Mitigation Services
ENVIRONMENTAL QUALITY

December 2018

Functional Based Watershed Planning Priorities

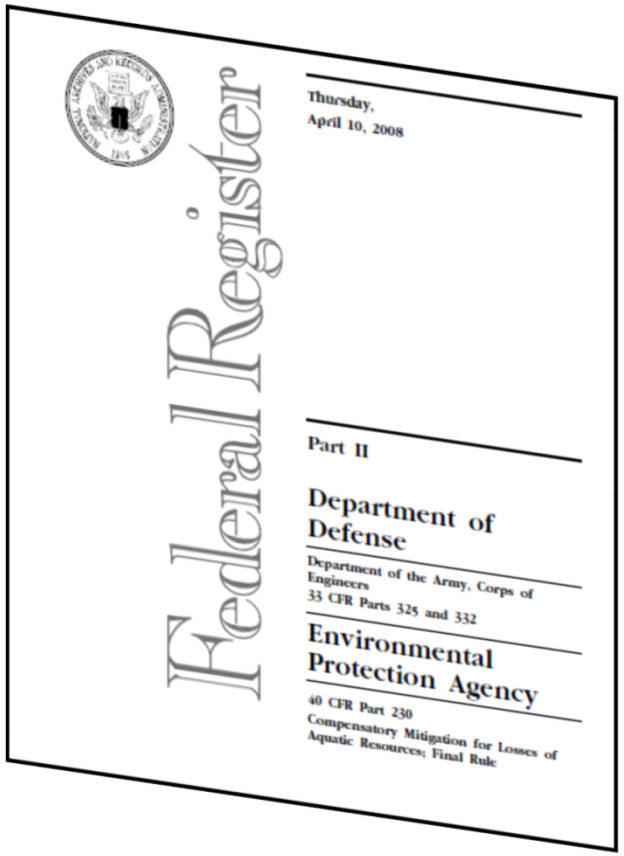
Department of Environmental Quality

Outline

- What are we required to do?
- What is NCDMS currently doing?
- Current Challenges
- What does NCDMS strive to do in the future?
- Compare and Contrast

40 CFR Part 230 Federal Mitigation Rule

332.3(c) ….*The ultimate goal of a watershed approach is to maintain and improve the quality and quantity of aquatic resources within watersheds through strategic selection of compensatory mitigation sites*



40 CFR Part 230 Federal Mitigation Rule

332.3(c)(2) *Considerations*. (i) A watershed approach to compensatory mitigation considers the importance of landscape position and resource type of compensatory mitigation projects for the sustainability of aquatic resource functions within the watershed. Such an *approach considers how the types and locations of compensatory mitigation projects will provide the desired aquatic resource functions, and will continue to function over time in a changing landscape.*

Current Planning Process

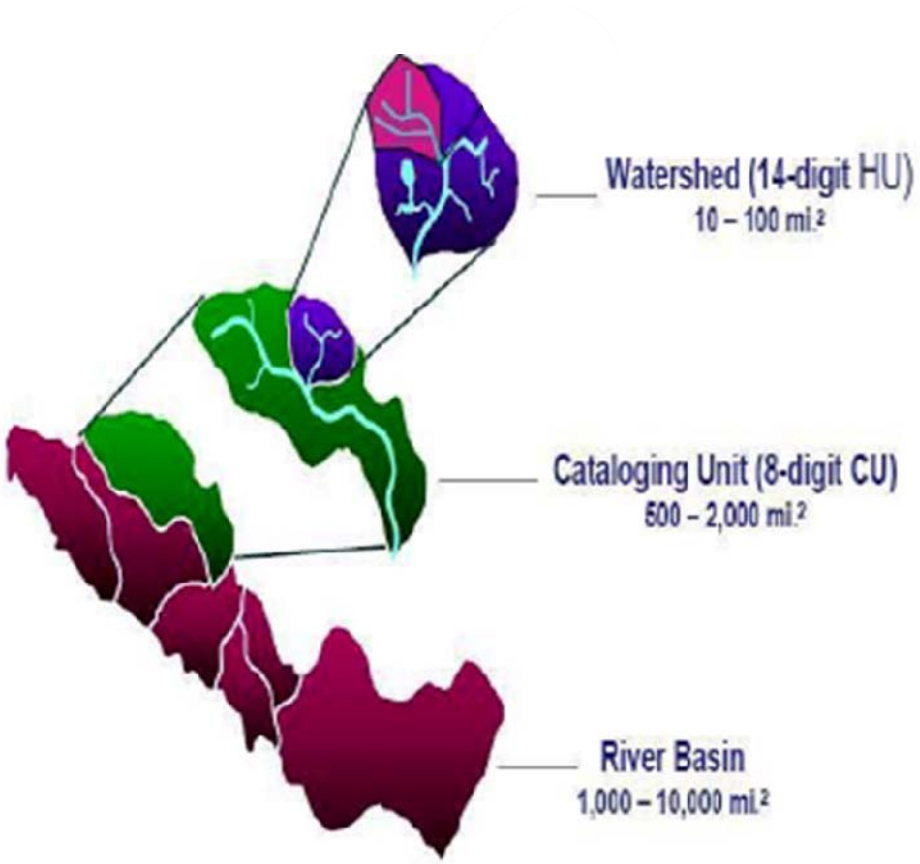
- **River Basin Restoration Priorities (RBRP)**
  - Single Document for each of the 17 river basins within NC
  - Analysis conducted within each 8-digit HUC
  - 14-digit HUCs identified as priority for restoration activities

