featuring finer-textured soils than coastal plain regions. The Southern Inner Piedmont contains schist, gneiss, and granite bedrock with oak-pine and oak-hickory forests, while the Southern Outer Piedmont has lower elevations with deep saprolite, red clayey subsoils dominated by Kanhapludults, and loblolly-shortleaf pine as the major forest type.

Upper Coastal Plain (65 - Southeastern Plains) - Irregular plains with Cretaceous or Tertiary-age sands, silts, and clays featuring relatively low-gradient, sandy-bottomed streams and natural vegetation of oak-hickory-pine and Southern mixed forest. The Sand Hills contain droughty, low-nutrient soils formed in thick sand beds supporting turkey oak and longleaf pine on drier sites, while the Tifton Upland has well-drained, brownish, loamy soils with iron-rich layers supporting mixed pine/hardwood forests.

Lower Coastal Plain (75 - Southern Coastal Plain) - Generally lower elevation with less relief and wetter soils than the Southeastern Plains, featuring barrier islands, coastal lagoons, marshes, and swampy lowlands. The Okefenokee Plains consist of flat plains with poorly drained soils, acidic softwater lakes, and coniferous forests, while the Okefenokee Swamp contains slow-moving, tea-colored acidic waters with cypress, blackgum, and bay forests in a rainfall-dependent system affected by drought and fire cycles.

3.2. Scalability: This SOP can be used for projects of all sizes. The development of the SOP focuses on functional characteristics of the above-mentioned aquatic resources, an approach which provides flexibility in the assessment of a wider range of projects. It also addresses both direct and indirect impacts for projects regardless of scale.

3.3. Project Type: The SOP is applicable to all regulated activities under Section 404 of the CWA, to include the assessment of adverse impacts and mitigation associated with permit applications, mitigation plans, and compliance and enforcement actions taken by the Savannah District[3].

4.0. REGULATIONS & DISTRICT GUIDELINES

4.1. 2008 Final Rule on Compensatory Mitigation for Losses of Aquatic Resources (Rule): The Rule (Federal Register, Vol. 30, No. 70:19594-19705, April 10, 2008) emphasizes that the process of selecting a location for compensation sites should be informed by: an assessment of watershed needs and how specific wetland and/or stream restoration projects can best address those needs. It also identifies a hierarchical preference for different compensatory mitigation options (i.e., mitigation banks, in-lieu-fee (ILF), and permittee responsible sites) to off-set adverse impacts. The Rule further requires measurable and enforceable ecological performance standards for all types of mitigation, so that project success can be evaluated, and regular monitoring is required to document the extent to which mitigation sites are achieving ecological performance standards. The Rule also specifies the components of a complete mitigation plan and emphasizes the use of science-based assessment procedures (i.e., functional and/or conditional assessments) to evaluate the extent of potential aquatic resource impacts and mitigation measures (USEPA/USACE, 2008).

[3] The SOP may be used at the discretion of the U.S. Environmental Protection Agency for compliance and enforcement cases within the Savannah District in which they serve as the lead federal agency.

4.2. Guidelines to Mitigation Selection: In accordance with the Rule, the District has developed this document to provide applicants with the appropriate procedure for evaluating and documenting the selection of appropriate compensatory mitigation, when multiple mitigation options are available to offset a permitted impact. The current Guidelines for Mitigation Selection are provided in Appendix 11.1 (included separately). Where compensation is proposed to be sourced from a mitigation bank or in-lieu-fee program, the Savannah District requires permit applicants to submit a completed Statement of Credit Availability (SOCA). The SOCA requires permit applicants to coordinate with the mitigation sponsor prior to submittal of the permit mitigation plan to ensure current credit availability and accurate accounting. The Template Statement of Credit Availability is provided in Appendix 11.2 (included separately).

4.3. Standard Mitigation Service Areas: Guidelines regarding mitigation service areas for new mitigation banking projects and ILF mitigation sites have been included separately in Appendix 11.3. The geographic boundaries of these standard mitigation service areas were developed utilizing the U.S. Geological Survey's eight (8) digit hydrologic unit codes and eco-regional considerations. There are 20 designated primary service areas (20 non-tidal, and 2 tidal) provided for use, along with supporting secondary services areas (where appropriate).

4.4. Monitoring Guidelines & Performance Standards for Freshwater Wetlands and Non-Tidal Streams: Comprehensive guidelines regarding the development of mitigation performance monitoring plans and the criteria for the assessment of mitigation performance have been included separately within Appendix 11.4.

4.5. Standard Credit Release Schedule: Guidelines for credit release schedules have been developed based on ecologically based project milestones. Generally, credit releases will be issued through the achievement of the following sequence of project milestones: 1) Approval of the instrument and/or mitigation plan, recording of the Declaration of Conservation Covenants and Restrictions, and execution of all project related final assurances for the project; 2) Completion of construction (to include all planting) and recording of the Conservation Easement; Achieve interim performance (for all resources associated with the project) and fully fund the long-term management plan; and Achieve final performance (for all resources associated with the project. For mitigation projects that require longer construction schedules (e.g., greater than one calendar year from construction initiation to the completion of planting), the Corps may consider (on a case-by-case basis) alternative credit release schedules to address approved intermediate phases of project construction. The standard credit release schedule is included separately within Appendix 11.5.

5.0. CREDITS

5.1. In-Kind Replacement: For the purposes of this SOP, the Savannah District has aligned mitigation credits with specific aquatic resource credit types in order to better replace the lost aquatic resource functions resulting from adverse impacts. In-kind replacement requires that mitigation resources have comparable functions and conditional characteristics as the resource being impacted. The list of credit types, below, will be utilized to achieve in-kind replacement. If in-kind replacement is unavailable at the time of permit issuance, the applicant will propose, and the Savannah District will determine, on a case-by-case basis, whether another resource credit type is appropriate for fulfilling the compensatory mitigation requirements for the aquatic resource impacts. "Legacy" credit types are addressed in Section 5.6 below.

5.2. Wetland Credit Types: The Hydrogeomorphic Approach, HGM, (Brinson, 1993, and Smith et al., 1995) is a methodology that helps wetland practitioners classify, group, and assess wetlands and their functional capacities. The goal of HGM is to consistently classify wetlands across diverse geomorphic landscapes and assess shared (i.e., HGM Class) functions of wetlands in comparison to a corresponding reference dataset. For the purposes of in-kind replacement of wetland resources, this SOP utilizes wetland credit classifications based on the HGM Classification, which focuses on the following three characteristics: 1) water source; 2) landscape position; and 3) hydrodynamics. With the greatest weight given to water source, the following list of wetland credit classifications will be applied to impacts and compensation in the Savannah District: 1) Freshwater Tidal; 2) Saltwater Tidal; 3) Riverine Credit Type (to include Riverine and Lacustrine Fringe HGM wetland classes); and 4) Non-Riverine Credit Type (to include Slope, Depressional and Flats HGM wetland classes). Note that the Non-Riverine Credit Type allows for impacts to wetlands of the respective HGM classes to be compensated using credits generated from mitigation conducted on any of the other HGM classes within this credit type, but does not preclude the requirement to implement compensatory mitigation project actions specific to the target HGM class.

1) Freshwater Tidal Wetlands express a hydrologic regime and hydrodynamics regulated by the ebb and flow of the diurnal tides inland of the Georgia coastline. Specifically, these Freshwater Tidal Wetlands are located in the eleven coastal counties (Brantley, Bryan, Camden, Charlton, Chatham, Effingham, Glynn, Liberty, Long, McIntosh, and Wayne) and in a landscape position adjacent to rivers, streams/creeks, and ditches that are subject to the influence of the tide. Further, these resources exhibit very low substrate salinities as compared to

Saltwater Tidal Wetlands, and are subsequently not dominated by salt-tolerant vegetation species typically associated with coastal marshlands.

2) Saltwater Tidal Wetlands express a hydrologic regime and hydrodynamics regulated by the ebb and flow of the diurnal tides along the Georgia coastline. Specifically, these Saltwater Tidal Wetlands are located in six of the eleven coastal counties (Bryan, Camden, Chatham, Glynn, Liberty, and McIntosh) and located in a landscape position adjacent to rivers, streams/creeks, ditches, and/or the Atlantic Ocean that are subject to the influence of the tide (i.e., lying within a tide-elevation range from 5.6 feet above mean tide level and below). Further, these resources exhibit higher substrate salinities than Freshwater Tidal Wetlands and are typically dominated by one or more salt tolerant vegetative species (as codified in Official Code of Georgia Annotated 12-5-282).

3) Riverine (to include Riverine and Lacustrine Fringe Wetlands) are wetlands located in a landscape position directly adjacent to rivers and streams, or their impoundments, respectively. The hydrologic regime of Riverine Wetlands is dominated by the frequency and duration of overbank flooding events from the adjacent tributary system. However, not all wetlands located adjacent to rivers or streams are necessarily "Riverine" wetlands, as the hydroperiod of Slope Wetlands adjacent to small, headwater streams (i.e., 1st and 2nd order streams) is not dominated by the frequency and duration of overbank flood events. The hydrologic regime of Lacustrine Fringe Wetlands is regulated by the water level in the adjacent impoundment. The impoundment itself maintains elevated water table levels in fringe wetlands, and additional water sources may include periodic inundation by surface water as the impoundment itself expands or recedes due to variations in rainfall, tributary inflow, etc. The dominant hydrodynamics of Riverine Wetlands is uni-directional and horizontal, largely consistent with the valley gradient. By comparison, the dominant hydrodynamics of Lacustrine Fringe wetlands is also horizontal, but is bi-directional, as the water moves into and out of the wetland with the rise and fall of the lake levels, and under influence of wind generated lake seiches (i.e., standing wave).

4) Non-Riverine (to Slope, Depressional and Flat Wetlands) are those wetlands typically located in a landscape position at the foot slope and toe slope of the valley, or in flat, non-riverine landscapes. The hydrologic regime of Slope Wetlands is predominantly regulated by hill slope movement and discharge of groundwater and is supplemented by direct precipitation. The dominant hydrodynamics of this wetland type is horizontally uni-directional, as water flows along a hydraulic gradient. For the purposes of assessing wetland adverse

impacts, Slope Wetlands will include those wetlands at the head of small streams, including areas up-gradient of distinct channel formation through 2nd order stream reaches (Wilder et al., 2013). The determination of stream order will follow the Modified Strahler[4] Stream Order[5] value provided in the Watershed Report Tool for stream reaches identified in the USEPA Waters GeoViewer Application (please refer to the following website: https://www.epa.gov/waterdata/waters-geoviewer). Unmapped stream reaches in the NHD dataset will be considered first order streams. Depressional and Flat Wetlands are those wetlands located in a closed depression or on a flat landscape, respectively. The hydrologic regime of these wetlands is predominately dependent on precipitation inputs, but depressional wetlands may also have a secondary groundwater component. The dominant hydrodynamics of these wetlands are vertical, as water enters these wetlands through precipitation events and exits via groundwater recharge and evapotranspiration.

5.3. Stream Credit Types: Stream credit types are based on the association of flow regime and landscape position. The following list of stream credit types will be utilized in the assessment of both impacts and compensation within the Savannah District: 1) Non-Perennial Streams[6]; 2) Perennial Streams (less than three (3) square mile watersheds); 3) Perennial Streams (greater than three (3) square mile watersheds).

1) Non-Perennial Streams are those tributaries that are located in very small catchments (i.e., usually less than 100 acres in size). Non-Perennial Streams can exhibit base flow during a portion of the year (intermittent) under the range of normal climatic conditions[7], or exhibit surface water flows during and shortly after storm events (ephemeral).

2) Perennial Streams (less than or equal to 3.0 square mile watersheds) are those tributaries located in small to medium-sized catchments that, under the range of normal climatic conditions, exhibit continuous base flow throughout the year. In

---

[4] Refer to Strahler, A. N., 1952. Hypsometric (area-altitude) analysis of erosional topography. Bulletin Geological Society of America. 63: 1117-1142.

[5] Refer to McKay, L., Bondelid, T., Dewald, T., Johnston, J., Moore, R., and Rea, A., "NHDPlus Version 2: User Guide", 2012.

[6] The Savannah District does not currently consider the geomorphic restoration of ephemeral streams to be ecologically appropriate.

[7] The Antecedent Rainfall Calculator and local precipitation record will be used to determine if a project site is under normal climatic conditions. Normal climatic conditions are defined as a range, 30 to 70 percent probability, of an amount of precipitation that could occur for each month of the year. The normal range is established through the statistical ranking of the precipitation record for 30-year period.

the Southern Coastal Plain (Level III Ecoregion 75), this stream credit type is calibrated to *Perennial Streams ≤ 7.0 square mile watersheds*.

3) Perennial Streams (greater than 3.0 square mile watersheds) are those tributaries located in medium to large catchments that, under the range of normal climatic conditions, exhibit continuous base flow throughout the year. In the Outer Coastal Plain (Level III Ecoregion 75), this stream credit type is calibrated to *Perennial Streams greater than 7.0 square mile watersheds*.

5.4. Open Waters, Ditches, and Canals: For features whose only function is to move water from one point to another and that function is not adversely impacted, compensation is generally not required. However, the Open Waters, Ditches, and Canals Classification is provided to address regulated impacts that adversely affect functions performed by these aquatic resources. For the purposes of this SOP, impacts to Open Waters, Ditches, and Canals may be assessed as an impaired wetland and/or stream credit type on a case-by-case basis, in consultation with the Savannah District.

5.5. Out-Of-Kind Replacement: The use of out-of-kind compensatory mitigation is detailed in the Guidelines for Mitigation Selection, which are provide separately in Appendix 11.1. If in-kind replacement is unavailable at the time compensation is required, the Savannah District will determine if another resource credit type is appropriate. However, stream credit types will not be approved for the compensation of wetland impacts, and wetlands credit types will not be approved for the compensation of stream impacts, and tidal wetland credit types cannot be used for non-tidal wetland impacts.

5.6. Legacy Credits: The Savannah District mitigation program has historically operated using two (2) generic credit types: stream credits and wetland credits. Since promulgation of the 2008 Rule, the Savannah District has recognized the need to diversify mitigation credit types based on aquatic resource classification to ensure compensatory mitigation is providing in-kind functional replacement. In the sections above, we define new mitigation credit types based on aquatic resource classifications to assist in no net loss of in-kind aquatic resources. However, there are large inventories of existing mitigation credits currently available for sale in the mitigation marketplace in Georgia. As a result, the Savannah District has developed the following guidelines regarding the applicability of these credits as compensation for aquatic resource impacts.

All existing, generic credits that have been authorized as part of an approved mitigation instrument (i.e., mitigation bank instruments and/or In-Lieu-Fee mitigation projects) that precede the effective date of the SOP, Version 1.0 (dated April 27, 2018) are considered "legacy" credits. Any legacy credits proposed as compensatory mitigation will continue to provide valid, in-kind compensation (e.g., legacy wetland credits for slope wetland impacts) and be sold in accordance with the terms and conditions associated with the approved mitigation instrument and any applicable instrument modifications.

The only exception to this legacy credit status will be for Saltwater and Freshwater Tidal Wetland credits in coastal areas (see Section 5.6.1 below). Once the required credits are calculated using the SOP, an equivalent number of legacy wetland credits will be determined through the application of a conversion factor. The conversion factor has been set to eight (8) credits per acre for wetland adverse impacts, and twelve (12) credits per linear foot for stream adverse impacts. These conversion factors are based on the results of research on compensatory mitigation in Georgia conducted by the University of Georgia, River Basin Center[8] and the Savannah District's internal review of the adverse impact and restoration/enhancement mitigation factors in the Wetland and Open Waters Worksheets of the 2004 SOP.

5.6.1. Legacy Wetland Credits in Coastal Areas: Legacy wetland credits servicing any portion of Georgia's eleven coastal counties (Brantley, Bryan, Camden, Charlton, Chatham, Effingham, Glynn, Liberty, Long, McIntosh, and Wayne) shall be considered out-of-kind for impacts to Saltwater and Freshwater Tidal Wetlands. Exceptions will be granted if legacy credits were generated from Saltwater Tidal Wetland or Freshwater Tidal Wetland areas that meet the respective resource definitions outlined in this SOP, or a provision in the approved banking instrument for a bank where legacy credits were generated, establishes intent to compensate for Saltwater or Freshwater Tidal Wetland impacts.

