

Charleston, West Virginia ■ Morgantown, West Virginia ■ Winchester, Virginia

"Stream Restoration and Mitigation: Requirements of the **Army Corps of Engineers**"

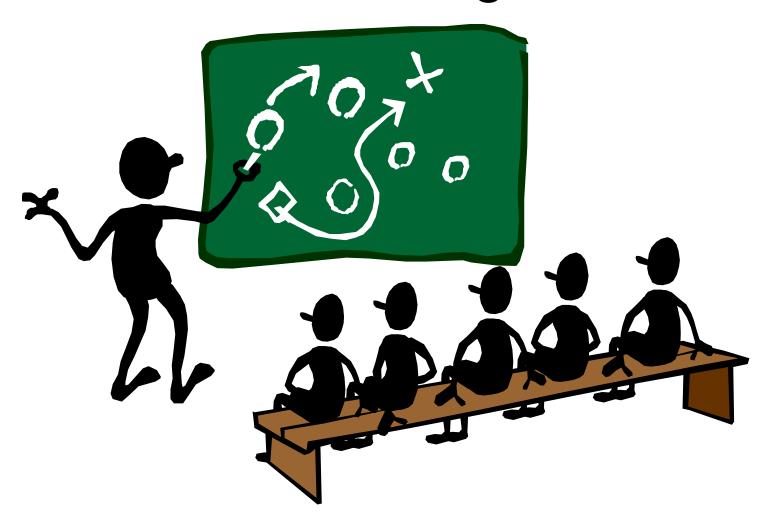
Presenters: Jessica Yeager







Permitting 101





Statutory Authorities

Section 10 of the Rivers and Harbors Act of 1899

Requires approval prior to any work in, on, over or under navigable waters of the United States, or which affects the course, location, condition or capacity of such waters

Section 404 of the Clean Water Act

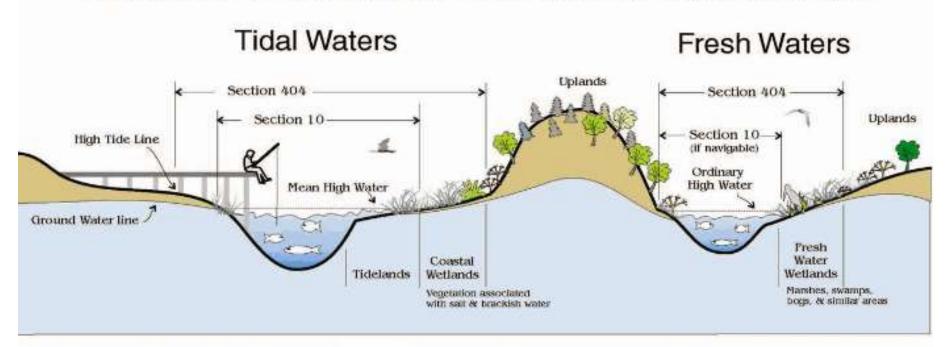
Requires approval prior to discharging dredged or fill material into the waters of the United States





So what is Jurisdictional?

Corps of Engineers Regulatory Jurisdiction



Section 103

Ocean Disposal of Dredged Material

Typical examples of regulated activities Ocean discharges of dredged material

Section 404

Discharge of Dredged or Fill Material (all waters of the U.S.)

All filling activities, utility lines, outfall structures, road crossings, beach nourishment, riprap, jetties, some excavation activities, etc.

Section 10

All Structures and Work (navigable waters)

Dreding, marinas, piers, wharves, floats, intake / outtake pipes, pillings, bulkheads, ramps, fills, overhead transmission lines, etc.

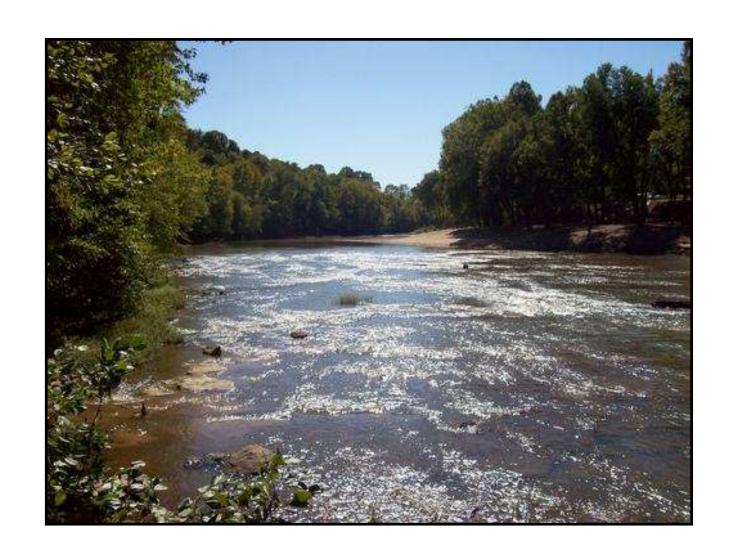


Section 10 River Kanawha River





Is this a Section 10 River?