- **Local Watershed Plans (LWP)**
  - Area: ~100 mi.^{2} RBRP priority areas
  - Comprehensive stakeholder process
  - Field data collection
  - Assessment
  - Identification of potential projects

- **Regional Watershed Plans (RWP)**
  - Area: ~500 mi.^{2}
  - Build upon existing planning efforts (LWPs, RBRPs)
  - Modeling and analysis of existing resources

Current Modeling Method

- **25 predefined metrics are calculated for all 14-digit HUCs in a River Basin**
- **Each metric is weighted based on:**
  - Water Quality Protection
  - Flood Retention
  - Riparian and Aquatic Habitat Protection
- **Compare all 14-digit watersheds within an 8-digit HUC**



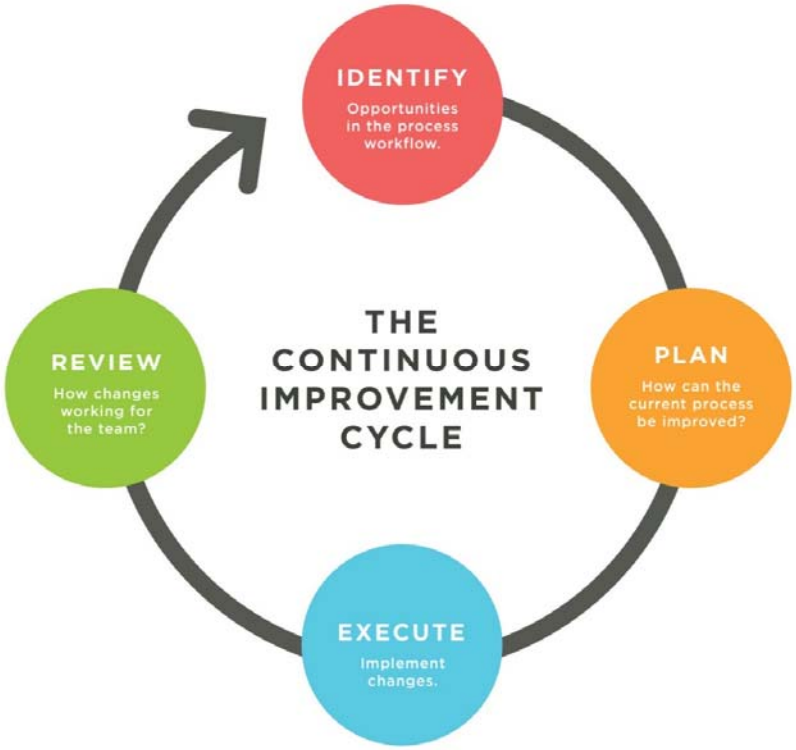
- **The top ~25% of watersheds are defined as priority watersheds**

Challenges Posed by Current Method

- Often only portions of a 14-digit HUC are degraded and warrant restoration intervention (25% suburban, 75% rural/forested)
- Failure to acquire mitigation within initial targets usually leads to adding more targeted watersheds
- Competition within targeted areas increases land acquisition costs
- Projects offering high environmental benefit outside of targeted watersheds are excluded
- Current targeting methodology relies on additional Local and Regional plans to identify specific watershed stressors