6.0. AQUATIC RESOURCE ASSESSMENTS FOR ADVERSE IMPACTS

6.1. Qualitative Resource Assessments for Adverse Impacts: The Savannah District has developed qualitative assessments to establish the existing qualitative functional capacity score of wetlands and streams proposed for all permitted impacts (including General and Standard Permits). For each of the following qualitative assessments, the Savannah District developed a dichotomous questionnaire (i.e., Yes/No) to categorize the function/condition of a wetland or stream. These responses are then converted into a categorical score (i.e., High, Moderate, Low) for each of the

[8] University of Georgia, River Basin Center. 2017. "No Net Loss In The U.S. Army Corps Savannah District,"

functions listed below. Each of the questions related to a function is equally weighted in the assessment, as is each of the functions. The following qualitative assessment methodologies will be utilized to establish the existing function/condition score:

6.1.1. Non-Tidal Freshwater Wetland Qualitative Assessment: The framework of the wetland qualitative assessment is based on the functions outlined in "A Regional Guidebook for Applying the Hydrogeomorphic Approach to Assessing Wetland Functions of Forested Wetlands in Alluvial Valleys of the Coastal Plain of the Southeastern United States" (Wilder et al., 2013). Specifically, this qualitative assessment focuses on the following list of resource functions: 1) Water Storage; 2) Biogeochemical Transformation; 3) Maintain Wetland Vegetative Community; and 4) Maintain Wetland Faunal Community. The total Non-tidal Freshwater Wetland Qualitative Functional Capacity Score is a result of the following basic composite functional attribute score combinations:

- "High" (H) function (e.g., H-H-H-H; H-H-H-M; H-H-H-L; H-H-M-M);
- "Moderate" (M) function (e.g., H-H-L-L; H-M-M-M; M-M-M-M; M-M-M-L; M-M-L-L);
- "Low" (L) function (e.g., H-L-L-L, M-L-L-L; L-L-L-L).

The Non-tidal Freshwater Wetland Qualitative Functional Capacity Score is then utilized in the Qualitative Workbook for Wetland Adverse Impacts. See description below in Section 7.1.1 to determine the mitigation requirement for a given wetland impact. Refer to Appendix 11.6 for the Non-tidal Freshwater Wetland Qualitative Assessment Workbook (included separately).

6.1.2. Tidal Freshwater Wetland Qualitative Assessment: The framework of the Tidal Freshwater Wetland Qualitative Assessment is based on the functions outlined in "A Regional Guidebook for Applying the Hydrogeomorphic Approach to Assessing Wetland Functions of Forested Wetlands in Alluvial Valleys of the Coastal Plain of the Southeastern United States" (Wilder et al., 2013). Specifically, this qualitative assessment focuses on the following list of resource functions: 1) Water Storage; 2) Biogeochemical Transformation; 3) Maintain Wetland Vegetative Community; and 4) Maintain Wetland Faunal Community. The total Tidal Freshwater Wetland Qualitative Functional Capacity Score is a result of the following basic composite functional attribute score combinations:

- "High" (H) function (e.g., H-H-H-H; H-H-H-M; H-H-H-L; H-H-M-M);
- "Moderate" (M) function (e.g., H-H-L-L; H-M-M-M; M-M-M-M; M-M-M-L; M-M-L-L);

- "Low" (L) function (e.g., H-L-L-L, M-L-L-L; L-L-L-L).

The Tidal Freshwater Wetland Qualitative Functional Capacity Score is then utilized in the Qualitative Workbook for Wetland Adverse Impacts. See description below in Section 7.1.1 to determine the mitigation requirement for a given wetland impact. Refer to Appendix 11.7 for the Tidal Freshwater Wetland Qualitative Assessment Workbook (included separately).

6.1.3. Tidal Saltwater Wetland Qualitative Assessment: The framework of the Tidal Saltwater Wetland Qualitative Assessment is based on the functions outlined in "A Regional Guidebook for Applying the Hydrogeomorphic Approach to Assessing the Functions of Tidal Fringe Wetlands Along the Mississippi and Alabama Gulf Coast" (Shafer et al., 2007). Specifically, this qualitative assessment focuses on the following list of resource functions: 1) Wave Energy Attenuation; 2) Biogeochemical Cycling; 3) Nekton Habitat Utilization; 4) Marsh-Dependent Wildlife Habitat; and 5) Plant Community Structure and Composition. The total Tidal Saltwater Wetland Qualitative Functional Capacity Score is a result of the following basic composite functional attribute score combinations:

- "High" function (e.g., H-H-H-H-H; H-H-H-H-M; H-H-H-H-L; H-H-H-M-M);
- "Moderate" function (e.g., H-H-H-L-L; H-H-M-M-M; H-H-L-L-L; H-M-M-M-M; M-M-M-M-M; M-M-M-M-L; M-M-M-L-L);
- "Low" function (e.g., H-L-L-L-L, M-M-L-L-L; M-L-L-L-L; L-L-L-L-L).

The Tidal Saltwater Wetland Qualitative Functional Capacity Score is then utilized within the Qualitative Workbook for Wetland Adverse Impacts. See equation below in Section 7.2.1 to determine the mitigation requirement for a given wetland impact. Refer to Appendix 11.8 for the Tidal Saltwater Wetland Qualitative Assessment Workbook (included separately).

