

MARYLAND WETLAND ECOLOGICAL INTEGRITY ASSESSMENT: Coastal Plain Region

Project/Site Name: _____	City/County: _____	Sampling Date: _____
Assessment Area Name (if >1 AA): _____	Observer(s): _____	
Delineation performed: <input type="checkbox"/> previously <input type="checkbox"/> concurrently Lat/Long: _____ AA size: _____ units _____		
Site Description: (general landscape setting, overview of riparian corridor, presence of braided/multithread system, topography, vegetation patterns, complexity and habitat richness; human and natural disturbance as indicated by spoil piles, beaver activity, dumping, vegetation removal, pest impacts, excessive flow; description of adjacent stream and sources/evidence of water input or alterations such as culverts, roads/trails, sediment). Representative site photographs of soil, nearest stream channel and banks, and vegetation are useful to show the features present.		

LANDSCAPE ASSESSMENT FOR PROJECT AREA (Section 3; office and field assessment)

Field observations to assist with scoring of buffers, aquatic context, or size of AA:	
METRIC	SCORE (use Section 3 tables to assign scores)
Buffer Perimeter: %Natural: <input type="checkbox"/> >95% <input type="checkbox"/> 85-95% <input type="checkbox"/> 75-84% <input type="checkbox"/> <75%	
Buffer Condition: %Natural: <input type="checkbox"/> >90% <input type="checkbox"/> 75-90% <input type="checkbox"/> 50-74% <input type="checkbox"/> <50%	
Aquatic Context: <input type="checkbox"/> 4 or more aquatic resources <input type="checkbox"/> 3 <input type="checkbox"/> 2 <input type="checkbox"/> 0-1	
Comparative Size: <input type="checkbox"/> Very large <input type="checkbox"/> Large <input type="checkbox"/> Medium to small <input type="checkbox"/> Small to very small	
Source(s) of size reduction, if any: <input type="checkbox"/> Beaver dam or lodge <input type="checkbox"/> Trail <input type="checkbox"/> Road <input type="checkbox"/> Railroad <input type="checkbox"/> Development <input type="checkbox"/> Agriculture <input type="checkbox"/> Impoundment <input type="checkbox"/> Human-constructed drainage (into or out of wetland) <input type="checkbox"/> Excavation <input type="checkbox"/> Fill <input type="checkbox"/> Groundwater extraction <input type="checkbox"/> Other _____	
From StreamStats: Impervious Surface in project area basin: _____ Forest Cover in project area basin: _____	
Additional channels in project area visible on LiDAR Hillshade image:	

WETLAND ASSESSMENT AREA ONLY:

ENVIRONMENTAL INFORMATION (Section 4.2)

Slope (deg/%): _____ Aspect (if applicable): _____

Landscape Position: Indicate all features present

<input type="checkbox"/> Active floodplain (depression or terrace)	<input type="checkbox"/> Beaver pond/Natural impoundment	<input type="checkbox"/> Riparian-Depression (in floodplain)	<input type="checkbox"/> Riparian terrace (outside seasonal flooding; historic floodplain or current terrace)
<input type="checkbox"/> Headwater stream/spring	<input type="checkbox"/> Seep/groundwater discharge site (toe slope)	<input type="checkbox"/> Swale	<input type="checkbox"/> Isolated Depression
<input type="checkbox"/> Oxbow	<input type="checkbox"/> Wetland charged by groundwater seeps (hill slope)	<input type="checkbox"/> Streambank	<input type="checkbox"/> Point bar
<input type="checkbox"/> Flats	<input type="checkbox"/> Braided Channels	<input type="checkbox"/> Other- describe	

Water Source: If more than one source is present, label as P (primary), S (Secondary), T (tertiary)

<input type="checkbox"/> Direct precipitation	<input type="checkbox"/> Groundwater discharge	<input type="checkbox"/> Natural surface flow	<input type="checkbox"/> Urban run-off/culverts
<input type="checkbox"/> Overbank flooding	<input type="checkbox"/> High groundwater	<input type="checkbox"/> Irrigation	<input type="checkbox"/> Pipes/outfall (directly feeding wetland)

Hydrological Regime: Circle the regime that best matches the conditions in the AA

H Permanently Flooded	G Intermittently Exposed	F Semipermanently Flooded	C Seasonally Flooded	E Seasonally Flooded-Saturated
B Seasonally Saturated	D Continuously Saturated	A Temporarily Flooded	I Intermittently Flooded	K Artificially Flooded

Observations/Comments:**CLASSIFICATION OF AA TO KEY WILDLIFE HABITAT AND HGM CLASS** (Section 4.3)