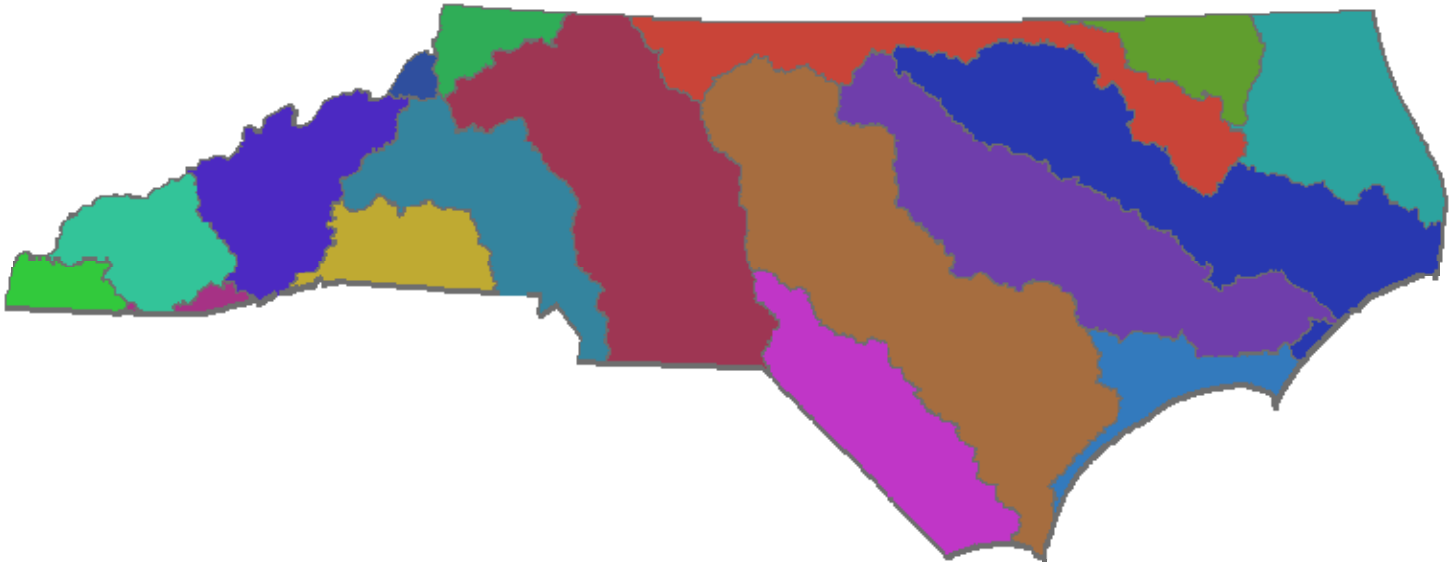
Moving Forward

- Reduce mitigation costs
- Data driven decision making
- Leverage big data and automation
- Function based priorities
- Integrate specific watershed planning goals into proposal evaluation and project acquisition



Watershed Planning Goal

Identify functional based watershed priorities on a statewide scale using high resolution data to focus project implementation in areas with greatest uplift potential.



Comply with the 2008 federal mitigation rule.

Proposed Planning Process

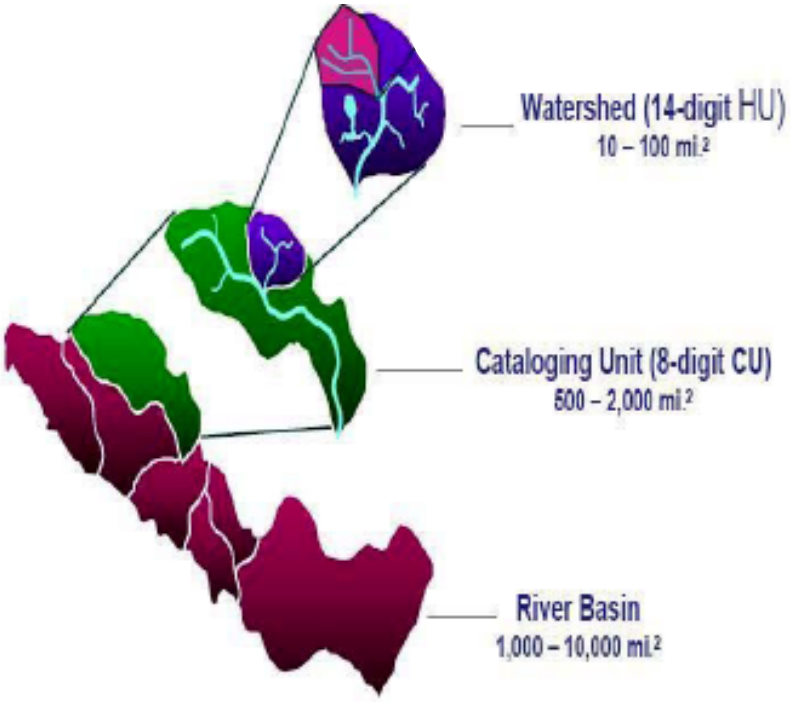
- **River Basin Restoration Priorities (RBRP)**
  - Collections of smaller catchments define priority areas
  - Informed by multiple models that evaluate three functional categories
  - Data driven online mapping for each of the 17 river basins within NC
  - Analysis conducted within each 8-digit HUC

- **Local Watershed Plans (LWP)**
  - Similar in scale and scope as current process
  - Reserved for areas where mitigation is difficult to acquire

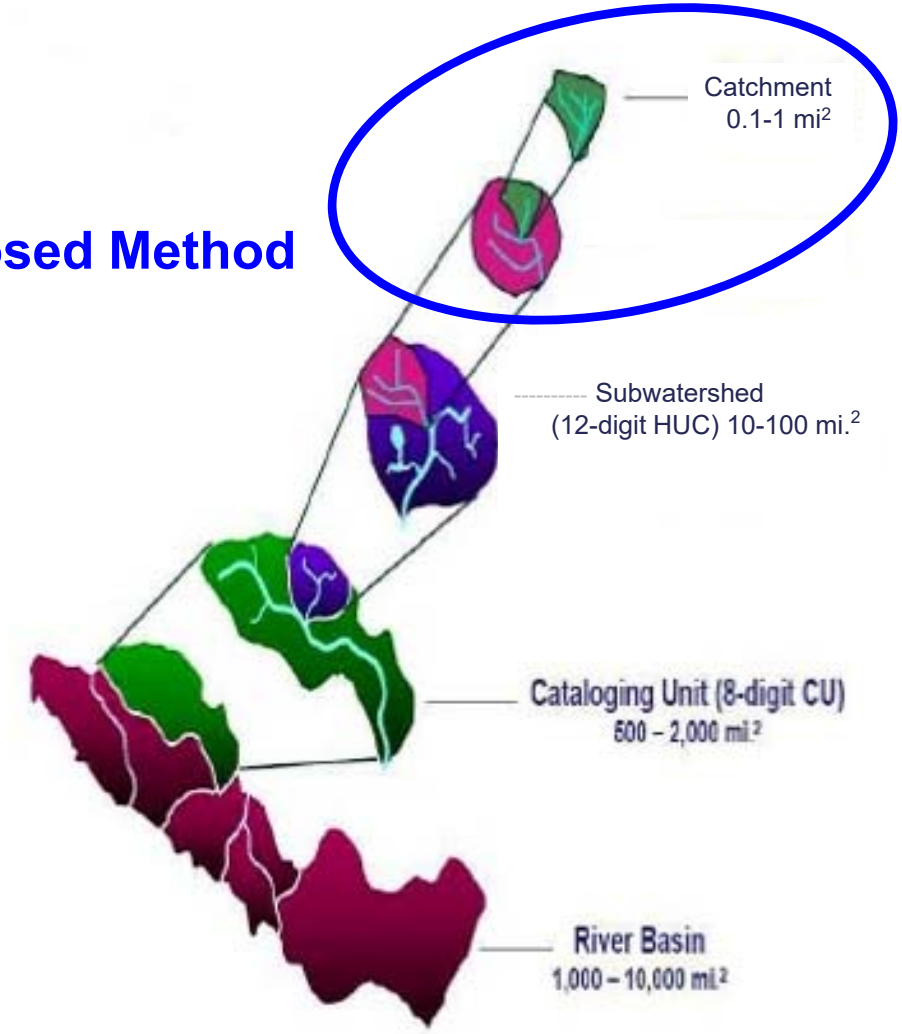
- **Regional Watershed Plans (RWP)**
  - Similar in scale as current process
  - Identifies watershed stressors in greater detail
  - Implemented in areas where mitigation needs are anticipated

