Attachment 12501.2-SPD - Instructions for Completing Mitigation Ratio-Setting Checklist. (See 12501-SPD for Revisions Sheet)

These instructions contain specific numeric adjustments (discrete, e.g., +1.0, or ranges, e.g., +0.25 to +4.0) that were determined by the PDT after assessing a variety of impact-mitigation scenarios and determining adjustments for each step that, in combination with other step adjustments, produce a reasonable range of final mitigation ratios. For steps where a range of adjustments is provided, PMs are directed to the attached examples for additional guidance. PMs **must** enter a separate justification for each adjustment within the checklist. PMs may deviate from the guidance provided herein if such deviations can be documented in the checklist with sufficient justification.

<table>
<tr><td>1</td><td colspan="4">Date: _____ Corps file no.: _____ Project Manager: _____

Impact site name: _____ ORM impact resource type: _____ Hydrology: _____
Cowardin or HGM type: _____ Impact area (acres): _____ Impact distance (linear feet): _____

For impact site name, multiple discrete (as entered in ORM) impacts are to be evaluated using multiple checklists; however, multiple impacts to one habitat type (Cowardin or HGM) could be lumped together to determine a mitigation ratio using one checklist. For each proposed impact to waters of the U.S., the project manager (PM) should consider each factor and, if applicable, document consideration in response column(s) using applicable procedures or guidelines. For mitigation proposals with multiple mitigation sites and/or types, see QMS procedure 12501 (section 7.3).</td></tr>
<tr><td></td><td></td><td>Column A:
Mitigation site name: _____
Mitigation type: _____
Resource type: _____
Cowardin/HGM type: _____
Hydrology: _____</td><td>Column B (optional):
Mitigation site name: _____
Mitigation type: _____
Resource type: _____
Cowardin/HGM type: _____
Hydrology: _____</td><td>Column C (optional):
Mitigation site name: _____
Mitigation type: _____
Resource type: _____
Cowardin/HGM type: _____
Hydrology: _____</td></tr>
</table>

2.a	**QUALITATIVE impact-mitigation comparison**: For preservation, complete step 2.c and 3. For other mitigation methods, has a Corps-approved functional/condition assessment been obtained? If not, complete step 2.a*; otherwise, complete step 2.b. Yes ☐ No ☐ *Optional: use Table 2 (below). Qualitative assessment of functional loss at the impact site versus expected functional gain at the mitigation site may warrant a lower or higher mitigation ratio. Using the list of functions below, compare impact (functional loss) and proposed mitigation (functional gain) at impact (I) and mitigation (M) sites. If, for most functions, I < M, then use a single adjustment less than 0 and equal or greater than -2.0; if I = M, then use adjustment of 0; or if I > M, then use adjustment greater than 0 and less than or equal to 4. Add adjustment to starting ratio of 1:1 to obtain baseline ratio. If adjustment is less than 0 (negative), add absolute value of adjustment to right (impact) side of starting ratio; otherwise, add to left (mitigation) side. See examples in attachment 12501.3. For a suite of potential functions from HGM (alternate lists of functions may be used), see Table 2 (below).	Note: steps 2.a, 2.b, and 2.c are mutually exclusive. If step 2.a is used, then complete the rest of the checklist (steps 4-10). Starting ratio: 1:1 Ratio adjustment: ___ Baseline ratio: __:__ PM justification:	Starting ratio: 1:1 Ratio adjustment: ___ Baseline ratio: __:__ PM justification:	Starting ratio: 1:1 Ratio adjustment: ___ Baseline ratio: __:__ PM justification:

