



U.S. Army Corps
of Engineers
St. Paul District

U.S. Army Corps of Engineers, St. Paul District Regulatory Branch
and
Minnesota Board of Water and Soil Resources



**Joint Guidance for Developing Mitigation Plan
Performance Standards and Credit Release Schedules in
Minnesota**

December 15, 2015

This document provides guidance on developing performance standards and credit release schedules for compensatory mitigation proposals in Minnesota. Performance standards and an associated credit release schedule are requirements of a complete Mitigation Plan (Plan) under both Federal (33 CRF Part 332.4(c)/40 CFR 230.94(c)) and State (MN Rule 8420.0705) rules. This is a suggested framework for developing performance standards and credit release schedules.

Section 1. Performance Standards

1.1 Developing Performance Standards

Performance standards are observable or measurable attributes used to determine if mitigation projects meet their functional objectives and goals in relation to a baseline condition. As such, performance standards may vary by project depending on the functional goals of the project and baseline conditions. Additionally, there may be different attributes to measure depending on the type and location of mitigation project being proposed. Performance standards should be clear, measurable and specific enough to evaluate site progress and success. The following sequential process should be followed in developing performance standards:

1. Determine and establish baseline conditions of the project site.
2. Determine functional objectives of the project (i.e., which wetland functions will improve as a result of proposed project actions).
3. Identify attributes to measure that are reflective of achieving functional objectives (vegetation, hydrology, water quality, biota, etc.).
4. Identify specific thresholds that equate to achievement of functional goals (% cover, number of species, etc.).

1.2 Identifying Attributes to Measure

Vegetation and hydrology are typically the attributes used as the basis for wetland mitigation performance standards in Minnesota. Although other attributes reflective of functional project goals can be proposed, it is important that they have all of the following characteristics:

- Can be objectively measured using standard, repeatable methodology;
- Can be expected to change within the typical monitoring period for wetland mitigation projects (5-10 years), demonstrating a trend towards success and sustainability; and
- Can be practicably measured (by general natural resource professionals, using reasonably available equipment and technology).

1.3 Identifying Specific Thresholds for Performance

Performance standards need to be identified that represent measurable changes in wetland function as compared to baseline conditions onsite. The ideal method for determining adequate performance standards for a particular project is to consider characteristics of a high functioning reference site of similar aquatic resource type, vegetation, soils, and landscape position. Ideally, only natural, undisturbed wetlands of high ecological integrity would serve as reference sites as they provide a context for what is achievable and can be expected in terms of functional outcomes. However, other conditions may affect what can be achieved and performance standards should be developed when necessary to reflect what can be practicably achieved. For example, a mitigation project in a highly altered watershed with significant ecological stressors may not be capable of exhibiting the range and level of wetland functions exhibited in a reference wetland within a less altered watershed. As such, some performance standards that reflect the reference wetland condition may not be appropriate as they are not achievable given the circumstances at the proposed mitigation site. Performance standards based on measurements of hydrology and vegetation should take into consideration the variability exhibited by appropriate reference sites by being flexible and adaptive to anticipated site characteristics. An area targeted for compensatory mitigation may utilize one reference wetland or characteristics from a group of reference wetlands.

Established and mature or maturing plant communities generally reflect established hydrologic site conditions and thus are important in determining overall project success at the end of the monitoring period. Therefore, plant community composition and structure can be used as a surrogate for estimating various wetland functions. However, following initial restoration activities, plant communities will often develop gradually and be reflective of more immediate short-term hydrologic conditions and management activities. Therefore, initial performance measures should rely more heavily on hydrology in conjunction with interim vegetation measures.

Typical vegetation measurements used for performance standards are as follows:

- percent absolute cover¹ of bare ground/open water
- percent relative cover² of native, non-invasive species (NNI)
- percent relative cover by non-native, invasive species³ (I)
- percent relative cover by hydrophytes (in wetland communities only)
- plant species richness

¹ Absolute cover: Total vegetative areal cover (by a species, group of species or sum of all species present).

² Relative cover: The absolute cover of a species, group of species or sum of all species as a percentage of the sum total absolute cover. E.g., if the absolute cover by NNI is 90% and the sum total absolute cover in a plot is 120%, then the relative cover by NNI is $90\%/120\% \times 100\% = 75\%$.

³ Refer to the most current Minnesota Department of Natural Resources' Native Plant List.

Proposed shrub dominated and forested communities typically include interim standards for 1) survival of planted stock and 2) vegetative areal cover and/or number of live stems/acre by woody species as well as final standards for 1) vegetative areal cover and/or 2) number of live stems/acre by woody species. Other vegetation assessment measures such as the Floristic Quality Assessment values and Minnesota County Biological Survey biodiversity significance rankings can be used if adequately justified. Otherwise, the above vegetation measurements are generally expected to be a part of performance standards for most Plans.

Hydrology performance standards must be developed for each wetland community. This could involve the collection of onsite hydrology data, correlated to approved wetland reference sites.

Individual performance standards must be developed for each wetland and upland vegetative community type where credit is proposed. They must also specify the number of full, consecutive growing seasons in which each performance standard must be met.

Section 2. Integrating Goals, Performance Standards, Monitoring and Credit Releases

The Plan should be a cohesive document showing the relationships among all aspects of the proposal. If an objective of the Plan is to improve a particular aquatic resource function of concern in the watershed, the performance standards must be reflective of the successful establishment or improvement of that particular function onsite. The project sponsor must describe how the standards are reflective of the project goals in the Plan. Likewise, it is essential that the project proponent clearly demonstrate the relationship between the performance standards, monitoring plan and credit release schedule. An acceptable performance standard without an appropriate methodology to monitor it will delay approval. No two sites are exactly the same and performance standards will vary to some extent from site to site. Therefore, what is acceptable and approved on one site will not necessarily be acceptable on another site. To assist the agencies in reviewing these proposals, include a detailed rationale so the agencies can consider the merits of the proposal.

Section 3. Credit Release Schedules

Credits are the currency of compensatory mitigation. Wetland credits generated on a site are generally released over a period of time as performance standards are achieved and monitoring shows a trend towards long-term success and sustainability onsite. There are some exceptions such as preservation projects and some extended restoration agricultural banking projects in Minnesota. Each Plan must include a credit release schedule that is tied to performance standards. In Minnesota, rather than releasing credits upon bank approval and securing a financial assurance, credits are typically withheld until compensatory mitigation sites are protected by a conservation easement, initial construction activities are completed and as-built surveys are approved. This process minimizes the need for financial assurances because credits are released based on actions taken rather than projected future actions.

For most projects in Minnesota, the initial credit release is 15% of the expected credit total for the project. This release occurs after the necessary protective conservation easements are recorded and initial construction activities are completed and inspected by the approving agencies. Subsequent releases (interim releases) prior to the final release are based on meeting specified performance standards as reflected in required monitoring reports. Final releases are based on meeting final specified performance standards in conjunction with a post-project wetland delineation report completed in accordance with the Corps of Engineers Wetland Delineation Manual (1987) and the applicable Regional Supplement.

A tiered approach to performance standards and credit release allows credits to be released concurrent with meeting performance standards, providing an incentive to sponsors to improve project outcomes to receive the early release of credits. A tiered approach typically involves setting four tiers of performance standards: an initial release, two interim standards and a final standard. Achievement of each performance standard results in a concurrent credit release, usually based on the percent of expected total credit for the project, apportioned by aquatic resource type. Table 1 provides an example of how performance standards and credit release schedules interact for a compensatory mitigation project.

Section 4. Agency Contacts

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Table 1: Credit Release Schedule Example

| Type of Compensation | Total Projected Acreage | Type of Wetland Credit | Credit Ratio | Final Projected Credits | Initial Release (15%) | Hydrology Performance Standards (release of additional 20% of total projected credits, excluding buffer) | Interim 1 Vegetation Performance Standards (release of additional 20% of total projected credits for wetland, 30% for buffer) | Interim 2 Vegetation Performance Standards (release of additional 20% of total projected credit for wetland, 30% buffer credit) | Final Vegetation Performance Standards & Approval of Final Wetland Delineation Report ⁴ (final release) |
|---|-------------------------|------------------------|--------------|-------------------------|-----------------------|--|---|---|--|
| Re-establishment/ Restoration of Completely Drained Wetland | 5.0 | Shrub-carr | 100% | 5.0000 | 0.7500 | 1.0000 | 1.0000 | 1.0000 | 1.2500 |
| Re-establishment/ Restoration of Completely Drained Wetland | 20.0 | Wet Meadow | 100% | 20.0000 | 3.0000 | 4.0000 | 4.0000 | 4.0000 | 5.0000 |
| Rehabilitation/ Restoration of Partially Drained Wetland | 5.0 | Hardwood Swamp | 50% | 2.5000 | 0.3750 | 0.5000 | 0.5000 | 0.5000 | 0.6250 |
| Upland Buffer (may not contribute to more than 25% of total bank credits) | 10.0 | Shrub-carr | 17% | 0.4250 | 0.0637 | 0.0000 | 0.1275 | 0.1275 | 0.1063 |
| | | Wet Meadow | 25% | 1.6500 | 0.2475 | 0.0000 | 0.4950 | 0.4950 | 0.4125 |
| | | Hardwood Swamp | 17% | 0.4250 | 0.0638 | 0.0000 | 0.1275 | 0.1275 | 0.1062 |
| Total | 40.0 | | | 30.0000 | 4.5 | 5.5000 | 6.2500 | 6.2500 | 7.5000 |

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| Initial Release (15% of total projected credits) | Approval of MBI/Plan, Conservation Easement Recorded, Approval of As-built plans, initial seeding completed |
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|--|--|
| Hydrology Performance Standards (release of additional 20% of total projected credits, excluding buffer) | Each PS met for ≥ 2 consecutive Growing Seasons to qualify for credit release |
| | Hardwood Swamp: <i>Insert Hydrology PS</i> |
| | Shrub-carr: <i>Insert Hydrology PS</i> |
| | Wet Meadow: <i>Insert Hydrology PS</i> |

| | |
|---|---|
| Interim 1 Vegetation Performance Standards (release of additional 20% of total projected credits for wetland, 30% for buffer) | Each PS met for ≥ 2 consecutive Growing Seasons to qualify for credit release |
| | Hardwood Swamp: $> \square\%$ survival of planted stock, or $> \square$ NNI tree seedlings/ac; $> \square\%$ cover by NNI species; $< \square\%$ cover by I; $> \square\%$ cover by hydrophytes |
| | Shrub-Carr: $\geq \square\%$ survival of planted stock, or $> \square$ NNI shrub seedlings/ac; $\geq \square\%$ cover by NNI species; $< \square\%$ cover by I; $> \square\%$ cover by hydrophytes; $\leq \square$ absolute cover bare ground |
| | Wet Meadow: $\geq \square\%$ cover by NNI; $< \square\%$ cover by I; $\geq \square$ NNI species; $> \square\%$ cover by hydrophytes; $\leq \square$ absolute cover bare ground |
| | Prairie Upland Buffer: $\geq \square\%$ cover by NNI; $< \square\%$ cover by I; $\geq \square$ NNI species; $\leq \square$ absolute cover bare ground |

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| Interim 2 Vegetation Performance Standards (release of additional 20% of total projected credit for wetland, 30% buffer credit) | Each PS met for ≥ 1 additional Growing Season to qualify for credit release |
| | Hardwood Swamp: $> \square\%$ cover by hydrophytic NNI tree species; $> \square\%$ cover by NNI in all strata (cumulatively); $< \square\%$ cover by I; $> \square$ NNI species; $> \square\%$ cover by hydrophytes |
| | Shrub-Carr: $\geq \square\%$ cover by NNI shrub species; $> \square\%$ cover by NNI in all strata (cumulatively); $< \square\%$ cover by I; $> \square$ NNI species; $> \square\%$ cover by hydrophytes; $\leq \square$ absolute cover bare ground |
| | Wet Meadow: $\geq \square\%$ cover by NNI; $< \square\%$ cover by I; $> \square$ NNI species; $> \square$ NNI dominants; $> \square\%$ cover by hydrophytes; $\leq \square$ absolute cover bare ground |
| | Prairie Upland Buffer: $\geq \square\%$ cover by NNI; $< \square\%$ cover by I; $\geq \square$ NNI species; $\leq \square$ absolute cover bare ground |

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|---|--|
| Final Vegetation Performance Standards (release of final 25% of total projected credit) | Approval of Final Wetland Delineation Report |
| | Each PS met for ≥ 1 additional Growing Season to qualify for credit release |
| | Hardwood Swamp: NNI hydrophytic tree species $> \square\%$ cover, or $> \square$ stems/ac with a basal diameter > 1 inch; $> \square\%$ cover by NNI in all strata (cumulatively); $< \square\%$ cover by I; $> \square$ NNI species; $> \square\%$ cover by hydrophytes |
| | Shrub-Carr: $\geq \square\%$ cover by NNI shrub species; $> \square\%$ cover by NNI in all strata (cumulatively); $< \square\%$ cover by I; $> \square$ NNI species; $> \square\%$ cover by hydrophytes; $\leq \square$ absolute cover bare ground |
| | Wet Meadow: $\geq \square\%$ cover by NNI; $< \square\%$ cover by I; $\geq \square$ NNI species; $\geq \square$ NNI dominants; $> \square\%$ cover by hydrophytes; $\leq \square$ absolute cover bare ground |
| | Prairie Upland Buffer: $\geq \square\%$ cover by NNI; $< \square\%$ cover by I; $\geq \square$ NNI species; $\leq \square$ absolute cover bare ground |

KEY: NNI = native, non-invasive species; I = non-native and/or invasive species; PS = performance standard

NOTES:

1. % cover refers to relative cover.
2. Dominant species determined by Dominance Test (“50/20 Rule”), Prevalence Index, or Hydrophytic Cover Index (for the latter, see Lichvar, R. and J. Gillrich. 2014. *Field Testing New Plot Designs and Methods for Determining Hydrophytic Vegetation During Wetland Delineations in the United States*. ERDC/CRREL TN-14-1).
3. This table may need to be modified during the monitoring period to address the development of unexpected community types or significant differences in extent of community types than anticipated.
4. The final release is dependent upon the resources meeting final performance standards and the results of the final wetland delineation. Therefore, the final release may or may not include release of the remainder of total projected credits.
5. When demonstrating that performance standards have been met for the minimum required full growing seasons, project proponents must put monitoring data and performance standards in the context of antecedent conditions onsite.