Scale

Current Method



Proposed Method

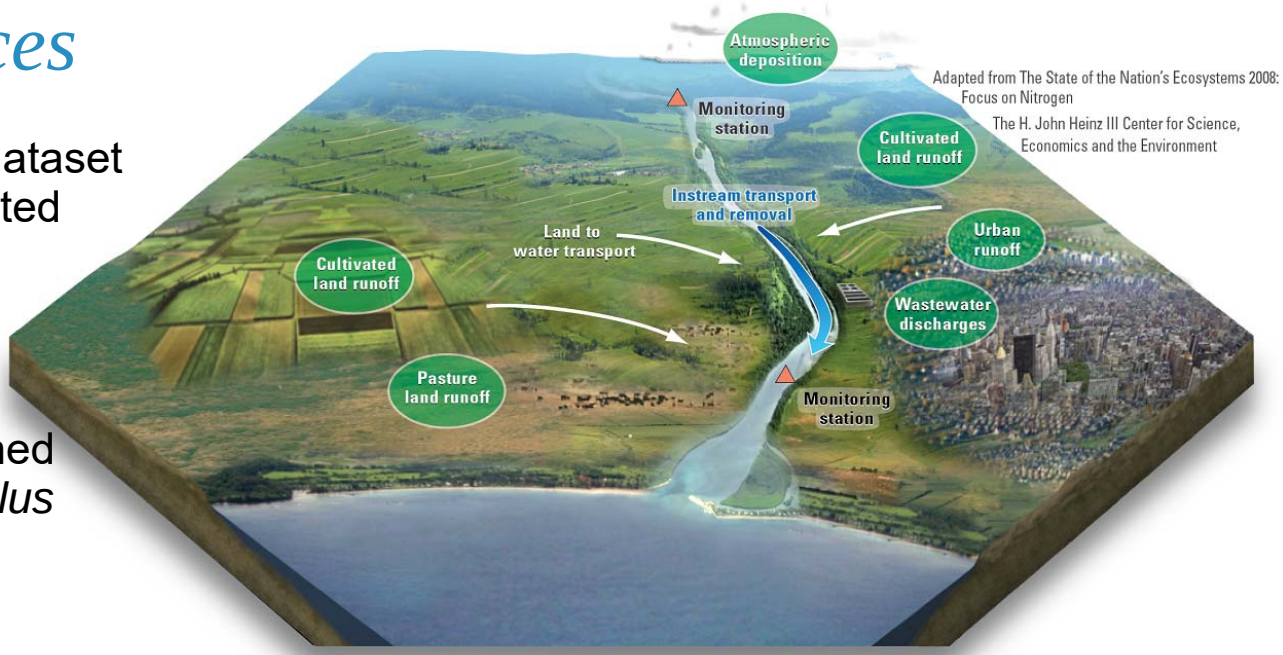


Improved Data Resources

- **NHD-Plus** – geospatial hydrologic dataset built by the USEPA and USGS; integrated suite of datasets (NHD, NED, WBD); version 2 (2012)

- **StreamCat –** a database of watershed *metrics built by USEPA: based NHD-Plus framework*

- **USGS SPARROW –** *Spatially Referenced Regressions On Watershed attributes*; models estimate nutrient and sediment transport through stream networks.