6.1.4. Non-Tidal Stream Qualitative Assessment: The framework of the Non-tidal Stream Qualitative Assessment is based upon the functions outlined by Fischenich (2006), "Functional Objectives for Stream Restoration", and Harman et al. (2012), "A Function-Based Framework for Stream Assessment and Restoration Projects". Specifically, this qualitative assessment focuses on the following list of resource functions: 1) Hydrology; 2) Hydraulics; 3) Geomorphology; 4) Physio-chemistry; and 5) Biology. The total Non-tidal Stream Qualitative Functional Capacity Score is a result of the following basic composite functional attribute score combinations:

- "High" function (e.g., H-H-H-H-H; H-H-H-H-M; H-H-H-H-L; H-H-H-M-M);

- "Moderate" function (e.g., H-H-H-L-L; H-H-M-M-M; H-H-L-L-L; H-M-M-M-M; M-M-M-M-M; M-M-M-M-L; M-M-M-L-L);
- "Low" function (e.g., H-L-L-L-L, M-M-L-L-L; M-L-L-L-L; L-L-L-L-L).

This Stream Qualitative Functional Capacity Score is then utilized within the Qualitative Workbook for Stream Adverse Impacts. See description below in Section 7.2.2 to determine the mitigation requirement for a given stream impact. Refer to Appendix 11.9 for the Non-tidal Stream Qualitative Assessment Workbook (included separately).

6.2. Quantitative Resource Assessments For Adverse Impacts: The District Engineer (DE), and/or his/her designee, may utilize quantitative functional assessments (e.g., Georgia HGMs, Georgia SQT,) to determine the appropriate amount of compensatory mitigation for a given impact, at his/her discretion. If the use of a quantitative functional assessments is not initiated by the DE or their designee, then applicants will use a qualitative assessment (described above in Sections 6.1.1 through 6.1.3) to determine the type and amount of compensatory mitigation required for a project impact.

7.0. ADVERSE IMPACT CALCULATIONS

7.1. Adverse Impact Workbook Definitions: Key terms applicable to the Wetland and Stream Qualitative Adverse Impacts Workbook are defined below. The workbooks are intended to support clear and consistent methodologies for impact credit calculations. Each workbook has been developed with drop-down lists, text hover tips, and input validation rules to assist the user with the completion of the adverse impact calculation.

Clearing and Grubbing is defined as a mechanized land clearing practice in which natural vegetation (i.e., trees, shrubs/sapling, woody vines, and herbs), roots, and woody debris are removed from the wetland. This activity also includes the displacement of surface soil horizons within the wetland associated with the use of a **root rake, bulldozer, or similar device used to remove rooted vegetation**.

Conversion of Kind is defined as converting tidal wetlands to non-tidal wetlands, or non-tidal wetlands to tidal wetlands, when the conversion is directly associated with a discharge of dredge and/or fill material (e.g., converting Saltwater Tidal Wetlands to freshwater wetlands by installing a tide gate).

Dewatering (Stream and Pump Diversions) – Short-term/Temporary is defined as the alteration of stream flows from the existing channel for the purposes of constructing a structure (e.g., culvert) in the stream bed and/or banks. Dewatering shall only be used for temporary or short-term durations (e.g., less than or equal to 90 days, less than 1 year). As a general rule, mitigation will be required for dewatering of streams, where the alteration of stream flows meets or exceeds 60 days. Diversions may include the construction of coffer dams (and bypass pumps), piped diversions, or the construction of impervious lined temporary diversion channels. Dewatering for greater than or equal to 1 year is considered a permanent loss of stream function and thus does not qualify under this impact type.

Duration refers to the temporal loss of wetland/stream functions associated with length of time during which an impact (primary or secondary impact) persists. The categories for the duration factor are as follows: 1) **Permanent/Reoccurring**[9] is defined as persisting greater than or equal to one year (i.e., 365 days); 2) **Short-Term – Less than 1 Year** is defined as persisting less than one year (i.e., less than 365 days, but greater than 90 days); 3) **Temporary – Less than (or equal to) 90 days** is defined as persisting 90 days or less.

Hydrologic Alteration - Drain is defined as an impairment which results in the reduction of the hydro-period of a wetland, when associated with a discharge of dredge or fill material. This factor includes extensively changing the duration, degree, and/or frequency of the wetland's hydroperiod.

Hydrologic Alteration - Impound is defined as the detention or retention of surface hydrology in a wetland and/or stream through the construction of a dam, weir, levee, or other man-made structure or activity.

Primary Adverse Impacts refers to the list of impact categories that are associated with the adverse modification of wetlands, streams, and/or open waters. Specifically, primary impacts are those impacts that are associated with discharge of dredged or fill material as regulated under Section 404 of the CWA. The list of Primary Adverse Impacts for Wetlands includes the following: 1) Discharge of Dredge Material; 2) Discharge of Fill; and, 3) Clearing and Grubbing. The list of Primary Adverse Impacts for Streams includes the following: 1) Discharge of Fill (including culverts); and 2) Primary Morphological Change.

Primary Morphological Alteration is defined as the hardening of the banks of the stream (either one or both), and/or the construction of perpendicular at-grade rock fords across the stream bed. Examples of hard engineering include placement of rip-rap,

[9] The temporal assessment of reoccurring impacts is not limited to consecutive days.

gabions, concrete structures, sheet-piles, or other hardening structures below the ordinary high water mark along the banks or bed of the stream. This does not include constructed riffles or instream structures incorporated as bed form and grade control features in natural channel restoration designs intended to improve aquatic resource function.

Secondary Adverse Impacts refers to the list of impact categories that are associated with the adverse modification of wetlands, streams, and/or open waters, which result from a discharge of dredged or fill material as regulated under Section 404 of the CWA. In accordance with the National Environmental Policy Act, the Savannah District will assess all reasonably foreseeable impacts to waters of the United States which fall within the Federal Scope of Analysis for a Section 404 Permit. The list of Secondary Adverse Impacts for Wetlands includes the following: 1) Hydrologic Alteration – Drain; 2) Hydrologic Alteration – Impound; 3) Conversion of Kind; and, 4) Vegetative Conversion. The list of Secondary Adverse Impacts for Streams includes the following: 1) Hydrologic Alteration - Impound; and 2) Secondary Morphological Alteration.

Secondary Morphological Alteration is defined as a reasonably foreseeable, functionally adverse change in the stream bed and/or banks as a result of an upstream or downstream primary adverse impact. Secondary morphological alterations may include changes in the stream bed and/or banks that result in losses of longitudinal habitat diversity (e.g., filling of pools, headcut migration through riffles), losses of the existing percentages of aquatic habitat (e.g., % of riffles and pools), loss of stream bank stability, and loss of floodplain connectivity (e.g., increased Bank Height Ratio and/or decreased Entrenchment Ratio).

Stream Qualitative Functional Capacity Score (SQFC Score) refers to the existing, pre-impact stream function score, as determined using the Stream Qualitative Assessment Workbook.

Stream Qualitative Functional Capacity Impact (SQFC Impact) refers to the product of the SQFC score and Type of Impact, as determined using the Qualitative Workbook for Stream Adverse Impacts.

Total Stream Qualitative Functional Capacity Impact (Total SQFC Impact) refers to the product of the SQFC Impact and Duration, as determined using the Qualitative Workbook for Stream Adverse Impacts.

Total Wetland Qualitative Functional Capacity Impact (Total WQFC Impact) refers to the product of the Wetland Qualitative Function Capacity Impact and Duration, as determined using the Qualitative Workbook for Wetland Adverse Impacts.

Impact Category refers to the characterization of the impact. Specifically, the impact will be categorized as either a primary adverse impact or secondary adverse impact.

Vegetative Conversion is defined as associated clearing of the natural, forested vegetative community within a wetland, in conjunction with but outside of the limits of a discharge of dredge or fill material. This activity is limited to cutting vegetation at an elevation above the soil surface within wetlands, and does not include soil displacement (i.e., grubbing, and/or mechanized land clearing).

Wetland Qualitative Functional Capacity Score (WQFC Score) refers to the existing function score of a wetland prior to the impact, as determined using the Wetland Qualitative Assessment Workbook.

Wetland Qualitative Functional Capacity Impact (WQFC Impact) refers to the product of the Wetland Qualitative Function Capacity Score and Type of Impact, as determined using the Qualitative Workbook for Wetland Adverse Impacts.

7.2. Qualitative Workbook for Adverse Impacts: The Qualitative Workbook for Adverse Impacts utilizes the following factors: 1) Type of Impact; and, 2) Duration of Impact. For each of these factors, the Savannah District developed a series of index values, on a 0.00 to 1.00 scale, to quantify the functional/conditional loss of the aquatic resources. In order to determine mitigation credits required, the Qualitative Workbooks for Wetland and Stream Adverse Impacts (please refer to Appendices 11.10 and 11.11, included separately) are calculated as follows:

7.2.1. Equations for Qualitative Workbook for Wetland Adverse Impacts:

a. <u>Equation 1</u>: (WQFC Score)(Type of Impact) = WQFC Impact

b. <u>Equation 2</u>: (WQFC Impact)(Duration) = Total WQFC Impact

c. <u>Equation 3</u>: (Total WQFC Impact)(Acres) = Total Wetland Credits Owed

7.2.2. Equations for Qualitative Workbook for Stream Adverse Impacts:

a. <u>Equation 1</u>: (SQFC Score)(Type of Impact) = SCFC Impact

b. Equation 2: (SQFC Impact)(Duration of Impact) = Total SQFC Impact

c. Equation 3: (Total SQFC Impact)(Linear Feet) = Total Stream Credits Owed[10,11]

8.0. MITIGATION ACTION CALCULATIONS

8.1. Quantitative Mitigation Assessments: Quantitative mitigation assessment methodologies are required to establish baseline functions for wetland and/or stream resources associated with mitigation projects. Quantitative assessment methodologies will be utilized to establish both the existing and proposed functional scores for each of the following aquatic resource types:

8.1.1. Georgia Non-Tidal Forested Freshwater Wetland Hydrogeomorphic Methodology (GA HGM): For the assessment of all freshwater forested wetland resources proposed for mitigation credit generation, mitigation sponsors will utilize the GA HGM to establish baseline conditions, estimate the proposed conditions, and verify that the proposed conditions have been achieved. The GA HGM was developed through the selection of function-based parameters as outlined in Wilder et al. (2013). All parameters were selected based upon their anticipated sensitivity to a measurable net lift of functions resulting from restoration/enhancement actions as documented during the monitoring period. In addition to the parameters selected from Wilder et al. (2013), a soil saturation threshold parameter was developed to assess wetland hydrologic functions. The list of parameters selected as part of the GA HGM has been provided in Table 1. As a guiding principle for this assessment methodology, wetland credit generation associated with restoration or enhancement actions will be based on a calculation of the proposed net functional lift from baseline, existing conditions. As a matter of practice, the Savannah District does not generally support the establishment or creation of wetland treatments on sites or in a landscape position lacking suitable conditions of existing hydric soils or natural wetland hydrodynamics. Refer to Appendices 11.12. and 11.13. for GA HGM Workbook and User Manual, included separately.

8.1.2. Georgia Wetland Pine Flats Hydrogeomorphic Methodology (GA Wet Pine Flats HGM): For the assessment of all wet pine flat wetland resources proposed for mitigation

---

[10] *If the impact incurred is to a Non-Perennial Stream with ephemeral flow, the Total 2018 Stream Credits Owed are prorated to 50 percent.*

[11] *If the impact incurred is to a Non-Perennial Stream with intermittent or ephemeral flow, the Total Legacy Stream Credits Owed are prorated to 60 percent.*

credit generation, mitigation sponsors will utilize the GA Wet Pine Flats HGM, to establish baseline conditions, estimate the proposed conditions, and verify that the proposed conditions have been achieved. The GA Wet Pine Flats HGM was developed through the selection of function-based parameters as informed by Rheinhardt et al. (2002). All parameters were selected based upon their anticipated sensitivity to a measurable net lift of functions resulting from restoration/enhancement actions as documented during the monitoring period. In addition to the parameters selected from Rheinhardt et al. (2002), a soil saturation threshold parameter was developed to assess wetland hydrologic functions. The list of parameters selected as part of the methodology has been provided in Table 2 of the GA Wet Pine Flats HGM. As a guiding principle for this assessment methodology, wetland credit generation associated with restoration or enhancement actions will be based on a calculation of the proposed net functional lift from baseline, existing conditions. Refer to Appendices 11.14. and 11.15. for GA Wet Pine Flats HGM Workbook and User Manual, included separately.

8.1.3. Georgia Tidal Wetland Hydrogeomorphic Methodology (GA Tidal HGM): This assessment methodology is currently in development. Appendices 11.16. and 11.17. are reserved for the GA Tidal Wetland HGM Workbook and User Manual.

8.1.4. Georgia Stream Quantification Tool (GA SQT): For the assessment of all stream resources proposed for mitigation credit generation, mitigation sponsors will utilize the GA SQT to establish baseline conditions, estimate the proposed conditions, and verify that the proposed conditions have been achieved. The GA SQT was developed through the selection of function-based parameters as outlined in the Tennessee Stream Quantification Tool (TDEC, 2017), North Carolina Stream Quantification Tool (Harman et al., 2017), and Wyoming Stream Quantification Tool (USACE, 2017). All parameters were selected based upon their anticipated sensitivity to a measurable net lift of functions resulting from restoration/enhancement actions as documented during the monitoring period. In addition to the parameters selected from Tennessee Stream Quantification Tool, a series of macro-invertebrate parameters was developed to assess stream biological functions. The list of parameters selected as part of the GA SQT has been provided in Table 3. As a guiding principle for this assessment methodology, stream credit generation associated with restoration or enhancement actions will be based on a calculation of the net functional lift from baseline conditions. As a matter of practice, while the Savannah District emphasizes projects that incorporate existing headwaters, it does not generally support the restoration of in-stream function for non-perennial streams with less than intermittent hydrologic permanence. Refer to Appendices 11.18 and 11.19 for the GA SQT Workbook and Georgia SQT User Manual & Scientific Support, included separately.

Table 1. Selected Function-Based Parameters for the GA HGM

Functional Category	Function-Based Parameters	Measurement Method
Hydrology/Water Storage	Soil Saturation	Water Table Measurements (measurements every 8 hours)
Maintain Vegetative Community	Wetland Vegetation Composition	Vegetative Plots
	Wetland Vegetation Structure	Vegetative Plots
Biogeochemical Transformation/Maintain Faunal Habitat	Upland Buffers	Buffer Width and % Perimeter

Table 2. Selected Function-Based Parameters for the GA Wet Pine Flats HGM

Functional Category	Function-Based Parameters	Measurement Method
Hydrology/Water Storage	Soil Saturation	Water Table Measurements (measurements every 8 hours)
Maintain Vegetative Community	Total Groundcover Taxa Richness	Vegetative Plots
	Indicator Species Taxa Richness	Vegetative Plots
	Percent Cover of Bunchgrasses & Rhynchospera	Vegetative Plots
	Percent Groundcover of Woody Taxa	Vegetative Plots
Biogeochemical Transformation/Maintain Faunal Habitat	Upland Buffers	Buffer Width and % Perimeter

Table 3. Selected Function-Based Parameters for the GA SQT

Functional Category	Function-Based Parameters	Measurement Method
Hydraulics	Floodplain Connectivity	Bank Height Ratio
		Entrenchment Ratio
Geomorphology	Riparian Vegetation[12]	Left Buffer Width (ft.)
		Right Buffer Width (ft.)
	Bed Form Characterization	Pool Spacing Ratio
		Percent Riffle
		LWD Index
Biology	Macros	Varies dependent upon the Level III and IV Eco-Region of the reach. Measurement methods can range from four to five total metrics. These metrics can include the assessment of EPT, burrowers, clingers, filterers-collectors, shredders, swimmers, and general taxa richness.

8.2. Preservation: If wetlands and/or streams are proposed for preservation, those resources must meet the preservation criteria outlined in the Rule. All proposed wetland and stream preservation must be supported with a Quantitative Mitigation Assessment to establish the existing functional capacity score. Generally, all preservation resources will need to achieve a "fully" functional score (i.e., greater than or equal to 0.70) at the assessment of existing conditions. If the Savannah District determines the proposed preservation resource to be appropriate as mitigation, the mitigation credit for that resource will be limited to no more than 20 percent of the total potential functional capacity score. Further, preservation may not comprise greater than 50% of the credit generation associated with a compensatory mitigation plan and must integrally augment the functional improvements to be achieved through active mitigation treatments. For commercial mitigation projects that propose greater than 50% of preservation, the instrument/plan will be conditioned limiting credit sales to no more than 50% of the total required compensatory mitigation for any given permitted impact.

[12] Additional SQT measurement methods are in development to assess the functional capacity of the riparian buffers, in addition to the status of real property protections. Users should refer to the current version of the SQT User Manual and Scientific Support Document for more information.

9.0 INSTRUMENT AND MITIGATION PLAN MODIFICATIONS

The Savannah District will consider requests for modification of approved banking instruments and ILF mitigation plans no later than the interim performance milestone. The District may consider modifications after this milestone on a case-by-case basis. Pursuant to 33 CFR Part 332.8(g), the District reserves the authority to limit the scope of modifications for eligibility for processing under the streamlined review process (including adaptive management, credit release amounts, and credit release schedules). All other modification requests will be evaluated under the standard modification process, which may require the approved instrument to be revised such that it is compliant with the District guidance in place at the time of the request.

10.0 SUPPORTING DOCUMENTATION

Each respective Adverse Impact and Mitigation Action workbook (e.g., HGM, SQT) must also be supported with the following information: 1) appropriate identification of the project location (vicinity and location maps); 2) a scaled figure defining the full extent of the subject aquatic resource impacts and/or mitigation activities on the project site; and 3) a copy of the completed assessment form, including the associated field assessments and raw data used to calculate the functional capacity (for both impacts and mitigation) of the aquatic resource. At the discretion of the Savannah District, additional documentation and/or site investigations associated with any wetland and/or stream adverse impact and/or mitigation assessment may be requested on a case-by-case basis.

11.0 LITERATURE REFERENCES

Brinson, M. M. 1993. A hydrogeomorphic classification for wetlands. Technical Report WRP-DE-4. US Army Corps of Engineers, Waterways Experiment Station, Vicksburg, MS.

Fischenich, J. C. 2006. Functional Objectives for Stream Restoration. Ecosystem Management and Restoration Research Program Report EMRRP-SR-52. U.S. Army Engineers Research and Development Center, Vicksburg, MS.

Griffith, G.E., Omernik, J.M., Comstock, J.A., Lawrence, S., Martin, G., Goddard, A., Hulcher, V.J., and Foster, T., 2001, Ecoregions of Alabama and Georgia, (color poster with map, descriptive text, summary tables, and photographs): Reston, Virginia, U.S. Geological Survey (map scale 1:1,700,000).

Harman, W., Starr, R., Carter, M., Tweedy, K., Suggs, K., and Miller, C. 2012. A Function-Based Framework for Stream Assessment and Restoration Projects. US Environmental Protection Agency, Office of Wetlands, Oceans, and Watersheds, Washington, D.C., EPA 843-K-12-006.

Harman, W.A. and C.J. Jones. 2017. North Carolina Stream Quantification Tool: Data Collection and Analysis Manual, NC SQT v3.0. Environmental Defense Fund, Raleigh, NC.

Hill, K., Skaggs, J.W., Jones, H., and Elkins, D. 2017. No Net Loss In The U.S. Army Corps Savannah District. University of Georgia, River Basin Center, Athens, GA.
Rheinhardt, R.D., Rheinhardt, M.C., and Brinson, M.M. 2002. "A regional guidebook for applying the hydrogeomorphic approach to assessing wetland functions of wet pine flats on mineral soils in the Atlantic and Gulf coastal plains," ERDC/EL TR-02-9, U.S. Army Engineer Research and Development Center, Vicksburg, MS.Shafer, D. J., Roberts T. H., Peterson, M. S., and Schmid, K. 2007. A Regional Guidebook for Applying the Hydrogeomorphic Approach to Assessing the Functions of Tidal Fringe Wetlands Along the Mississippi and Alabama Gulf Coast, ERDC/EL TR-07-2. U.S. Army Engineer Research and Development Center, Vicksburg, MS.

Smith, R. D., Ammann, A., Bartoldus, C., and Brinson, M. M. (1995). An approach for assessing wetland functions using hydrogeomorphic classification, reference wetlands, and functional indices. Technical Report WRP-DE-9. U.S. Army Engineers, Waterways Experiment Station, Vicksburg, MS.

Strahler, A. N., 1952. Hypsometric (area-altitude) analysis of erosional topography. Bulletin Geological Society of America. 63: 1117-1142.

TDEC. 2017. Tennessee Stream Quantification Tool: Data Collection and Analysis Manual, TN SQT v1.0. Tennessee Department of Environment and Conservation, Nashville, TN.

Wilder, T. C., Rheinhardt, R. D. and Noble, C. V. 2013. A regional guidebook for applying the Hydrogeomorphic Approach to assessing wetland functions of forested wetlands in alluvial valleys of the coastal Plain of the southeastern United States. Technical Report ERDC/EL TR-13-1. U.S. Army Engineer Research and Development Center, Vicksburg, MS.

U.S. Army Corps of Engineers. 2017. Wyoming Stream Quantification Tool (WSQT) User Manual and Spreadsheet. Beta Version.

U.S. Environmental Protection Agency and U.S. Army Corps of Engineers. 2008. Wetlands Compensatory Mitigation Rule Factsheet.

U.S. Environmental Protection Agency. Ecoregion Download Files by State - Region 4. Georgia Ecoregion Descriptions. https://www.epa.gov/eco-research/ecoregion-download-files-state-region-4. Accessed: 08/18/2025.