Section 10 River Coal River – Normal Flow Conditions



YES



Activities That Require Section 10



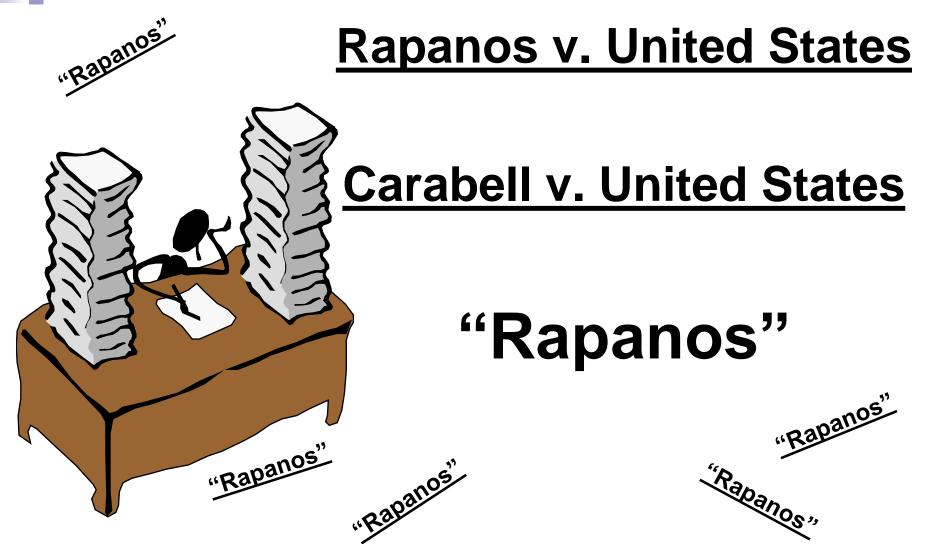
Section 404 of the CWA Dredged and Fill Material

- Wetlands
- Channels with a Defined Bed and Bank that have an OHWM
 - Intermittent and Perennial Streams (or Relatively Permanent Waters)
 - □ Ephemeral Channels (that pass the significant nexus test)
- Tidal Areas, Mud Flats....(or things we don't see in WV that still fall under Section 404)









Aquatic Resources Post Rapanos

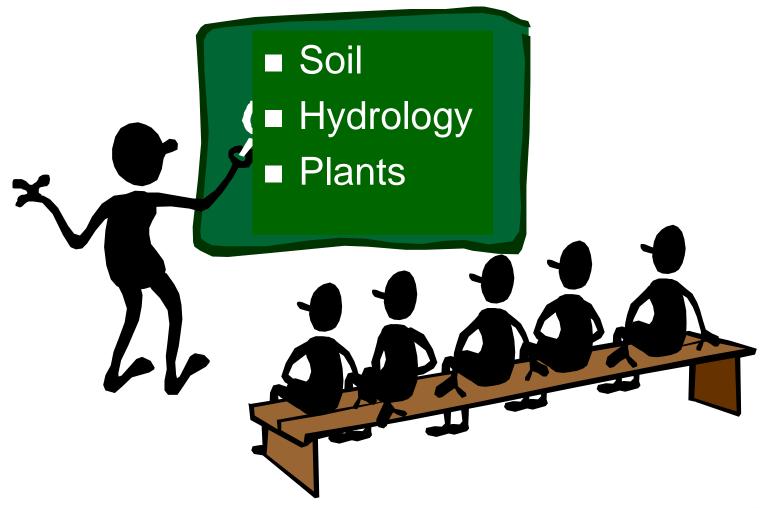


When You Hear The Term Wetland.....



What Makes A Wetland A Wetland

What Makes A Wetland A Wetland Are Three Features



Is this a Wetland?











Significant Nexus Evaluation (SNE)

This will require an assessment of both **hydrologic** and **ecological** factors

- Hydrologic volume duration and frequency of flow, proximity to the TNW, size of the watershed, rainfall, snowpack etc.
- Ecological the ability of the tributary and/or adj. wetlands to carry pollutants and flood waters to TNWs, or to provide aquatic habitat that supports biota of a TNW or to trap/filter pollutants; store flood waters or maintain water quality of a TNW



Surprise!!!!!



Delineations Can be Deadly



Why you shouldn't delineate in the Rain.....



Was This A Stream?



- Has Bed And Bank Features
- Perennial InNature –OriginatedFrom A Seep
- Close To ATNW



Well Look What I Did!!!!!



Pre-Construction Delineation



Section 404 Do I need a permit?







Regulated Activities



Discharge of dredged or fill material into waters of the United States



Regulated Activities



Discharge of dredged or fill material into waters of the United States



Regulated Activities



Placement of material below the Ordinary High Water Mark





GENERAL PERMITSNationwide PermitRegional General Permits

INDIVIDUAL PERMITS

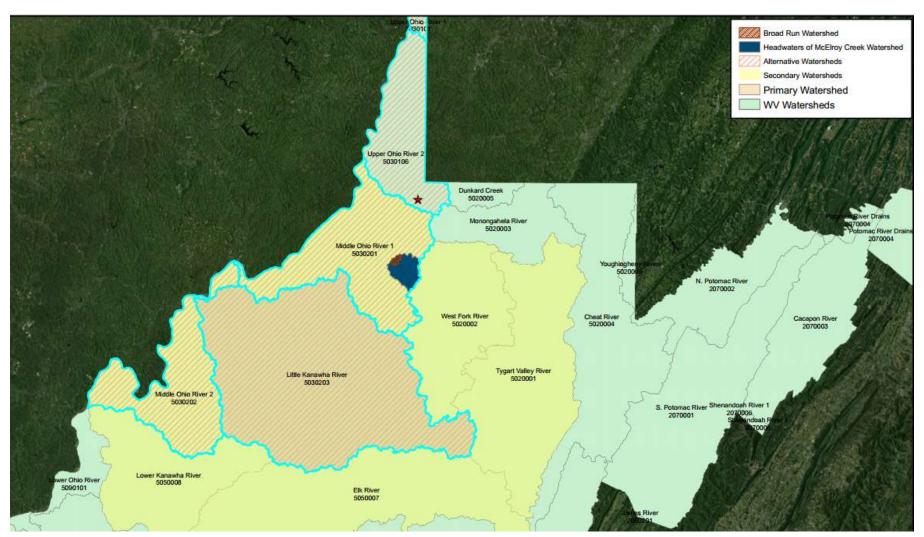


Mitigation Rule

- <u>Goal</u> level playing field (permittee, Mitigation Banks, ILFs) to the maximum extent practicable
- Mitigation sequence retained
- □ avoid, minimize, compensate for unavoidable impacts and lost aquatic functions
- Preference hierarchy for mitigation options:
- Mitigation bank credits
- In-lieu fee program credits
- □ Permittee-responsible mitigation under a watershed approach
 - On-site and/or in-kind permittee-responsible mitigation
 - Off-site and/or out-of-kind permittee-responsible mitigation
- Watershed Approach
- <u>Performance Standards</u> ecologically-driven, equivalent/effective standards, best available science
- <u>Compliance</u> increase compliance visits, establish enforceable success criteria, prescribed monitoring reports
- Adaptive management make fixes for successful performance
- Does not change when mitigation is required
- Does change where and how



Watershed_Approach







<u>ILF</u>

Enhancement

Restoration

Rehabilitation

Preservation

Compensation

Banking

HOW DOES IT WORK?????





STEP 1

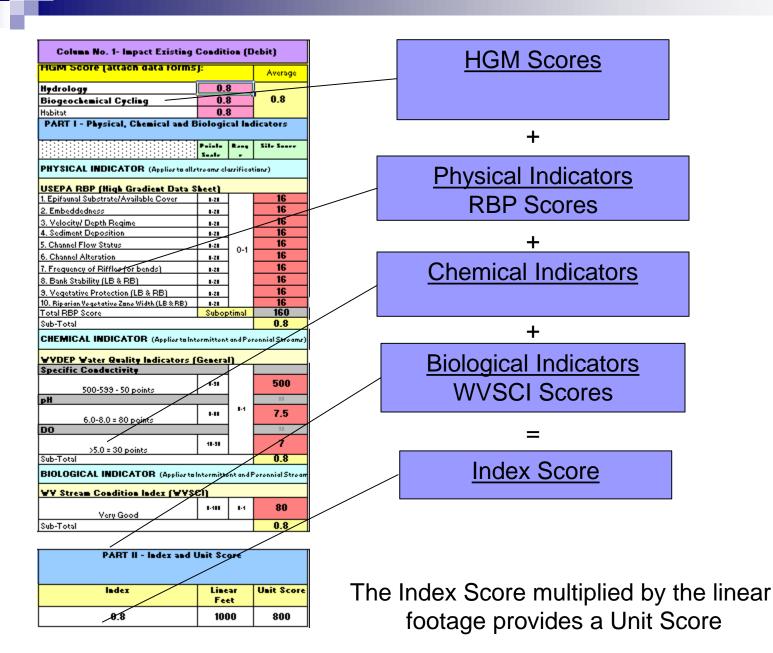
- Determine Your Impacts
- Determine Existing Condition of the Impact Area
 - □ SWVM
 - HGM Functional Capacity Scores
 - Physical Indicators RBP Scores
 - Chemical Indicators Water Quality
 - Biological Indicators WVSCI



West Virginia Stream and Wetland Valuation Metric

(Stream Valuation Metric - Worksheet 1 of 3) USACE FILE HO./Project Royanide Crook Dovolupment (SWTM 72.0 Example) IMPACT -\$1.5346 39.1713 January 22, 2011 Claudy, 40 degrees COORDINATES: Hame: (in Decimal Degrees) STREAM CLASSIFICATION IMPACT STREAM/SITE ID AND SITE DESCRIPTION Channel Slape 4%, 70 ac Watershed, Un-impaired MITIGATION STREAM CLASS./SITE ID AND SITE Intermittent, Channel Slape 4.5%, \$5 ac [X aleran alape, maleraked aine Janerage], anallered as DESCRIPTION: Vatorshod, minimal impairments due ta que alope, watershed nive Janesagel, availered or exploration and logging STREAM IMPACT LENGTH: FORM OF MIT COORDINATES: PRECIPITATION PAST 4# Permittee Reconscible: -\$1.5213 39.2314 Mitigation Langth: MITIGATION: (in Decimal Degrees) HRS: Ourite Column No. 2- Mitigation Existing Condition Culumn No. 3- Mitigation Projected at Five Tears Culumn Hu. 4- Mitigation Projected at Ten Tears Culuma Ha. 5- Mitigation Projected At Maturity Column No. 1- Impact Existing Condition (Dabit) Part Cumpletius (Credit) Part Completion (Credit) Average Hydrology Hydrelegy Hydrology Hydrology 0.795 Hydrology 0.79\$ Bingonchomical Cycling 0.753 Bingenchemical Cycling 0.349 Bingenchemical Cycline 0.692 Bingenchemical Cycling 0.723 Bingonchomical Cycling 0.765 0.3#2 0.798 0.743 0.162 0.223 Paint Pau Site Sann Paint Ran Sile Sone Painta Pan Smale qe PHTSICAL INDICATOR (Applicate all alerance alamifications) PHTSICAL INDICATOR [Applicate all alerance alamifications] PHTSICAL INDICATOR (Applicate all decommutanifications) PHTSICAL INDICATOR [Applicate all alerance alamifications] PHTSICAL INDICATOR (Applicate all alerane alamifications) USEPA RBP (High Gradient Data Shoot) 1. Epifaunal Substrato/Available Caver 8-28 1. Epifaunal Substrato/Available Caver 8-28 1. Epifaunal Substrato/Availablo Covor 8-28 1-21 2. Emboddodnorr 1:21 2. Emboddodnorr 1-21 2. Emboddodnass 1-21 1-21 3. Volacity/ Dopth Rogimo 3. Volacity/Dopth Rogimo 3. Volacity/Dopth Rogimo 3. Volacity/ Dopth Rogimo 3. Volacity/ Dopth Rogimo 4. Sodimont Deparition 1-21 4. Sediment Deparition 1.21 4. Sediment Deparition 1-21 4. Sediment Deparition 1-21 4. Sediment Deparition 1.21 5. Channel Flau Statur 1-21 5. Channel Flau Statur 1.21 5. Channel Flau Statur 1-21 5. Channel Flow Statur 1-21 5. Channol Flau Statur 1-21 6. Channol Altoration 6. Channol Altoration 8-28 6. Channel Alteration 1-21 6. Channol Altoration 1.21 6. Channol Altoration 1-21 11-21 12 7. Frequency of Riffler (or bendr) 7. Frequency of Riffler (or bendr) 7. Frequency of Riffler (or bendr) 1.21 7. Frequency of Riffler (or bendr) 1.21 1-21 1-21 7. Frequency of Riffler (or bendr) 1-21 8. Bank Stability (LB & RB) 14 8. Bank Stability (LB & RB) 12 8. Bank Stability (LB & RB) 8. Bank Stability (LB & RB) 8. Bank Stability (LB & RB) 1.21 1.21 1-21 1-21 1-21 9. Voqotativo Protoction (LB & RB) 1-21 14 9. Voqotativo Protoction (LB & RB) 1-21 12 9. Voqotativo Protoction (LB & RB) 1-21 9. Voqotativo Protoction (LB & RB) 1-21 9. Voqotativo Protoction (LB & RB) 1-21 10. Riparian Vegetaline ZoneWidlk JLD & RDJ 10. Riparian Vegelaliur Zuur Widlk (LD & RD) 10. Riparian Vegetaline Zone Width JLD & RDJ 10. Riparian Vegelaline ZoneWidlb JLD & RDJ 10. Riparian Vegetalius ZuneWidth JLD & RDJ Total RBP Score Total RBP Score 100 Tatal RBP Scare Total RBP Score 175 CHEMICAL INDICATOR (Applies to Information) and Pr CHEMICAL INDICATOR (Applica to Informitted and Personnial Sterano) CHEMICAL INDICATOR (Applicate Intermitted and Personal Steram CHEMICAL INDICATOR (Applies to Informitted and Personial Steeres) CHEMICAL INDICATOR (Applies to Informillian) and Personal Sterano WTDEP Water Quality Indicators (General) 500 375 350 350 100-199 - 85 paintr 500-599 - 50 paintr 300-399 - 70 paintr 300-399 - 70 paints 300-399 - 70 paints 1:11 5-38 5-38 5-38 6.2 5.5 5.7 5-58 5.7 5.3 6.0-8.0 - 80 paints 4.6-5.5 - 10 paints 4.6-5.5 - 10 paints 5.6-6.0 - 45 paints 5.6-6.0 - 45 paintr 12 11-11 0.975 0.725 0.725 BIOLOGICAL INDICATOR (Applies to Informittent and Personnial Steel BIOLOGICAL IMDICATOR Japplica la Informitical and Pro-BIOLOGICAL INDICATOR Jappion in Intermitted and Per BIOLOGICAL INDICATOR (Applica to toloralitical and Pro-WT Streem Condition Index (WTSCI) WT Streem Condition Index (WTSCI) 1-111 1.1 72 1:411 63 1411 14 65 1411 14 1-111 1-1 72 Juit Sen Unit Sca Foot Foot Foot Foot Foot 0.404333333 250 202.013 0.447166667 475 212.4 0.665 475 315.## 0.769166667 475 365.354 0.794333333 475 377.31









STEP 2

- Determine Your Mitigation
- Determine Existing Condition of the Mitigation Area
- Predict Mitigation Site Condition at:
 - □ 5 years
 - □ 10 years
 - □20 years



| Column No. 2- Mitigation Exis Baseline (Credi | | | • | | | | |
|--|-----------------|-----------|-------------|--|--|--|--|
| HGM Score (attach data forms | J: | | Averag | | | | |
| Hydrology | | | | | | | |
| Biogeochemical Cycling 0.61 | | | | | | | |
| Habitat | 0.4 | 3 | | | | | |
| PART I - Physical, Chemical and B | iologic | al Indi | cators | | | | |
| | | | | | | | |
| | Puists Seale | B, | Sile Saar | | | | |
| PHYSICAL INDICATOR (Applies to alls | | rrificati | iow) | | | | |
| USEPA RBP (High Gradient Data S | | | | | | | |
| Epifaunal Substrate/Available Cover | 1-21 | | 9 | | | | |
| 2. Embeddedness | 1-21 |] | 9 | | | | |
| 3. Velocity/ Depth Regime | 1-21 | 1 | 12 | | | | |
| 4. Sediment Deposition | 1-21 | 1 | 8 | | | | |
| 5. Channel Flow Status | 1-21 | ١ | 11 | | | | |
| 6. Channel Alteration | 1-21 | 14 | 9 | | | | |
| 7. Frequency of Riffles (or bends) | 1-21 | 1 | 12 | | | | |
| 8. Bank Stability (LB & RB) | 1-21 | 1 | 10 | | | | |
| 3. Vegetative Protection (LB & RB) | 1-21 | 1 | 10 | | | | |
| 10. Riparian Voqotativo Zano Width (LB & RB) | 1-21 | 1 | 12 | | | | |
| Total RBP Score | Mare | lenip | 102 | | | | |
| Sub-Total | | | 0.51 | | | | |
| CHEMICAL INDICATOR (Applier to Int | ormittont | and Por | onnial Stro | | | | |
| WYDEP Water Quality Indicators (| General | | | | | | |
| Specific Conductivity | _ | | - 11 | | | | |
| <=99 - 90 points | 141 | | 52.9 | | | | |
| pH | _ | i ' | - 11 | | | | |
| | 5-51 | 14 | 6.92 | | | | |
| 6.0-8.0 = 80 points | | | | | | | |
| DO . | | l | - 11 | | | | |
| NE 0 - 20 i- N- | 11-31 | | 9.05 | | | | |
| >5.0 = 30 points Sub-Total | | | 1 | | | | |
| BIOLOGICAL INDICATOR (Applier to | Intermitte | nt and P | oronnial St | | | | |
| WY Stream Condition Index (WYS | | | | | | | |
| | 1411 | ы | 89.55 | | | | |
| Very Good | 1 | ı | | | | | |

| | 1 |
|------------|----------------|
| | |
| Jait Score | |
| | |
| | |
| Linear | Unit Score |
| Feet | |
| 571 | 393.04 |
| | |
| | Linear Feet |

| Column No. 3- Mitigation Projection (C | | Five Y | (ears | |
|--|-----------|--------------|--------------|--|
| High Score Lattach data Forms | J: | | Average | |
| Hydrology | | | | |
| Biogeochemical Cycling | 72 | 0.62 | | |
| Habitat | 0.5 | 51 | | |
| PART I - Physical, Chemical and B | iologic | al Indi | icators | |
| | | | | |
| | Paiala | Bq | Sile Soore | |
| | | • | | |
| PHYSICAL INDICATOR (Applies to all s | troams cl | urificat | iow) | |
| USEPA RBP (High Gradient Data S | heet) | | | |
| 1. Epifaunal Substrate/Available Cover | 1-21 | | 14 | |
| 2. Embeddedness | 1-21 | | 13 | |
| 3. Velocity/ Depth Regime | 1-21 |] | 14 | |
| 4. Sediment Deposition | 1:21 |] | 11 | |
| 5. Channel Flow Status | 1-21 | 14 | 13 | |
| 6. Channel Alteration | 1-21 |] " " | - 11 | |
| 7. Frequency of Riffles (or bends) | 1-21 | 1 | 14 | |
| 8. Bank Stability (LB & RB) | 1-21 | 1 | 12 | |
| 3. Vegetative Protection (LB & RB) | 1-21 | 1 | 13 | |
| 10. Riparian Voqotativo Zano Width (LB & RB) | 1-21 | 1 | 14 | |
| Total RBP Score | Subo | ptimal | 129 | |
| Sub-Total | | | 0.645 | |
| CHEMICAL INDICATOR (Applier to Int | ormittont | and Por | onnial Stroa | |
| WYDEP Water Quality Indicators (| Genera | ŋ | | |
| Specific Conductivity | | | | |
| | 1:11 | | 52.9 | |
| <=99 - 90 points pH | | 1 | | |
| pii | T | 14 | 0.00 | |
| 6.0-8.0 = 80 points | 5-58 | | 6.92 | |
| DO | |] | | |
| | 11-31 | | 9.05 | |
| >5.0 = 30 points Sub-Total | | | - | |
| | | | | |
| BIOLOGICAL INDICATOR (Applies | ta later | mittes | t and Per | |
| | en | | | |
| WV Stream Condition Index (WVS) | - | | | |
| WY Stream Condition Index (WYS) | 1:111 | 14 | 89.55 | |