Key Wildlife Habitat: _____ HGM Class: _____

Optional: NVC Community Type/Plant Association: _____

Stream Key Wildlife Habitat Type: Coastal Plain Stream Blackwater Stream Coastal Plain River**SOIL/SUBSTRATE** (Section 4.4)**Note:** if the floodplain does not naturally have hydric soils, and still does not have hydric soils under current conditions, only score Microtopography, Organic Matter Accumulation, and Soil Disturbance.**Mapped Soil Type:** _____ **Depth to water table** _____ **Hydric soil?** _____ **Hydric Soil Indicators:** _____
Depth of O horizon _____ **Depth of A horizon** _____ **Extensive roots in soil?** _____ **Soil Matrix Hue Value/Chroma** _____

Note any deviations from the characteristics described for the mapped soil type for this AA and potential causes. Describe any impacts to the soil surface such as trampling/compaction from animals or machinery, ruts or other disturbances from ATV or other vehicular activity, or sedimentation.

Observations/Comments (including for metrics below):**Soil Biogeochemical Processing:****Soil Redox concentrations:** >10% surface area and start 0-6" from soil surface start >6-12" start >12-18"
<10% surface area and start 0-6" from soil surface start >6-12" None within 18" **Score:** _____**Soil Organic Matter:** Horizon present (any thickness) Mineral surface layer(s) $\geq 4"$ thick with matrix value ≤ 3 and chroma ≤ 2
 Mineral surface layer $< 4"$ thick and Matrix value ≤ 3 and chroma ≤ 2 Matrix value > 3 and ≤ 4 or chroma > 2 and ≤ 3 **Score:** _____**Microtopography:** $\geq 50\%$ of Assessment Area 30-49% of AA 10-29% of AA $< 10\%$ of AA **Score:** _____**Organic Matter Accumulation:** Estimated ground cover of herbaceous/woody plants (living and dead residue): _____%
Estimated cover of leaf litter (loose leaves must be at least 1" thick or decaying leaves must have at least 5 stacked layers): _____%
% herbaceous/woody + % leaf litter: $> 75\%$ $> 50-74\%$ $> 25-50\%$ $\leq 25\%$ **Score:** _____**Soil Disturbance:** Presence of bare soil due to human activities: None/minimal Minor/small patches Moderate Substantial
Extent of impact of disturbance: None Minimal Moderate Extensive
Depth of disturbance and ponding/channeling: None $< 2"$ 2-4", some ponding/channeling $> 4"$, ponding/channeling**Score:** _____**HYDROLOGY** (Section 4.5)**Water Source**— Identify dominant water source and natural/unnatural influence for the AA by KWH type. **Natural:** Sheet flow present Natural narrow channel present Mimics natural hydrology Groundwater input Expected overbank flooding
 Expected plant community Other _____ **Unnatural/Manipulated:** Impoundment Inflow from anthropogenic sources Fill Ditching Channelization Confined to small outlet Lost water sources due to alterations Multiple sources and some degraded Incised and no longer floods Other _____**Point Source Discharge** (into or adjacent to site): Lacking Minor Moderate Major**Unnatural Obstructions** (to ground or surface water): None Minor ($< 25\%$) Moderate (25-75%) Major ($> 75\%$)**Alteration to:** Overland Flow Groundwater Overbank Flooding Plant Community Wetland Extent inputTiming: Recent (within 5 years) Historic Permanent hydrologic changeNegative effect: AA Flow and circulation Redirects or confines flows into/through AA Reduced water table Reduced inundation None**Score:** _____**Observations/Comments:****Stream Bank and Channel**— Describe the stream channel in the project area, including evidence of alteration and signs of recovery/stabilization.**Evidence of bank/channel equilibrium:** Recovering to meander Low energy stream with bare banks Variety of pool depths Variety of stream velocities Visual flow of water from channel banks or wetlands (groundwater flow) Still pools with some flow and floodplain connection Embedded woody debris of size and amount consistent with what is available in riparian area Well-defined usual high water line with obvious floodplain Little or no active undercutting or burial of riparian vegetation Braided channels Other _____**Evidence of channel instability/migration:** Riparian vegetation buried Recent sediment or gravel deposited Active incision/downcutting Braided channels have coalesced Buried hydric soil and/or gravel layer and depth _____ Other _____**Overall channel instability:** None/minimal Minor Moderate Substantial**Sources of channel instability/migration:** Lacks vertical controls (vegetation, wood, rock, etc.) Excessive channel deposition/bar development Historic channel alteration Proximity and landscape position presents potential impact to AA hydrology Other _____**Evidence of bank instability:** Banks undercut, slides, and/or slumps Riparian vegetation declining Shrub/trees falling into channel Bank uniformly scoured and unvegetated Other _____

Overall bank instability: None/minimal Minor Moderate Substantial

Sources of bank instability: Vertical banks Highly erodible materials Raw unvegetated banks Excessive bedload Other _____

If available: Bank Erosion Hazard Index _____ Near Bank Stress _____

Score: _____

Aquatic Life: (if available for site or use nearest, most recent Biological Stream Survey point in stream):

Benthic IBI- Value _____ Rating: Good (≥ 4) Fair (3-3.99) Poor <3 Fish IBI- Value _____ Rating: Good (≥ 4) Fair (3-3.99) Poor <3

Observations/Comments:

Hydroperiod and Hydrologic Connectivity – Determine the natural variability and/or recent alteration of the duration, frequency, and magnitude of inundation/saturation in the AA by KWH type.

