Appendix H

IV. Data Forms

Investigators: _____Date:_____

Project Name: _____Corps file No#_____

Brief Project Description:

Mitigation Debit Tables (Factors are defined in Section II of the MTSMP)

Adverse Impacts (debit) Factors and Worksheet.

FACTORS	**MULTIPLIERS**								
Stream Type (Pg 18)	Ephemeral 0.2	Intermittent 0.3	>2nd Order Perennial 0.6	1st or 2nd Order Perennial 0.8					
Stream Status (Pg 18)	Tertiary 0.1	Secondary 0.3	Primary 0.6						
Existing Condition (Pg 19)	Impaired 0.1	Somewhat Impaired 0.75	Fully Functional 1.5						
Duration (Pg 19)	Temporary (<12 months) 0.0	Short Term (12-24 months) 0.1	Permanent (>24 months) 0.3						
Dominant Impact (Pg 20)	Shade Clear 0.05	Utility Crossing 0.15	Bank Stabilization* See table I.2	Culvert 0.3	Detention /Weir 0.75	Morphologic 1.5	Impound 2.0	Pipe 2.2	Fill 2.5
Collective Impact (Pg 21)	0.0005* linear feet of stream impacted by this dominant impact								

Bank Stabilization Multipliers

Multiplier	Description For Bank Stabilization (Dominant Impact)
0.1	Vegetation only. (End result is a living herbaceous, woody, or mixed plant community. Coir logs, fabric, or other soft temporary protection is acceptable with no additional debits needed.)
0.2	Vegetation combined with dead woody material. (End result is a living herbaceous, woody, or mixed plant community with a less than 50% dead wood component in the toe and/or bank. Coir logs, fabric, or other soft temporary protection is acceptable with no additional debits needed.)
0.3	Vegetation above the Ordinary High Water Mark (OHWM) combined with either a rock Toe or 50%+ dead wood at or below OHWM. (End result is a living herbaceous, woody, or mixed plant community above the OHWM and rock or dead wood at or below the OHWM. Coir logs, fabric, or other soft temporary protection is acceptable with no additional debits needed.)
0.4	Rock riprap above and below the OHWM, and any type of vanes/barbs/weirs/hard points that project into the channel. (End result is little or no vegetation on bank for rock riprap revetments, or an eroding bankline protected by one or more vanes/barbs/weirs/hard points/etc.)
0.5	Log Cribs, or combinations of bank riprap with vanes/barbs/weirs/hard points. (Log crib structures filled with soil, plants, and/or rock extending below and/or above the OHWM, or projects using vanes/barbs/weirs/hard points that also include a rock riprap revetment or toe along the bank)
0.7	Retaining Walls. (Vertical or nearly vertical retaining walls constructed of gabion baskets, hand-placed stone, masonry, concrete, steel, wood, or other materials.)

Note: The cumulative impact factor for the overall project must be used in each reach column on the Total Debits Worksheet below.

Total Debits Worksheet

Factor	Impact Area 1	Impact Area 2	Impact Area 3	Impact Area 4	Impact Area 5	Impact Area 6
Stream Type						
Stream Status						
Existing Condition						
Duration						
Dominant Impact						
Collective Impact						
Sum of Factors (SF_i)						
Linear Feet Impact (LF_i)						
SF_i X LF_i						

Note: Some projects (including maintenance) that are less than 300 ft in length may not require compensatory mitigation.

Total Debits = Σ (SF_i X LF_i) = _____

Mitigation Credit Tables

Brief Mitigation Description:

Riparian Zone

The Corps will determine the maximum credit width which is typically limited by the flood plain or channel migration which ever more appropriate.

Use the table below to determine the minimum width for your proposed riparian credit area using existing adjacent land use and percent slope.

Land Use	**Less than 5% slope (1x)**	**5% - 20% slope (2x)**	**21% -40% slope (3x)**	**Greater than 40% slope (4x)**
Residential	50	100	150	200
Agricultural - Grazing lands/ non cultivated	50	100	150	200
Recreational	75	150	225	300
Institutional / Agricultural-cultivated	75	150	225	300
Industrial	100	200	300	400
Landfill	100	200	300	400
Other Categories (including use of reference reach data)	Case-by-case	Case-by-case	Case-by-case	Case-by-case

Calculate the Net Improvement Factor for each side of the stream independently utilizing the table below. Definition for "Area to be restored" is in Section II.

Net Improvement For Riparian Buffers

Stream Status (Pg 18)	**Buffer Width (1side)**	**91-100% Area to be restored**	**61-90% Area to be restored**	**33-60% Area to be Restored**	**1-32% Area to be restored**	**No Restoration Needed***
Primary	4x min width	1.0	0.9	0.8	0.7	0.6
	3x min. width	0.8	0.7	0.6	0.5	0.4
	2x min. width	0.6	0.55	0.5	0.4	0.3
	Minimum Width	0.4	0.3	0.25	0.2	0.15
Secondary	4x min width	0.95	0.85	0.75	0.65	0.55
	3x min. width	0.75	0.65	0.55	0.45	0.35
	2x min. width	0.55	0.45	0.4	0.35	0.25
	Minimum Width	0.3	0.25	0.2	0.15	0.1
Tertiary	4x min width	0.8	0.7	0.6	0.5	0.4
	3x min. width	0.65	0.6	0.5	0.4	0.3
	2x min. width	0.5	0.45	0.4	0.3	0.2
	Minimum Width	0.25	0.2	0.15	0.1	0.05

***** "No Restoration Needed" refers to areas of buffer that have an established riparian corridor or will mature into native riparian area without active restoration. To be eligible for credits, long-term protection of restored and/or intact, naturally forested riparian zones through restrictive covenants, conservation easements or transfer in fee title to a conservation entity is required.

NOTE: Credits may not be given for riparian widths deemed excessive to providing benefits to the aquatic system. If both sides of the stream are owned or could reasonably be obtained by the applicant, buffering of both sides of the stream is recommended. Streams that are unstable and require major stream channel or bank restoration is not considered candidate streams for solely buffer enhancement credit.

Use net improvements previously calculated in Step 4 to insert in the table below. Net improvements should be calculated independently for each side of a single reach of stream. In cases where only a single side of a reach is buffered, a reach multiplier of 0.75 is used. In cases where both sides of a reach are buffered, a reach multiplier of 1.25 is used.

Riparian Credit Factors

FACTORS	**MULTIPLIERS**					
Net Improvement (Pg 21)	Riparian Buffer Enhancement (step 4) (Calculate value from above Net Improvement table) 0.05 – 1.0					
Type of Protection (Pg 22)	Permit Condition 0.03	Covenants 0.05	Deed Restriction 0.12	Conservation Easement 0.15	Fee Title 0.2	
Mitigation Timing (Pg 23)	Schedule 5* 0.0	Schedule 4 0.02	Schedule 3 0.05	Schedule 2 0.08	Schedule 1 0.1	
Comparative Stream Order (Pg 18)	Same Order 0.2	1 Order Difference 0.01	2 or more Order Difference 0.0			
Location (Pg 23)	On-site 0.2	Off-site 0.1	Outside 0.0			

*Use this option to calculate credits when no restoration of buffer necessary

Riparian Credit Worksheet

FACTORS		**Mitigation Reach 1**	**Mitigation Reach 2**	**Mitigation Reach 3**	**Mitigation Reach 4**	**Mitigation Reach 5**
Net Improvement	Stream Side A					
Net Improvement	Stream Side B					
Type of Protection						
Mitigation Timing						
Comparative Stream Order						
Location						
Sum of Factors (SF_i)						
Linear Feet Impact (LF_i)						
Reach Multiplier (RM) Buffer 1 side = 0.75 Buffer both sides = 1.25						
SF_m x LF_m x RM						

Total Riparian Credits = Σ (SF_m x LF_m x RM) = _____

Mitigation Credit Tables
Stream Channel

Stream Restoration Credit Factors

FACTORS	MULTIPLIERS				
Net Improvement (Pg 21)	Minimal 1.2	Moderate 1.8	Substantial 2.5		
Stream Status (Pg 18)	Tertiary 0.05	Secondary 0.2	Primary 0.3		
Type of Protection (Pg 22)	Permit Condition 0.03	Covenants 0.05	Deed Restriction 0.1	Conservation Easement 0.15	Fee Title 0.2
Mitigation Timing (Pg 23)	Schedule 5* 0.0	Schedule 4 0.02	Schedule 3 0.05	Schedule 2 0.08	Schedule 1 0.1
Comparative Stream Order (Pg 18)	Same Order 0.2	1 Order Difference 0.01	2 or more Order Difference 0.0		
Location (Pg 23)	On-site 0.2	Off-site 0.1	Outside 0.0		

Stream Restoration Credit Worksheet

Factors	**Mitigation Reach 1**	**Mitigation Reach 2**	**Mitigation Reach 3**	**Mitigation Reach 4**	**Mitigation Reach 5**
Net Improvement					
Stream Status					
Type of Protection					
Mitigation Timing					
Comparative Stream Order					
Location					
Sum of Factors SF_m=					
Linear Feet LF_m =					
SF_m x LF_m =					

Total Stream Credits = Σ (SF_m x LF_m) == _____

Overall Summary Worksheet

Date: _____

Investigators: _____

Project Name: _____Corps file No#_____

Total Debits			Debits	Linear Ft
	A			
Mitigation Banking Credit Summary			**Credit**	**Linear Ft**
	B	Riparian zone/Buffer Enhancement		
	C	Stream Restoration		
	D	Total Proposed Bank Mitigation = B + C		
In-Lieu Fee Credit Summary			**Credit**	**Linear Ft**
	E	Riparian zone/Buffer Enhancement		
	F	Stream Restoration		
	G	Total Proposed ILF Mitigation = E + F		
Permittee-responsible Credit Summary			**Credit**	**Linear Ft**
	H	Riparian zone/Buffer Enhancement		
	I	Stream Restoration		
	J	Total Proposed Permittee-responsible Mitigation = H + I		
Credit Grand Totals			**Credit**	**Linear Ft**
	K	Total Riparian Enhancement Mitigation = B+E H		
	L	Total Stream Restoration Mitigation = C + F + I		
	M	Total Proposed Mitigation = D + G + J		

Proposed Mitigation Credits $\geq$ Debits (M $\geq$ A)	True or False