2.b	**QUANTITATIVE impact-mitigation comparison**: Use step 2.b if a Corps-approved functional/condition assessment been obtained. In general, project managers should consider requiring a functional/condition assessment and using step 2.b for projects where total permanent impacts exceed 0.5 acre or 300 linear feet. Acceptable functional/condition assessment methods must be aquatic resource-based, standardized, comparable from site to site, peer-reviewed, unmodified, and approved by the applicable Corps District. If a district-approved method is not available, use step 2. Use Before-After-Mitigation-Impact (BAMI) spreadsheet (attachment 12501.4) (if a district-approved functional/condition method is not available, use step 2.a. instead). See example below. Note: In an extreme case, the BAMI procedure could result in a ratio (and overall mitigation proposal) unacceptable to the Corps. For example, providing a very large but low quality mitigation site (low functional gain resulting a in a very high ratio) may result in functional gain equaling loss numerically, but this may not be acceptable because the required compensatory mitigation must be appropriate to the scope and degree of the impacts (see 33 CFR 320.4(r)(2)).	Note: steps 2.a, 2.b, and 2.c are mutually exclusive. If step 2.b is used, steps 2.b and 5 may also be mutually exclusive. If a functional/condition assessment method is used that explicitly accounts for area (such as HGM), steps 2.b and 5 are mutually exclusive; however, if a method is used that does *not* explicitly account for area (such as CRAM), then both steps should be used. Complete the rest of the checklist (steps 4-10 or steps 4 and 6-10, as appropriate). Baseline ratio from BAMI spreadsheet (attached): __:__	Baseline ratio from BAMI procedure (attached): __:__	Baseline ratio from BAMI procedure (attached): __:__
2.c	Preservation baseline ratio (complete Table 2 step A).	Baseline ratio: __:1 PM justification:	Baseline ratio: __:1 PM justification:	Baseline ratio: __:1 PM justification:

3	Preservation adjustment (complete Table 2 steps B-E and enter total adjustment from step E).	Ratio adjustment: PM justification:	Ratio adjustment: PM justification:	Ratio adjustment: PM justification:
4	**Mitigation site location**: Mitigation located outside impacted watershed generally warrants a higher mitigation ratio. The project manager will determine the appropriate Hydrologic Unit Code (HUC) to define the term "watershed" in this context. Is mitigation located outside of the impacted watershed? If yes, +1.0, if no, +0.	Ratio adjustment: PM justification:	Ratio adjustment: PM justification:	Ratio adjustment: PM justification:
5	**Net loss of aquatic resource surface area**: Different types of mitigation result in varying net losses of aquatic resource area. For definitions of mitigation types, see mitigation rule at 33 CFR 332.2. Re-establishment or establishment +0, rehabilitation, enhancement, preservation +1.0 (these three mitigation types result in a net loss of aquatic resource area in cases where permanent loss of waters of the U.S. is authorized and not offset by either re-establishment or establishment).	Note: If step 2.b is used, steps 2.b and 5 may also be mutually exclusive. If a functional/condition assessment method is used that explicitly accounts for area (such as HGM), steps 2.b and 5 are mutually exclusive; however, if a method is used that does *not* explicitly account for area (such as CRAM), then both steps should be used. Ratio adjustment: PM justification:	Ratio adjustment: PM justification:	Ratio adjustment: PM justification:

6	**Type conversion:** Out-of-kind mitigation may warrant a higher mitigation ratio. However, out-of-kind mitigation can be appropriate if the proposed mitigation habitat type serves the aquatic resource needs of the watershed/ecoregion. In considering out-of-kind mitigation, project managers should consider whether impacts or mitigation would consist of rare or regionally significant habitat types (e.g., vernal pools). Project manager will determine the relative values of different habitat types and document herein. Justification for the use of out-of-kind mitigation must be documented herein. Would mitigation result in: (A) conversion from a highly valuable and/or rare habitat type to a common type? Or (B) vice versa? Magnitude of adjustment should vary with value of habitats involved. Calculate ratio adjustment based on answers to questions (A) and (B): Y,N: +0.25 to +4.0; N,Y: -0.25 to -4.0; N,N: +0.	Ratio adjustment: PM justification:	Ratio adjustment: PM justification:	Ratio adjustment: PM justification:

7	**Risk and uncertainty:** Mitigation ratios should reflect the inherent uncertainty of mitigation. Factors to consider include: 1) permittee-responsible mitigation; 2) mitigation site did not formerly support targeted aquatic resources; 3) difficult-to-replace resources (see 33 CFR 332.3(e)(3) and (f)(2)); 4) modified hydrology (e.g., high-flow bypass); 5) artificial hydrology (e.g., pumped water source); 6) structures requiring long-term maintenance (e.g., outfalls, drop structures, weirs, bank stabilization structures); 7) planned vegetation maintenance (e.g., mowing, landclearing, fuel modification activities); 8) e.g., shallow, buried structures (riprap, clay liners), and 9) absence of long-term preservation mechanism. Note: this list is not all-inclusive. Each factor can range from +0.1 to +0.3 depending on the level of anticipated risk and the amount of maintenance or management required to sustain the compensatory mitigation project. Sum factor adjustments (+0 if no factors). Generally, uncertainty in banks and in lieu fee programs is accounted for in the credit release process.	Ratio adjustment: PM justification:	Ratio adjustment: PM justification:	Ratio adjustment: PM justification:

8	**Temporal loss**: Constructed habitats take time to mature and replace aquatic functions; this typically warrants a higher mitigation ratio in cases where a delay is planned between impacts and full replacement of functions. Project manager should estimate the time between when the authorized impacts occur and constructed mitigation is expected to replace lost functions, including the monitoring period. In cases where all performance standards are expected to be achieved prior to impacts, no temporal loss should be assessed (for permittee-responsible only). Similarly, in cases where interim performance standards are expected to be achieved, a lower ratio adjustment may be appropriate. Unexpected delays in compensatory mitigation project implementation should be handled as compliance actions. a. For scheduled, known delays between impacts and construction of mitigation: multiply delay (in months) by 0.05; b. To account for time required for full replacement of functions during monitoring period: generally, if mitigation is comprised of trees/woodlands or saltmarsh, +3; if shrubs, +2; if herbaceous, +1; c. Add adjustments from steps (a) and (b).	Ratio adjustment: PM justification:	Ratio adjustment: PM justification:	Ratio adjustment: PM justification:

9	**Final mitigation ratio(s):** Project manager should enter the final mitigation ratio(s) arrived at after consideration of the above factors (either qualitative OR quantitative). Project manager should enter the extent of authorized impacts and required mitigation by area (acreage) and/or distance (linear feet), as well as the corresponding resource type (lake, non-tidal wetland, other, pond, stream/river/ocean, tidal wetland) and Cowardin or Hydrogeomorphic Method (HGM) classification type. To obtain the final mitigation ratio*: a. Take baseline ratio from step 2.a, 2.b, or 2.c; b. Add ratio adjustments from steps 3-8; c. If total of adjustments is greater than 0 (positive), add total to left (mitigation) side of baseline ratio; d. If total of adjustments is less than 0 (negative), add ABS of total to right (impact) side of baseline ratio; Note 1: minimum ratio = 1:1 if step 2.a or 2.c used. If step 2.b used, final ratio can be less than 1:1 assuming completed functional/condition assessment, in combination with other steps, justifies a ratio less than 1:1 (i.e., total of adjustments is negative). Note 2: Final ratio in each column should be as calculated. If desired, express ratio equal to X:1 (traditional format: for example, 1:4 = 0.25:1), but ONLY in step 9's PM comments and in step 10.	Column A: 1. Baseline ratio (step 2.a, 2.b, or 2.c) = __:__ 2. Total adjustments (steps 3-8) = ___ 3. Final ratio: __ : __ Proposed impact (total): ___ acre ___ linear feet to Resource type: _____ Cowardin or HGM: _____ Hydrology: _____ Required mitigation: ___ acre ___ linear feet of Mitigation type: _____ Resource type: _____ Cowardin or HGM: _____ Hydrology: _____ Additional PM comments:	Column B: 1. Baseline ratio (step 2.a, 2.b, or 2.c) = __:__ 2. Total adjustments (steps 3-8) = ___ 3. Final ratio: __ : __ Remaining impact: _____ Required mitigation: ___ acre ___ linear feet of Mitigation type: _____ Resource type: _____ Cowardin or HGM: _____ Hydrology: _____ Additional PM comments:	Column C: 1. Baseline ratio (step 2a, 2.b, or 2.c) = __:__ 2. Total adjustments (steps 3-8) = ___ 3. Final ratio: __ : __ Remaining impact: _____ Required mitigation: ___ acre ___ linear feet of Mitigation type: _____ Resource type: _____ Cowardin or HGM: _____ Hydrology: _____ Additional PM comments:

10	**Final compensatory mitigation requirements:** Summarize the checklist results, combining all required mitigation for this impact site.	PM summary:

*In the final determination of required mitigation, direct and indirect impacts should be considered:

a. Indirect impacts: Compensatory mitigation may be required to offset predictable indirect impacts. The PM should document any indirect impacts caused by the proposed/authorized activity.

b. Cumulative impacts: In some cases, cumulative impacts should be considered when determining if compensatory mitigation should be required. The extent of cumulative impacts should be documented using available information, such as analyses or data associated with a Special Area Management Plan (SAMP), Watershed Management Plan, land use/land cover scenario assessment, hydrologic modeling, etc. The information used should be fully cited herein and in the decision document. The assessment must focus on the proposed action's direct and indirect impacts (i.e., incremental impact of the proposed activity) in the context of the cumulative effects caused by past, present, and reasonably foreseeable actions, to reduce the proposed activity's contribution to cumulative effects in the region.

Table 1. Qualitative comparison of functions (functional loss vs. gain):

Function	Impact site	Mitigation site	PM Justification
Short- or long-term surface water storage			
Subsurface water storage			
Moderation of groundwater flow or discharge			
Dissipation of energy			
Cycling of nutrients			
Removal of elements and compounds			
Retention of particulates			
Export of organic carbon			
Maintenance of plant and animal communities			
Step 2.a adjustment for column __:			

Table 1 instructions:

1. Describe amount of functional loss (impact) and gain (mitigation) in each respective column. Gain and loss can be described in text (for example, small loss, moderate loss, large loss, no loss, etc.) or symbolically (for example, +, ++, +++, 0, ---, --, -).
2. Note: alternate lists of functions may be used.
3. Note: a single adjustment should be used to account for all functions combined (see example 7 in attachment 12501.3)

Table 2. Baseline ratio and total adjustment determinations for preservation:

Steps	Criteria	Results	PM Justification
A.	Baseline ratio (5:1, 3:1, or 1:1):		
B.	Functions adjustment (5, 3, or 1):		
C.	Threat adjustment (5, 3, or 1):		
D.	Degree of protection adjustment (5, 3, or 1):		
E.	Total adjustment for column __ (add steps B-D):		
Supporting information:			
	Impacted aquatic resource(s):		
	Preserved aquatic resource(s)/site(s):		
	Threat:		
	Protection type:		

Table 2 instructions:

A. Baseline ratio based on expected functional loss at impact site (1:1 low; 3:1 Moderate; 5:1 high). Copy to step 2.c in checklist.
B. Describe existing functions by requiring FCAM where available (otherwise make qualitative determination)(note: these are all within a range of high functional scores): Low end of range (>75% of reference standard FCAM score) (+5) Medium part of range (>85%) (+3) High end of range (>95%) (+1) *Assumption: waters of the U.S. and riparian buffer can fall into any category, but upland buffer should always assumed to be in low part of the range.
C. Level of threat: Low (+5) (increasing/continuing trend of development in watershed) Medium (+3) (site shown as developed in specific/general plan) High (+1) (development entitlements/permits in place)
D. "Degrees" of long-term protection: Low (management plan) (+5) Medium (restrictive covenant/deed restriction) (+3) High (conservation easement) (+1)
E. Total adjustment (add steps B-D). Copy adjustment to step 3 in checklist.
Supporting information: Impacted aquatic resource(s): Describe functional loss at impact site, preferably based on functional or condition assessment data. Preserved aquatic resource(s)/site(s): Describe aquatic resource functions at preserved site, preferably based on functional or condition assessment data. Threat: Describe threat to preserved site based on local planning document(s), pending/issued development permits, watershed study/plan, etc. Protection type: Describe type of long-term protection.

Before-After-Mitigation-Impact (BAMI) procedure **(CRAM example)**

Functions/conditions	$Impact_{Before}$	$Impact_{After}$	$Impact_{delta}$	$Mitigation_{Before}$	$Mitigation_{After}$	$Mitigation_{delta}$
4.1 Buffer and Landscape Context						
4.1.1 Landscape Connectivity	9	3	-6	6	6	0
4.1.2 Percent of AA with Buffer	12	6	-6	3	9	6
4.1.3 Average Buffer Width	3	3	0	3	12	9
4.1.4 Buffer Condition	6	6	0	3	9	6
RAW SCORE	**15.0**	**8.0**	**-7**	**9.0**	**15.7**	**7**
FINAL SCORE	**62.5**	**33.6**	**-29**	**37.5**	**65.3**	**28**
4.2 Attribute 2: Hydrology						
4.2.1 Water Source	6	6	0	6	6	0
4.2.2 Hydroperiod or Channel Stability	9	12	3	3	9	6
4.2.3 Hydrologic Connectivity	12	9	-3	3	12	9
RAW SCORE	**27.0**	**27.0**	**0**	**12.0**	**27.0**	**15**
FINAL SCORE	**75.0**	**75.0**	**0**	**33.4**	**75.0**	**42**
4.3 Attribute 3: Physical Structure						
4.3.1 Structural Patch Richness	6	3	-3	3	9	6
4.3.2 Topographic Complexity	6	3	-3	3	6	3
RAW SCORE	**12.0**	**6.0**	**-6**	**6.0**	**15.0**	**9**
FINAL SCORE	**50.0**	**25.0**	**-25**	**25.0**	**62.5**	**38**
4.4 Attribute 4: Biotic Structure						
4.4.1 Number of Plant Layers	12	9	-3	6	9	3
4.4.2 Co-Dominant Species	6	6	0	6	12	6
4.4.3 Percent Invasion	6	9	3	3	12	9
4.4.4 Interspersion/Zonation	9	3	-6	3	9	6
4.4.5 Vertical Structure	6	3	-3	3	6	3
RAW SCORE	**23**	**14**	**-9**	**11**	**26**	**15**
FINAL SCORE	**63.9**	**38.9**	**-25**	**30.6**	**72.3**	**42**
OVERALL SCORE	**65.0**	**46.0**	**-19**	**32.0**	**70.0**	**38**

Quotient= $ABS(M/I)_{deltas}$ **2**

Baseline ratio: **1 : 2**

BAMI procedure instructions:

1. Choose functional method. Acceptable functional assessment methods must be aquatic resource-based, standardized, comparable from site to site, peer-reviewed, and must be approved by the applicable Corps District.
2. List functions/condition categories in leftmost column.
3. Utilize Before-After-Mitigation-Impact (BAMI) procedure above to calculate function deltas.
4. Obtain absolute value (ABS*) of quotient of mitigation-delta over impact-delta for overall score (if method has no overall score, use median of quotients for function categories or individual functions. *Absolute value is the nonnegative number for any real number, so if your quotient is negative, simply drop the negative sign to get the ABS. For example: the ABS of -9/3 = 3.
5. To get baseline ratio: If quotient (Q) is less than 1, baseline ratio = 1/Q : 1; if quotient is greater than 1, baseline ratio = 1 : Q.
6. Input Step 2.b baseline ratio into the checklist document.