Natural variation of hydroperiod: Low High

Information Sources: Visual indicators Monitoring Wells Hydrology/Hydraulic analysis Bank Height Ratio _____ Entrenchment Ratio _____

Overbank flooding (if available): 2-year storm 10-year 100-year

Degree of connection to floodplain: Complete **Disconnection/entrenchment:** Minimal Moderate Disconnected and/or severely entrenched

Evidence of overbank flooding: Recent Evidence of overbank flooding Some evidence, likely during large storm events Generally no longer occurs

Change/Alteration of hydroperiod: None Due to natural events Due to human influences: Minor Moderate Substantial

Backwater flooding or lateral movement affected by restrictions: List restrictions: _____

Score: _____

Observations/Comments:

KEY WILDLIFE HABITAT (Section 4.6)

Interspersion/Patch Richness –interspersion of vegetation patches and number of different obvious types of physical surfaces or features that may provide habitat for aquatic, wetland, or riparian animal species.

Interspersion of habitats/physical features (see examples): High Moderate Low or Minimal None or Few

Features present: Spring or upwelling groundwater Depression Vegetated pool Unvegetated pool Unvegetated flat Island Animal mound or burrow Beaver dam or lodge Beaver-chewed vegetation Oxbow, swale, secondary channel Wind-thrown tree hole Mound Bank overhang with tree roots Tip-up tree root mound Brush piles Abundant deciduous leaf litter Partially buried natural debris Debris jam Plant hummock/tussocks Other wildlife habitat Wildlife species observed: _____

Score: _____

Observations/Comments:

Vertical Structure – Refer to metrics for selected Key Wildlife Habitat Type for scoring.

Forested systems: Canopy: Heterogeneous patches of different ages or sizes: Yes Mostly Somewhat No

Gaps of varying sizes Impacted by beaver activity Impacted by forest pests/pathogens

Woody vertical layers: Multiple layers present One layer missing or homogeneous >1 layer missing, little variation Only 1-2 layers present

Large trees (DBH > 60 cm or 24") present: $\geq 10\%$ $<10\%$

Trees present with DBH > 30 cm or 12": $\geq 20\%$ $< 20\%$

Degradation due to cutting, browsing, pests/pathogens: Minimal Moderate Extensive Source(s) of degradation: _____

Bog and Fen systems: Woody layer mortality (if layer present): Due to natural factors Minor human-caused Moderate human-caused

Extensive human-caused Impacted by forest pests/pathogens Impacted by browsing/grazing

Expected structure: Present Minor alteration Moderate Alteration Extensive Alteration

Score : _____

Observations/Comments:

Standing and Downed Coarse Woody Debris – Refer to metrics for selected Key Wildlife Habitat type for scoring.

Forested systems: Standing snags and downed logs: Size diversity: High Moderate Moderate-low Low

Stage of downed log decay: Variable including advanced stage Variable with few advanced Variable with no advanced Low variability

Source(s) of woody debris if not natural (cutting, pest/pathogens, etc.): _____

Bog and Fen systems: Woody and/or litter: Typical peat accumulation Human-caused alteration Minor Moderate Substantial Impacted by forest pests/pathogens

Ground cover alterations: None Minor Moderate Substantial

Score: _____

Observations/Comments:

VEGETATION (Section 4.6) Additional species may be listed on a separate sheet. See Scoring Sheet for %cover examples.

NOTE: Include native diagnostic, disturbance indicator, and state rare, threatened, and endangered species regardless of %cover.

Species:	Absolute % Cover	Species:	Absolute % Cover
Tree Stratum: woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger DBH			
1.		5.	
2.		6.	
3.		7.	
4.		8.	
Sapling Stratum: woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH			
1.		4.	
2.		5.	
3.		6.	
Shrub Stratum: woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height			
1.		6.	
2.		7.	
3.		8.	
4.		9.	
5.		10.	
Herb Stratum: all herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody species, except woody vines, less than approximately 3 ft (1 m) in height			
1.		7.	
2.		8.	
3.		9.	
4.		10.	
5.		11.	
6.		12.	
Woody Vine Stratum: all woody vines, regardless of height			
1.		4.	
2.		5.	
3.		6.	

KWH VEGETATION COMPOSITION (Use tables in Section 4.6 to assign scores).