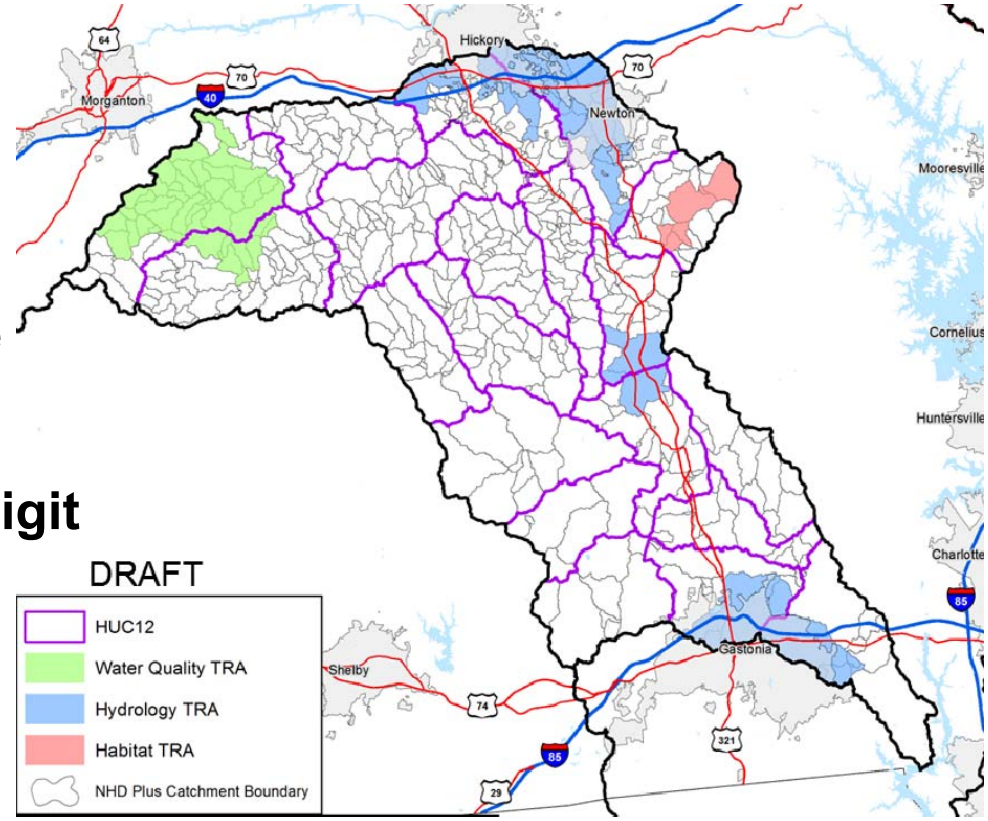
Proposed Modeling Method

- **Three independent functional models**
  Habitat, Hydrology, Water Quality

- **15-30 metrics**
  Specifically address the functional category are assigned to that model

- **Compare all catchments within an 8-digit HUC**

- **Spatial "Hot Spot" analysis**
  Defines collections of contiguous catchments that have thematic functional problems



Old versus *New* RBRP Methodology

Targeted Local Watersheds (TLWs)	Targeted Resource Areas (TRAs)
TLWs represented at HUC-14 (~30-80 mi^2) watershed	TRAs represented as clusters of NHD^{Plus} catchments; may cross HUC-12 or HUC-8 boundary
Priorities based upon HUC-14s with highest composite score	Priorities based one or more functional models: Hydrology, Water Quality, Habitat
"Diluted" priorities in some CUs	Focused priorities
Watershed restoration goals are generic and do not offer substantive information for project evaluation.	Supports direct linkages between watershed planning goals and project implementation.

Project Implementation

- Full integration of watershed planning through site selection and evaluation process
- Planning Process identifies watershed stressors, projects identify and address sources
- Proposals addressing more functional stressors receive higher scores
- Proposals addressing issues identified by the planning process are eligible for additional points

Functional Category	Functional Stressor	Functional Uplift Potential					Planning Identified Stressor		
	Check boxes below to identify stressors addressed by proposal.	Complete this section for identified functional stressors ONLY. Select the option that best describes the uplift potential for the majority of the project area.					Check box below if stressor is identified through watershed planning		
							TRA	RWP	LWP
Water Quality	☐ Inadequate riparian buffer / wetland vegetation	Low	Moderate	High	Very High				
	☑ Sediment	Low	Moderate	High	Very High				✓
	☑ Nutrients	Low	Moderate	High	Very High				✓
	☐ Fecal Coliform	Low	Moderate	High	Very High				
	☐ Other	Low	Moderate	High	Very High				
Hydrology	☑ Peak Flows	Low	Moderate	High	Very High				
	☑ Artificial Barriers	Low	Moderate	High	Very High				
	☐ Ditching/Draining	Low	Moderate	High					
	☐ Other	Low	Moderate	High	Very High				
Habitat	☑ Habitat Fragmentation	Low	Moderate	High	Very High		✓		
	☐ Limited Bedform Diversity	Low	Moderate	High	Very High				
	☐ Absence of Large Woody Debris	Low	Moderate	High	Very High				
	☐ Other	Low	Moderate	High	Very High				
Functional and Planning Subtotal	Total Count	2	2	1	—	Total Count	1	—	2
	Multiplier	x 1	x 3	x 6	x 10	Multiplier	x 2	x 4	x 6
	Count x Function Multiplier	2	6	6	—	Count x Planning Multiplier	2	—	12
	Sum of Function	14 (A)				Sum of Planning	14 (B)		

Acknowledgements

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