| PART II - Index and Unit Score | | | |
|--------------------------------|----------------|------------|--|
| Index | Linear Feet | Unit Score | |
| 0.750833333 | 571 | 428.73 | |

| HGM Score (attach data forms | i): | | Averag | | | |
|--|-----------------|----------|-------------|--|--|--|
| Hydrology 0.78 | | | | | | |
| Biogeochemical Cycling | 2 | 0.76 | | | | |
| Habitat | 0.6 | 8 | | | | |
| PART I - Physical, Chemical and E | Biologic | al lad | licators | | | |
| | Paiala Saale | k.nq | Sile San | | | |
| PHYSICAL INDICATOR (Applied to all a | rtroams cl | usificat | iow) | | | |
| USEPA RBP (High Gradient Data S | heet) | | | | | |
| 1. Epifaunal Substrate/Available Cover | 1-21 | 1 | 15 | | | |
| 2. Embeddedness | 1-21 | 1 | 15 | | | |
| 3. Velocity/ Depth Regime | 1-21 | 1 | 16 | | | |
| 4. Sediment Deposition | 1-21 | 4 | 16 | | | |
| 5. Channel Flow Status | 1-21 | 14 | 16 | | | |
| 6. Channel Alteration | 1-21 | 1 | 17 | | | |
| 7. Frequency of Riffles (or bends) | 1-21 | | 15 | | | |
| 8. Bank Stability (LB & RB) | 1-21 | | 17 | | | |
| 9. Vegetative Protection (LB & RB) | 1-21 | | 16 | | | |
| 10. Riparian Voqotativo Zano Width (LB & RB) | 1-21 | | 16 | | | |
| Total RBP Score | Subop | timal | 159 | | | |
| Sub-Total | | | 0.79 | | | |
| CHEMICAL INDICATOR (Applior to Int | tormittont | and Por | onnial Stro | | | |
| WYDEP Water Quality Indicators (| Genera | ր | | | | |
| Specific Conductivity | | 1 | | | | |
| <=99 - 90 points | 1-31 | | 52.9 | | | |
| рН | | | | | | |
| | 5-51 | 14 | 6.92 | | | |
| 6.0-8.0 = 80 points | | - | | | | |
| DO | T | 1 | | | | |
| >5.0 = 30 points | 11-11 | | 9.05 | | | |
| Sub-Total | | _ | 1 | | | |
| BIOLOGICAL INDICATOR (Applies | ta later | mitte | at and Pa | | | |
| WY Stream Condition Index (WYS | cŋ | | | | | |
| | 1411 | 14 | 89.5 | | | |

| Sub-Total | | | |
|-------------------------------|-------------|-------|------------|
| BIOLOGICAL INDICATOR (Applic | er to Inter | mitte | at and Per |
| WY Stream Condition Index (WY | 'scŋ | | |
| Very Good | 1411 | и | 89.55 |
| Sub-Total | | | 1 |
| PART II - Index and | l Unit Sco | re | • |
| | l Unit Sco | re | • |
| | Line Fee | ar | Unit Sco |

| THE RESERVE OF THE PERSON OF T | | | |
|--|-----------------|--------------|------------------------|
| HGM Score (attach data forms | F | | Averag |
| Hydrology | 9 | | |
| Biogeochemical Cycling | 2 | 0.896 | |
| Habitat | 0.8 | 7 | |
| PART I - Physical, Chemical and E | Biologic | al lad | icators |
| | Paiala Saala | tan | Sile San |
| PHYSICAL INDICATOR (Applies to alls | | urificati | onr) |
| USEPA RBP (High Gradient Data S | heet) | | |
| 1. Epifaunal Substrate/Available Cover | 1-21 | | 16 |
| 2. Embeddedness | 1:21 | | 16 |
| 3. Velocity/ Depth Regime | 1-21 | | 17 |
| 4. Sediment Deposition | 1-21 | | 17 |
| 5. Channel Flow Status | 1-21 | 14 | 17 |
| 6. Channel Alteration | 1-21 |] " " | 18 |
| 7. Frequency of Riffles (or bends) | 1-21 | | 16 |
| 8. Bank Stability (LB & RB) | 1-21 | 1 | 18 |
| 9. Vegetative Protection (LB & RB) | 1-21 | 1 | 17 |
| 10. Riparian Voqotativo Zano Width (LB & RB) | 1-21 | 1 | 17 |
| Total RBP Score | Opt | imal | 169 |
| Sub-Total | | | 0.84 |
| CHEMICAL INDICATOR (Applier to Int WYDEP Water Quality Indicators (Specific Conductivity | | | onnial Stro |
| <=99 - 90 points | 1-31 | | 52.9 |
| ρĦ | 5-91 | 14 | 6.92 |
| 6.0.00 - 00: | | | 0.32 |
| 6.0-8.0 = 80 points | | | |
| DO 0.0-0.0 = 00 points | | | |
| DO | 11-31 | | 9.05 |
| DO >5.0 = 30 points | 11-51 | | 9.05 |
| DO >5.0 = 30 points Sub-Total | | | 1 |
| DO >5.0 = 30 points Sub-Total BIOLOGICAL INDICATOR (Applier | ta Inter | mitton | 9.05 1 t and Per |
| DO >5.0 = 30 points Sub-Total | te later CI) | | 1 t and Par |
| DO >5.0 = 30 points Sub-Total BIOLOGICAL INDICATOR (Applier | ta Inter | mittan | 1 |

PART II - Index and Unit Score

Index

0.9225



Linear Feet Unit Score

526.75

571



STEP 3

- Determine Temporal Loss
- Determine Long-term Protection
- Determine Buffer
- Determine Restoration Level
- Evaluate ILF



(See instruction page to insert default values for MITIGA **Temporal Larr-Construction** Matri Robbook decrition at reactional tensional tens between the time at an impact field and completion at compromaters antiquities formality. Years Sub-Total Temporal Lorr-Materity Halo: Pooled behaves exemplelies at exempose describing his movement sed the line consisted for molecily, on it coldes ta kanalina fi, e. metarity aktore aleedam la pennide negenia mellee end deleitan milkin eigerien aleeem ne mellend kaktore. × Add. Mitigation Temporal Larr-Maturity (Tears) Sak-Talul

| • | TION BANKING 454 ILF) | |
|---|---|------------------------------|
| ī | Lung-te | rm Protection |
| | × Add. Mitigation and Monitoring Period | Lung-Term Protection (Tears) |
| | | |
| | | |
| | | |
| | | |
| | | *** |
| | 8 - S/18 Year Monitoring | 101 |
| | Seb-Telal | • |

| PART IV - Index to Unit Score Conversion | | | | | |
|--|-------------|-----------------------|---------------------------------------|--|--|
| Final Index Scure | Linear Feet | Unit Scure (Debit) | ILF Cartr (Offretting Debit Unitr) | | |
| 9.‡ | 1000 | *** | \$640,000.00 | | |
| | | | •• | | |

| PART V- Comparison of Unit Scores and Projected Balance | | | | | | | | | |
|---|------|---|------------|--|------------|--|-----------------|--|---------|
| Final Unit Scure (Debit) [Hu Het Lurr Talue] | :00 | Mitigation Exirting Condition - Baroline (Crodit) | 393.03#333 | Mitigation Projected at Five Tears Port Completion | 42#.725#33 | Mitigation Projected at Ten Tears Port Completion (Credit) | 4#2.970#3 | Mitigation Projected At Maturity (Gredit) | 526.74# |
| FINAL PROJECTED NET BAL | ANCE | | | | 35.6#75 | | \$9.9325 | | 133.709 |

PART III - Impact Factors

| | Part VI - Mitigation (|
|---|------------------------|
| Extent of Streem Restoration *Bulst: Reference the Indicational Academi to determine the accreal Restoration quer project | |
| "Bale2: Plane as "I" in the appropriate nategory [only netrol on Level Restoration | - |
| Lovel II Restoration | × |
| Lovel III Restoration | |

| enriderations (Ince | atives) | | | | | | |
|---------------------|---|--------|--------------------------------|--|--|--|--|
| | Extended Upland Buffer Zune "Bule": Reference Indonesianal hadral for the definition of the Duffer Zune Hiliaglian | | | | | | |
| | Ealrala and Typea [belon] "Bale": Ealra lbe baffer midlb for each abanel mide [Left Dank and Right Dank] "Bale": Selvat lbe appropriate miligation type | | | | | | |
| | Buffer Width | | Left Benk | | | | |
| | | 0-50 | Prozorvation and Ro-vogotation | | | | |
| | 25 | 51-150 | Prozorvation | | | | |
| | Buffer Width | | Right Bank | | | | |
| | | 0-50 | Prozervation and Re-vegetation | | | | |
| | 25 | 51-150 | Prozorvation | | | | |
| | Average | 25 | | | | | |

| Site | Impact Unit Tield (Debit) | Mitigation Unit Tield (Credit) |
|----------------------------------|------------------------------|--------------------------------------|
| Main Channel Dan Branch (DB 3-4) | 800 | 257.3901 |



| Lung-term Protection | | | | |
|---|------------------------------|--|--|--|
| × Add. Mitigation and Monitoring Pariod | Lung-Term Protection (Tears) | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| 8 - 5/18 Year Marillaring | 101 | | | |
| Seb-Telal | • | | | |

| PART IV - Index to Unit Score Conversion | | | | |
|---|------|-----|--------------|--|
| Final Index Linear Feet Unit Scure ILF Curts Scure (Debit) (Offsetting Debit Units) | | | | |
| 0.8 | 1000 | 200 | \$640,000.00 | |

| Tempural Lurs-Constructi | |
|--|--|
| Note: Retirate decritics at squalic transferral translation to the line at so impo- utilization (secretify, | l (dekil) sed eemplelies et eempeeesleeg |
| Years | 5 |
| Sub-Total | 0.12 |
| Temegral Larr-Maturit | t - |
| Wate: Period between nemptoline at nempeonstory miligation measures and the | |
| la basalian fi.e. metarilg at tree aleetam to granide negenia meller and deleitan. | |
| | |
| la basalias filo, motavilg ab terratentam la grasido arqueia motter sad deteitas. | |
| ta kaaslina fi, o, metavily ak teer aleetan la graaide argenia meller sak deleilan. mercikash | ilkia riporius storus se intlust katilor Tompural Lurr- |
| ta kaaslina fi, o, metavily ak teer aleetan la graaide argenia meller sak deleilan. mercikash | ilkia riporius storus se intlust katilor Tompural Lurr- |
| te kanalina (i.e. metarily ak leve aleetam la gennide negenia meller sak deleilan. meerikash | ilkia riporius storus se intlust katilor Tompural Lurr- |

| Lung-term Protection | | | | |
|---|------------------------------|--|--|--|
| × Add. Mitigation and Monitoring Period | Lung-Torm Protoction (Tours) | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| 28X - 5/18 Year Hasilaring | 50 | | | |
| | | | | |
| Seb-Telal | 0.3200 | | | |

| PART IV - Index to Unit Score Conversion | | | | |
|--|-------------|-----------------------|---------------------------------------|--|
| Final Index Scure | Linear Feet | Unit Scure (Dabit) | ILF Cartr (Offrotting Dobit Unitr) | |
| 1.4### | 1000 | 1410.1 | \$1,184,640.00 | |



| Temporal Larr-Cour | truction |
|---|--|
| Halo: Robbeele deculiee et ugastie beeelieest leee botwoee the lier s miligatiee feredit | |
| Years | 5 |
| Sub-Total | 0.12 |
| Temporal Larry | |
| Nato: Proint between anapteline at anapeantury miligation means | reased the line expelled her materity, so it extates |
| Halo: Proint believe annylelin at annyenastary miligelina mesan | reased the line required has malarity, so it relates |
| Nato: Period between nampletina at nampennature miligation means. Panalina fi.e. maturity at twee atentam to penalde negania matter an | reased the line required has malarity, so it relates |
| Note: I cried between ampletina at ampenacions utilization messas e tanalina fi. e. metacily at tree alectam to generide acquain metter en mecridary. | oo and the line required his naturily, so it exclude it delicition within eigeneise above as well and helder Tompured Lucr- |
| Note: I cried between ampletina at ampenacions utilization messas e tanalina fi. e. metacily at tree alectam to generide acquain metter en mecridary. | oo and the line required his naturily, so it exclude it delicition within eigeneise above as well and helder Tompured Lucr- |

| Lung-term Protection | | | | |
|--|------------------------------|--|--|--|
| ×Add. Mitigation and Monitoring Period | Lung-Term Protection (Tears) | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| 28X - 5/48 Year Manifering | 50 | | | |
| Seb-Telal | 0.320# | | | |

| PART IV - Indox to Unit Score Conversion | | | | | |
|--|-------------|-----------------------|---------------------------------------|--|--|
| Final Index Scure | Linear Feet | Unit Scure (Debit) | ILF Cartr (Offretting Debit Unitr) | | |
| 1.400 | 1000 | 1400.0 | \$1,184,640.00 | | |

| | PART V- Comperison of Unit Scores and Projected Balance | | | | | | | | |
|---|---|---|-------------|--|------------|--|-----------|--|---------|
| Final Unit Scure (Debit) [Hu Het Lurz Talue] | 14#0.# | Mitigation Existing Condition - Baseline (Credit) | 393.03\$333 | Mitigation Projected at Five Tears Port Completion | 42#.725#33 | Mitigation Projected at Ten Tears Port Completion (Credit) | 4#2.970#3 | Mitigation Projected At Maturity (Credit) | 526.74# |
| INAL PROJECTED NET BALANCE 35.6475 \$9.9325 133.769 | | | | | | | | | |

| Pert | TI - Mitigation (| enriderations (Inc | entives) |
|---|-------------------|--------------------|----------|
| Extent of Streem Restoration "Bule1: Reference the Indicational handred to delevative the accord Restoration Levels "Bule2: Plane as "X" in the appropriate salegary [only orient nee]. | lbrinni for | | "Bale": |
| LovellRestaration | | 1 | |
| Lovel II Restoration | × |] | Buffer W |
| Lovel III Restoration | | 1 | |

| Site | Impact Unit Tield (Debit) | Mitigation Unit Tield (Credit) |
|----------------------------------|------------------------------|--------------------------------------|
| Main Channel Dan Branch (DB 3-4) | 1480.8 | 257.3901 |

| Extended Upland Baller Zane | | |
|---|--|--|
| "Bale": Reference Indennianal bandool for the definitions of the Doffer Zone Hiligation | | |
| Entrate and Types [below] | | |
| "Male " - Pales Har Lagger - 13H Consent at a seed at a Hard Beat and Birth Books | | |

"Bale": Euler the haffer midth for each abanel aide (Left Dach and Right Dach "Bale": Selent the appenyriale miligation type

| Buffer Width | Loft Bank | |
|--------------|------------|--------------------------------|
| | 0-50 | Prozorvation and Ro-voqotation |
| 25 | 51-150 | Prozorvation |
| Buffer Width | Right Bank | |
| | 0-50 | Prozorvation and Ro-vogotation |
| 25 | 51-150 | Prozorvation |
| Average | 25 | |
| Buffer | | |





Determine Which Mitigation Avenue to Pursue



ANY QUESTIONS??????