Invasive Species:
Maximum invasive species cover in any one woody layer (if present): <1% 1- 5% >5-10% >10%
Absolute cover of invasive/disturbance species in herbaceous layer: <1% 1-5% >5-30% >30% **Score:** _____
Observations/Comments:

Native Species: *Refer to metrics for selected Key Wildlife Habitat Type for scoring.*
Woody layer (if present): Dominated by diagnostic native species Some diagnostic species absent/reduced Few diagnostic species Few/no diagnostic species present
Herbaceous layer: Dominated by diagnostic native species Some diagnostic species absent/reduced Few diagnostic species Few/no diagnostic species present
Cover of native species indicative of disturbance: 0-1% 2-10% >10-30% >30%
Bog and Fen/Springs: Sphagnum cover - Continuous/abundant Absent from small areas Reduced Very low **Score:** _____
Observations/Comments:

Alterations/Stressors: *Indicate stressors and alterations affecting the observed vegetation composition of the AA.*
 Recent timber harvest (clearcut or selective cut) Tree plantation Mowing or shrub cutting Herbicide use Trampling/ORV Excessive animal herbivory Pest damage Unnatural fire regime Trash/dumping
 Other _____
Suggestions for improving native species cover and natural vegetation composition _____

Observations/Comments:

Floristic Quality Assessment: *(see Excel data sheet or manual for calculation):*
Native mean C-value _____ : >4 3-4 <3-2 <2
Adjusted FQI _____ **Score:** _____

MARYLAND WETLAND ECOLOGICAL INTEGRITY ASSESSMENT: Coastal Plain Region SCORING FORM

Project/Site Name: _____ City/County: _____ Sampling Date: _____

Assessment Area Name (if >1 AA): _____ Observer(s): _____

Scoring Scale: 3.5- 4 = Excellent 2.5-3.49 = Good 1.5-2.49 = Fair 1-1.49 = Poor

Core Factor	Metric	Metric Score	Mean Core Factor Score	Weighting Factor	Overall Core Factor Score (Mean Core Factor Score X Weighting Factor)
Landscape (Assessment for project area)	Buffer Perimeter		(Sum of metric scores: _____) / 4 = _____	0.3	
	Buffer Condition				
	Aquatic Context				
	Comparative Size				
Soil/Substrate* <small>* If only Microtopography, Organic Matter Accumulation, and Soil Disturbance were scored, divide by 3 rather than 5</small>	Redox Concentrations		(Sum of metric scores: _____) / 5 or /3* = _____	0.1	
	Microtopography				
	Soil Organic Matter				
	Soil Disturbance				
Hydrology	Water source		(Sum of metric scores: _____) / 3 = _____	0.2	
	Channel				
	Hydroperiod and Hydrologic Connectivity				
Key Wildlife Habitat and Vegetation Composition	Interspersion/Patch Richness		(Sum of metric scores: _____) / 6 = _____	0.4	
	Vertical Structure				
	Coarse Woody Debris				
	Invasive Species				
	Native Species Composition				
	Floristic Quality Assessment				

Sum of Overall Core Factor Scores = Overall KWH Ecological Integrity Assessment (EIA) Score:

From WRR layers (see Manual Section 3.5): Mark all categories present in WRR layers. Assign the single highest score for a maximum of +0.2 for WRR layers:

- Nontidal Wetlands of Special State Concern (+ 0.2)
- Biodiversity Conservation Network Tier 1, 2, or 3 (+ 0.2)
- Forest Interior Dwelling Species (FIDS) area: Class 1 (+ 0.1)
- Targeted Ecological Area (+ 0.1)
- Sensitive Species Project Review Area (+ 0.1)

From MDE Tier II High Quality Waters (Section 3.5):

- Upstream of, within, or adjacent to Tier II High Quality stream segment (+ 0.2)

From StreamStats (see Manual Section 3.5):

- Impervious surface area for project area basin is low (< 5%) (+ 0.2)
- Forest cover in project area basin is >90% (+ 0.2)

From field observations (see Manual Section 5.1):

- Maryland nontidal wetland(s) with significant plant or wildlife value (as defined by COMAR 26.23.01.01B80) but not designated as a Nontidal Wetland of Special State Concern (add + 0.2 for each wetland to the Overall EIA score)
- State rare, threatened, or endangered plants or state rare natural community noted during field data collection but not mapped in Biodiversity Conservation Network Tier 1, 2, or 3 (+ 0.2)
- Sensitive species (colonial waterbird nesting colony, native mussel bed, anadromous fish) (+ 0.1)
- Dominated by native trees greater than 30cm or 12" diameter at breast height (+ 0.1)
- Dominated by hard mast (i.e., acorns and nuts) producing native species in the tree stratum (+ 0.1)

FINAL Key Wildlife Habitat Ecological Integrity Assessment SCORE and RATING: _____

Comments: