APPENDIX D: ASSESSMENT AREA DATA FORMS

Basic Information Sheet: Riverine Wetlands

Assessment Area Name: AA3-MTR-02833-NAW-03235	
Project Name: HSR JM	
Assessment Area ID #:	
Project ID #:	**Date:** 4/25/19
Assessment Team Members for This AA:	
LSL, DM	
Average Bankfull Width:	
Approximate Length of AA (10 times bankfull width, min 100 m, max 200 m):	
Upstream Point Latitude:	**Longitude:**
Downstream Point Latitude: 37.2084	**Longitude:** -121.7262

Wetland Sub-type:

☐ Confined ☒ Non-confined

AA Category:

☐ Restoration ☐ Mitigation ☐ Impacted ☐ Ambient ☐ Reference ☐ Training

☒ Other: Preproject

Did the river/stream have flowing water at the time of the assessment? ☒ yes ☐ no

What is the apparent hydrologic flow regime of the reach you are assessing?

The hydrologic flow regime of a stream describes the frequency with which the channel conducts water. *Perennial* streams conduct water all year long, whereas *ephemeral* streams conduct water only during and immediately following precipitation events. *Intermittent* streams are dry for part of the year, but conduct water for periods longer than ephemeral streams, as a function of watershed size and water source.

☒ perennial ☐ intermittent ☐ ephemeral

Photo Identification Numbers and Description:

	Photo ID No.	Description	Latitude	Longitude	Datum
1		Upstream			
2		Middle Left			
3		Middle Right			
4		Downstream			
5					
6					
7					
8					
9					
10					

Site Location Description:

Comments:

Scoring Sheet: Riverine Wetlands

AA Name: AA3			**Date:** 4/25/19
Attribute 1: Buffer and Landscape Context (pp. 11-19)			**Comments**
	Alpha.	Numeric	
Stream Corridor Continuity (D)	B		100m
Buffer:			
	Alpha.	Numeric	
Buffer submetric A: Percent of AA with Buffer	A		100%
Buffer submetric B: Average Buffer Width	A		219 m
Buffer submetric C: Buffer Condition	C		
Raw Attribute Score = $D+[C \times (A \times B)^{1/2}]^{1/2}$			**Final Attribute Score = (Raw Score/24) x 100**
Attribute 2: Hydrology (pp. 20-26)			
	Alpha.	Numeric	
Water Source	C		
Channel Stability	A		
Hydrologic Connectivity	B		2.14 Avg.
Raw Attribute Score = sum of numeric scores			**Final Attribute Score = (Raw Score/36) x 100**
Attribute 3: Physical Structure (pp. 27-33)			
	Alpha.	Numeric	
Structural Patch Richness	A		
Topographic Complexity	B		B2
Raw Attribute Score = sum of numeric scores			**Final Attribute Score = (Raw Score/24) x 100**
Attribute 4: Biotic Structure (pp. 34-41)			
Plant Community Composition (based on sub-metrics A-C)			
	Alpha.	Numeric	
Plant Community submetric A: Number of plant layers	A		4 layers
Plant Community submetric B: Number of Co-dominant species	C		7
Plant Community submetric C: Percent Invasion	A		14% invasives
Plant Community Composition Metric *(numeric average of submetrics A-C)*			
Horizontal Interspersion	C		
Vertical Biotic Structure	C		
Raw Attribute Score = sum of numeric scores			**Final Attribute Score = (Raw Score/36) x 100**
Overall AA Score (average of four final Attribute Scores)			

Worksheet for Stream Corridor Continuity Metric for Riverine Wetlands

Lengths of Non-buffer Segments For Distance of 500 m Upstream of AA		Lengths of Non-buffer Segments For Distance of 500 m Downstream of AA	
Segment No.	Length (m)	Segment No.	Length (m)
1		1	100
2		2	
3		3	
4		4	
5		5	
Upstream Total Length	0	Downstream Total Length	100

Percent of AA with Buffer Worksheet

In the space provided below make a quick sketch of the AA, or perform the assessment directly on the aerial imagery; indicate where buffer is present, estimate the percentage of the AA perimeter providing buffer functions, and record the estimate amount in the space provided.

Percent of AA with Buffer: 100 %

Worksheet for calculating average buffer width of AA

6

Line	Buffer Width (m)
A	200
B	215
C	200
D	160
E	250
F	230
G	250
H	250
Average Buffer Width *Round to the nearest integer*	219m

Worksheet for Assessing Channel Stability for Riverine Wetlands

Condition	Field Indicators (check all existing conditions)
Indicators of Channel Equilibrium	☒ The channel (or multiple channels in braided systems) has a well-defined bankfull contour that clearly demarcates an obvious active floodplain in the cross-sectional profile of the channel throughout most of the AA. ☒ Perennial riparian vegetation is abundant and well established along the bankfull contour, but not below it. ☐ There is leaf litter, thatch, or wrack in most pools (if pools are present). ☒ The channel contains embedded woody debris of the size and amount consistent with what is naturally available in the riparian area. ☐ There is little or no active undercutting or burial of riparian vegetation. ☐ If mid-channel bars and/or point bars are present, they are not densely vegetated with perennial vegetation. ☐ Channel bars consist of well-sorted bed material (smaller grain size on the top and downstream end of the bar, larger grain size along the margins and upstream end of the bar). ☒ There are channel pools, the spacing between pools tends to be regular and the bed is not planar throughout the AA ☐ The larger bed material supports abundant mosses or periphyton.
Indicators of Active Degradation	☐ The channel is characterized by deeply undercut banks with exposed living roots of trees or shrubs. ☐ There are abundant bank slides or slumps. ☐ The lower banks are uniformly scoured and not vegetated. ☐ Riparian vegetation is declining in stature or vigor, or many riparian trees and shrubs along the banks are leaning or falling into the channel. ☐ An obvious historical floodplain has recently been abandoned, as indicated by the age structure of its riparian vegetation. ☐ The channel bed appears scoured to bedrock or dense clay. ☐ Recently active flow pathways appear to have coalesced into one channel (i.e. a previously braided system is no longer braided). ☐ The channel has one or more knickpoints indicating headward erosion of the bed.
Indicators of Active Aggradation	☒ There is an active floodplain with fresh splays of coarse sediment (sand and larger that is not vegetated) deposited in the current or previous year. ☐ There are partially buried living tree trunks or shrubs along the banks. ☐ The bed is planar (flat or uniform gradient) overall; it lacks well-defined channel pools, or they are uncommon and irregularly spaced. ☐ There are partially buried, or sediment-choked, culverts. ☐ Perennial terrestrial or riparian vegetation is encroaching into the channel or onto channel bars below the bankfull contour. ☐ There are avulsion channels on the floodplain or adjacent valley floor.
Overall	☒ **Equilibrium** ☐ **Degradation** ☐ **Aggradation**

Riverine Wetland Entrenchment Ratio Calculation Worksheet

The following 5 steps should be conducted for each of 3 cross-sections located in the AA at the approximate midpoints along straight riffles or glides, away from deep pools or meander bends. An attempt should be made to place them at the top, middle, and bottom of the AA.

Steps	Replicate Cross-sections →	TOP	MID	BOT
1 Estimate bankfull width.	This is a critical step requiring familiarity with field indicators of the bankfull contour. Estimate or measure the distance between the right and left bankfull contours.	8m	12m	8m
2: Estimate max. bankfull depth.	Imagine a level line between the right and left bankfull contours; estimate or measure the height of the line above the thalweg (the deepest part of the channel).	1m	1m	1m
3: Estimate flood prone depth.	Double the estimate of maximum bankfull depth from Step 2.	2m	2m	2m
4: Estimate flood prone width.	Imagine a level line having a height equal to the flood prone depth from Step 3; note where the line intercepts the right and left banks; estimate or measure the length of this line.	20m	18m	17m
5: Calculate entrenchment ratio.	Divide the flood prone width (Step 4) by the bankfull width (Step 1).	2.5m	1.5m	2.13m
6: Calculate average entrenchment ratio.	Calculate the average results for Step 5 for all 3 replicate cross-sections. Enter the average result here and use it in Table 13a or 13b.			2.04

Structural Patch Type Worksheet for Riverine wetlands

Circle each type of patch that is observed in the AA and enter the total number of observed patches in Table below. In the case of riverine wetlands, their status as confined or non-confined must first be determined (see page 6) to determine with patches are expected in the system (indicated by a "1" in the table below). Any feature onsite should only be counted once as a patch type. If a feature appears to meet the definition of more than one patch type (i.e. swale and secondary channel) the practitioner should choose which patch type best illustrates the feature. Not all features at a site will be patch types.

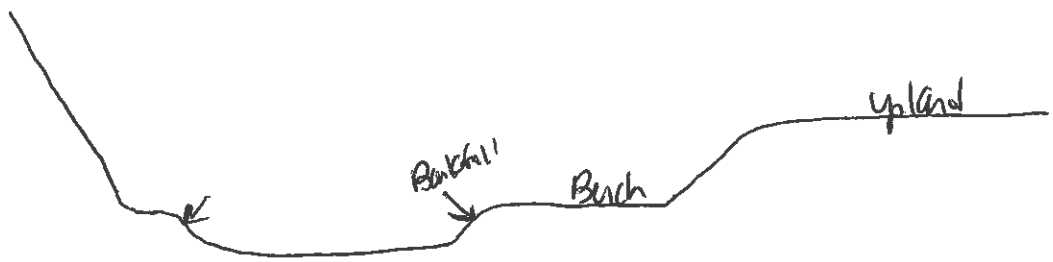
Please refer to the CRAM Photo Dictionary at** *www.cramwetlands.org* **for photos of each of the following patch types.

STRUCTURAL PATCH TYPE (circle for presence)	**Riverine (Non-confined)**	**Riverine (Confined)**
Minimum Patch Size	**3 m^2**	**3 m^2**
Abundant wrackline or organic debris in channel, on floodplain	1	1
Bank slumps or undercut banks in channels or along shoreline	1	1
Cobbles and/or Boulders	1	1
Debris jams	1	1
Filamentous macroalgae or algal mats	1	1
Large woody debris	1	1
Pannes or pools on floodplain	1	N/A
Plant hummocks and/or sediment mounds	1	1
Point bars and in-channel bars	1	1
Pools or depressions in channels (wet or dry channels)	1	1
Riffles or rapids (wet or dry channels)	1	1
Secondary channels on floodplains or along shorelines	1	N/A
Standing snags (at least 3 m tall)	1	1
Submerged vegetation	1	N/A
Swales on floodplain or along shoreline	1	N/A
Variegated, convoluted, or crenulated foreshore (instead of broadly arcuate or mostly straight)	1	1
Vegetated islands (mostly above high-water)	1	N/A
Total Possible	**17**	**12**
No. Observed Patch Types (enter here and use in Table 14 below)	13	

Worksheet for AA Topographic Complexity

At three locations along the AA, make a sketch of the profile of the stream from the AA boundary down to its deepest area then back out to the other AA boundary. Try to capture the benches and the intervening micro-topographic relief. To maintain consistency, make drawings at each of the stream hydrologic connectivity measurements, always facing downstream. Include the water level, an arrow at the bankfull contour, and label the benches. Based on these sketches and the profiles in Figure 10, choose a description in Table 16 that best describes the overall topographic complexity of the AA.

Profile 1



Profile 2

Same

Profile 3

Same

Plant Community Metric Worksheet: Co-dominant species richness for Riverine wetlands
(A dominant species represents ≥10% *relative* cover)

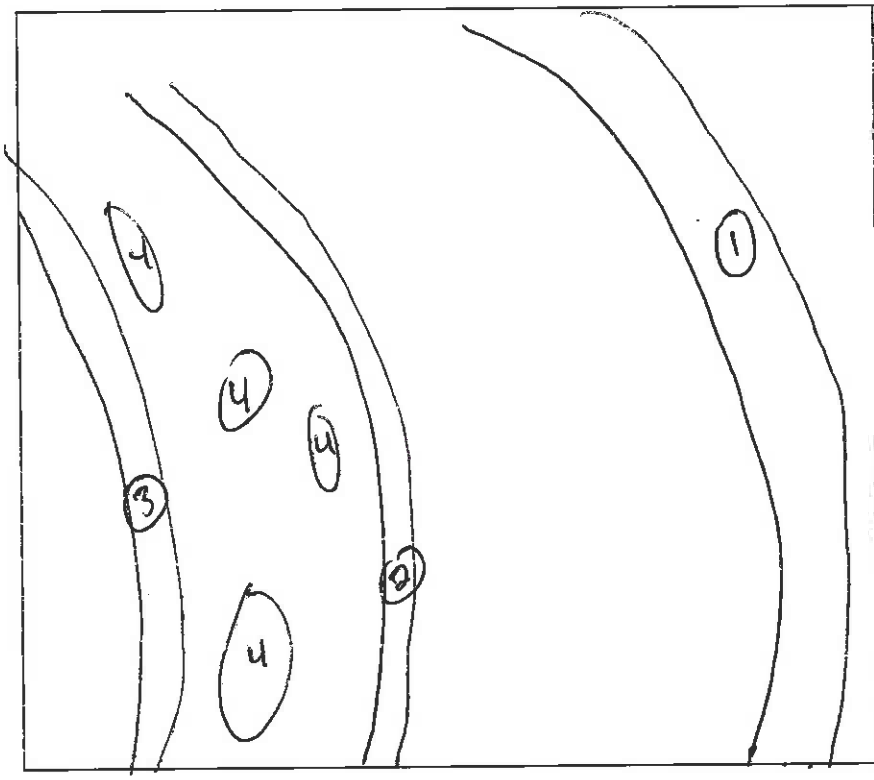
Special Note:

** Combine the counts of co-dominant species from all layers to identify the total species count. Each plant species is only counted once when calculating the Number of Co-dominant Species and Percent Invasion submetric scores, regardless of the numbers of layers in which it occurs.*

Floating or Canopy-forming (non-confined only)	Invasive?	Short (<0.5 m)	Invasive?
		Bromus diandrus	Y
Medium (0.5-1.5 m)	**Invasive?**	**Tall (1.5-3.0 m)**	**Invasive?**
Mulefat	N	Cottonwood	N
Cottonwood	N	Mulefat	N
Cattails (Typha latafolia)	N	Poison oak	N
Poison oak	N		
Very Tall (>3.0 m)	**Invasive?**	**Total number of co-dominant species for all layers combined (enter here and use in Table 18)**	7
Cottonwood	N		
Coast live oak	N		
Sycamore	N	**Percent Invasion *Round to the nearest integer* (enter here and use in Table 18)**	1/7=14%

Horizontal Interspersion Worksheet.

Use the spaces below to make a quick sketch of the AA in plan view, outlining the major plant zones (this should take no longer than 10 minutes). Assign the zones names and record them on the right. Based on the sketch, choose a single profile from Figure 12 that best represents the AA overall.



Assigned zones:

1) very tall | PO

2) Cattails

3) upland grasses

4) Cottonwood | shortherbs

5)

6)

Worksheet for Wetland disturbances and conversions

<table>
<tr><td>Has a major disturbance occurred at this wetland?</td><td>Yes</td><td colspan="2">No</td><td></td><td></td></tr>
<tr><td>If yes, was it a flood, fire, landslide, or other?</td><td>flood</td><td colspan="2">fire</td><td>landslide</td><td>other</td></tr>
<tr><td>If yes, then how severe is the disturbance?</td><td>likely to affect site next 5 or more years</td><td colspan="2">likely to affect site next 3-5 years</td><td colspan="2">likely to affect site next 1-2 years</td></tr>
<tr><td rowspan="4">Has this wetland been converted from another type? If yes, then what was the previous type?</td><td>depressional</td><td colspan="2">vernal pool</td><td colspan="2">vernal pool system</td></tr>
<tr><td>non-confined riverine</td><td colspan="2">confined riverine</td><td colspan="2">seasonal estuarine</td></tr>
<tr><td>perennial saline estuarine</td><td colspan="2">perennial non-saline estuarine</td><td colspan="2">wet meadow</td></tr>
<tr><td>lacustrine</td><td colspan="2">seep or spring</td><td colspan="2">playa</td></tr>
</table>

Stressor Checklist Worksheet

HYDROLOGY ATTRIBUTE (WITHIN 50 M OF AA)	Present	Significant negative effect on AA
Point Source (PS) discharges (POTW, other non-stormwater discharge)		
Non-point Source (Non-PS) discharges (urban runoff, farm drainage)	X	
Flow diversions or unnatural inflows		
Dams (reservoirs, detention basins, recharge basins)		
Flow obstructions (culverts, paved stream crossings)		
Weir/drop structure, tide gates		
Dredged inlet/channel		
Engineered channel (riprap, armored channel bank, bed)	X	
Dike/levees		
Groundwater extraction		
Ditches (borrow, agricultural drainage, mosquito control, etc.)		
Actively managed hydrology		
Comments		

PHYSICAL STRUCTURE ATTRIBUTE (WITHIN 50 M OF AA)	Present	Significant negative effect on AA
Filling or dumping of sediment or soils **(N/A for restoration areas)**		
Grading/ compaction **(N/A for restoration areas)**		
Plowing/Discing **(N/A for restoration areas)**		
Resource extraction (sediment, gravel, oil and/or gas)		
Vegetation management		
Excessive sediment or organic debris from watershed		
Excessive runoff from watershed		
Nutrient impaired (PS or Non-PS pollution)	X	
Heavy metal impaired (PS or Non-PS pollution)		
Pesticides or trace organics impaired (PS or Non-PS pollution)	X	
Bacteria and pathogens impaired (PS or Non-PS pollution)		
Trash or refuse		
Comments		

BIOTIC STRUCTURE ATTRIBUTE (WITHIN 50 M OF AA)	Present	Significant negative effect on AA
Mowing, grazing, excessive herbivory (within AA)		
Excessive human visitation		
Predation and habitat destruction by non-native vertebrates (e.g., *Virginia opossum* and domestic predators, such as feral pets)		
Tree cutting/sapling removal		
Removal of woody debris		
Treatment of non-native and nuisance plant species		
Pesticide application or vector control		
Biological resource extraction or stocking (fisheries, aquaculture)		
Excessive organic debris in matrix (for vernal pools)		
Lack of vegetation management to conserve natural resources	X	
Lack of treatment of invasive plants adjacent to AA or buffer	X	
Comments		

BUFFER AND LANDSCAPE CONTEXT ATTRIBUTE (WITHIN 500 M OF AA)	Present	Significant negative effect on AA
Urban residential	X	
Industrial/commercial		
Military training/Air traffic		
Dams (or other major flow regulation or disruption)		
Dryland farming		
Intensive row-crop agriculture		
Orchards/nurseries		
Commercial feedlots		
Dairies		
Ranching (enclosed livestock grazing or horse paddock or feedlot)		
Transportation corridor	X	
Rangeland (livestock rangeland also managed for native vegetation)		
Sports fields and urban parklands (golf courses, soccer fields, etc.)		
Passive recreation (bird-watching, hiking, etc.)	X	
Active recreation (off-road vehicles, mountain biking, hunting, fishing)		
Physical resource extraction (rock, sediment, oil/gas)		
Biological resource extraction (aquaculture, commercial fisheries)		
Comments		

Basic Information Sheet: Riverine Wetlands

Assessment Area Name: AA_6-CDW-02228	
Project Name:	
Assessment Area ID #: 6	
Project ID #:	**Date:** 4/25/19
Assessment Team Members for This AA: Linnea LSL, D. Maniscalco	
Average Bankfull Width:	
Approximate Length of AA (10 times bankfull width, min 100 m, max 200 m): 100m	
Upstream Point Latitude:	**Longitude:**
Downstream Point Latitude:	**Longitude:**

Wetland Sub-type:

☐ Confined ☒ Non-confined

AA Category:

☐ Restoration ☐ Mitigation ☐ Impacted ☐ Ambient ☐ Reference ☐ Training

☒ Other: Pre-project

Did the river/stream have flowing water at the time of the assessment? ☒ yes ☐ no

What is the apparent hydrologic flow regime of the reach you are assessing?

The hydrologic flow regime of a stream describes the frequency with which the channel conducts water. *Perennial* streams conduct water all year long, whereas *ephemeral* streams conduct water only during and immediately following precipitation events. *Intermittent* streams are dry for part of the year, but conduct water for periods longer than ephemeral streams, as a function of watershed size and water source.

☐ perennial ☒ intermittent ☐ ephemeral

Photo Identification Numbers and Description:

	Photo ID No.	Description	Latitude	Longitude	Datum
1		Upstream			
2		Middle Left			
3		Middle Right			
4		Downstream			
5					
6					
7					
8					
9					
10					

Site Location Description:

Comments:

Scoring Sheet: Riverine Wetlands

AA Name: AA6					Date: 4/25/15
Attribute 1: Buffer and Landscape Context (pp. 11-19)					**Comments**
Stream Corridor Continuity (D)			Alpha.	Numeric	
			A		
Buffer:					
Buffer submetric A: Percent of AA with Buffer	Alpha. B	Numeric			50%
Buffer submetric B: Average Buffer Width	C				87.5m
Buffer submetric C: Buffer Condition	C				
Raw Attribute Score = D+[C x (A x B)^{½}]^{½}					**Final Attribute Score = (Raw Score/24) x 100**
Attribute 2: Hydrology (pp. 20-26)					
			Alpha.	Numeric	
Water Source			C		
Channel Stability			B		
Hydrologic Connectivity			C		1.57
Raw Attribute Score = sum of numeric scores					**Final Attribute Score = (Raw Score/36) x 100**
Attribute 3: Physical Structure (pp. 27-33)					
			Alpha.	Numeric	
Structural Patch Richness			D		
Topographic Complexity			C		
Raw Attribute Score = sum of numeric scores					**Final Attribute Score = (Raw Score/24) x 100**
Attribute 4: Biotic Structure (pp. 34-41)					
Plant Community Composition (based on sub-metrics A-C)					
Plant Community submetric A: Number of plant layers	Alpha. D	Numeric			1
Plant Community submetric B: Number of Co-dominant species	D				4
Plant Community submetric C: Percent Invasion	D				75%
Plant Community Composition Metric *(numeric average of submetrics A-C)*					
Horizontal Interspersion			D		Channel w/ 1 layer of plants
Vertical Biotic Structure			D		
Raw Attribute Score = sum of numeric scores					**Final Attribute Score = (Raw Score/36) x 100**
Overall AA Score (average of four final Attribute Scores)					

Worksheet for Stream Corridor Continuity Metric for Riverine Wetlands

Lengths of Non-buffer Segments For Distance of 500 m Upstream of AA		Lengths of Non-buffer Segments For Distance of 500 m Downstream of AA	
Segment No.	Length (m)	Segment No.	Length (m)
1	75	1	15m
2		2	
3		3	
4		4	
5		5	
Upstream Total Length	75	Downstream Total Length	15

Percent of AA with Buffer Worksheet

In the space provided below make a quick sketch of the AA, or perform the assessment directly on the aerial imagery; indicate where buffer is present, estimate the percentage of the AA perimeter providing buffer functions, and record the estimate amount in the space provided.

Percent of AA with Buffer: 50 %

Worksheet for calculating average buffer width of AA

Line	Buffer Width (m)
A	~~155~~ 80
B	~~175~~ 85
C	85
D	75
E	80
F	80
G	100
H	115
Average Buffer Width ***Round to the nearest integer***	87.5m

Worksheet for Assessing Channel Stability for Riverine Wetlands

Condition	Field Indicators (check all existing conditions)
Indicators of Channel Equilibrium	☒ The channel (or multiple channels in braided systems) has a well-defined bankfull contour that clearly demarcates an obvious active floodplain in the cross-sectional profile of the channel throughout most of the AA. ☐ Perennial riparian vegetation is abundant and well established along the bankfull contour, but not below it. ☐ There is leaf litter, thatch, or wrack in most pools (if pools are present). ☐ The channel contains embedded woody debris of the size and amount consistent with what is naturally available in the riparian area. ☒ There is little or no active undercutting or burial of riparian vegetation. ☐ If mid-channel bars and/or point bars are present, they are not densely vegetated with perennial vegetation. ☐ Channel bars consist of well-sorted bed material (smaller grain size on the top and downstream end of the bar, larger grain size along the margins and upstream end of the bar). ☐ There are channel pools, the spacing between pools tends to be regular and the bed is not planar throughout the AA ☐ The larger bed material supports abundant mosses or periphyton.
Indicators of Active Degradation	☐ The channel is characterized by deeply undercut banks with exposed living roots of trees or shrubs. ☐ There are abundant bank slides or slumps. ☐ The lower banks are uniformly scoured and not vegetated. ☐ Riparian vegetation is declining in stature or vigor, or many riparian trees and shrubs along the banks are leaning or falling into the channel. ☐ An obvious historical floodplain has recently been abandoned, as indicated by the age structure of its riparian vegetation. ☐ The channel bed appears scoured to bedrock or dense clay. ☐ Recently active flow pathways appear to have coalesced into one channel (i.e. a previously braided system is no longer braided). ☐ The channel has one or more knickpoints indicating headward erosion of the bed.
Indicators of Active Aggradation	☐ There is an active floodplain with fresh splays of coarse sediment (sand and larger that is not vegetated) deposited in the current or previous year. ☐ There are partially buried living tree trunks or shrubs along the banks. ☒ The bed is planar (flat or uniform gradient) overall; it lacks well-defined channel pools, or they are uncommon and irregularly spaced. ☐ There are partially buried, or sediment-choked, culverts. ☐ Perennial terrestrial or riparian vegetation is encroaching into the channel or onto channel bars below the bankfull contour. ☐ There are avulsion channels on the floodplain or adjacent valley floor.
Overall	☐ **Equilibrium** ☐ **Degradation** ☐ **Aggradation**

Riverine Wetland Entrenchment Ratio Calculation Worksheet

The following 5 steps should be conducted for each of 3 cross-sections located in the AA at the approximate midpoints along straight riffles or glides, away from deep pools or meander bends. An attempt should be made to place them at the top, middle, and bottom of the AA.

Steps	Replicate Cross-sections ⟶	TOP	MID	BOT
1 Estimate bankfull width.	This is a critical step requiring familiarity with field indicators of the bankfull contour. Estimate or measure the distance between the right and left bankfull contours.	6.7m	5m	4m
2: Estimate max. bankfull depth.	Imagine a level line between the right and left bankfull contours; estimate or measure the height of the line above the thalweg (the deepest part of the channel).	0.5m ~~1.0m~~	0.5m	0.5m
3: Estimate flood prone depth.	Double the estimate of maximum bankfull depth from Step 2.	1.0m	1.0m	1.0m
4: Estimate flood prone width.	Imagine a level line having a height equal to the flood prone depth from Step 3; note where the line intercepts the right and left banks; estimate or measure the length of this line.	10m	9.8m	5.5 ~~20m~~
5: Calculate entrenchment ratio.	Divide the flood prone width (Step 4) by the bankfull width (Step 1).	~~.69m~~ 1.49	1.96m	1.25 ~~5m~~
6: Calculate average entrenchment ratio.	Calculate the average results for Step 5 for all 3 replicate cross-sections. Enter the average result here and use it in Table 13a or 13b.			1.57 ~~2.8~~

Structural Patch Type Worksheet for Riverine wetlands

Circle each type of patch that is observed in the AA and enter the total number of observed patches in Table below. In the case of riverine wetlands, their status as confined or non-confined must first be determined (see page 6) to determine with patches are expected in the system (indicated by a "1" in the table below). Any feature onsite should only be counted once as a patch type. If a feature appears to meet the definition of more than one patch type (i.e. swale and secondary channel) the practitioner should choose which patch type best illustrates the feature. Not all features at a site will be patch types.

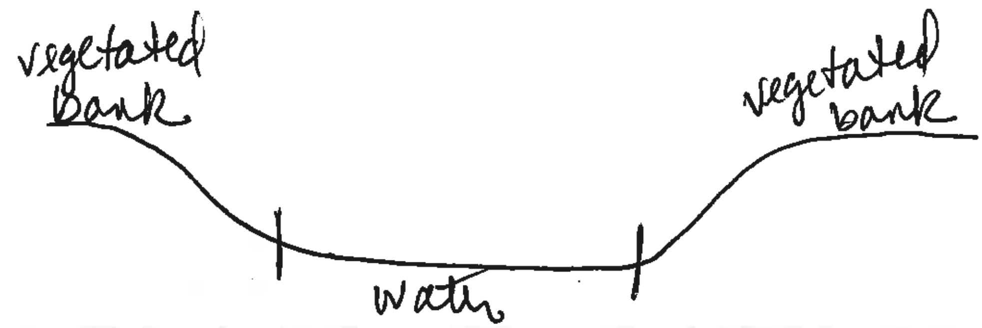
Please refer to the CRAM Photo Dictionary at www.cramwetlands.org for photos of each of the following patch types.

STRUCTURAL PATCH TYPE (circle for presence)	**Riverine (Non-confined)**	**Riverine (Confined)**
Minimum Patch Size	$3\ m^2$	$3\ m^2$
Abundant wrackline or organic debris in channel, on floodplain	1	1
Bank slumps or undercut banks in channels or along shoreline	1	1
Cobbles and/or Boulders	1	1
Debris jams	1	1
Filamentous macroalgae or algal mats	1	1
Large woody debris	1	1
Pannes or pools on floodplain	1	N/A
Plant hummocks and/or sediment mounds	1	1
Point bars and in-channel bars	1	1
Pools or depressions in channels (wet or dry channels)	1	1
Riffles or rapids (wet or dry channels)	1	1
Secondary channels on floodplains or along shorelines	1	N/A
Standing snags (at least 3 m tall)	1	1
Submerged vegetation	1	N/A
Swales on floodplain or along shoreline	1	N/A
Variegated, convoluted, or crenulated foreshore (instead of broadly arcuate or mostly straight)	1	1
Vegetated islands (mostly above high-water)	1	N/A
Total Possible	17	12
No. Observed Patch Types (enter here and use in Table 14 below)	5	

Worksheet for AA Topographic Complexity

At three locations along the AA, make a sketch of the profile of the stream from the AA boundary down to its deepest area then back out to the other AA boundary. Try to capture the benches and the intervening micro-topographic relief. To maintain consistency, make drawings at each of the stream hydrologic connectivity measurements, always facing downstream. Include the water level, an arrow at the bankfull contour, and label the benches. Based on these sketches and the profiles in Figure 10, choose a description in Table 16 that best describes the overall topographic complexity of the AA.

Profile 1



Profile 2

same

Profile 3

same

Plant Community Metric Worksheet: Co-dominant species richness for Riverine wetlands

(A dominant species represents ≥10% *relative* cover)

Special Note:

** Combine the counts of co-dominant species from all layers to identify the total species count. Each plant species is only counted once when calculating the Number of Co-dominant Species and Percent Invasion submetric scores, regardless of the numbers of layers in which it occurs.*

Floating or Canopy-forming (non-confined only)	Invasive?	Short (<0.5 m)	Invasive?
Medium (0.5-1.5 m)	**Invasive?**	**Tall (1.5-3.0 m)**	**Invasive?**
~~Fes~~ Festuca perrenis	Y		
Avena barbada	Y		
Rumex crispus	Y		
Unknown shrub	N		
Very Tall (>3.0 m)	**Invasive?**	**Total number of co-dominant species for all layers combined (enter here and use in Table 18)**	4
		Percent Invasion *Round to the nearest integer* (enter here and use in Table 18)	75%

Horizontal Interspersion Worksheet.

Use the spaces below to make a quick sketch of the AA in plan view, outlining the major plant zones (this should take no longer than 10 minutes). Assign the zones names and record them on the right. Based on the sketch, choose a single profile from Figure 12 that best represents the AA overall.

Assigned zones:

1) Grasses

2)

3)

4)

5)

6)

Worksheet for Wetland disturbances and conversions

Has a major disturbance occurred at this wetland?	Yes	No		
If yes, was it a flood, fire, landslide, or other?	flood	fire	landslide	other
If yes, then how severe is the disturbance?	likely to affect site next 5 or more years	likely to affect site next 3-5 years	likely to affect site next 1-2 years	
Has this wetland been converted from another type? If yes, then what was the previous type?	depressional	vernal pool	vernal pool system	
	non-confined riverine	confined riverine	seasonal estuarine	
	perennial saline estuarine	perennial non-saline estuarine	wet meadow	
	lacustrine	seep or spring	playa	

Stressor Checklist Worksheet

HYDROLOGY ATTRIBUTE (WITHIN 50 M OF AA)	Present	Significant negative effect on AA
Point Source (PS) discharges (POTW, other non-stormwater discharge)		
Non-point Source (Non-PS) discharges (urban runoff, farm drainage)	X	
Flow diversions or unnatural inflows	X	
Dams (reservoirs, detention basins, recharge basins)		
Flow obstructions (culverts, paved stream crossings)	X	
Weir/drop structure, tide gates		
Dredged inlet/channel		
Engineered channel (riprap, armored channel bank, bed)		
Dike/levees		
Groundwater extraction		
Ditches (borrow, agricultural drainage, mosquito control, etc.)		
Actively managed hydrology		
Comments		

PHYSICAL STRUCTURE ATTRIBUTE (WITHIN 50 M OF AA)	Present	Significant negative effect on AA
Filling or dumping of sediment or soils **(N/A for restoration areas)**		
Grading/ compaction **(N/A for restoration areas)**	X	
Plowing/Discing **(N/A for restoration areas)**	X	
Resource extraction (sediment, gravel, oil and/or gas)		
Vegetation management		
Excessive sediment or organic debris from watershed		
Excessive runoff from watershed		
Nutrient impaired (PS or Non-PS pollution)	X	
Heavy metal impaired (PS or Non-PS pollution)		
Pesticides or trace organics impaired (PS or Non-PS pollution)	X	
Bacteria and pathogens impaired (PS or Non-PS pollution)		
Trash or refuse	X	
Comments		

BIOTIC STRUCTURE ATTRIBUTE (WITHIN 50 M OF AA)	Present	Significant negative effect on AA
Mowing, grazing, excessive herbivory (within AA)	X	
Excessive human visitation		
Predation and habitat destruction by non-native vertebrates (e.g., *Virginia opossum* and domestic predators, such as feral pets)		
Tree cutting/sapling removal		
Removal of woody debris		
Treatment of non-native and nuisance plant species		
Pesticide application or vector control	X	
Biological resource extraction or stocking (fisheries, aquaculture)		
Excessive organic debris in matrix (for vernal pools)		
Lack of vegetation management to conserve natural resources	X	
Lack of treatment of invasive plants adjacent to AA or buffer	X	

Comments

BUFFER AND LANDSCAPE CONTEXT ATTRIBUTE (WITHIN 500 M OF AA)	Present	Significant negative effect on AA
Urban residential	X	
Industrial/commercial		
Military training/Air traffic		
Dams (or other major flow regulation or disruption)		
Dryland farming		
Intensive row-crop agriculture	X	
Orchards/nurseries	X	
Commercial feedlots		
Dairies		
Ranching (enclosed livestock grazing or horse paddock or feedlot)		
Transportation corridor	X	
Rangeland (livestock rangeland also managed for native vegetation)		
Sports fields and urban parklands (golf courses, soccer fields, etc.)		
Passive recreation (bird-watching, hiking, etc.)		
Active recreation (off-road vehicles, mountain biking, hunting, fishing)		
Physical resource extraction (rock, sediment, oil/gas)		
Biological resource extraction (aquaculture, commercial fisheries)		

Comments

update AA poly

Basic Information Sheet: Depressional Wetlands

Assessment Area Name: AAB-COB-1802

Project Name: HSR JM

Assessment Area ID #:

Project ID #: | **Date:** 4/22/19

Assessment Team Members for This AA

AU

AA Category:

☐ Pre-Restoration ☐ Post-Restoration ☐ Pre-Mitigation ☐ Post-Mitigation

☒ Pre-Impact ☐ Post-Impact ☐ Training ☐ Ambient

☐ Reference ☐ Other:

Origin of Wetland (if known):

☐ Natural system ☒ Artificial system

Type of Management (if known):

☐ waterfowl/birds ☐ amphibians ☐ general wildlife ☐ sediment ☒ water quality ☐ stormwater

☐ water supply (agriculture) ☐ water supply (livestock) ☐ not managed ☐ other:

Which best describes the type of depressional wetland?

☒ freshwater marsh ☐ alkaline marsh ☐ brackish marsh

☐ other (specify):

AA Encompasses:

☐ entire wetland ☒ portion of the wetland

Which best describes the hydrologic state of the wetland at the time of assessment?

☐ ponded/inundated ☒ saturated soil, but no surface water ☒ dry

What is the apparent hydrologic regime of the wetland?

Perennially flooded systems contain surface water year-round, *seasonally flooded* depressional wetlands are defined as supporting surface water for 4-11 months of the year (in > 5 out of 10 years.) *Temporarily flooded* depressional wetlands possess surface water between 2 weeks and 4 months of the year.

☐ perennially flooded ☒ seasonally flooded ☒ temporarily flooded

Does your wetland connect with the floodplain of a nearby stream? ☐ yes ☐ no

(system subject to overbank flow, a dammed stream does not count)

Does the wetland have a defined on undefined outlet? ☐ defined ☐ undefined

Does the wetland have a defined on undefined inlet? ☐ defined ☐ undefined

Are the inlet and outlet at the same location? ☐ yes ☐ no

Is the topographic basin of the wetland ☐ distinct **or** ☐ indistinct **?**

An *indistinct* topographic basin is one that lacks obvious boundaries between wetland and upland. Examples of such features are seasonal, depressional wetlands in very low-gradient landscapes.

Photo Identification Numbers and Description:

Photos should be taken from edge of AA looking toward the centroid of AA

	Photo ID No.	Description	Latitude	Longitude	Datum
1		(to) North			
2		(to) East			
3		(to) South			
4		(to) West			
5					
6					
7					
8					
9					
10					

Site Location Description and Land Use:

Comments:

3 photos on KH phone

Scoring Sheet: Depressional Wetlands

AA Name: AA8 - COB -1802 **Date:** 4/22/19

Attribute 1: Buffer and Landscape Context (pp. 8-15)	Alpha.	Numeric	Comments
Aquatic Area Abundance Score (D)	C		30% AAA
Buffer:			
Buffer submetric A: Percent of AA with Buffer	A		100%
Buffer submetric B: Average Buffer Width	B		154m
Buffer submetric C: Buffer Condition	C		
Raw Attribute Score = D+[C x (A x B)$^{1/2}$]$^{1/2}$			**Final Attribute Score = (Raw Score/24) x 100**

Attribute 2: Hydrology (pp. 16-21)	Alpha.	Numeric	Comments
Water Source	C		> 20% developed
Hydroperiod	D		controlled in +out
Hydrologic Connectivity	C		67% levee
Raw Attribute Score = sum of numeric scores			**Final Attribute Score = (Raw Score/36) x 100**

Attribute 3: Physical Structure (pp. 22-28)	Alpha.	Numeric	Comments
Structural Patch Richness	C		5 patches
Topographic Complexity	A		1 bench w/ micro
Raw Attribute Score = sum of numeric scores			**Final Attribute Score = (Raw Score/24) x 100**

Attribute 4: Biotic Structure (pp. 29-39)	Alpha.	Numeric	Comments
Plant Community Composition (based on submetrics A-C)			
Plant Community submetric A: Number of plant layers	C		2 layers
Plant Community submetric B: Number of Co-dominant species	C		5 codoms
Plant Community submetric C: Percent Invasion	D		67% invasion
Plant Community Composition Metric *(numeric average of submetrics A-C)*			
Horizontal Interspersion	C		
Vertical Biotic Structure	B		
Raw Attribute Score = sum of numeric scores			**Final Attribute Score = (Raw Score/36) x 100**
Overall AA Score (average of four final Attribute Scores)			

Worksheet for Aquatic Area Abundance Metric (Method 1)

Percentage of Transect Lines that Contains Aquatic Area of Any Kind	
Segment Direction	Percentage of Transect Length That is an Aquatic Feature
North	475m = 95%
South	0%
East	100m = 20%
West	15m = 3%
Average Percentage of Transect Length That Is an Aquatic Feature	29.5 – 30

Percent of AA with Buffer Worksheet.

In the space provided below make a quick sketch of the AA, or perform the assessment directly on the aerial imagery; indicate where buffer is present, estimate the percentage of the AA perimeter providing buffer functions, and record the estimate amount in the space provided.

Percent of AA with Buffer: 100 %

Worksheet for calculating average buffer width of AA

Line	Buffer Width (m)
A	250
B	250
C	250
D	250
E	180
F	15
G	15
H	20
Average Buffer Width ***Round to the nearest whole number (integer)***	153.75 – $\boxed{154}$

Structural Patch Type Worksheet for Depressional Wetlands

Check each type of patch that is observed in the AA and use the total number of observed patches in Table 15.

STRUCTURAL PATCH TYPE (circle for presence)	**Depressional**
Minimum Patch Size	**3 m^2**
Abundant wrack or organic debris in channel, on floodplain, or across depressional wetland plain	X
Animal mounds and burrows	X
Bank slumps or undercut banks in channels or along shoreline	—
Cobbles and Boulders	—
Concentric or parallel high water marks	—
Filamentous macroalgae or algal mats	X
Islands (mostly above high-water)	—
Large woody debris	—
Non-vegetated flats or bare ground (sandflats, mudflats, gravel flats, etc.)	X
Open water	—
Plant hummocks and/or sediment mounds	—
Soil cracks	X
Standing snag(s) (1 or more at least 3 m tall)	—
Submerged vegetation	—
Swales on floodplain or along shoreline	—
Variegated, convoluted, or crenulated foreshore (instead of broadly arcuate or mostly straight)	—
Woody vegetation in water	—
Total Possible	**17**
No. Observed Patch Types (enter here and use in Table 15 below)	[illegible] 5

Worksheet for AA Topographic Complexity

At two locations in the AA, make a sketch of the profile from the AA boundary to AA boundary. Try to capture the major topographic features, slopes and intervening micro-topographic relief. Based on these sketches and the profiles in Figure 7, choose a description in Table 17 that best describes the overall topographic complexity of the AA.

North to South

East to West

Plant Community Metric Worksheet 2 of 8: Co-dominant species richness (A dominant species represents ≥10% *relative* cover)

* *Combine the counts of co-dominant species from all layers to identify the total species count. Each plant species is only counted once when calculating the Number of Co-dominant Species and Percent Invasion submetric scores, regardless of the numbers of layers in which it occurs.*

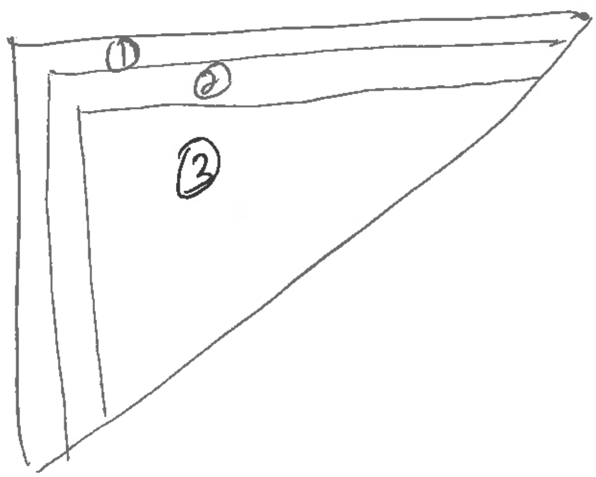
Floating or Canopy-forming	Invasive?	Short (<0.5 m)	Invasive?
		Rumex crispus	X
		Unknown 1 (not on Cal-IPC)	

Medium (0.5 – 1.5 m)	Invasive?	Tall (1.5 – 3.0 m)	Invasive?
Festuca perennis	X		

Very Tall (>3.0 m)	Invasive?		
		Total number of co-dominant species for all layers combined (enter here and use in Table 19)	3
		Percent Invasion *Round to the nearest whole number (integer)* (enter here and use in Table 19)	67%

Horizontal Interspersion Worksheet

Use the spaces below to make a sketch of the AA in plan view, outlining the major plant zones (this should take no longer than 10 minutes). Assign names to the zones and record them on the right. Based on the sketch, choose a single profile from Figure 8 that best represents the AA overall.



Assigned zones:

1) bank or levee / grass

2) mud

3) dead / rumex mix

4)

5)

6)

Wetland disturbances and conversions Worksheet

Has a major disturbance occurred at this wetland?	Yes	No		
If yes, was it a flood, fire, landslide, or other?	flood	fire	landslide	other

If yes, then how severe is the disturbance?	likely to affect site next 5 or more years	likely to affect site next 3-5 years	likely to affect site next 1-2 years
Has this wetland been converted from another type? If yes, then what was the previous type?	depressional	vernal pool	vernal pool system
	non-confined riverine	confined riverine	bar-built estuarine
	perennial saline estuarine	perennial non-saline estuarine	wet meadow
	lacustrine	seep or spring	playa

Stressor Checklist Worksheet

HYDROLOGY ATTRIBUTE (WITHIN 50 M OF AA)	Present	Significant negative effect on AA
Point Source (PS) discharges (POTW, other non-stormwater discharge)		
Non-point Source (Non-PS) discharges (urban runoff, farm drainage)	X	
Flow diversions or unnatural inflows		
Dams (reservoirs, detention basins, recharge basins)	X	
Flow obstructions (culverts, paved stream crossings)		
Weir/drop structure, tide gates		
Dredged inlet/channel		
Engineered channel (riprap, armored channel bank, bed)		
Dike/levees	X	
Groundwater extraction		
Ditches (borrow, agricultural drainage, mosquito control, etc.)	X	
Actively managed hydrology	X	
Comments		

PHYSICAL STRUCTURE ATTRIBUTE (WITHIN 50 M OF AA)	Present	Significant negative effect on AA
Filling or dumping of sediment or soils **(N/A for restoration areas)**		
Grading/ compaction **(N/A for restoration areas)**	X	
Plowing/Discing **(N/A for restoration areas)**		
Resource extraction (sediment, gravel, oil and/or gas)		
Vegetation management		
Excessive sediment or organic debris from watershed		
Excessive runoff from watershed		
Nutrient impaired (PS or Non-PS pollution)	X	
Heavy metal impaired (PS or Non-PS pollution)		
Pesticides or trace organics impaired (PS or Non-PS pollution)		
Bacteria and pathogens impaired (PS or Non-PS pollution)	X	
Trash or refuse	X	
Comments		

BIOTIC STRUCTURE ATTRIBUTE (WITHIN 50 M OF AA)	Present	Significant negative effect on AA
Mowing, grazing, excessive herbivory (within AA)		
Excessive human visitation		
Predation and habitat destruction by non-native vertebrates (e.g., *Virginia opossum* and domestic predators, such as feral pets)		
Tree cutting/sapling removal		
Removal of woody debris		
Treatment of non-native and nuisance plant species		
Pesticide application or vector control		
Biological resource extraction or stocking (fisheries, aquaculture)		
Excessive organic debris in matrix (for vernal pools)		
Lack of vegetation management to conserve natural resources	X	X
Lack of treatment of invasive plants adjacent to AA or buffer	X	X
Comments		

BUFFER AND LANDSCAPE CONTEXT ATTRIBUTE (WITHIN 500 M OF AA)	Present	Significant negative effect on AA
Urban residential	X	
Industrial/commercial		
Military training/Air traffic		
Dams (or other major flow regulation or disruption)		
Dryland farming	X	
Intensive row-crop agriculture		
Orchards/nurseries		
Commercial feedlots		
Dairies		
Ranching (enclosed livestock grazing or horse paddock or feedlot)		
Transportation corridor	X	
Rangeland (livestock rangeland also managed for native vegetation)		
Sports fields and urban parklands (golf courses, soccer fields, etc.)		
Passive recreation (bird-watching, hiking, etc.)		
Active recreation (off-road vehicles, mountain biking, hunting, fishing)		
Physical resource extraction (rock, sediment, oil/gas)		
Biological resource extraction (aquaculture, commercial fisheries)		
Comments		

update AA poly

Basic Information Sheet: Depressional Wetlands

Assessment Area Name: AA9-CDB-1804	
Project Name: HSR JM	
Assessment Area ID #:	
Project ID #:	**Date:** 4/22/19
Assessment Team Members for This AA	
LSL, LC, RJVS, KK, DD, ML	

AA Category:

☐ Pre-Restoration ☐ Post-Restoration ☐ Pre-Mitigation ☐ Post-Mitigation

[x] Pre-Impact ☐ Post-Impact ☐ Training ☐ Ambient

☐ Reference ☐ Other:

Origin of Wetland (if known):

☐ Natural system [x] Artificial system

Type of Management (if known):

☐ waterfowl/birds ☐ amphibians ☐ general wildlife ☐ sediment [x] water quality ☐ stormwater

☐ water supply (agriculture) ☐ water supply (livestock) ☐ not managed ☐ other:

Which best describes the type of depressional wetland?

[x] freshwater marsh ☐ alkaline marsh ☐ brackish marsh

☐ other (specify):

AA Encompasses:

☐ entire wetland [x] portion of the wetland

Which best describes the hydrologic state of the wetland at the time of assessment?

☐ ponded/inundated [x] saturated soil, but no surface water [x] dry

What is the apparent hydrologic regime of the wetland?

Perennially flooded systems contain surface water year-round, *seasonally flooded* depressional wetlands are defined as supporting surface water for 4-11 months of the year (in > 5 out of 10 years.) *Temporarily flooded* depressional wetlands possess surface water between 2 weeks and 4 months of the year.

☐ perennially flooded [x] seasonally flooded [x] temporarily flooded

Does your wetland connect with the floodplain of a nearby stream? ☐ yes ☐ no
(system subject to overbank flow, a dammed stream does not count)

Does the wetland have a defined on undefined outlet? ☐ defined ☐ undefined
Does the wetland have a defined on undefined inlet? ☐ defined ☐ undefined
Are the inlet and outlet at the same location? ☐ yes ☐ no

Is the topographic basin of the wetland ☐ distinct **or** ☐ indistinct **?**
An *indistinct* topographic basin is one that lacks obvious boundaries between wetland and upland. Examples of such features are seasonal, depressional wetlands in very low-gradient landscapes.

Photo Identification Numbers and Description:

Photos should be taken from edge of AA looking toward the centroid of AA

	Photo ID No.	Description	Latitude	Longitude	Datum
1		(to) North			
2		(to) East			
3		(to) South			
4		(to) West			
5					
6					
7					
8					
9					
10					

Site Location Description and Land Use:

Comments:

3 photos on KK phone

Scoring Sheet: Depressional Wetlands

AA Name: AA9					Date: 4/22/19
Attribute 1: Buffer and Landscape Context (pp. 8-15)					**Comments**
Aquatic Area Abundance Score (D)			Alpha.	Numeric	
			B		32% AAA
Buffer:					
	Alpha.	Numeric			
Buffer submetric A: Percent of AA with Buffer	A				100%
Buffer submetric B: Average Buffer Width	C				116m
Buffer submetric C: Buffer Condition	C				
Raw Attribute Score = D+[C x (A x B)^{½}]^{½}					**Final Attribute Score = (Raw Score/24) x 100**
Attribute 2: Hydrology (pp. 16-21)					
			Alpha.	Numeric	
Water Source			C		7 20% developed
Hydroperiod			D		pumps/gates
Hydrologic Connectivity			C		
Raw Attribute Score = sum of numeric scores					**Final Attribute Score = (Raw Score/36) x 100**
Attribute 3: Physical Structure (pp. 22-28)					
			Alpha.	Numeric	
Structural Patch Richness			C		5 patches
Topographic Complexity			C		no benches, has micro
Raw Attribute Score = sum of numeric scores					**Final Attribute Score = (Raw Score/24) x 100**
Attribute 4: Biotic Structure (pp. 29-39)					
Plant Community Composition (based on submetrics A-C)					
	Alpha.	Numeric			
Plant Community submetric A: Number of plant layers	C				2 layers
Plant Community submetric B: Number of Co-dominant species	C				5 codoms
Plant Community submetric C: Percent Invasion	B				20% invasion
Plant Community Composition Metric *(numeric average of submetrics A-C)*					
Horizontal Interspersion			C		
Vertical Biotic Structure			C		[illegible] method 1
Raw Attribute Score = sum of numeric scores					**Final Attribute Score = (Raw Score/36) x 100**
Overall AA Score (average of four final Attribute Scores)					

Worksheet for Aquatic Area Abundance Metric (Method 1)

Percentage of Transect Lines that Contains Aquatic Area of Any Kind	
Segment Direction	Percentage of Transect Length That is an Aquatic Feature
North	160m = 32%
South	450m = 90%
East	15m = 3%
West	15m = 3%
Average Percentage of Transect Length That Is an Aquatic Feature	32%

Percent of AA with Buffer Worksheet.

In the space provided below make a quick sketch of the AA, or perform the assessment directly on the aerial imagery; indicate where buffer is present, estimate the percentage of the AA perimeter providing buffer functions, and record the estimate amount in the space provided.

Percent of AA with Buffer: 100 %

Worksheet for calculating average buffer width of AA

Line	Buffer Width (m)
A	30
B	75
C	40
D	250
E	250
F	250
G	15
H	15
Average Buffer Width ***Round to the nearest whole number (integer)***	115.6 → $\boxed{116}$

Structural Patch Type Worksheet for Depressional Wetlands

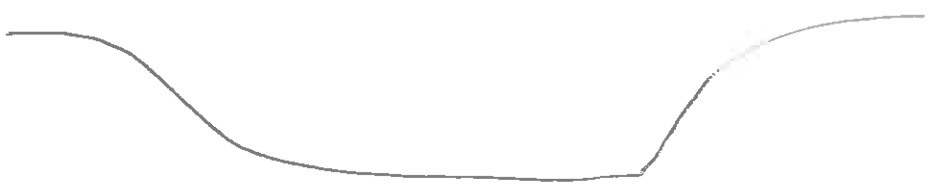
Check each type of patch that is observed in the AA and use the total number of observed patches in Table 15.

STRUCTURAL PATCH TYPE (circle for presence)	Depressional
Minimum Patch Size	**3 m^2**
Abundant wrack or organic debris in channel, on floodplain, or across depressional wetland plain	X
Animal mounds and burrows	X
Bank slumps or undercut banks in channels or along shoreline	—
Cobbles and Boulders	
Concentric or parallel high water marks	—
Filamentous macroalgae or algal mats	—
Islands (mostly above high-water)	—
Large woody debris	—
Non-vegetated flats or bare ground (sandflats, mudflats, gravel flats, etc.)	X
Open water	X
Plant hummocks and/or sediment mounds	—
Soil cracks	X
Standing snag(s) (1 or more at least 3 m tall)	—
Submerged vegetation	—
Swales on floodplain or along shoreline	—
Variegated, convoluted, or crenulated foreshore (instead of broadly arcuate or mostly straight)	—
Woody vegetation in water	—
Total Possible	**17**
No. Observed Patch Types (enter here and use in Table 15 below)	5

Worksheet for AA Topographic Complexity

At two locations in the AA, make a sketch of the profile from the AA boundary to AA boundary. Try to capture the major topographic features, slopes and intervening micro-topographic relief. Based on these sketches and the profiles in Figure 7, choose a description in Table 17 that best describes the overall topographic complexity of the AA.

North to South



East to West

Plant Community Metric Worksheet 2 of 8: Co-dominant species richness
(A dominant species represents ≥10% *relative* cover)

* *Combine the counts of co-dominant species from all layers to identify the total species count. Each plant species is only counted once when calculating the Number of Co-dominant Species and Percent Invasion submetric scores, regardless of the numbers of layers in which it occurs.*

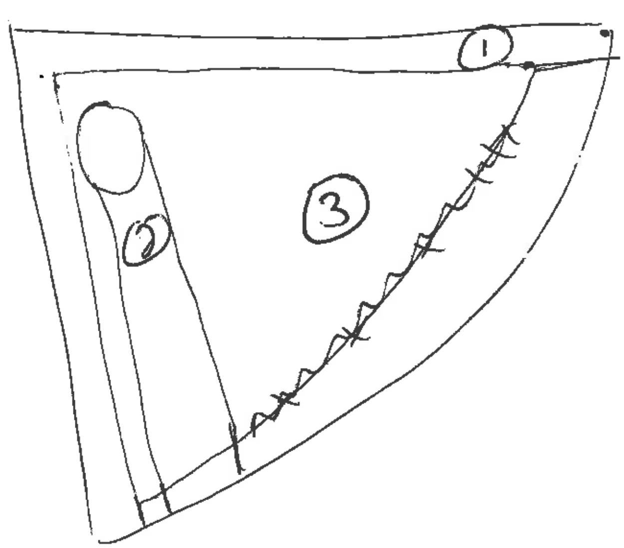
Floating or Canopy-forming	Invasive?	Short (<0.5 m)	Invasive?
		Rumex crispus	X
		Unknown 1 (not on Cal-IPC)	

Medium (0.5 – 1.5 m)	Invasive?	Tall (1.5 – 3.0 m)	Invasive?
Epilobium sp.			
~~Rumex crispus~~			
Veronica anagilis-aquatica			
Rumex conglomeratus			

Very Tall (>3.0 m)	Invasive?		
		Total number of co-dominant species for all layers combined (enter here and use in Table 19)	5
		Percent Invasion *Round to the nearest whole number (integer)* (enter here and use in Table 19)	20%

Horizontal Interspersion Worksheet

Use the spaces below to make a sketch of the AA in plan view, outlining the major plant zones (this should take no longer than 10 minutes). Assign names to the zones and record them on the right. Based on the sketch, choose a single profile from Figure 8 that best represents the AA overall.



Assigned zones:

1) Levee banks

2) water/mud

3) Rumex / Vernica mix

4)

5)

6)

Wetland disturbances and conversions Worksheet

Has a major disturbance occurred at this wetland?	Yes	No		
If yes, was it a flood, fire, landslide, or other?	flood	fire	landslide	other
If yes, then how severe is the disturbance?	likely to affect site next 5 or more years	likely to affect site next 3-5 years	likely to affect site next 1-2 years	
Has this wetland been converted from another type? If yes, then what was the previous type?	depressional	vernal pool	vernal pool system	
	non-confined riverine	confined riverine	bar-built estuarine	
	perennial saline estuarine	perennial non-saline estuarine	wet meadow	
	lacustrine	seep or spring	playa	

Stressor Checklist Worksheet

HYDROLOGY ATTRIBUTE (WITHIN 50 M OF AA)	Present	Significant negative effect on AA
Point Source (PS) discharges (POTW, other non-stormwater discharge)		
Non-point Source (Non-PS) discharges (urban runoff, farm drainage)	X	
Flow diversions or unnatural inflows		
Dams (reservoirs, detention basins, recharge basins)	X	
Flow obstructions (culverts, paved stream crossings)		
Weir/drop structure, tide gates		
Dredged inlet/channel		
Engineered channel (riprap, armored channel bank, bed)		
Dike/levees	X	
Groundwater extraction		
Ditches (borrow, agricultural drainage, mosquito control, etc.)	X	
Actively managed hydrology	X	
Comments		

PHYSICAL STRUCTURE ATTRIBUTE (WITHIN 50 M OF AA)	Present	Significant negative effect on AA
Filling or dumping of sediment or soils **(N/A for restoration areas)**		
Grading/ compaction **(N/A for restoration areas)**	X	
Plowing/Discing **(N/A for restoration areas)**		
Resource extraction (sediment, gravel, oil and/or gas)		
Vegetation management		
Excessive sediment or organic debris from watershed		
Excessive runoff from watershed		
Nutrient impaired (PS or Non-PS pollution)	X	
Heavy metal impaired (PS or Non-PS pollution)		
Pesticides or trace organics impaired (PS or Non-PS pollution)		
Bacteria and pathogens impaired (PS or Non-PS pollution)	X	
Trash or refuse	X	
Comments		

BIOTIC STRUCTURE ATTRIBUTE (WITHIN 50 M OF AA)	Present	Significant negative effect on AA
Mowing, grazing, excessive herbivory (within AA)		
Excessive human visitation		
Predation and habitat destruction by non-native vertebrates (e.g., *Virginia opossum* and domestic predators, such as feral pets)		
Tree cutting/sapling removal		
Removal of woody debris		
Treatment of non-native and nuisance plant species		
Pesticide application or vector control		
Biological resource extraction or stocking (fisheries, aquaculture)		
Excessive organic debris in matrix (for vernal pools)		
Lack of vegetation management to conserve natural resources	X	X
Lack of treatment of invasive plants adjacent to AA or buffer	X	X
Comments		

BUFFER AND LANDSCAPE CONTEXT ATTRIBUTE (WITHIN 500 M OF AA)	Present	Significant negative effect on AA
Urban residential	X	
Industrial/commercial		
Military training/Air traffic		
Dams (or other major flow regulation or disruption)		
Dryland farming	X	
Intensive row-crop agriculture		
Orchards/nurseries		
Commercial feedlots		
Dairies		
Ranching (enclosed livestock grazing or horse paddock or feedlot)		
Transportation corridor	X	
Rangeland (livestock rangeland also managed for native vegetation)		
Sports fields and urban parklands (golf courses, soccer fields, etc.)		
Passive recreation (bird-watching, hiking, etc.)		
Active recreation (off-road vehicles, mountain biking, hunting, fishing)		
Physical resource extraction (rock, sediment, oil/gas)		
Biological resource extraction (aquaculture, commercial fisheries)		
Comments		

[illegible]

Basic Information Sheet: Riverine Wetlands

Assessment Area Name: AA11-COW-01865	
Project Name: HSRTM	
Assessment Area ID #:	
Project ID #:	**Date:** 4/22/19
Assessment Team Members for This AA:	
ALL	
Average Bankfull Width: 6m	
Approximate Length of AA (10 times bankfull width, min 100 m, max 200 m): 100m	
Upstream Point Latitude:	**Longitude:**
Downstream Point Latitude:	**Longitude:**

Wetland Sub-type:

☒ Confined ☒ Non-confined

AA Category:

☐ Restoration ☐ Mitigation ☒ Impacted ☐ Ambient ☐ Reference ☐ Training

☐ Other:

Did the river/stream have flowing water at the time of the assessment? ☒ yes ☐ no

What is the apparent hydrologic flow regime of the reach you are assessing?

The hydrologic flow regime of a stream describes the frequency with which the channel conducts water. *Perennial* streams conduct water all year long, whereas *ephemeral* streams conduct water only during and immediately following precipitation events. *Intermittent* streams are dry for part of the year, but conduct water for periods longer than ephemeral streams, as a function of watershed size and water source.

☒ perennial ☐ intermittent ☐ ephemeral

Photo Identification Numbers and Description:

	Photo ID No.	Description	Latitude	Longitude	Datum
1		Upstream			
2		Middle Left			
3		Middle Right			
4		Downstream			
5					
6					
7					
8					
9					
10					

Site Location Description:

Comments:

2 photos on KK phone

1 facing upstream
2 facing downstream

Scoring Sheet: Riverine Wetlands

AA Name: AA11 - COW			Date: 4/22/19
Attribute 1: Buffer and Landscape Context (pp. 11-19)			**Comments**
	Alpha.	Numeric	
Stream Corridor Continuity (D)	D		400m break upstream

Buffer:	Alpha.	Numeric	Comments
Buffer submetric A: Percent of AA with Buffer	D		0% no buffer - road fence
Buffer submetric B: Average Buffer Width	D		
Buffer submetric C: Buffer Condition	D		
Raw Attribute Score = D+[C x (A x B)^{½}]^{½}			**Final Attribute Score = (Raw Score/24) x 100**

Attribute 2: Hydrology (pp. 20-26)	Alpha.	Numeric	
Water Source	C		>20% developed/ag
Channel Stability	B		some aggradation but not severe
Hydrologic Connectivity	D		1.2 entrenchment ratio
Raw Attribute Score = sum of numeric scores			**Final Attribute Score = (Raw Score/36) x 100**

Attribute 3: Physical Structure (pp. 27-33)	Alpha.	Numeric	
Structural Patch Richness	D		4 patches
Topographic Complexity	D		no benches
Raw Attribute Score = sum of numeric scores			**Final Attribute Score = (Raw Score/24) x 100**

Attribute 4: Biotic Structure (pp. 34-41)			
Plant Community Composition (based on sub-metrics A-C)	Alpha.	Numeric	
Plant Community submetric A: Number of plant layers	B		3 layers
Plant Community submetric B: Number of Co-dominant species	D		4 codoms
Plant Community submetric C: Percent Invasion	A		0% invasion
Plant Community Composition Metric *(numeric average of submetrics A-C)*			
Horizontal Interspersion	D		
Vertical Biotic Structure	B		
Raw Attribute Score = sum of numeric scores			**Final Attribute Score = (Raw Score/36) x 100**

Overall AA Score (average of four final Attribute Scores)	

Worksheet for Stream Corridor Continuity Metric for Riverine Wetlands

Lengths of Non-buffer Segments For Distance of 500 m Upstream of AA		Lengths of Non-buffer Segments For Distance of 500 m Downstream of AA	
Segment No.	Length (m)	Segment No.	Length (m)
1	400	1	
2		2	
3		3	
4		4	
5		5	
Upstream Total Length	400m	Downstream Total Length	0m

Percent of AA with Buffer Worksheet

In the space provided below make a quick sketch of the AA, or perform the assessment directly on the aerial imagery; indicate where buffer is present, estimate the percentage of the AA perimeter providing buffer functions, and record the estimate amount in the space provided.

Percent of AA with Buffer: 0 %

Worksheet for calculating average buffer width of AA

Line	Buffer Width (m)
A	
B	
C	
D	
E	
F	
G	
H	
Average Buffer Width *Round to the nearest integer*	0

Worksheet for Assessing Channel Stability for Riverine Wetlands

Condition	Field Indicators (check all existing conditions)
Indicators of Channel Equilibrium	[x] The channel (or multiple channels in braided systems) has a well-defined bankfull contour that clearly demarcates an obvious active floodplain in the cross-sectional profile of the channel throughout most of the AA.
	☐ Perennial riparian vegetation is abundant and well established along the bankfull contour, but not below it.
	[x] There is leaf litter, thatch, or wrack in most pools (if pools are present).
	[x] The channel contains embedded woody debris of the size and amount consistent with what is naturally available in the riparian area.
	[x] There is little or no active undercutting or burial of riparian vegetation.
	☐ If mid-channel bars and/or point bars are present, they are not densely vegetated with perennial vegetation.
	☐ Channel bars consist of well-sorted bed material (smaller grain size on the top and downstream end of the bar, larger grain size along the margins and upstream end of the bar).
	☐ There are channel pools, the spacing between pools tends to be regular and the bed is not planar throughout the AA
	☐ The larger bed material supports abundant mosses or periphyton.
Indicators of Active Degradation	☐ The channel is characterized by deeply undercut banks with exposed living roots of trees or shrubs.
	☐ There are abundant bank slides or slumps.
	☐ The lower banks are uniformly scoured and not vegetated.
	☐ Riparian vegetation is declining in stature or vigor, or many riparian trees and shrubs along the banks are leaning or falling into the channel.
	☐ An obvious historical floodplain has recently been abandoned, as indicated by the age structure of its riparian vegetation.
	☐ The channel bed appears scoured to bedrock or dense clay.
	☐ Recently active flow pathways appear to have coalesced into one channel (i.e. a previously braided system is no longer braided).
	☐ The channel has one or more knickpoints indicating headward erosion of the bed.
Indicators of Active Aggradation	☐ There is an active floodplain with fresh splays of coarse sediment (sand and larger that is not vegetated) deposited in the current or previous year.
	☐ There are partially buried living tree trunks or shrubs along the banks.
	[x] The bed is planar (flat or uniform gradient) overall; it lacks well-defined channel pools, or they are uncommon and irregularly spaced.
	☐ There are partially buried, or sediment-choked, culverts.
	[x] Perennial terrestrial or riparian vegetation is encroaching into the channel or onto channel bars below the bankfull contour.
	☐ There are avulsion channels on the floodplain or adjacent valley floor.
Overall	[x] **Equilibrium** ☐ **Degradation** [x] **Aggradation**

Riverine Wetland Entrenchment Ratio Calculation Worksheet

The following 5 steps should be conducted for each of 3 cross-sections located in the AA at the approximate midpoints along straight riffles or glides, away from deep pools or meander bends. An attempt should be made to place them at the top, middle, and bottom of the AA.				
Steps	**Replicate Cross-sections** ⟶	**TOP**	**MID**	**BOT**
1 Estimate bankfull width.	This is a critical step requiring familiarity with field indicators of the bankfull contour. Estimate or measure the distance between the right and left bankfull contours.	6.0	6.0	6.0
2: Estimate max. bankfull depth.	Imagine a level line between the right and left bankfull contours; estimate or measure the height of the line above the thalweg (the deepest part of the channel).	0.4	0.4	0.4
3: Estimate flood prone depth.	Double the estimate of maximum bankfull depth from Step 2.	0.8	0.8	0.8
4: Estimate flood prone width.	Imagine a level line having a height equal to the flood prone depth from Step 3; note where the line intercepts the right and left banks; estimate or measure the length of this line.	7.5	7.0	7.0
5: Calculate entrenchment ratio.	Divide the flood prone width (Step 4) by the bankfull width (Step 1).	1.25	1.17	1.17
6: Calculate average entrenchment ratio.	Calculate the average results for Step 5 for all 3 replicate cross-sections. Enter the average result here and use it in Table 13a or 13b.			1.20

Structural Patch Type Worksheet for Riverine wetlands

Circle each type of patch that is observed in the AA and enter the total number of observed patches in Table below. In the case of riverine wetlands, their status as confined or non-confined must first be determined (see page 6) to determine with patches are expected in the system (indicated by a "1" in the table below). Any feature onsite should only be counted once as a patch type. If a feature appears to meet the definition of more than one patch type (i.e. swale and secondary channel) the practitioner should choose which patch type best illustrates the feature. Not all features at a site will be patch types.

Please refer to the CRAM Photo Dictionary at** *www.cramwetlands.org* **for photos of each of the following patch types.

STRUCTURAL PATCH TYPE (circle for presence)	Riverine (Non-confined)	Riverine (Confined)
Minimum Patch Size	3 m^2	3 m^2
Abundant wrackline or organic debris in channel, on floodplain	1	1
Bank slumps or undercut banks in channels or along shoreline	1	1
Cobbles and/or Boulders	1	1
Debris jams	1	1
Filamentous macroalgae or algal mats	1	1
Large woody debris	1	1
Pannes or pools on floodplain	1	N/A
Plant hummocks and/or sediment mounds	1	1
Point bars and in-channel bars	1	1
Pools or depressions in channels (wet or dry channels)	1	1
Riffles or rapids (wet or dry channels)	1	1
Secondary channels on floodplains or along shorelines	1	N/A
Standing snags (at least 3 m tall)	1	1
Submerged vegetation	1	N/A
Swales on floodplain or along shoreline	1	N/A
Variegated, convoluted, or crenulated foreshore (instead of broadly arcuate or mostly straight)	1	1
Vegetated islands (mostly above high-water)	1	N/A
Total Possible	17	12
No. Observed Patch Types (enter here and use in Table 14 below)	4	

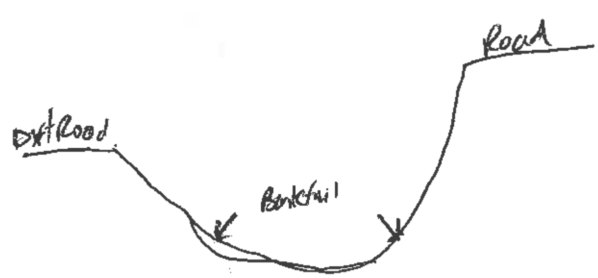
Worksheet for AA Topographic Complexity

At three locations along the AA, make a sketch of the profile of the stream from the AA boundary down to its deepest area then back out to the other AA boundary. Try to capture the benches and the intervening micro-topographic relief. To maintain consistency, make drawings at each of the stream hydrologic connectivity measurements, always facing downstream. Include the water level, an arrow at the bankfull contour, and label the benches. Based on these sketches and the profiles in Figure 10, choose a description in Table 16 that best describes the overall topographic complexity of the AA.

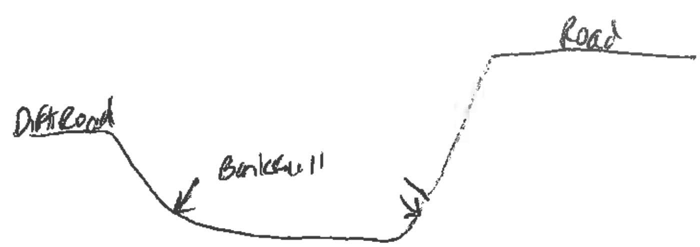
Profile 1

Same

Profile 2



Profile 3



Plant Community Metric Worksheet: Co-dominant species richness for Riverine wetlands

(A dominant species represents ≥10% *relative* cover)

Special Note:

* *Combine the counts of co-dominant species from all layers to identify the total species count. Each plant species is only counted once when calculating the Number of Co-dominant Species and Percent Invasion submetric scores, regardless of the numbers of layers in which it occurs.*

Floating or Canopy-forming (non-confined only)	Invasive?	Short (<0.5 m)	Invasive?

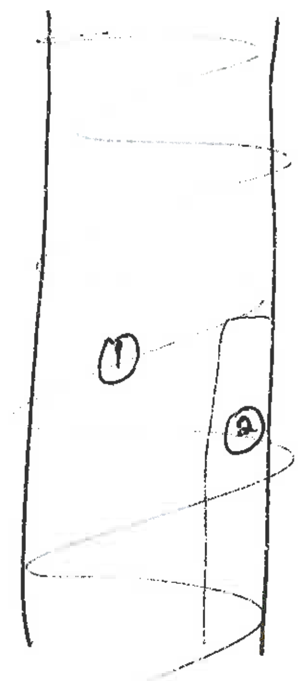
Medium (0.5-1.5 m)	Invasive?	Tall (1.5-3.0 m)	Invasive?
Poison oak		Poison oak	
Rubus ursinus			

Very Tall (>3.0 m)	Invasive?
Red willow	
Arroyo willow	

Total number of co-dominant species for all layers combined (enter here and use in Table 18)	4
Percent Invasion *Round to the nearest integer* (enter here and use in Table 18)	0%

Horizontal Interspersion Worksheet.

Use the spaces below to make a quick sketch of the AA in plan view, outlining the major plant zones (this should take no longer than 10 minutes). Assign the zones names and record them on the right. Based on the sketch, choose a single profile from Figure 12 that best represents the AA overall.



Assigned zones:

1) Willow Canopy

2) Po/Rubus

3)

4)

5)

6)

Worksheet for Wetland disturbances and conversions

Has a major disturbance occurred at this wetland?	Yes	No		
If yes, was it a flood, fire, landslide, or other?	flood	fire	landslide	other
If yes, then how severe is the disturbance?	likely to affect site next 5 or more years	likely to affect site next 3-5 years	likely to affect site next 1-2 years	
Has this wetland been converted from another type? If yes, then what was the previous type?	depressional	vernal pool	vernal pool system	
	non-confined riverine	confined riverine	seasonal estuarine	
	perennial saline estuarine	perennial non-saline estuarine	wet meadow	
	lacustrine	seep or spring	playa	

Stressor Checklist Worksheet

HYDROLOGY ATTRIBUTE (WITHIN 50 M OF AA)	Present	Significant negative effect on AA
Point Source (PS) discharges (POTW, other non-stormwater discharge)		
Non-point Source (Non-PS) discharges (urban runoff, farm drainage)	X	
Flow diversions or unnatural inflows	X	
Dams (reservoirs, detention basins, recharge basins)		
Flow obstructions (culverts, paved stream crossings)	X	
Weir/drop structure, tide gates		
Dredged inlet/channel		
Engineered channel (riprap, armored channel bank, bed)		
Dike/levees		
Groundwater extraction		
Ditches (borrow, agricultural drainage, mosquito control, etc.)	X	
Actively managed hydrology		
Comments		

PHYSICAL STRUCTURE ATTRIBUTE (WITHIN 50 M OF AA)	Present	Significant negative effect on AA
Filling or dumping of sediment or soils **(N/A for restoration areas)**		
Grading/ compaction **(N/A for restoration areas)**		
Plowing/Discing **(N/A for restoration areas)**	X	
Resource extraction (sediment, gravel, oil and/or gas)		
Vegetation management		
Excessive sediment or organic debris from watershed		
Excessive runoff from watershed		
Nutrient impaired (PS or Non-PS pollution)	X	
Heavy metal impaired (PS or Non-PS pollution)		
Pesticides or trace organics impaired (PS or Non-PS pollution)	X	
Bacteria and pathogens impaired (PS or Non-PS pollution)	X	
Trash or refuse	X	X
Comments		

BIOTIC STRUCTURE ATTRIBUTE (WITHIN 50 M OF AA)	Present	Significant negative effect on AA
Mowing, grazing, excessive herbivory (within AA)		
Excessive human visitation		
Predation and habitat destruction by non-native vertebrates (e.g., *Virginia opossum* and domestic predators, such as feral pets)		
Tree cutting/sapling removal		
Removal of woody debris		
Treatment of non-native and nuisance plant species		
Pesticide application or vector control		
Biological resource extraction or stocking (fisheries, aquaculture)	X	
Excessive organic debris in matrix (for vernal pools)		
Lack of vegetation management to conserve natural resources	X	
Lack of treatment of invasive plants adjacent to AA or buffer	X	
Comments		

BUFFER AND LANDSCAPE CONTEXT ATTRIBUTE (WITHIN 500 M OF AA)	Present	Significant negative effect on AA
Urban residential		
Industrial/commercial		
Military training/Air traffic	X	
Dams (or other major flow regulation or disruption)		
Dryland farming		
Intensive row-crop agriculture		
Orchards/nurseries	X	X
Commercial feedlots		
Dairies		
Ranching (enclosed livestock grazing or horse paddock or feedlot)		
Transportation corridor		
Rangeland (livestock rangeland also managed for native vegetation)	X	X
Sports fields and urban parklands (golf courses, soccer fields, etc.)		
Passive recreation (bird-watching, hiking, etc.)		
Active recreation (off-road vehicles, mountain biking, hunting, fishing)		
Physical resource extraction (rock, sediment, oil/gas)		
Biological resource extraction (aquaculture, commercial fisheries)		
Comments		

Basic Information Sheet: Riverine Wetlands

Assessment Area Name: AA12

Project Name: HSR SJM

Assessment Area ID #:

Project ID #: | **Date:** 4/24/2019

Assessment Team Members for This AA:

RJ Van Sant

Kristen Klinefelter

Average Bankfull Width: 6m

Approximate Length of AA (10 times bankfull width, min 100 m, max 200 m): 100m

Upstream Point Latitude: 36.9724 **Longitude:** -121.5243

Downstream Point Latitude: 36.9731 **Longitude:** -121.5235

Wetland Sub-type:

☐ Confined ☑ Non-confined

AA Category:

☐ Restoration ☐ Mitigation ☐ Impacted ☐ Ambient ☐ Reference ☐ Training

☑ Other: PRE-IMPACT

Did the river/stream have flowing water at the time of the assessment? ☑ yes ☐ no

What is the apparent hydrologic flow regime of the reach you are assessing?

The hydrologic flow regime of a stream describes the frequency with which the channel conducts water. *Perennial* streams conduct water all year long, whereas *ephemeral* streams conduct water only during and immediately following precipitation events. *Intermittent* streams are dry for part of the year, but conduct water for periods longer than ephemeral streams, as a function of watershed size and water source.

☑ perennial ☑ intermittent ☐ ephemeral

Photo Identification Numbers and Description:

	Photo ID No.	Description	Latitude	Longitude	Datum
1	1	Upstream			
2	2	Middle ~~Left~~ Upstream			
3	3	Middle ~~Right~~ Down			
4		Downstream			
5					
6					
7					
8					
9					
10					

Site Location Description:

Comments:

Scoring Sheet: Riverine Wetlands

AA Name: AA 12.			**Date:** 4/24/2019
Attribute 1: Buffer and Landscape Context (pp. 11-19)	Alpha.	Numeric	**Comments**
Stream Corridor Continuity (D)	D	3	400 m seg. upstream
Buffer:			
Buffer submetric A: Percent of AA with Buffer	B	9	50%.
Buffer submetric B: Average Buffer Width	A	12	250 m avg.
Buffer submetric C: Buffer Condition	B	9	Natives and non-natives, undisturbed
Raw Attribute Score = $D+[C \times (A \times B)^{1/2}]^{1/2}$			**Final Attribute Score = (Raw Score/24) x 100**
Attribute 2: Hydrology (pp. 20-26)	Alpha.	Numeric	
Water Source	C	6	
Channel Stability	A	12	Mostly equilibrium
Hydrologic Connectivity	A	12	4.6
Raw Attribute Score = sum of numeric scores			**Final Attribute Score = (Raw Score/36) x 100**
Attribute 3: Physical Structure (pp. 27-33)	Alpha.	Numeric	
Structural Patch Richness	D	3	4 patches
Topographic Complexity	B	9	B2 - 1 bench, micro
Raw Attribute Score = sum of numeric scores			**Final Attribute Score = (Raw Score/24) x 100**
Attribute 4: Biotic Structure (pp. 34-41)			
Plant Community Composition (based on sub-metrics A-C)	Alpha.	Numeric	
Plant Community submetric A: Number of plant layers	B	9	3 layers
Plant Community submetric B: Number of Co-dominant species	D	3	4 co-dominants
Plant Community submetric C: Percent Invasion	D	3	50%
Plant Community Composition Metric *(numeric average of submetrics A-C)*			
Horizontal Interspersion	D	3	
Vertical Biotic Structure	B	9	mostly very tall over med
Raw Attribute Score = sum of numeric scores			**Final Attribute Score = (Raw Score/36) x 100**
Overall AA Score (average of four final Attribute Scores)			

Worksheet for Stream Corridor Continuity Metric for Riverine Wetlands

Lengths of Non-buffer Segments For Distance of 500 m Upstream of AA		Lengths of Non-buffer Segments For Distance of 500 m Downstream of AA	
Segment No.	Length (m)	Segment No.	Length (m)
1	400	1	
2		2	
3		3	
4		4	
5		5	
Upstream Total Length	400	Downstream Total Length	0

Percent of AA with Buffer Worksheet

In the space provided below make a quick sketch of the AA, or perform the assessment directly on the aerial imagery; indicate where buffer is present, estimate the percentage of the AA perimeter providing buffer functions, and record the estimate amount in the space provided.

SEE AERIAL

Percent of AA with Buffer: 50 **%**

Worksheet for calculating average buffer width of AA

Line	Buffer Width (m)
A	250
B	250
C	250
D	250
E	250
F	250
G	250
H	250
Average Buffer Width *Round to the nearest integer*	250

Worksheet for Assessing Channel Stability for Riverine Wetlands

Condition	Field Indicators (check all existing conditions)
Indicators of Channel Equilibrium	☑ The channel (or multiple channels in braided systems) has a well-defined bankfull contour that clearly demarcates an obvious active floodplain in the cross-sectional profile of the channel throughout most of the AA. ☐ Perennial riparian vegetation is abundant and well established along the bankfull contour, but not below it. ☐ There is leaf litter, thatch, or wrack in most pools (if pools are present). ☑ The channel contains embedded woody debris of the size and amount consistent with what is naturally available in the riparian area. ☑ There is little or no active undercutting or burial of riparian vegetation. ☐ If mid-channel bars and/or point bars are present, they are not densely vegetated with perennial vegetation. ☐ Channel bars consist of well-sorted bed material (smaller grain size on the top and downstream end of the bar, larger grain size along the margins and upstream end of the bar). ☐ There are channel pools, the spacing between pools tends to be regular and the bed is not planar throughout the AA ☐ The larger bed material supports abundant mosses or periphyton.
Indicators of Active Degradation	☐ The channel is characterized by deeply undercut banks with exposed living roots of trees or shrubs. ☐ There are abundant bank slides or slumps. ☐ The lower banks are uniformly scoured and not vegetated. ☐ Riparian vegetation is declining in stature or vigor, or many riparian trees and shrubs along the banks are leaning or falling into the channel. ☐ An obvious historical floodplain has recently been abandoned, as indicated by the age structure of its riparian vegetation. ☐ The channel bed appears scoured to bedrock or dense clay. ☐ Recently active flow pathways appear to have coalesced into one channel (i.e. a previously braided system is no longer braided). ☐ The channel has one or more knickpoints indicating headward erosion of the bed.
Indicators of Active Aggradation	☐ There is an active floodplain with fresh splays of coarse sediment (sand and larger that is not vegetated) deposited in the current or previous year. ☐ There are partially buried living tree trunks or shrubs along the banks. ☑ The bed is planar (flat or uniform gradient) overall; it lacks well-defined channel pools, or they are uncommon and irregularly spaced. ☐ There are partially buried, or sediment-choked, culverts. ☐ Perennial terrestrial or riparian vegetation is encroaching into the channel or onto channel bars below the bankfull contour. ☐ There are avulsion channels on the floodplain or adjacent valley floor.
Overall	☑ **Equilibrium** ☐ **Degradation** ☑ **Aggradation**

Riverine Wetland Entrenchment Ratio Calculation Worksheet

The following 5 steps should be conducted for each of 3 cross-sections located in the AA at the approximate midpoints along straight riffles or glides, away from deep pools or meander bends. An attempt should be made to place them at the top, middle, and bottom of the AA.

Steps	Replicate Cross-sections →	TOP	MID	BOT
1 Estimate bankfull width.	This is a critical step requiring familiarity with field indicators of the bankfull contour. Estimate or measure the distance between the right and left bankfull contours.	4	8	6
2: Estimate max. bankfull depth.	Imagine a level line between the right and left bankfull contours; estimate or measure the height of the line above the thalweg (the deepest part of the channel).	0.75	0.5	0.75
3: Estimate flood prone depth.	Double the estimate of maximum bankfull depth from Step 2.	1.5	1	1.5
4: Estimate flood prone width.	Imagine a level line having a height equal to the flood prone depth from Step 3; note where the line intercepts the right and left banks; estimate or measure the length of this line.	25	21	30
5: Calculate entrenchment ratio.	Divide the flood prone width (Step 4) by the bankfull width (Step 1).	6.25	2.6	5
6: Calculate average entrenchment ratio.	Calculate the average results for Step 5 for all 3 replicate cross-sections. Enter the average result here and use it in Table 13a or 13b.			4.6

Structural Patch Type Worksheet for Riverine wetlands

Circle each type of patch that is observed in the AA and enter the total number of observed patches in Table below. In the case of riverine wetlands, their status as confined or non-confined must first be determined (see page 6) to determine with patches are expected in the system (indicated by a "1" in the table below). Any feature onsite should only be counted once as a patch type. If a feature appears to meet the definition of more than one patch type (i.e. swale and secondary channel) the practitioner should choose which patch type best illustrates the feature. Not all features at a site will be patch types.

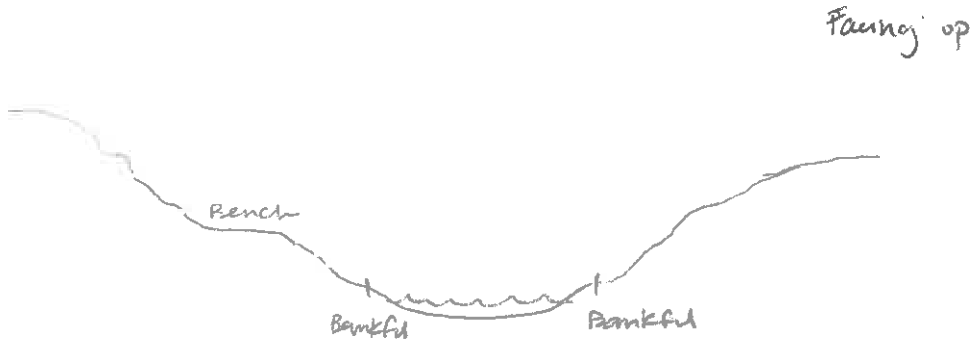
Please refer to the CRAM Photo Dictionary at www.cramwetlands.org for photos of each of the following patch types.

STRUCTURAL PATCH TYPE (circle for presence)	**Riverine (Non-confined)**	**Riverine (Confined)**
Minimum Patch Size	**3 m^2**	**3 m^2**
Abundant wrackline or organic debris in channel, on floodplain	1	1
Bank slumps or undercut banks in channels or along shoreline	1	1
Cobbles and/or Boulders	1	1
Debris jams	1	1
Filamentous macroalgae or algal mats	1	1
Large woody debris	1	1
Pannes or pools on floodplain	1	N/A
Plant hummocks and/or sediment mounds	1	1
Point bars and in-channel bars	1	1
Pools or depressions in channels (wet or dry channels)	1	1
Riffles or rapids (wet or dry channels)	1	1
Secondary channels on floodplains or along shorelines	1	N/A
Standing snags (at least 3 m tall)	1	1
Submerged vegetation	1	N/A
Swales on floodplain or along shoreline	1	N/A
Variegated, convoluted, or crenulated foreshore (instead of broadly arcuate or mostly straight)	1	1
Vegetated islands (mostly above high-water)	1	N/A
Total Possible	**17**	**12**
No. Observed Patch Types (enter here and use in Table 14 below)	4	

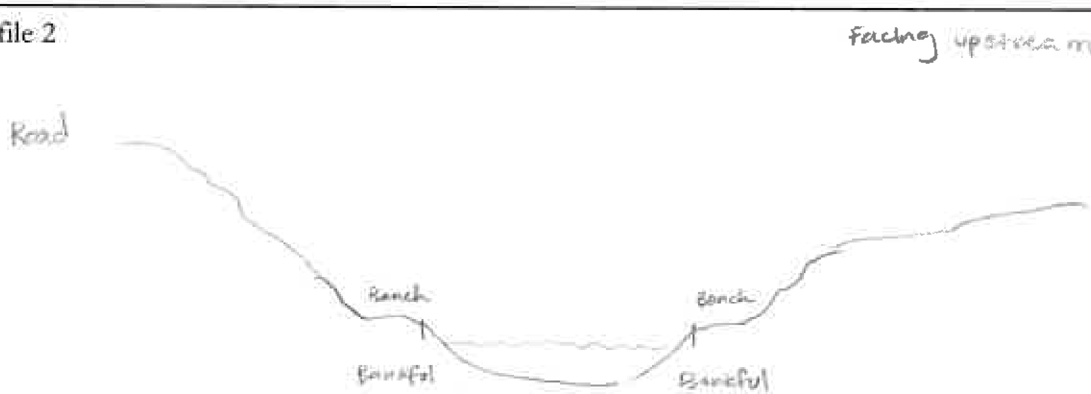
Worksheet for AA Topographic Complexity

At three locations along the AA, make a sketch of the profile of the stream from the AA boundary down to its deepest area then back out to the other AA boundary. Try to capture the benches and the intervening micro-topographic relief. To maintain consistency, make drawings at each of the stream hydrologic connectivity measurements, always facing downstream. Include the water level, an arrow at the bankfull contour, and label the benches. Based on these sketches and the profiles in Figure 10, choose a description in Table 16 that best describes the overall topographic complexity of the AA.

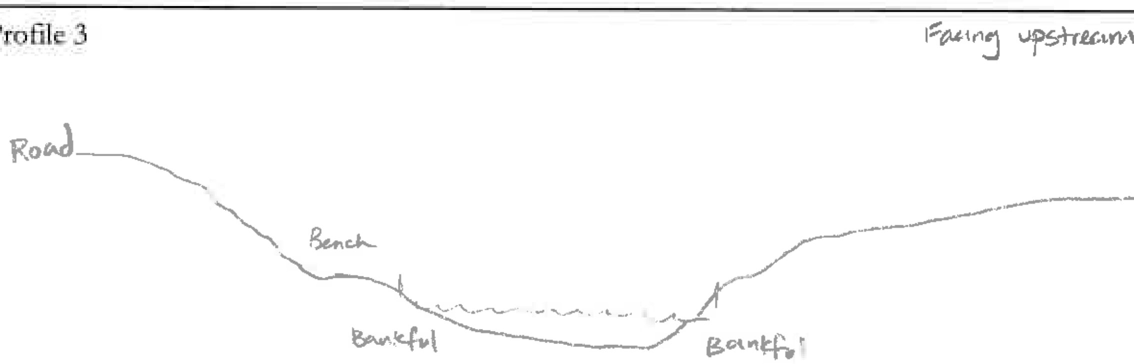
Profile 1



Profile 2



Profile 3



Plant Community Metric Worksheet: Co-dominant species richness for Riverine wetlands
(A dominant species represents ≥10% *relative* cover)

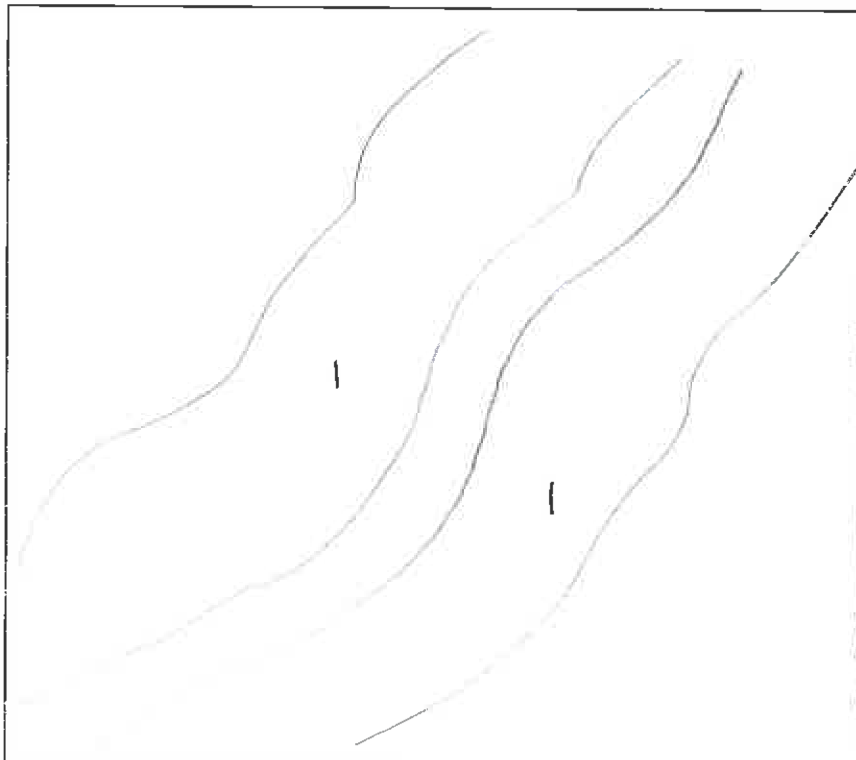
Special Note:

** Combine the counts of co-dominant species from all layers to identify the total species count. Each plant species is only counted once when calculating the Number of Co-dominant Species and Percent Invasion submetric scores, regardless of the numbers of layers in which it occurs.*

Floating or Canopy-forming (non-confined only)	Invasive?	Short (<0.5 m)	Invasive?
Medium (0.5-1.5 m)	**Invasive?**	**Tall (1.5-3.0 m)**	**Invasive?**
Conium maculatum	✓	Conium maculatum	✓
Rubus ursinus			
Very Tall (>3.0 m)	**Invasive?**	**Total number of co-dominant species for all layers combined (enter here and use in Table 18)**	4
Salix laevigata			
Ailanthus altissima	✓		
		Percent Invasion *Round to the nearest integer* (enter here and use in Table 18)	50%

Horizontal Interspersion Worksheet.

Use the spaces below to make a quick sketch of the AA in plan view, outlining the major plant zones (this should take no longer than 10 minutes). Assign the zones names and record them on the right. Based on the sketch, choose a single profile from Figure 12 that best represents the AA overall.



Assigned zones:

1) Willows and Hemlock / Blackberry all mixed

2)

3)

4)

5)

6)

Worksheet for Wetland disturbances and conversions

<table>
<tr><td>Has a major disturbance occurred at this wetland?</td><td colspan="2">Yes</td><td colspan="2">No</td><td></td><td></td></tr>
<tr><td>If yes, was it a flood, fire, landslide, or other?</td><td colspan="2">flood</td><td colspan="2">fire</td><td>landslide</td><td>other</td></tr>
<tr><td>If yes, then how severe is the disturbance?</td><td colspan="2">likely to affect site next 5 or more years</td><td colspan="2">likely to affect site next 3-5 years</td><td colspan="2">likely to affect site next 1-2 years</td></tr>
<tr><td rowspan="4">Has this wetland been converted from another type? If yes, then what was the previous type?</td><td colspan="2">depressional</td><td colspan="2">vernal pool</td><td colspan="2">vernal pool system</td></tr>
<tr><td colspan="2">non-confined riverine</td><td colspan="2">confined riverine</td><td colspan="2">seasonal estuarine</td></tr>
<tr><td colspan="2">perennial saline estuarine</td><td colspan="2">perennial non-saline estuarine</td><td colspan="2">wet meadow</td></tr>
<tr><td colspan="2">lacustrine</td><td colspan="2">seep or spring</td><td colspan="2">playa</td></tr>
</table>

Stressor Checklist Worksheet

HYDROLOGY ATTRIBUTE (WITHIN 50 M OF AA)	Present	Significant negative effect on AA
Point Source (PS) discharges (POTW, other non-stormwater discharge)		
Non-point Source (Non-PS) discharges (urban runoff, farm drainage)	X	
Flow diversions or unnatural inflows		
Dams (reservoirs, detention basins, recharge basins)		
Flow obstructions (culverts, paved stream crossings)		
Weir/drop structure, tide gates		
Dredged inlet/channel		
Engineered channel (riprap, armored channel bank, bed)		
Dike/levees		
Groundwater extraction		
Ditches (borrow, agricultural drainage, mosquito control, etc.)	X	
Actively managed hydrology		

Comments

PHYSICAL STRUCTURE ATTRIBUTE (WITHIN 50 M OF AA)	Present	Significant negative effect on AA
Filling or dumping of sediment or soils **(N/A for restoration areas)**		
Grading/ compaction **(N/A for restoration areas)**	X	
Plowing/Discing **(N/A for restoration areas)**	X	
Resource extraction (sediment, gravel, oil and/or gas)		
Vegetation management		
Excessive sediment or organic debris from watershed		
Excessive runoff from watershed		
Nutrient impaired (PS or Non-PS pollution)	X	
Heavy metal impaired (PS or Non-PS pollution)		
Pesticides or trace organics impaired (PS or Non-PS pollution)	X	
Bacteria and pathogens impaired (PS or Non-PS pollution)	X	
Trash or refuse		

Comments

BIOTIC STRUCTURE ATTRIBUTE (WITHIN 50 M OF AA)	Present	Significant negative effect on AA
Mowing, grazing, excessive herbivory (within AA)	X	
Excessive human visitation		
Predation and habitat destruction by non-native vertebrates (e.g., *Virginia opossum* and domestic predators, such as feral pets)		
Tree cutting/sapling removal		
Removal of woody debris		
Treatment of non-native and nuisance plant species		
Pesticide application or vector control	X	
Biological resource extraction or stocking (fisheries, aquaculture)		
Excessive organic debris in matrix (for vernal pools)		
Lack of vegetation management to conserve natural resources	X	
Lack of treatment of invasive plants adjacent to AA or buffer	X	

Comments

BUFFER AND LANDSCAPE CONTEXT ATTRIBUTE (WITHIN 500 M OF AA)	Present	Significant negative effect on AA
Urban residential	X	
Industrial/commercial		
Military training/Air traffic		
Dams (or other major flow regulation or disruption)		
Dryland farming		
Intensive row-crop agriculture	X	
Orchards/nurseries	X	
Commercial feedlots		
Dairies		
Ranching (enclosed livestock grazing or horse paddock or feedlot)		
Transportation corridor	X	
Rangeland (livestock rangeland also managed for native vegetation)		
Sports fields and urban parklands (golf courses, soccer fields, etc.)		
Passive recreation (bird-watching, hiking, etc.)		
Active recreation (off-road vehicles, mountain biking, hunting, fishing)		
Physical resource extraction (rock, sediment, oil/gas)		
Biological resource extraction (aquaculture, commercial fisheries)		

Comments

Basic Information Sheet: Depressional Wetlands

Assessment Area Name: AAM_FWP-02526
Project Name: HBR
Assessment Area ID #: 17
Project ID #: Date: 4/24/19

Assessment Team Members for This AA

L. Cervantes, D. Maniscalco

AA Category:

☐ Pre-Restoration ☐ Post-Restoration ☐ Pre-Mitigation ☐ Post-Mitigation

☒ Pre-Impact ☐ Post-Impact ☐ Training ☐ Ambient

☐ Reference ☐ Other:

Origin of Wetland (if known):

☒ Natural system ☐ Artificial system

Type of Management (if known):

☐ waterfowl/birds ☐ amphibians ☐ general wildlife ☐ sediment ☐ water quality ☐ stormwater ☐ water supply (agriculture) ☐ water supply (livestock) ☐ not managed ☒ other: Conservation easement

Which best describes the type of depressional wetland?

☒ freshwater marsh ☐ alkaline marsh ☐ brackish marsh

☐ other (specify):

AA Encompasses:

☐ entire wetland ☒ portion of the wetland

Which best describes the hydrologic state of the wetland at the time of assessment?

☒ ponded/inundated ☐ saturated soil, but no surface water ☐ dry

What is the apparent hydrologic regime of the wetland?

Perennially flooded systems contain surface water year-round, *seasonally flooded* depressional wetlands are defined as supporting surface water for 4-11 months of the year (in > 5 out of 10 years.) *Temporarily flooded* depressional wetlands possess surface water between 2 weeks and 4 months of the year.

☒ perennially flooded ☐ seasonally flooded ☐ temporarily flooded

Does your wetland connect with the floodplain of a nearby stream? ☒ yes ☐ no
(system subject to overbank flow, a dammed stream does not count)

Does the wetland have a defined on undefined outlet? ☒ defined ☐ undefined
Does the wetland have a defined on undefined inlet? ☒ defined ☐ undefined
Are the inlet and outlet at the same location? ☐ yes ☒ no

Is the topographic basin of the wetland ☒ distinct **or** ☐ indistinct **?**
An *indistinct* topographic basin is one that lacks obvious boundaries between wetland and upland. Examples of such features are seasonal, depressional wetlands in very low-gradient landscapes.

Photo Identification Numbers and Description:
Photos should be taken from edge of AA looking toward the centroid of AA

	Photo ID No.	Description	Latitude	Longitude	Datum
1		(to) North			
2		(to) East			
3		(to) South			
4		(to) West			
5					
6					
7					
8					
9					
10					

Site Location Description and Land Use:

Comments:

Scoring Sheet: Depressional Wetlands

AA Name: 17-FWP-02526			**Date:** 4/23/19
Attribute 1: Buffer and Landscape Context (pp. 8-15)			**Comments**
	Alpha.	Numeric	
Aquatic Area Abundance Score (D)	B		37%
Buffer:			
	Alpha.	Numeric	
Buffer submetric A: Percent of AA with Buffer	A		100%
Buffer submetric B: Average Buffer Width	A		250m
Buffer submetric C: Buffer Condition	C		Non-native spp
Raw Attribute Score = D+[C x (A x B)$^{1/2}$]$^{1/2}$			**Final Attribute Score = (Raw Score/24) x 100**
Attribute 2: Hydrology (pp. 16-21)			
	Alpha.	Numeric	
Water Source	C		
Hydroperiod	B		
Hydrologic Connectivity	B ~~A~~		
Raw Attribute Score = sum of numeric scores			**Final Attribute Score = (Raw Score/36) x 100**
Attribute 3: Physical Structure (pp. 22-28)			
	Alpha.	Numeric	
Structural Patch Richness	C		5
Topographic Complexity	D		
Raw Attribute Score = sum of numeric scores			**Final Attribute Score = (Raw Score/24) x 100**
Attribute 4: Biotic Structure (pp. 29-39)			
Plant Community Composition (based on submetrics A-C)			
	Alpha.	Numeric	
Plant Community submetric A: Number of plant layers	B		3
Plant Community submetric B: Number of Co-dominant species	B		7
* *Plant Community submetric C: Percent Invasion*	C		29%
Plant Community Composition Metric *(numeric average of submetrics A-C)*			
Horizontal Interspersion	D		
Vertical Biotic Structure	D		
Raw Attribute Score = sum of numeric scores			**Final Attribute Score = (Raw Score/36) x 100**
Overall AA Score (average of four final Attribute Scores)			

Worksheet for Aquatic Area Abundance Metric (Method 1)

Percentage of Transect Lines that Contains Aquatic Area of Any Kind	
Segment Direction	Percentage of Transect Length That is an Aquatic Feature
North	20
South	100
East	29
West	0
Average Percentage of Transect Length That Is an Aquatic Feature	37%

Percent of AA with Buffer Worksheet.

In the space provided below make a quick sketch of the AA, or perform the assessment directly on the aerial imagery; indicate where buffer is present, estimate the percentage of the AA perimeter providing buffer functions, and record the estimate amount in the space provided.

Percent of AA with Buffer: 100 %

Worksheet for calculating average buffer width of AA

Line	Buffer Width (m)
A	250
B	
C	
D	
E	
F	
G	
H	
Average Buffer Width ***Round to the nearest whole number (integer)***	250

Structural Patch Type Worksheet for Depressional Wetlands

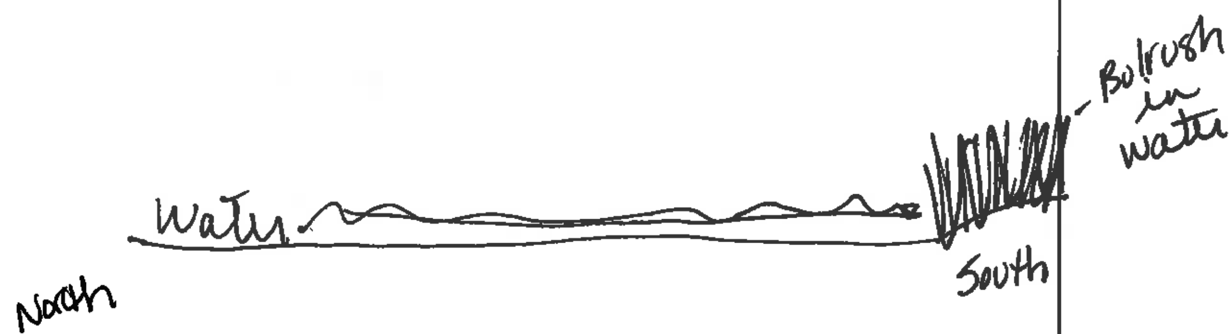
Check each type of patch that is observed in the AA and use the total number of observed patches in Table 15.

STRUCTURAL PATCH TYPE (circle for presence)	Depressional
Minimum Patch Size	**3 m^2**
Abundant wrack or organic debris in channel, on floodplain, or across depressional wetland plain	X
Animal mounds and burrows	X
Bank slumps or undercut banks in channels or along shoreline	
Cobbles and Boulders	X
Concentric or parallel high water marks	
Filamentous macroalgae or algal mats	
Islands (mostly above high-water)	
Large woody debris	
Non-vegetated flats or bare ground (sandflats, mudflats, gravel flats, etc.)	
Open water	X
Plant hummocks and/or sediment mounds	
Soil cracks	X
Standing snag(s) (1 or more at least 3 m tall)	
Submerged vegetation	
Swales on floodplain or along shoreline	
Variegated, convoluted, or crenulated foreshore (instead of broadly arcuate or mostly straight)	
Woody vegetation in water	
Total Possible	**17**
No. Observed Patch Types (enter here and use in Table 15 below)	5

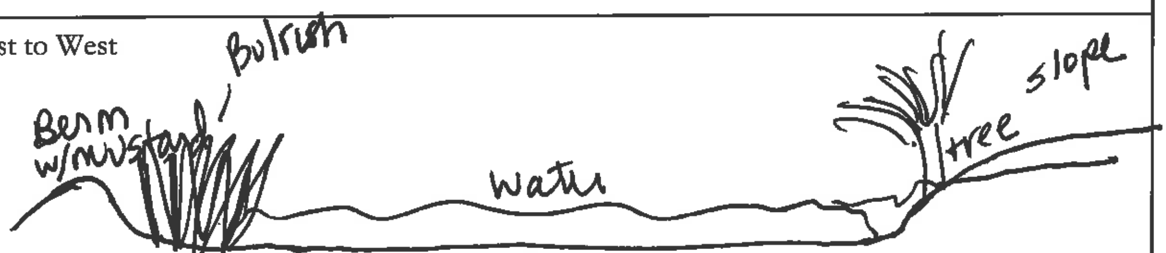
Worksheet for AA Topographic Complexity

At two locations in the AA, make a sketch of the profile from the AA boundary to AA boundary. Try to capture the major topographic features, slopes and intervening micro-topographic relief. Based on these sketches and the profiles in Figure 7, choose a description in Table 17 that best describes the overall topographic complexity of the AA.

North to South



East to West



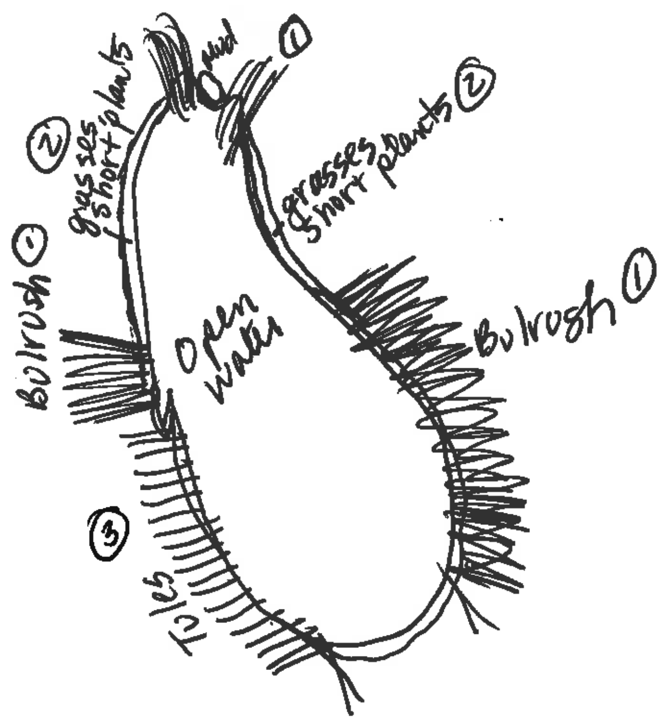
Plant Community Metric Worksheet 2 of 8: Co-dominant species richness
(A dominant species represents ≥10% *relative* cover)

** Combine the counts of co-dominant species from all layers to identify the total species count. Each plant species is only counted once when calculating the Number of Co-dominant Species and Percent Invasion submetric scores, regardless of the numbers of layers in which it occurs.*

Floating or Canopy-forming	Invasive?	Short (<0.5 m)	Invasive?
		Lythrum spp	Y
		Rumex	Y
		Clover - looked up invasives + not [illegible] of them	N
		Distichilus	N
		~~[illegible]~~ Matricaria discoidea	n
Medium (0.5 – 1.5 m)	**Invasive?**	**Tall (1.5 – 3.0 m)**	**Invasive?**
Rumex crispus	Y	Bulrush	N
Tule	N		
Very Tall (>3.0 m)	**Invasive?**		
		Total number of co-dominant species for all layers combined (enter here and use in Table 19)	7
		Percent Invasion *Round to the nearest whole number (integer)* (enter here and use in Table 19)	29

Horizontal Interspersion Worksheet

Use the spaces below to make a sketch of the AA in plan view, outlining the major plant zones (this should take no longer than 10 minutes). Assign names to the zones and record them on the right. Based on the sketch, choose a single profile from Figure 8 that best represents the AA overall.



Assigned zones:

1) Bolrush

2) Grasses + short plants

3) Tules

4)

5)

6)

Wetland disturbances and conversions Worksheet

Has a major disturbance occurred at this wetland?	Yes	No		
If yes, was it a flood, fire, landslide, or other?	flood	fire	landslide	other
If yes, then how severe is the disturbance?	likely to affect site next 5 or more years	likely to affect site next 3-5 years	likely to affect site next 1-2 years	
Has this wetland been converted from another type? If yes, then what was the previous type?	depressional	vernal pool	vernal pool system	
	non-confined riverine	confined riverine	bar-built estuarine	
	perennial saline estuarine	perennial non-saline estuarine	wet meadow	
	lacustrine	seep or spring	playa	

Stressor Checklist Worksheet

HYDROLOGY ATTRIBUTE (WITHIN 50 M OF AA)	Present	Significant negative effect on AA
Point Source (PS) discharges (POTW, other non-stormwater discharge)		
Non-point Source (Non-PS) discharges (urban runoff, farm drainage)	X	
Flow diversions or unnatural inflows		
Dams (reservoirs, detention basins, recharge basins)		
Flow obstructions (culverts, paved stream crossings)	X	
Weir/drop structure, tide gates		
Dredged inlet/channel		
Engineered channel (riprap, armored channel bank, bed)		
Dike/levees		
Groundwater extraction		
Ditches (borrow, agricultural drainage, mosquito control, etc.)		
Actively managed hydrology		
Comments		

PHYSICAL STRUCTURE ATTRIBUTE (WITHIN 50 M OF AA)	Present	Significant negative effect on AA
Filling or dumping of sediment or soils **(N/A for restoration areas)**		
Grading/ compaction **(N/A for restoration areas)**		
Plowing/Discing **(N/A for restoration areas)**		
Resource extraction (sediment, gravel, oil and/or gas)		
Vegetation management		
Excessive sediment or organic debris from watershed		
Excessive runoff from watershed		
Nutrient impaired (PS or Non-PS pollution)		
Heavy metal impaired (PS or Non-PS pollution)		
Pesticides or trace organics impaired (PS or Non-PS pollution)		
Bacteria and pathogens impaired (PS or Non-PS pollution)		
Trash or refuse		
Comments		
Nothing in this list		

BIOTIC STRUCTURE ATTRIBUTE (WITHIN 50 M OF AA)	Present	Significant negative effect on AA
Mowing, grazing, excessive herbivory (within AA)	X	
Excessive human visitation		
Predation and habitat destruction by non-native vertebrates (e.g., *Virginia opossum* and domestic predators, such as feral pets)		
Tree cutting/sapling removal		
Removal of woody debris		
Treatment of non-native and nuisance plant species		
Pesticide application or vector control		
Biological resource extraction or stocking (fisheries, aquaculture)		
Excessive organic debris in matrix (for vernal pools)		
Lack of vegetation management to conserve natural resources	X	
Lack of treatment of invasive plants adjacent to AA or buffer	X	
Comments		

BUFFER AND LANDSCAPE CONTEXT ATTRIBUTE (WITHIN 500 M OF AA)	Present	Significant negative effect on AA
Urban residential		
Industrial/commercial		
Military training/Air traffic		
Dams (or other major flow regulation or disruption)		
Dryland farming		
Intensive row-crop agriculture		
Orchards/nurseries		
Commercial feedlots		
Dairies		
Ranching (enclosed livestock grazing or horse paddock or feedlot)		
Transportation corridor		
Rangeland (livestock rangeland also managed for native vegetation)	X	
Sports fields and urban parklands (golf courses, soccer fields, etc.)		
Passive recreation (bird-watching, hiking, etc.)		
Active recreation (off-road vehicles, mountain biking, hunting, fishing)		
Physical resource extraction (rock, sediment, oil/gas)		
Biological resource extraction (aquaculture, commercial fisheries)		
Comments		

Basic Information Sheet: Depressional Wetlands

Assessment Area Name: AA18-FWM 02401-02433	
Project Name: HDR	
Assessment Area ID #: 18	
Project ID #:	**Date:** 4/24/19
Assessment Team Members for This AA	
L. Cervantes, D Manuscalco	

AA Category:

☐ Pre-Restoration   Post-Restoration ☐   Pre-Mitigation ☐ Training   Post-Mitigation ☐

☐ Reference   ☐ Other:

Origin of Wetland (if known):

☒ Natural system

☐ waterfowl/birds ☐ amphibians ☐ general wildlife ☐ sediment ☐ water quality ☐ stormwater
☐ water supply (agriculture) ☐ water supply (livestock) ☐ not managed ☒ other: conservation easement

☒ portion of the wetland

Which best describes the hydrologic state of the wetland at the time of assessment?

☒ ponded/inundated   ☐ saturated soil, but no surface water   ☐ dry

Does your wetland connect with the floodplain of a nearby stream? ☒ yes ☐ no

(system subject to overbank flow, a dammed stream does not count)

Does the wetland have a defined on undefined outlet? ☒ defined ☐ undefined

Does the wetland have a defined on undefined inlet? ☒ defined ☐ undefined

Are the inlet and outlet at the same location? ☐ yes ☒ no

Is the topographic basin of the wetland ☒ distinct **or** ☐ indistinct **?**

An *indistinct* topographic basin is one that lacks obvious boundaries between wetland and upland. Examples of such features are seasonal, depressional wetlands in very low-gradient landscapes.

Photo Identification Numbers and Description:

Photos should be taken from edge of AA looking toward the centroid of AA

	Photo ID No.	Description	Latitude	Longitude	Datum
1		(to) North			
2		(to) East			
3		(to) South			
4		(to) West			
5					
6					
7					
8					
9					
10					

Site Location Description and Land Use:

Comments:

Scoring Sheet: Depressional Wetlands

AA Name: AA18	**Date:** 4/24/19

Attribute 1: Buffer and Landscape Context (pp. 8-15)			**Comments**
	Alpha.	Numeric	
Aquatic Area Abundance Score (D)	C		18.2%
Buffer:			
	Alpha.	Numeric	
Buffer submetric A: Percent of AA with Buffer	A		100% buffer
Buffer submetric B: Average Buffer Width	A		250 m avg
Buffer submetric C: Buffer Condition	C		↑ ~~[illegible]~~natives w/disturbance
Raw Attribute Score = D+[C x (A x B)^{½}]^{½}			**Final Attribute Score = (Raw Score/24) x 100**

Attribute 2: Hydrology (pp. 16-21)			
	Alpha.	Numeric	
Water Source	C		>20% Ag
Hydroperiod	B		~~[illegible]~~ Inputs/natural drawdown
Hydrologic Connectivity	B		~20% w/steep banks
Raw Attribute Score = sum of numeric scores			**Final Attribute Score = (Raw Score/36) x 100**

Attribute 3: Physical Structure (pp. 22-28)			
	Alpha.	Numeric	
Structural Patch Richness	C		6 patches
Topographic Complexity	B		1 bench, low micro
Raw Attribute Score = sum of numeric scores			**Final Attribute Score = (Raw Score/24) x 100**

Attribute 4: Biotic Structure (pp. 29-39)			
Plant Community Composition (based on submetrics A-C)			
	Alpha.	Numeric	
Plant Community submetric A: Number of plant layers	B		3 layers
Plant Community submetric B: Number of Co-dominant species	B		8 co dom
Plant Community submetric C: Percent Invasion	C		25% invasion
Plant Community Composition Metric *(numeric average of submetrics A-C)*			
Horizontal Interspersion	B		medium interspersion
Vertical Biotic Structure	B		25-30% entrainment (Juncus + bulrush areas)
Raw Attribute Score = sum of numeric scores			**Final Attribute Score = (Raw Score/36) x 100**
Overall AA Score (average of four final Attribute Scores)			

Worksheet for Aquatic Area Abundance Metric (Method 1)

Percentage of Transect Lines that Contains Aquatic Area of Any Kind	
Segment Direction	Percentage of Transect Length That is an Aquatic Feature
North	25%
South	36%
East	12%
West	~~0%~~ 0
Average Percentage of Transect Length That Is an Aquatic Feature	18.25

Percent of AA with Buffer Worksheet.

In the space provided below make a quick sketch of the AA, or perform the assessment directly on the aerial imagery; indicate where buffer is present, estimate the percentage of the AA perimeter providing buffer functions, and record the estimate amount in the space provided.

Percent of AA with Buffer: 100 **%**

Worksheet for calculating average buffer width of AA

Line	Buffer Width (m)
A	250
B	
C	
D	
E	
F	
G	
H	
Average Buffer Width *Round to the nearest whole number (integer)*	250

Structural Patch Type Worksheet for Depressional Wetlands

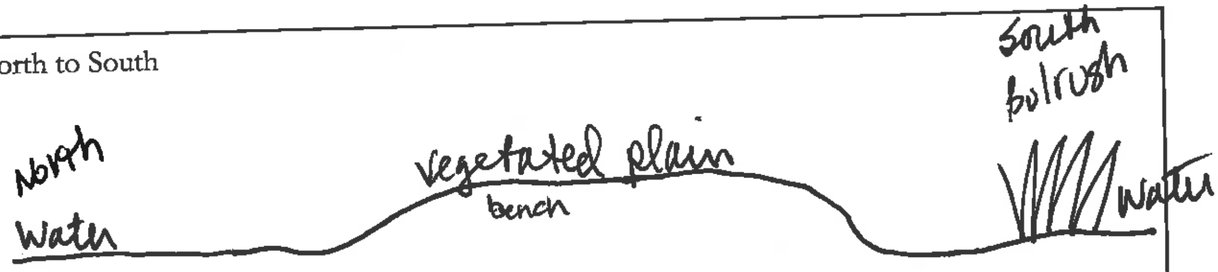
Check each type of patch that is observed in the AA and use the total number of observed patches in Table 15.

STRUCTURAL PATCH TYPE (circle for presence)	Depressional
Minimum Patch Size	**3 m^2**
Abundant wrack or organic debris in channel, on floodplain, or across depressional wetland plain	X
Animal mounds and burrows	X
Bank slumps or undercut banks in channels or along shoreline	X
Cobbles and Boulders	
Concentric or parallel high water marks	
Filamentous macroalgae or algal mats	X
Islands (mostly above high-water)	
Large woody debris	
Non-vegetated flats or bare ground (sandflats, mudflats, gravel flats, etc.)	
Open water	X
Plant hummocks and/or sediment mounds	X
Soil cracks	
Standing snag(s) (1 or more at least 3 m tall)	
Submerged vegetation	
Swales on floodplain or along shoreline	
Variegated, convoluted, or crenulated foreshore (instead of broadly arcuate or mostly straight)	
Woody vegetation in water	
Total Possible	**17**
No. Observed Patch Types (enter here and use in Table 15 below)	6

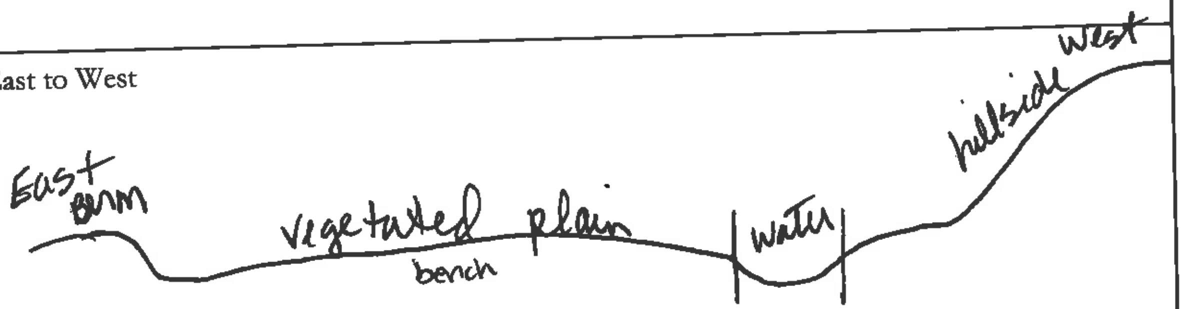
Worksheet for AA Topographic Complexity

At two locations in the AA, make a sketch of the profile from the AA boundary to AA boundary. Try to capture the major topographic features, slopes and intervening micro-topographic relief. Based on these sketches and the profiles in Figure 7, choose a description in Table 17 that best describes the overall topographic complexity of the AA.

North to South



East to West



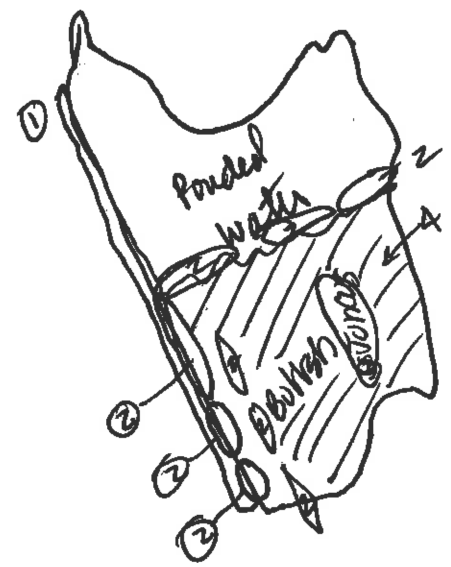
Plant Community Metric Worksheet 2 of 8: Co-dominant species richness
(A dominant species represents ≥10% *relative* cover)

** Combine the counts of co-dominant species from all layers to identify the total species count. Each plant species is only counted once when calculating the Number of Co-dominant Species and Percent Invasion submetric scores, regardless of the numbers of layers in which it occurs.*

Floating or Canopy-forming	**Invasive?**	**Short (<0.5 m)**	**Invasive?**
		Rumex crispus	Y
		Lythrum	Y
		Clover spp	n
		Distichlis	n
		Pickleweed	n
Medium (0.5 – 1.5 m)	**Invasive?**	**Tall (1.5 – 3.0 m)**	**Invasive?**
Rumex crispus	Y	Bulrush	n
Juncus		Tules	n
Very Tall (>3.0 m)	**Invasive?**		
		Total number of co-dominant species for all layers combined (enter here and use in Table 19)	8
		Percent Invasion ***Round to the nearest whole number (integer)*** (enter here and use in Table 19)	25%

Horizontal Interspersion Worksheet

Use the spaces below to make a sketch of the AA in plan view, outlining the major plant zones (this should take no longer than 10 minutes). Assign names to the zones and record them on the right. Based on the sketch, choose a single profile from Figure 8 that best represents the AA overall.



Assigned zones:

1) Tules

2) Bulrush

3) Juncus

4) Pickleweed + Distichlis

5)

6)

Wetland disturbances and conversions Worksheet

Has a major disturbance occurred at this wetland?	Yes	No		
If yes, was it a flood, fire, landslide, or other?	flood	fire	landslide	other
If yes, then how severe is the disturbance?	likely to affect site next 5 or more years	likely to affect site next 3-5 years	likely to affect site next 1-2 years	
Has this wetland been converted from another type? If yes, then what was the previous type?	depressional	vernal pool	vernal pool system	
	non-confined riverine	confined riverine	bar-built estuarine	
	perennial saline estuarine	perennial non-saline estuarine	wet meadow	
	lacustrine	seep or spring	playa	

Stressor Checklist Worksheet

HYDROLOGY ATTRIBUTE (WITHIN 50 M OF AA)	Present	Significant negative effect on AA
Point Source (PS) discharges (POTW, other non-stormwater discharge)		
Non-point Source (Non-PS) discharges (urban runoff, farm drainage)	X	
Flow diversions or unnatural inflows		
Dams (reservoirs, detention basins, recharge basins)		
Flow obstructions (culverts, paved stream crossings)	X	
Weir/drop structure, tide gates		
Dredged inlet/channel		
Engineered channel (riprap, armored channel bank, bed)		
Dike/levees		
Groundwater extraction		
Ditches (borrow, agricultural drainage, mosquito control, etc.)		
Actively managed hydrology		
Comments		

PHYSICAL STRUCTURE ATTRIBUTE (WITHIN 50 M OF AA)	Present	Significant negative effect on AA
Filling or dumping of sediment or soils **(N/A for restoration areas)**		
Grading/ compaction **(N/A for restoration areas)**		
Plowing/Discing **(N/A for restoration areas)**		
Resource extraction (sediment, gravel, oil and/or gas)		
Vegetation management		
Excessive sediment or organic debris from watershed		
Excessive runoff from watershed		
Nutrient impaired (PS or Non-PS pollution)		
Heavy metal impaired (PS or Non-PS pollution)		
Pesticides or trace organics impaired (PS or Non-PS pollution)		
Bacteria and pathogens impaired (PS or Non-PS pollution)		
Trash or refuse		
Comments		

BIOTIC STRUCTURE ATTRIBUTE (WITHIN 50 M OF AA)	Present	Significant negative effect on AA
Mowing, grazing, excessive herbivory (within AA)	X	
Excessive human visitation		
Predation and habitat destruction by non-native vertebrates (e.g., *Virginia opossum* and domestic predators, such as feral pets)		
Tree cutting/sapling removal		
Removal of woody debris		
Treatment of non-native and nuisance plant species		
Pesticide application or vector control		
Biological resource extraction or stocking (fisheries, aquaculture)		
Excessive organic debris in matrix (for vernal pools)		
Lack of vegetation management to conserve natural resources	X	
Lack of treatment of invasive plants adjacent to AA or buffer	X	
Comments		

BUFFER AND LANDSCAPE CONTEXT ATTRIBUTE (WITHIN 500 M OF AA)	Present	Significant negative effect on AA
Urban residential		
Industrial/commercial		
Military training/Air traffic		
Dams (or other major flow regulation or disruption)		
Dryland farming		
Intensive row-crop agriculture		
Orchards/nurseries		
Commercial feedlots		
Dairies		
Ranching (enclosed livestock grazing or horse paddock or feedlot)		
Transportation corridor		
Rangeland (livestock rangeland also managed for native vegetation)	X	
Sports fields and urban parklands (golf courses, soccer fields, etc.)		
Passive recreation (bird-watching, hiking, etc.)		
Active recreation (off-road vehicles, mountain biking, hunting, fishing)		
Physical resource extraction (rock, sediment, oil/gas)		
Biological resource extraction (aquaculture, commercial fisheries)		
Comments		

Basic Information Sheet: Depressional Wetlands

Assessment Area Name: AA-19-PNP-02524
Project Name: HSR
Assessment Area ID #: 19
Project ID #: **Date:** 4/24/19
Assessment Team Members for This AA
Lanika Cervantes, Donna Mariscalco

AA Category:
☐ Pre-Restoration ☐ Post-Restoration ☐ Pre-Mitigation ☐ Post-Mitigation
[x] Pre-Impact ☐ Post-Impact ☐ Training ☐ Ambient
☐ Reference ☐ Other:

Origin of Wetland (if known):
[x] Natural system ☐ Artificial system

Type of Management (if known):
☐ waterfowl/birds ☐ amphibians ☐ general wildlife ☐ sediment ☐ water quality ☐ stormwater
☐ water supply (agriculture) ☐ water supply (livestock) ☐ not managed [x] other: conservation easement

Which best describes the type of depressional wetland?
[x] freshwater marsh ☐ alkaline marsh ☐ brackish marsh
☐ other (specify):

AA Encompasses:
☐ entire wetland [x] portion of the wetland

Which best describes the hydrologic state of the wetland at the time of assessment?
[x] ponded/inundated ☐ saturated soil, but no surface water ☐ dry

What is the apparent hydrologic regime of the wetland?
Perennially flooded systems contain surface water year-round, *seasonally flooded* depressional wetlands are defined as supporting surface water for 4-11 months of the year (in > 5 out of 10 years.) *Temporarily flooded* depressional wetlands possess surface water between 2 weeks and 4 months of the year.
[x] perennially flooded ☐ seasonally flooded ☐ temporarily flooded

Does your wetland connect with the floodplain of a nearby stream? ☒ yes ☐ no

(system subject to overbank flow, a dammed stream does not count)

Does the wetland have a defined on undefined outlet? ☒ defined ☐ undefined

Does the wetland have a defined on undefined inlet? ☒ defined ☐ undefined

Are the inlet and outlet at the same location? ☐ yes ☒ no

Is the topographic basin of the wetland ☒ distinct **or** ☐ indistinct **?**

An *indistinct* topographic basin is one that lacks obvious boundaries between wetland and upland. Examples of such features are seasonal, depressional wetlands in very low-gradient landscapes.

Photo Identification Numbers and Description:

Photos should be taken from edge of AA looking toward the centroid of AA

	Photo ID No.	Description	Latitude	Longitude	Datum
1		(to) North			
2		(to) East			
3		(to) South			
4		(to) West			
5					
6					
7					
8					
9					
10					

Site Location Description and Land Use:

Ponded areas on conservation easement

Comments:

Scoring Sheet: Depressional Wetlands

AA19

AA Name: FWP-02524		**Date:** 4/23/19	
Attribute 1: Buffer and Landscape Context (pp. 8-15)	Alpha.	Numeric	Comments
Aquatic Area Abundance Score (D)	C		18%
Buffer:			
Buffer submetric A: Percent of AA with Buffer	A		100%
Buffer submetric B: Average Buffer Width	A		234
Buffer submetric C: Buffer Condition	C		
Raw Attribute Score = D+[C x (A x B)^{½}]^{½}			**Final Attribute Score = (Raw Score/24) x 100**
Attribute 2: Hydrology (pp. 16-21)	Alpha.	Numeric	
Water Source	C		Ag farms upstream of AAs
Hydroperiod	B		
Hydrologic Connectivity	A		
Raw Attribute Score = sum of numeric scores			**Final Attribute Score = (Raw Score/36) x 100**
Attribute 3: Physical Structure (pp. 22-28)	Alpha.	Numeric	
Structural Patch Richness	C		4
Topographic Complexity	D		
Raw Attribute Score = sum of numeric scores			**Final Attribute Score = (Raw Score/24) x 100**
Attribute 4: Biotic Structure (pp. 29-39)			
Plant Community Composition (based on submetrics A-C)	Alpha.	Numeric	
Plant Community submetric A: Number of plant layers	B		3 layers
Plant Community submetric B: Number of Co-dominant species	D		3
Plant Community submetric C: Percent Invasion	C		66%
Plant Community Composition Metric *(numeric average of submetrics A-C)*			
Horizontal Interspersion	D		
Vertical Biotic Structure	D		
Raw Attribute Score = sum of numeric scores			**Final Attribute Score = (Raw Score/36) x 100**
Overall AA Score (average of four final Attribute Scores)			

Worksheet for Aquatic Area Abundance Metric (Method 1)

Percentage of Transect Lines that Contains Aquatic Area of Any Kind	
Segment Direction	Percentage of Transect Length That is an Aquatic Feature
North	37%
South	27%
East	8%
West	0%
Average Percentage of Transect Length That Is an Aquatic Feature	18%

Percent of AA with Buffer Worksheet.

In the space provided below make a quick sketch of the AA, or perform the assessment directly on the aerial imagery; indicate where buffer is present, estimate the percentage of the AA perimeter providing buffer functions, and record the estimate amount in the space provided.

Percent of AA with Buffer: 100 %

Worksheet for calculating average buffer width of AA

Line	Buffer Width (m)
A	250
B	250
C	250
D	250
E	125
F	250
G	250
H	250
Average Buffer Width ***Round to the nearest whole number (integer)***	234

Structural Patch Type Worksheet for Depressional Wetlands

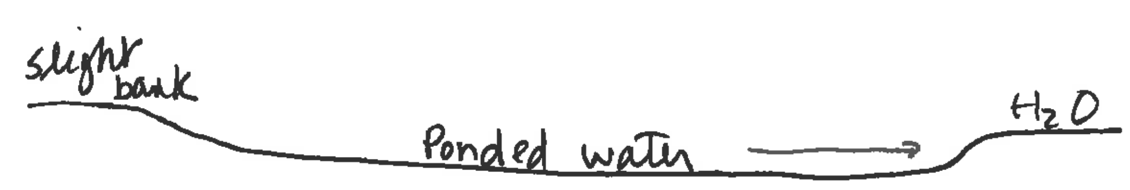
Check each type of patch that is observed in the AA and use the total number of observed patches in Table 15.

STRUCTURAL PATCH TYPE (circle for presence)	Depressional
Minimum Patch Size	3 m^2
Abundant wrack or organic debris in channel, on floodplain, or across depressional wetland plain	X
Animal mounds and burrows	X
Bank slumps or undercut banks in channels or along shoreline	
Cobbles and Boulders	
Concentric or parallel high water marks	
Filamentous macroalgae or algal mats	
Islands (mostly above high-water)	
Large woody debris	
Non-vegetated flats or bare ground (sandflats, mudflats, gravel flats, etc.)	
Open water	X
Plant hummocks and/or sediment mounds	
Soil cracks	X
Standing snag(s) (1 or more at least 3 m tall)	
Submerged vegetation	
Swales on floodplain or along shoreline	
Variegated, convoluted, or crenulated foreshore (instead of broadly arcuate or mostly straight)	
Woody vegetation in water	
Total Possible	17
No. Observed Patch Types (enter here and use in Table 15 below)	4

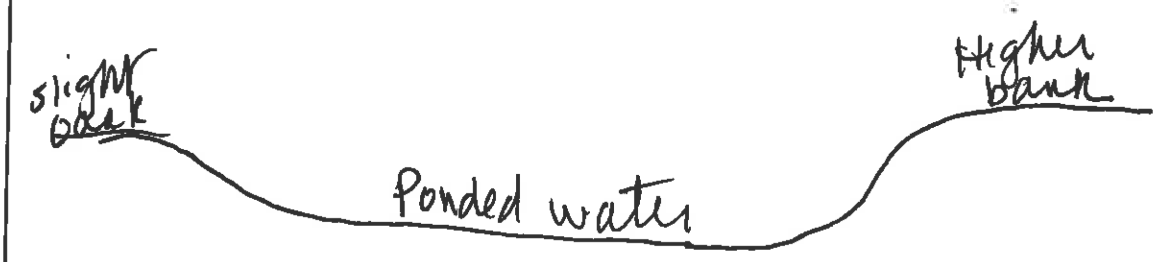
Worksheet for AA Topographic Complexity

At two locations in the AA, make a sketch of the profile from the AA boundary to AA boundary. Try to capture the major topographic features, slopes and intervening micro-topographic relief. Based on these sketches and the profiles in Figure 7, choose a description in Table 17 that best describes the overall topographic complexity of the AA.

North to South



East to West



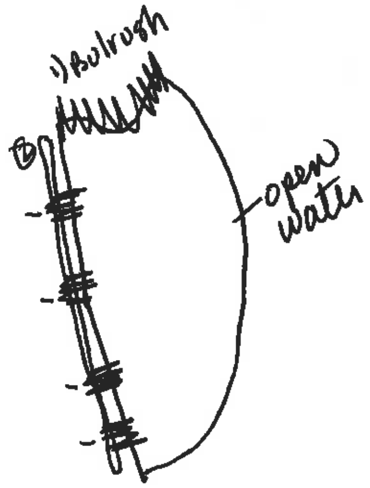
Plant Community Metric Worksheet 2 of 8: Co-dominant species richness
(A dominant species represents ≥10% *relative* cover)

* *Combine the counts of co-dominant species from all layers to identify the total species count. Each plant species is only counted once when calculating the Number of Co-dominant Species and Percent Invasion submetric scores, regardless of the numbers of layers in which it occurs.*

Floating or Canopy-forming	Invasive?	Short (<0.5 m)	Invasive?
		Rumex crispus	Y
		Lythrum hyssopifolium	Y
Medium (0.5 – 1.5 m)	**Invasive?**	**Tall (1.5 – 3.0 m)**	**Invasive?**
Rumex crispus	Y	Schoenoplectus californicus	N
Very Tall (>3.0 m)	**Invasive?**		
		Total number of co-dominant species for all layers combined (enter here and use in Table 19)	3
		Percent Invasion ***Round to the nearest whole number (integer)*** (enter here and use in Table 19)	66%

Horizontal Interspersion Worksheet

Use the spaces below to make a sketch of the AA in plan view, outlining the major plant zones (this should take no longer than 10 minutes). Assign names to the zones and record them on the right. Based on the sketch, choose a single profile from Figure 8 that best represents the AA overall.



Assigned zones:

1) Bulrush

2) Low plant layer

3)

4)

5)

6)

Wetland disturbances and conversions Worksheet

Has a major disturbance occurred at this wetland?	Yes	No		
If yes, was it a flood, fire, landslide, or other?	flood	fire	landslide	other
If yes, then how severe is the disturbance?	likely to affect site next 5 or more years	likely to affect site next 3-5 years	likely to affect site next 1-2 years	
Has this wetland been converted from another type? If yes, then what was the previous type?	depressional	vernal pool	vernal pool system	
	non-confined riverine	confined riverine	bar-built estuarine	
	perennial saline estuarine	perennial non-saline estuarine	wet meadow	
	lacustrine	seep or spring	playa	

Stressor Checklist Worksheet

HYDROLOGY ATTRIBUTE (WITHIN 50 M OF AA)	Present	Significant negative effect on AA
Point Source (PS) discharges (POTW, other non-stormwater discharge)		
Non-point Source (Non-PS) discharges (urban runoff, farm drainage)	X	
Flow diversions or unnatural inflows		
Dams (reservoirs, detention basins, recharge basins)		
Flow obstructions (culverts, paved stream crossings)	X	
Weir/drop structure, tide gates		
Dredged inlet/channel		
Engineered channel (riprap, armored channel bank, bed)		
Dike/levees		
Groundwater extraction		
Ditches (borrow, agricultural drainage, mosquito control, etc.)		
Actively managed hydrology		
Comments		

PHYSICAL STRUCTURE ATTRIBUTE (WITHIN 50 M OF AA)	Present	Significant negative effect on AA
Filling or dumping of sediment or soils **(N/A for restoration areas)**		
Grading/ compaction **(N/A for restoration areas)**		
Plowing/Discing **(N/A for restoration areas)**		
Resource extraction (sediment, gravel, oil and/or gas)		
Vegetation management		
Excessive sediment or organic debris from watershed		
Excessive runoff from watershed		
Nutrient impaired (PS or Non-PS pollution)		
Heavy metal impaired (PS or Non-PS pollution)		
Pesticides or trace organics impaired (PS or Non-PS pollution)		
Bacteria and pathogens impaired (PS or Non-PS pollution)		
Trash or refuse		
Comments		
Nothing in this list		

BIOTIC STRUCTURE ATTRIBUTE (WITHIN 50 M OF AA)	**Present**	**Significant negative effect on AA**
Mowing, grazing, excessive herbivory (within AA)	X	
Excessive human visitation		
Predation and habitat destruction by non-native vertebrates (e.g., *Virginia opossum* and domestic predators, such as feral pets)		
Tree cutting/sapling removal		
Removal of woody debris		
Treatment of non-native and nuisance plant species		
Pesticide application or vector control		
Biological resource extraction or stocking (fisheries, aquaculture)		
Excessive organic debris in matrix (for vernal pools)		
Lack of vegetation management to conserve natural resources	X	
Lack of treatment of invasive plants adjacent to AA or buffer	X	
Comments		

BUFFER AND LANDSCAPE CONTEXT ATTRIBUTE (WITHIN 500 M OF AA)	**Present**	**Significant negative effect on AA**
Urban residential		
Industrial/commercial		
Military training/Air traffic		
Dams (or other major flow regulation or disruption)		
Dryland farming		
Intensive row-crop agriculture		
Orchards/nurseries		
Commercial feedlots		
Dairies		
Ranching (enclosed livestock grazing or horse paddock or feedlot)		
Transportation corridor		
Rangeland (livestock rangeland also managed for native vegetation)	X	
Sports fields and urban parklands (golf courses, soccer fields, etc.)		
Passive recreation (bird-watching, hiking, etc.)		
Active recreation (off-road vehicles, mountain biking, hunting, fishing)		
Physical resource extraction (rock, sediment, oil/gas)		
Biological resource extraction (aquaculture, commercial fisheries)		
Comments		

Basic Information Sheet: Slope Wetlands

Assessment Area Name: AA21

Project Name: HSR SJM

Assessment Area ID#:

Project ID#: | **Date** 4/24/2019

Assessment Team Members for This AA:
Kristen Klinefelter
RJ Van Sant

Assessment Area Size:

Surface water present during the assessment? ☑ Yes ☐ No **Flowing?** ☐ Yes ☑ No

Briefly describe the hydrology of the AA (e.g., water sources, channels, swales, etc.)
Part of a large wet meadow that is saturated

AA Category:

☐ Pre-Restoration ☐ Post-Restoration ☐ Pre-Mitigation ☐ Post-Mitigation
☑ Pre-Impact ☐ Post-Impact ☐ Ambient ☐ Reference
☐ Training ☐ Other:

Which best describes the type of wetland?
☐ Channeled Wet Meadow (assoc. with a fluvial channel) ☑ Non-Channeled Wet Meadow
☐ Channeled Forested Slope ☐ Non-Channeled Forested Slope ☐ Seep or Spring

Are peat soils present in the AA? ☐ Yes ☑ No

AA Encompasses:
☐ entire wetland ☑ portion of the wetland

Which best describes the dominant hydrologic state of the AA at the time of assessment?
☑ ponded/inundated ☐ saturated soil, but no surface water ☐ moist ☐ dry

What is the apparent hydrologic regime of the wetland?

Perennial slope wetlands contain surface water year-round, *seasonal* slope wetlands support surface water for 4-11 months of the year (in > 5 out of 10 years.) *Temporarily flooded* slope wetlands possess surface water between 2 weeks and 4 months of the year.

☐ perennial ☑ seasonal ☐ temporarily flooded

Photo Identification Numbers and Description:		
	Photo ID No.	**Description**
1		Looking North into the AA
2		Looking South into the AA
3		Looking East into the AA
4		Looking West into the AA
5		
6		
7		
8		
9		
10		

Site Location Description (including County and USGS Topographic Quadrangle if known):

Comments:

Scoring Sheet: Slope Wetlands

AA Name: AA 21		**Date**	4/24/2019

Attribute 1: Buffer and Landscape Context	Alpha	Numeric	**Comments**
Aquatic Area Abundance (D)	A	12	> 88% ang
Buffer			
Buffer submetric A: Percent of AA with Buffer	A	12	100%
Buffer submetric B: Average Buffer Width	A	12	
Buffer submetric C: Buffer Condition	B	9	B1 - mix natives/non, little human visits
Raw Attribute Score = D+[C x (A x B)½]½ (do not round)			**Final Attribute Score = (Raw Score/24) x 100**

Attribute 2: Hydrology	Alpha	Numeric	
Water Source	C	6	> 20% ag
Hydroperiod	B	9	
Hydrologic Connectivity (all but Channeled)	A	12	
Hydro Connectivity submetric A: Bank Height Ratio	—	—	Not channelized
Hydro Connectivity submetric B: Percent Dewatered	A	12	No evidence of dewatering
Hydrologic Connectivity for Channeled (*avg. of submetrics A-B*)	A		
Raw Attribute Score = sum of numeric scores			**Final Attribute Score = (Raw Score/36) x 100**

A or B
(? supporting)
[illegible] ?

Attribute 3: Physical Structure	Alpha	Numeric	
Structural Patch Richness	D	3	1 patch
Topographic Complexity	B	9	D - Physical types, A - veg roughness
Raw Attribute Score = sum of numeric scores			**Final Attribute Score = (Raw Score/24) x 100**

Attribute 4: Biotic Structure	Alpha	Numeric	
Plant Community Composition (submetric A is not applicable for Non-Channeled meadows)			
Plant Community submetric A: Number of plant layers	—	—	
Plant Community submetric B: Number of Co-dominant species	B	9	5 co-doms
Plant Community submetric C: Percent Invasive species	A	12	0%
Plant Comm. Composition (*avg. of submetrics A-C or B-C*)			
Horizontal Interspersion	C	6	minimal
Plant Life Forms	D	3	2
Raw Attribute Score = sum of numeric scores			**Final Attribute Score = (Raw Score/36) x 100**
Overall AA Score (average of four final Attribute Scores)			

Worksheet for Aquatic Area Abundance Metric

Percentage of Transect Lines that Contains Wetland or Aquatic Habitat of Any Kind	
Segment Direction	Percentage of Transect Length That is an Aquatic Feature
North	100%
South	> 50%
East	100%
West	100%
Average Percentage of Transect Length That Is an Aquatic Feature	> 88%

Percent of AA with Buffer Worksheet.

In the space provided on the datasheet, make a quick sketch of the AA, or perform the assessment directly on the aerial imagery; indicate where buffer is present, estimate the percentage of the AA perimeter providing buffer functions, and record the estimate amount in the space provided.

SEE AERIAL

Worksheet for calculating Average Buffer Width of AA

Line	Buffer Width (m)
A	250
B	250
C	250
D	250
E	250
F	250
G	250
H	125
Average Buffer Width	234

~~might be more~~

Channeled Wet Meadow and Channeled Forested Slope Wetland Bank Height Calculation Worksheet

The following 4 steps should be conducted for each of 3 cross-sections located in the AA at the approximate midpoints along straight riffles or glides, away from deep pools or meander bends. An attempt should be made to place them at the top, middle, and bottom of the AA.

Steps	Replicate Cross-sections →	TOP	MID	BOT
1 Estimate bankfull width.	This is a critical step requiring familiarity with field indicators of the bankfull contour. Measure the distance between the right and left bankfull contours.			
2: Estimate max. bankfull depth.	Imagine a level line between the right and left bankfull contours; measure the height of the line above the thalweg (the deepest part of the channel).			
3: Estimate max. bank height	Identify the location of the top of bank. Measure the height between the thalweg and the top of bank location.			
4: Calculate bank height ratio.	Divide the bank height (Step 3) by the bankfull depth (Step 2). Keep two significant figures.			
5: Calculate average bank height ratio.	Calculate the average results for Step 4 for all 3 replicate cross-sections. Enter the average result here and use it in Table 14. Keep two significant figures (hundredths).			

Worksheet for Assessing Hydrologic Connectivity: Percent Dewatered for Slope Wetlands.

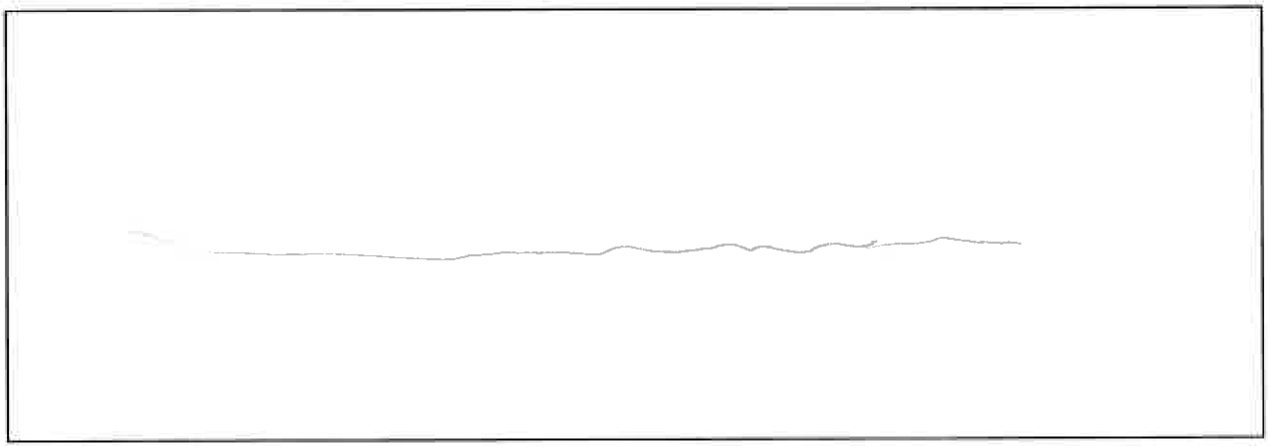
Condition	Field Indicators (check all existing conditions)
Indicators of Intact Hydrologic Connectivity	☑ No channel incision ☑ Vigor of plant species, especially hydrophytes ☑ Low or no cover of upland plant species ☑ No rill or gully development ☑ No areas of bare soil ☑ No soil cracking ☑ No changes in soil structure or moisture content ☐ Surface water present on the wetland plain late into the summer season ☑ Groundwater emerging ☐ Moist peat soil ☐ Floating fens ☐ Evidence of regular inundation on floodplain slope wetlands (wrack etc.)
Indicators of Degraded Hydrologic Connectivity (dewatering)	☐ Evidence of channel incision, including low entrenchment ratios, undercut banks, block bank failures, sloughing banks, hanging or exposed roots, channel scoured to bedrock or dense clay, active knickpoints, active gully erosion, active headcutting ☐ Stress or mortality of plants ☐ Presence of xeric plant species ☐ Development of rills or gullies on the wetland surface ☐ Areas of bare soil ☐ Areas of soil cracking ☐ Drying of peat ☐ Decrease in vigor of hydrophytes ☐ Changes in plant or animal species or communities ☐ Changes in soil structure or moisture content ☐ More than 5% cover in the AA of upland conifer species (e.g. Douglas fir (*Pseudotsuga menziesii*), Lodgepole Pine (*Pinus contorta)*, see special note) ☐ More than 5% cover in the AA of upland broadleaf tree species (e.g. tanoak (*Notholithocarpus densiflorus*), coast live oak (*Quercus agrifolia*) ☐ More than 5% cover in the AA of upland shrub species (e.g. sagebrush (*Artemisia tridentate)*, rabbitbrush (*Ericameria nauseosa)*, French broom (*Genista monspessulana*) ☐ More than 5% cover in the AA of upland vines (e.g. English ivy (*Hedera helix)*, Himalayan blackberry (*Rubus armeniacus)*, field bindweed (*Convolvulus arvensis*) ☐ More than 5% cover in the AA of upland grasses (e.g. ripgut brome (*Bromus diandrus)*, cheatgrass (*Bromus tectorum)*, needlegrass (*Stipa pulchra*) ☐ More than 5% cover in the AA of upland herbs and forbs (e.g. ragweed (*Ambrosia artemisiifolia)*, mustard (*Brassica rapa)*, yellow star thistle (*Centaurea solstitialis*)
Overall area of the wetland showing evidence of dewatering	**☑ No dewatering** **☐ <25% dewatered** **☐ 25-50% dewatered** **☐ >50% dewatered**

Structural Patch Type Worksheet for Slope Wetlands

STRUCTURAL PATCH TYPE (circle for presence)	Slope Wetland
Minimum Patch Size	**3 m^2**
Abundant wrack or organic debris in channel, or across wetland plain	
Active fluvial channel(s)	
Animal mounds and burrows, sediment disturbance, or vole trails	
Bank slumps or undercut banks in channels	
Beaver dams or lodges	
Boulders or bedrock outcrop	
Cutoff channels or oxbows	
Filamentous macroalgae or algal mats	
Gravel, cobble, or sand	
Large woody debris	
Moss	
Non-vegetated flats or bare ground	
Pannes or pools on wetland surface	
Plant hummocks and/or tussocks	
Sediment mounds around the bases of shrubs or trees	
Sediment splays	
Soil cracks	
Springs or upwelling groundwater	✓
Standing snags (at least 3 m tall)	
Submerged vegetation (in channels or open water)	
Swales	
Thatch	
Variegated, convoluted, or crenulated upland edge (not broadly arcuate or mostly straight)	
Total Possible	**23**
No. Observed Patch Types (enter here and use in Table 17 below)	1

Worksheet for AA Topographic Complexity

Complete a sketch of the topographic profile of the AA along a cross section perpendicular to the overall slope of wetland within the AA. Draw the section to include both AA boundaries. Include both the ground surface and the vegetation roughness. Indicate the letter grade for each component in the space below the sketch. Note the AA boundaries and important topographic features.



Physical topographic complexity score ___D___ Vegetation roughness score___A__________

Plant Community Metric Worksheet: Co-dominant species richness for Channeled Wet Meadow, Channeled Forested Slope Wetlands, Non-channeled Forested Slope Wetlands, and Seeps and Springs

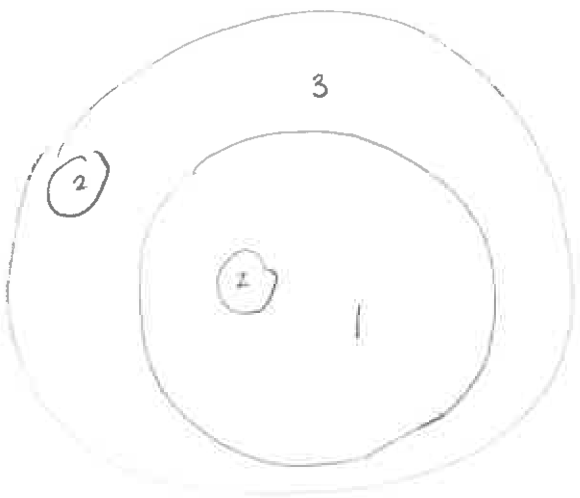
Floating or Canopy-forming	Invasive?	Short (<0.3 m)	Invasive?
Medium (0.3-1.0 m)	**Invasive?**	**Tall (1.0-3.0 m)**	**Invasive?**
Very Tall (>3.0 m)	**Invasive?**	**Total number of co-dominant species for all layers combined (enter here and see Table 21)**	
		Percent Invasion (enter here and see Table 21)	

Table 22: Worksheet for Co-dominant Plant Species.

Co-dominant Species	Check if Invasive
Typha sp.	
Eleocharis macrostachya	
Juncus articularius	
Juncus xiphiodes	
Rumex conglomeratus	
Schoenoplectus sp.	
Total Number of Co-dominants	6
Total Number of Invasive Co-dominant species	0
Percent Invasive Species (round to nearest integer)	0%

Horizontal Interspersion Worksheet

Use the spaces below to make a quick sketch of the AA in plan view, outlining the major plant zones (this should take no longer than 10 minutes). Assign the zones names and record them on the right. Based on the sketch, choose a single profile from Figure 17 that best represents the AA overall.



Assigned zones:

1) Typha

2) Willows

3) Juncus / Rumex

4)

5)

6)

Table 24. Plant Life Forms Metric.

Life Form	Present in > 5% of AA?
Bryophytes (mosses, liverworts, hornworts)	
Coniferous Trees	
Deciduous Broadleaf Trees	✓
Evergreen Broadleaf Trees	
Ferns	
Grasses	
Herbs/Forbs	
Lichens or Fungi	
Sedges/Rushes	✓
Shrubs	
Vines	
Total Number of life forms	2

Worksheet: Stressor Checklist

HYDROLOGY ATTRIBUTE (WITHIN 50 M OF AA)	Present	Present and likely to have significant negative effect on AA
Point Source (PS) discharges (POTW, other non-stormwater discharge)		
Non-point Source (Non-PS) discharges (urban runoff, farm drainage)	X	
Flow diversions or unnatural inflows		
Dams (reservoirs, detention basins, recharge basins)		
Flow obstructions (culverts, paved stream crossings)		
Weir/drop structure, tide gates		
Dredged inlet/channel		
Engineered channel (riprap, armored channel bank, bed)		
Dike/levees		
Groundwater extraction		
Ditches (borrow, agricultural drainage, mosquito control, etc.)		
Actively managed hydrology		
Comments		

PHYSICAL STRUCTURE ATTRIBUTE (WITHIN 50 M OF AA)	Present	Present and likely to have significant negative effect on AA
Filling or dumping of sediment or soils **(N/A for restoration areas)**		
Grading/ compaction **(N/A for restoration areas)**	X	
Plowing/Discing **(N/A for restoration areas)**	X	
Resource extraction (sediment, gravel, oil and/or gas)		
Vegetation management		
Excessive sediment or organic debris from watershed		
Excessive runoff from watershed		
Nutrient impaired (PS or Non-PS pollution)	X	
Heavy metal impaired (PS or Non-PS pollution)		
Pesticides or trace organics impaired (PS or Non-PS pollution)	X	
Bacteria and pathogens impaired (PS or Non-PS pollution)	X	
Trash or refuse		
Comments		

BIOTIC STRUCTURE ATTRIBUTE (WITHIN 50 M OF AA)	Present	Present and Likely to Have Significant negative effect on AA
Mowing, grazing, excessive herbivory (within AA)	X	
Excessive human visitation		
Predation and habitat destruction by non-native vertebrates (e.g., *Virginia opossum* and domestic predators, such as feral pets)		
Tree cutting/sapling removal		
Removal of woody debris		
Treatment of non-native and nuisance plant species		
Pesticide application or vector control		
Biological resource extraction or stocking (fisheries, aquaculture)		
Excessive organic debris in matrix (for vernal pools)		
Lack of vegetation management to conserve natural resources		
Lack of treatment of invasive plants adjacent to AA or buffer	X	
Comments		

BUFFER AND LANDSCAPE CONTEXT ATTRIBUTE (WITHIN 500 M OF AA)	Present	Present and likely to have significant negative effect on AA
Urban residential	X	
Industrial/commercial		
Military training/Air traffic		
Dams (or other major flow regulation or disruption)		
Dryland farming		
Intensive row-crop agriculture	X	
Orchards/nurseries	X	
Commercial feedlots		
Dairies		
Ranching (enclosed livestock grazing or horse paddock or feedlot)		
Transportation corridor	X	
Rangeland (livestock rangeland also managed for native vegetation)		
Sports fields and urban parklands (golf courses, soccer fields, etc.)		
Passive recreation (bird-watching, hiking, etc.)		
Active recreation (off-road vehicles, mountain biking, hunting, fishing)		
Physical resource extraction (rock, sediment, oil/gas)		
Biological resource extraction (aquaculture, commercial fisheries)		
Comments		

Basic Information Sheet: Slope Wetlands

Assessment Area Name: AA 22

Project Name: HSR SJM

Assessment Area ID#:

Project ID#: | **Date** 4/24/2019

Assessment Team Members for This AA:
Kristen Klinefelter
RJ Van Sant

Assessment Area Size:

Surface water present during the assessment? □ Yes □ No **Flowing?** □ Yes ☑ No

Briefly describe the hydrology of the AA (e.g., water sources, channels, swales, etc.)
Non-channelized wet meadow, dry during assessment
Portion of larger wet meadow
Relatively flat

AA Category:

□ Pre-Restoration □ Post-Restoration □ Pre-Mitigation □ Post-Mitigation

☑ Pre-Impact □ Post-Impact □ Ambient □ Reference

□ Training □ Other:

Which best describes the type of wetland?

□ Channeled Wet Meadow (assoc. with a fluvial channel) ☑ Non-Channeled Wet Meadow

□ Channeled Forested Slope □ Non-Channeled Forested Slope □ Seep or Spring

Are peat soils present in the AA? □ Yes ☑ No

AA Encompasses:

□ entire wetland ☑ portion of the wetland

Which best describes the dominant hydrologic state of the AA at the time of assessment?

□ ponded/inundated □ saturated soil, but no surface water □ moist □ dry

What is the apparent hydrologic regime of the wetland?

Perennial slope wetlands contain surface water year-round, *seasonal* slope wetlands support surface water for 4-11 months of the year (in > 5 out of 10 years.) *Temporarily flooded* slope wetlands possess surface water between 2 weeks and 4 months of the year.

□ perennial □ seasonal ☑ temporarily flooded

Photo Identification Numbers and Description:

	Photo ID No.	Description
1	2	Looking North into the AA
2	3	Looking South into the AA
3	1	Looking East into the AA
4	4	Looking West into the AA
5		
6		
7		
8		
9		
10		

Site Location Description (including County and USGS Topographic Quadrangle if known):

Comments:

Scoring Sheet: Slope Wetlands

AA Name: AA22			Date	4/26/2019
Attribute 1: Buffer and Landscape Context			**Comments**	
	Alpha	Numeric		
Aquatic Area Abundance (D)	A	12	81%	
Buffer				
Buffer submetric A: Percent of AA with Buffer	A	12	100%	
Buffer submetric B: Average Buffer Width	A	12	232 m	
Buffer submetric C: Buffer Condition	B	9	Mix of natives and non, little human visitation / soil disturbance	
Raw Attribute Score = D+[C x (A x B)½]½ (do not round)			**Final Attribute Score = (Raw Score/24) x 100**	

Attribute 2: Hydrology			
	Alpha	Numeric	
Water Source	C	6	>20% ag
Hydroperiod	B	9	
Hydrologic Connectivity (all but Channeled)	A	12	
Hydro Connectivity submetric A: Bank Height Ratio	—	—	
Hydro Connectivity submetric B: Percent Dewatered	A	12	Little dewatering
Hydrologic Connectivity for Channeled (*avg. of submetrics A-B*)		12	
Raw Attribute Score = sum of numeric scores			**Final Attribute Score = (Raw Score/36) x 100**

Attribute 3: Physical Structure			
	Alpha	Numeric	
Structural Patch Richness	D	3	4
Topographic Complexity	C	6	D - top, B - Roughness
Raw Attribute Score = sum of numeric scores			**Final Attribute Score = (Raw Score/24) x 100**

Attribute 4: Biotic Structure			
Plant Community Composition (submetric A is not applicable for Non-Channeled meadows)			
	Alpha	Numeric	
Plant Community submetric A: Number of plant layers	—	—	
Plant Community submetric B: Number of Co-dominant species	D	3	3 co-doms
Plant Community submetric C: Percent Invasive species	D	3	66%
Plant Comm. Composition (*avg. of submetrics A-C or B-C*)			
	Alpha	Numeric	
Horizontal Interspersion	D	2	Uniform throughout
Plant Life Forms	D	3	2
Raw Attribute Score = sum of numeric scores			**Final Attribute Score = (Raw Score/36) x 100**

Overall AA Score (average of four final Attribute Scores)	

Worksheet for Aquatic Area Abundance Metric

Percentage of Transect Lines that Contains Wetland or Aquatic Habitat of Any Kind	
Segment Direction	Percentage of Transect Length That is an Aquatic Feature
North	100
South	25
East	100
West	100
Average Percentage of Transect Length That Is an Aquatic Feature	81%

Percent of AA with Buffer Worksheet.

In the space provided on the datasheet, make a quick sketch of the AA, or perform the assessment directly on the aerial imagery; indicate where buffer is present, estimate the percentage of the AA perimeter providing buffer functions, and record the estimate amount in the space provided.

SEE AERIAL

Worksheet for calculating Average Buffer Width of AA

Line	Buffer Width (m)
A	250
B	250
C	250
D	250
E	250
F	250
G	200
H	150
Average Buffer Width	232

Channeled Wet Meadow and Channeled Forested Slope Wetland Bank Height Calculation Worksheet

The following 4 steps should be conducted for each of 3 cross-sections located in the AA at the approximate midpoints along straight riffles or glides, away from deep pools or meander bends. An attempt should be made to place them at the top, middle, and bottom of the AA.

Steps	Replicate Cross-sections ⟶	TOP	MID	BOT
1 Estimate bankfull width.	This is a critical step requiring familiarity with field indicators of the bankfull contour. Measure the distance between the right and left bankfull contours.			
2: Estimate max. bankfull depth.	Imagine a level line between the right and left bankfull contours; measure the height of the line above the thalweg (the deepest part of the channel).			
3: Estimate max. bank height	Identify the location of the top of bank. Measure the height between the thalweg and the top of bank location.			
4: Calculate bank height ratio.	Divide the bank height (Step 3) by the bankfull depth (Step 2). Keep two significant figures.			
5: Calculate average bank height ratio.	Calculate the average results for Step 4 for all 3 replicate cross-sections. Enter the average result here and use it in Table 14. Keep two significant figures (hundredths).			

Worksheet for Assessing Hydrologic Connectivity: Percent Dewatered for Slope Wetlands.

Condition	Field Indicators (check all existing conditions)
Indicators of Intact Hydrologic Connectivity	☑ No channel incision ☑ Vigor of plant species, especially hydrophytes ☑ Low or no cover of upland plant species ☑ No rill or gully development ☐ No areas of bare soil ☐ No soil cracking ☐ No changes in soil structure or moisture content ☐ Surface water present on the wetland plain late into the summer season ☐ Groundwater emerging ☐ Moist peat soil ☐ Floating fens ☐ Evidence of regular inundation on floodplain slope wetlands (wrack etc.)
Indicators of Degraded Hydrologic Connectivity (dewatering)	☐ Evidence of channel incision, including low entrenchment ratios, undercut banks, block bank failures, sloughing banks, hanging or exposed roots, channel scoured to bedrock or dense clay, active knickpoints, active gully erosion, active headcutting ☐ Stress or mortality of plants ☐ Presence of xeric plant species ☐ Development of rills or gullies on the wetland surface ☑ Areas of bare soil ☑ Areas of soil cracking ☐ Drying of peat ☐ Decrease in vigor of hydrophytes ☐ Changes in plant or animal species or communities ☐ Changes in soil structure or moisture content ☐ More than 5% cover in the AA of upland conifer species (e.g. Douglas fir (*Pseudotsuga menziesii*), Lodgepole Pine (*Pinus contorta)*, see special note) ☐ More than 5% cover in the AA of upland broadleaf tree species (e.g. tanoak (*Notholithocarpus densiflorus*), coast live oak (*Quercus agrifolia*) ☐ More than 5% cover in the AA of upland shrub species (e.g. sagebrush (*Artemisia tridentate)*, rabbitbrush (*Ericameria nauseosa)*, French broom (*Genista monspessulana*) ☐ More than 5% cover in the AA of upland vines (e.g. English ivy (*Hedera helix)*, Himalayan blackberry (*Rubus armeniacus)*, field bindweed (*Convolvulus arvensis*) ☐ More than 5% cover in the AA of upland grasses (e.g. ripgut brome (*Bromus diandrus)*, cheatgrass (*Bromus tectorum)*, needlegrass (*Stipa pulchra*) ☐ More than 5% cover in the AA of upland herbs and forbs (e.g. ragweed (*Ambrosia artemisiifolia)*, mustard (*Brassica rapa)*, yellow star thistle (*Centaurea solstitialis*)
Overall area of the wetland showing evidence of dewatering	☑ **No dewatering** * ☐ **<25% dewatered** ☐ **25-50% dewatered** ☐ **>50% dewatered**

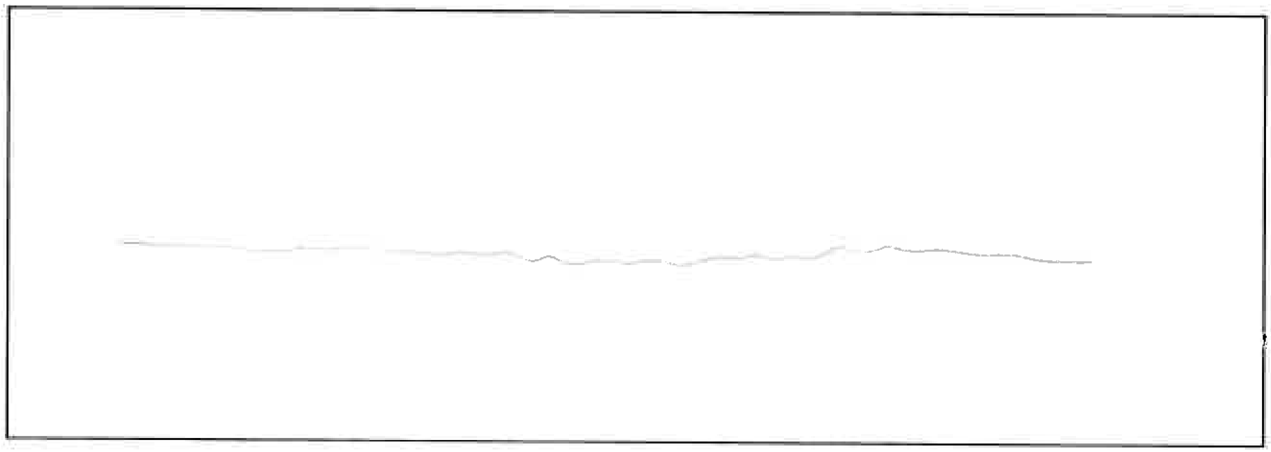
* Evidence according to checklist of dewatering, but seems like a naturally dry area

Structural Patch Type Worksheet for Slope Wetlands

STRUCTURAL PATCH TYPE (circle for presence)	Slope Wetland
Minimum Patch Size	**3 m^2**
Abundant wrack or organic debris in channel, or across wetland plain	
Active fluvial channel(s)	
Animal mounds and burrows, sediment disturbance, or vole trails	
Bank slumps or undercut banks in channels	
Beaver dams or lodges	
Boulders or bedrock outcrop	
Cutoff channels or oxbows	
Filamentous macroalgae or algal mats	
Gravel, cobble, or sand	
Large woody debris	
Moss	
Non-vegetated flats or bare ground	✓
Pannes or pools on wetland surface	✓
Plant hummocks and/or tussocks	
Sediment mounds around the bases of shrubs or trees	
Sediment splays	
Soil cracks	✓
Springs or upwelling groundwater	
Standing snags (at least 3 m tall)	
Submerged vegetation (in channels or open water)	
Swales	
Thatch	✓
Variegated, convoluted, or crenulated upland edge (not broadly arcuate or mostly straight)	
Total Possible	**23**
No. Observed Patch Types (enter here and use in Table 17 below)	4

Worksheet for AA Topographic Complexity

Complete a sketch of the topographic profile of the AA along a cross section perpendicular to the overall slope of wetland within the AA. Draw the section to include both AA boundaries. Include both the ground surface and the vegetation roughness. Indicate the letter grade for each component in the space below the sketch. Note the AA boundaries and important topographic features.



Physical topographic complexity score D Vegetation roughness score B

Plant Community Metric Worksheet: Co-dominant species richness for Channeled Wet Meadow, Channeled Forested Slope Wetlands, Non-channeled Forested Slope Wetlands, and Seeps and Springs

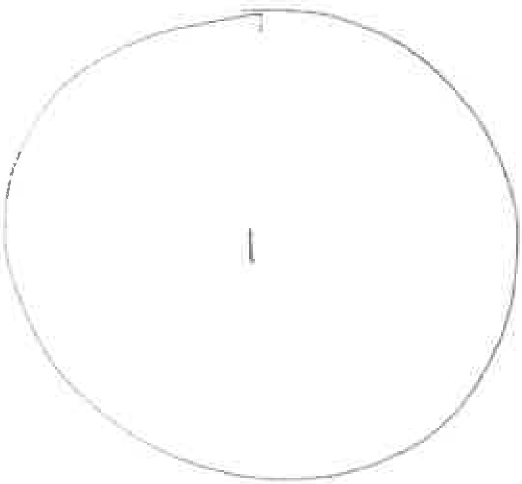
Floating or Canopy-forming	Invasive?	Short (<0.3 m)	Invasive?
Medium (0.3-1.0 m)	**Invasive?**	**Tall (1.0-3.0 m)**	**Invasive?**
Very Tall (>3.0 m)	**Invasive?**	**Total number of co-dominant species for all layers combined (enter here and see Table 21)**	
		Percent Invasion (enter here and see Table 21)	

Table 22: Worksheet for Co-dominant Plant Species.

Co-dominant Species	Check if Invasive
Festuca perrenis	✓
Salicornia sp.	
Hordeum murinum	✓
Total Number of Co-dominants	3
Total Number of Invasive Co-dominant species	2
Percent Invasive Species (round to nearest integer)	66%

Horizontal Interspersion Worksheet

Use the spaces below to make a quick sketch of the AA in plan view, outlining the major plant zones (this should take no longer than 10 minutes). Assign the zones names and record them on the right. Based on the sketch, choose a single profile from Figure 17 that best represents the AA overall.



Assigned zones:

1) Festuca/Hordeum/ Salicornia mix

2)

3)

4)

5)

6)

Table 24. Plant Life Forms Metric.

Life Form	Present in > 5% of AA?
Bryophytes (mosses, liverworts, hornworts)	
Coniferous Trees	
Deciduous Broadleaf Trees	
Evergreen Broadleaf Trees	
Ferns	
Grasses	✓
Herbs/Forbs	
Lichens or Fungi	
Sedges/Rushes	
Shrubs	
Vines	
Total Number of life forms	2

Succulent ✓

Worksheet: Stressor Checklist

HYDROLOGY ATTRIBUTE (WITHIN 50 M OF AA)	Present	Present and likely to have significant negative effect on AA
Point Source (PS) discharges (POTW, other non-stormwater discharge)		
Non-point Source (Non-PS) discharges (urban runoff, farm drainage)	X	
Flow diversions or unnatural inflows		
Dams (reservoirs, detention basins, recharge basins)		
Flow obstructions (culverts, paved stream crossings)		
Weir/drop structure, tide gates		
Dredged inlet/channel		
Engineered channel (riprap, armored channel bank, bed)		
Dike/levees		
Groundwater extraction		
Ditches (borrow, agricultural drainage, mosquito control, etc.)	X	
Actively managed hydrology		
Comments		

PHYSICAL STRUCTURE ATTRIBUTE (WITHIN 50 M OF AA)	Present	Present and likely to have significant negative effect on AA
Filling or dumping of sediment or soils **(N/A for restoration areas)**		
Grading/ compaction **(N/A for restoration areas)**	X	
Plowing/Discing **(N/A for restoration areas)**	X	
Resource extraction (sediment, gravel, oil and/or gas)		
Vegetation management		
Excessive sediment or organic debris from watershed		
Excessive runoff from watershed		
Nutrient impaired (PS or Non-PS pollution)	X	
Heavy metal impaired (PS or Non-PS pollution)		
Pesticides or trace organics impaired (PS or Non-PS pollution)	X	
Bacteria and pathogens impaired (PS or Non-PS pollution)	X	
Trash or refuse		
Comments		

BIOTIC STRUCTURE ATTRIBUTE (WITHIN 50 M OF AA)	Present	Present and Likely to Have Significant negative effect on AA
Mowing, grazing, excessive herbivory (within AA)		
Excessive human visitation	X	
Predation and habitat destruction by non-native vertebrates (e.g., *Virginia opossum* and domestic predators, such as feral pets)		
Tree cutting/sapling removal		
Removal of woody debris		
Treatment of non-native and nuisance plant species		
Pesticide application or vector control		
Biological resource extraction or stocking (fisheries, aquaculture)		
Excessive organic debris in matrix (for vernal pools)		
Lack of vegetation management to conserve natural resources	X	
Lack of treatment of invasive plants adjacent to AA or buffer	X	
Comments		

BUFFER AND LANDSCAPE CONTEXT ATTRIBUTE (WITHIN 500 M OF AA)	Present	Present and likely to have significant negative effect on AA
Urban residential		
Industrial/commercial	X	
Military training/Air traffic		
Dams (or other major flow regulation or disruption)		
Dryland farming		
Intensive row-crop agriculture		
Orchards/nurseries	X	
Commercial feedlots		
Dairies		
Ranching (enclosed livestock grazing or horse paddock or feedlot)		
Transportation corridor		
Rangeland (livestock rangeland also managed for native vegetation)	X	
Sports fields and urban parklands (golf courses, soccer fields, etc.)		
Passive recreation (bird-watching, hiking, etc.)		
Active recreation (off-road vehicles, mountain biking, hunting, fishing)		
Physical resource extraction (rock, sediment, oil/gas)		
Biological resource extraction (aquaculture, commercial fisheries)		
Comments		

Basic Information Sheet: Riverine Wetlands

Assessment Area Name: AA23	
Project Name: HSR SJM	
Assessment Area ID #:	
Project ID #:	**Date:** 4/24/2019
Assessment Team Members for This AA:	
Kristen Klinefelter	
RJ Van Sant	
Average Bankfull Width: 5M	
Approximate Length of AA (10 times bankfull width, min 100 m, max 200 m): 100m	
Upstream Point Latitude: 36.9636	**Longitude:** -121.9428
Downstream Point Latitude: 36.9645	**Longitude:** -121.9426

Wetland Sub-type:

☐ Confined ☑ Non-confined

AA Category:

☐ Restoration ☐ Mitigation ☐ Impacted ☐ Ambient ☐ Reference ☐ Training

☑ Other: PRE-IMPACT

Did the river/stream have flowing water at the time of the assessment? ☑ yes ☐ no

standing water, not flowing

What is the apparent hydrologic flow regime of the reach you are assessing?

The hydrologic flow regime of a stream describes the frequency with which the channel conducts water. *Perennial* streams conduct water all year long, whereas *ephemeral* streams conduct water only during and immediately following precipitation events. *Intermittent* streams are dry for part of the year, but conduct water for periods longer than ephemeral streams, as a function of watershed size and water source.

☒ perennial ☐ intermittent ☐ ephemeral

Photo Identification Numbers and Description:

	Photo ID No.	Description	Latitude	Longitude	Datum
1	1	Upstream			
2	2	Middle Left	Facing east		
3		Middle Right			
4		Downstream			
5					
6					
7					
8					
9					
10					

Site Location Description:

Comments:

Could not access majority of site due to dense poison oak throughout

Scoring Sheet: Riverine Wetlands

AA Name: AA 23			Date: 4/24/2019
Attribute 1: Buffer and Landscape Context (pp. 11-19)			**Comments**
	Alpha.	Numeric	
Stream Corridor Continuity (D)	A	12	NO INTERRUPTION
Buffer:			
	Alpha.	Numeric	
Buffer submetric A: Percent of AA with Buffer	A	12	100%
Buffer submetric B: Average Buffer Width	A	12	250 M
Buffer submetric C: Buffer Condition	B	9	mix of natives/non, mostly undisturbed soils
Raw Attribute Score = $D+[C \times (A \times B)^{½}]^{½}$			**Final Attribute Score = (Raw Score/24) x 100**
Attribute 2: Hydrology (pp. 20-26)			
	Alpha.	Numeric	
Water Source	C	6	>20% ag.
Channel Stability	B	9	Equilibrium + aggradation
Hydrologic Connectivity	A	12	> 2.2
Raw Attribute Score = sum of numeric scores			**Final Attribute Score = (Raw Score/36) x 100**
Attribute 3: Physical Structure (pp. 27-33)			
	Alpha.	Numeric	
Structural Patch Richness	D	3	
Topographic Complexity	B	9	1 bench, some micro
Raw Attribute Score = sum of numeric scores			**Final Attribute Score = (Raw Score/24) x 100**
Attribute 4: Biotic Structure (pp. 34-41)			
Plant Community Composition (based on sub-metrics A-C)			
	Alpha.	Numeric	
Plant Community submetric A: Number of plant layers	B	9	3 layers
Plant Community submetric B: Number of Co-dominant species	D	3	4 co-doms
Plant Community submetric C: Percent Invasion	A	12	0%
Plant Community Composition Metric *(numeric average of submetrics A-C)*			
Horizontal Interspersion	D	3	M uniform
Vertical Biotic Structure	A	12	>50% overlap 3 layers
Raw Attribute Score = sum of numeric scores			**Final Attribute Score = (Raw Score/36) x 100**
Overall AA Score (average of four final Attribute Scores)			

Worksheet for Stream Corridor Continuity Metric for Riverine Wetlands

Lengths of Non-buffer Segments For Distance of 500 m Upstream of AA		Lengths of Non-buffer Segments For Distance of 500 m Downstream of AA	
Segment No.	Length (m)	Segment No.	Length (m)
1		1	
2		2	
3		3	
4		4	
5		5	
Upstream Total Length	0	Downstream Total Length	0

Percent of AA with Buffer Worksheet

In the space provided below make a quick sketch of the AA, or perform the assessment directly on the aerial imagery; indicate where buffer is present, estimate the percentage of the AA perimeter providing buffer functions, and record the estimate amount in the space provided.

SEE AERIAL

Percent of AA with Buffer: 100 %

Worksheet for calculating average buffer width of AA

Line	Buffer Width (m)
A	250
B	250
C	250
D	250
E	250
F	250
G	250
H	250
Average Buffer Width *Round to the nearest integer*	250

Worksheet for Assessing Channel Stability for Riverine Wetlands

Condition	Field Indicators (check all existing conditions)
Indicators of Channel Equilibrium	☑ The channel (or multiple channels in braided systems) has a well-defined bankfull contour that clearly demarcates an obvious active floodplain in the cross-sectional profile of the channel throughout most of the AA. ☐ Perennial riparian vegetation is abundant and well established along the bankfull contour, but not below it. ☐ There is leaf litter, thatch, or wrack in most pools (if pools are present). ☑ The channel contains embedded woody debris of the size and amount consistent with what is naturally available in the riparian area. ☑ There is little or no active undercutting or burial of riparian vegetation. ☐ If mid-channel bars and/or point bars are present, they are not densely vegetated with perennial vegetation. ☐ Channel bars consist of well-sorted bed material (smaller grain size on the top and downstream end of the bar, larger grain size along the margins and upstream end of the bar). ☐ There are channel pools, the spacing between pools tends to be regular and the bed is not planar throughout the AA ☐ The larger bed material supports abundant mosses or periphyton.
Indicators of Active Degradation	☐ The channel is characterized by deeply undercut banks with exposed living roots of trees or shrubs. ☐ There are abundant bank slides or slumps. ☐ The lower banks are uniformly scoured and not vegetated. ☐ Riparian vegetation is declining in stature or vigor, or many riparian trees and shrubs along the banks are leaning or falling into the channel. ☐ An obvious historical floodplain has recently been abandoned, as indicated by the age structure of its riparian vegetation. ☐ The channel bed appears scoured to bedrock or dense clay. ☐ Recently active flow pathways appear to have coalesced into one channel (i.e. a previously braided system is no longer braided). ☐ The channel has one or more knickpoints indicating headward erosion of the bed.
Indicators of Active Aggradation	☐ There is an active floodplain with fresh splays of coarse sediment (sand and larger that is not vegetated) deposited in the current or previous year. ☐ There are partially buried living tree trunks or shrubs along the banks. ☑ The bed is planar (flat or uniform gradient) overall; it lacks well-defined channel pools, or they are uncommon and irregularly spaced. ☐ There are partially buried, or sediment-choked, culverts. ☑ Perennial terrestrial or riparian vegetation is encroaching into the channel or onto channel bars below the bankfull contour. ☐ There are avulsion channels on the floodplain or adjacent valley floor.
Overall	☑ **Equilibrium** ☐ **Degradation** ☑ **Aggradation**

Riverine Wetland Entrenchment Ratio Calculation Worksheet

The following 5 steps should be conducted for each of 3 cross-sections located in the AA at the approximate midpoints along straight riffles or glides, away from deep pools or meander bends. An attempt should be made to place them at the top, middle, and bottom of the AA.				
Steps	**Replicate Cross-sections** ——→	**TOP***	**MID***	**BOT**
1 Estimate bankfull width.	This is a critical step requiring familiarity with field indicators of the bankfull contour. Estimate or measure the distance between the right and left bankfull contours.			
2: Estimate max. bankfull depth.	Imagine a level line between the right and left bankfull contours; estimate or measure the height of the line above the thalweg (the deepest part of the channel).			
3: Estimate flood prone depth.	Double the estimate of maximum bankfull depth from Step 2.			
4: Estimate flood prone width.	Imagine a level line having a height equal to the flood prone depth from Step 3; note where the line intercepts the right and left banks; estimate or measure the length of this line.			
5: Calculate entrenchment ratio.	Divide the flood prone width (Step 4) by the bankfull width (Step 1).	> 2.2	> 2.2	
6: Calculate average entrenchment ratio.	Calculate the average results for Step 5 for all 3 replicate cross-sections. Enter the average result here and use it in Table 13a or 13b.			> 2.2

* could not access due to dense poison oak, but not entrenched because of very gradual slopes

Structural Patch Type Worksheet for Riverine wetlands

Circle each type of patch that is observed in the AA and enter the total number of observed patches in Table below. In the case of riverine wetlands, their status as confined or non-confined must first be determined (see page 6) to determine with patches are expected in the system (indicated by a "1" in the table below). Any feature onsite should only be counted once as a patch type. If a feature appears to meet the definition of more than one patch type (i.e. swale and secondary channel) the practitioner should choose which patch type best illustrates the feature. Not all features at a site will be patch types.

**Please refer to the CRAM Photo Dictionary at www.cramwetlands.org for photos of each of the following patch types.*

STRUCTURAL PATCH TYPE (circle for presence)	**Riverine (Non-confined)**	**Riverine (Confined)**
Minimum Patch Size	**3 m²**	**3 m²**
Abundant wrackline or organic debris in channel, on floodplain	1	1
Bank slumps or undercut banks in channels or along shoreline	1	1
Cobbles and/or Boulders	1	1
Debris jams	1	1
Filamentous macroalgae or algal mats	1	1
Large woody debris	1	1
Pannes or pools on floodplain	1	N/A
Plant hummocks and/or sediment mounds	1	1
Point bars and in-channel bars	1	1
Pools or depressions in channels (wet or dry channels)	1	1
Riffles or rapids (wet or dry channels)	1	1
Secondary channels on floodplains or along shorelines	1	N/A
Standing snags (at least 3 m tall)	1	1
Submerged vegetation	1	N/A
Swales on floodplain or along shoreline	1	N/A
Variegated, convoluted, or crenulated foreshore (instead of broadly arcuate or mostly straight)	1	1
Vegetated islands (mostly above high-water)	1	N/A
Total Possible	**17**	**12**
No. Observed Patch Types (enter here and use in Table 14 below)	2	

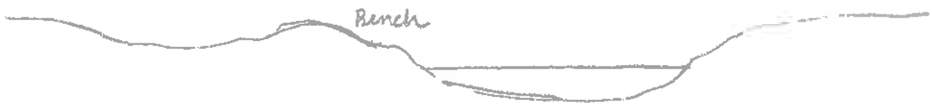
Worksheet for AA Topographic Complexity

At three locations along the AA, make a sketch of the profile of the stream from the AA boundary down to its deepest area then back out to the other AA boundary. Try to capture the benches and the intervening micro-topographic relief. To maintain consistency, make drawings at each of the stream hydrologic connectivity measurements, always facing downstream. Include the water level, an arrow at the bankfull contour, and label the benches. Based on these sketches and the profiles in Figure 10, choose a description in Table 16 that best describes the overall topographic complexity of the AA.

Profile 1

Facing up

Profile 2



Profile 3

Could not access due to dense poison oak

Plant Community Metric Worksheet: Co-dominant species richness for Riverine wetlands
(A dominant species represents ≥10% *relative* cover)

Special Note:

** Combine the counts of co-dominant species from all layers to identify the total species count. Each plant species is only counted once when calculating the Number of Co-dominant Species and Percent Invasion submetric scores, regardless of the numbers of layers in which it occurs.*

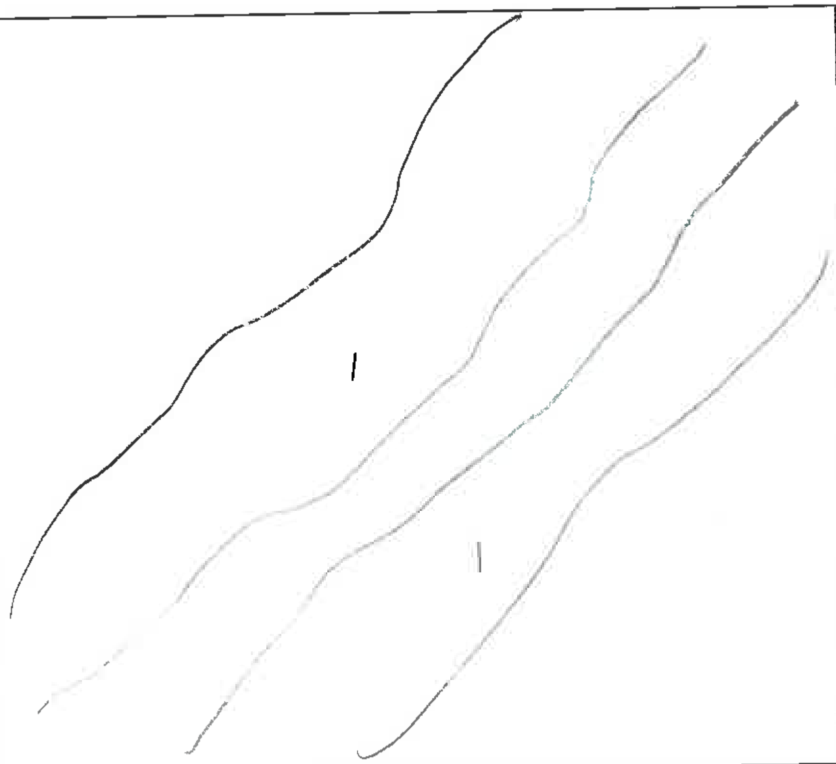
Floating or Canopy-forming (non-confined only)	Invasive?	Short (<0.5 m)	Invasive?

Medium (0.5-1.5 m)	Invasive?	Tall (1.5-3.0 m)	Invasive?
Rubus ursinus	N		
Toxicodendron diversilobum	N	Toxicodendron diversilobum	N

Very Tall (>3.0 m)	Invasive?		
Salix laevigata	N	**Total number of co-dominant species for all layers combined (enter here and use in Table 18)**	4
Salix lasiolepis	N		
		Percent Invasion *Round to the nearest integer* (enter here and use in Table 18)	0%

Horizontal Interspersion Worksheet.

Use the spaces below to make a quick sketch of the AA in plan view, outlining the major plant zones (this should take no longer than 10 minutes). Assign the zones names and record them on the right. Based on the sketch, choose a single profile from Figure 12 that best represents the AA overall.



Assigned zones:

1) Willow / Rubus / Toxicodendron
2)
3)
4)
5)
6)

Worksheet for Wetland disturbances and conversions

Has a major disturbance occurred at this wetland?	Yes	No		
If yes, was it a flood, fire, landslide, or other?	flood	fire	landslide	other
If yes, then how severe is the disturbance?	likely to affect site next 5 or more years	likely to affect site next 3-5 years	likely to affect site next 1-2 years	
Has this wetland been converted from another type? If yes, then what was the previous type?	depressional	vernal pool	vernal pool system	
	non-confined riverine	confined riverine	seasonal estuarine	
	perennial saline estuarine	perennial non-saline estuarine	wet meadow	
	lacustrine	seep or spring	playa	

Stressor Checklist Worksheet

HYDROLOGY ATTRIBUTE (WITHIN 50 M OF AA)	Present	Significant negative effect on AA
Point Source (PS) discharges (POTW, other non-stormwater discharge)		
Non-point Source (Non-PS) discharges (urban runoff, farm drainage)	X	
Flow diversions or unnatural inflows		
Dams (reservoirs, detention basins, recharge basins)		
Flow obstructions (culverts, paved stream crossings)		
Weir/drop structure, tide gates		
Dredged inlet/channel		
Engineered channel (riprap, armored channel bank, bed)		
Dike/levees		
Groundwater extraction		
Ditches (borrow, agricultural drainage, mosquito control, etc.)	X	
Actively managed hydrology		
Comments		

PHYSICAL STRUCTURE ATTRIBUTE (WITHIN 50 M OF AA)	Present	Significant negative effect on AA
Filling or dumping of sediment or soils **(N/A for restoration areas)**		
Grading/ compaction **(N/A for restoration areas)**	X	
Plowing/Discing **(N/A for restoration areas)**	X	
Resource extraction (sediment, gravel, oil and/or gas)		
Vegetation management		
Excessive sediment or organic debris from watershed		
Excessive runoff from watershed		
Nutrient impaired (PS or Non-PS pollution)	X	
Heavy metal impaired (PS or Non-PS pollution)		
Pesticides or trace organics impaired (PS or Non-PS pollution)	X	
Bacteria and pathogens impaired (PS or Non-PS pollution)	X	
Trash or refuse		
Comments		

BIOTIC STRUCTURE ATTRIBUTE (WITHIN 50 M OF AA)	Present	Significant negative effect on AA
Mowing, grazing, excessive herbivory (within AA)	X	
Excessive human visitation		
Predation and habitat destruction by non-native vertebrates (e.g., *Virginia opossum* and domestic predators, such as feral pets)		
Tree cutting/sapling removal		
Removal of woody debris		
Treatment of non-native and nuisance plant species		
Pesticide application or vector control		
Biological resource extraction or stocking (fisheries, aquaculture)		
Excessive organic debris in matrix (for vernal pools)		
Lack of vegetation management to conserve natural resources	X	
Lack of treatment of invasive plants adjacent to AA or buffer		

Comments

BUFFER AND LANDSCAPE CONTEXT ATTRIBUTE (WITHIN 500 M OF AA)	Present	Significant negative effect on AA
Urban residential	X	
Industrial/commercial		
Military training/Air traffic		
Dams (or other major flow regulation or disruption)		
Dryland farming		
Intensive row-crop agriculture	X	
Orchards/nurseries		
Commercial feedlots		
Dairies		
Ranching (enclosed livestock grazing or horse paddock or feedlot)		
Transportation corridor	X	
Rangeland (livestock rangeland also managed for native vegetation)		
Sports fields and urban parklands (golf courses, soccer fields, etc.)		
Passive recreation (bird-watching, hiking, etc.)		
Active recreation (off-road vehicles, mountain biking, hunting, fishing)		
Physical resource extraction (rock, sediment, oil/gas)		
Biological resource extraction (aquaculture, commercial fisheries)		

Comments

Basic Information Sheet: Slope Wetlands

Assessment Area Name: AA24-PFO-03487	
Project Name: HSR JM	
Assessment Area ID#:	
Project ID#:	**Date** 4/24/19

Assessment Team Members for This AA:

LSL, ML

Assessment Area Size:

Surface water present during the assessment? ☐ Yes ☒ No **Flowing?** ☐ Yes ☒ No

Briefly describe the hydrology of the AA (e.g., water sources, channels, swales, etc.)

AA Category:

☐ Pre-Restoration ☐ Post-Restoration ☐ Pre-Mitigation ☐ Post-Mitigation

☒ Pre-Impact ☐ Post-Impact ☐ Ambient ☐ Reference

☐ Training ☐ Other:

Which best describes the type of wetland?

☐ Channeled Wet Meadow (assoc. with a fluvial channel) ☒ Non-Channeled Wet Meadow

☐ Channeled Forested Slope ☒ Non-Channeled Forested Slope ☐ Seep or Spring

Are peat soils present in the AA? ☐ Yes ☒ No

AA Encompasses:

☐ entire wetland ☒ portion of the wetland

Which best describes the dominant hydrologic state of the AA at the time of assessment?

☐ ponded/inundated ☐ saturated soil, but no surface water ☐ moist ☒ dry

What is the apparent hydrologic regime of the wetland?

Perennial slope wetlands contain surface water year-round, *seasonal* slope wetlands support surface water for 4-11 months of the year (in > 5 out of 10 years.) *Temporarily flooded* slope wetlands possess surface water between 2 weeks and 4 months of the year.

☐ perennial ☒ seasonal ☒ temporarily flooded

Photo Identification Numbers and Description:

	Photo ID No.	Description
1		Looking North into the AA
2		Looking South into the AA
3		Looking East into the AA
4		Looking West into the AA
5		
6		
7		
8		
9		
10		

Site Location Description (including County and USGS Topographic Quadrangle if known):

Comments:

2 pics LSL phone

1 facing N

1 facing S

Scoring Sheet: Slope Wetlands

AA Name: AA24			**Date**	4/24/19
Attribute 1: Buffer and Landscape Context			**Comments**	
Aquatic Area Abundance (D)	Alpha: A	Numeric:	73%	
Buffer				
Buffer submetric A: Percent of AA with Buffer	Alpha: A	Numeric:	100%	
Buffer submetric B: Average Buffer Width	~~A~~ C		~~[illegible]~~ 111m	
Buffer submetric C: Buffer Condition	B			
Raw Attribute Score = D+[C x (A x B)$^{1/2}$]$^{1/2}$ (do not round)			**Final Attribute Score = (Raw Score/24) x 100**	
Attribute 2: Hydrology				
Water Source	Alpha: C	Numeric:		
Hydroperiod	A			
Hydrologic Connectivity (all but Channeled)	A			
Hydro Connectivity submetric A: Bank Height Ratio	Alpha:	Numeric:		
Hydro Connectivity submetric B: Percent Dewatered				
Hydrologic Connectivity for Channeled (*avg. of submetrics A-B*)				
Raw Attribute Score = sum of numeric scores			**Final Attribute Score = (Raw Score/36) x 100**	
Attribute 3: Physical Structure				
Structural Patch Richness	Alpha: C	Numeric:	7 patches	
Topographic Complexity	B		C topo A roughness	
Raw Attribute Score = sum of numeric scores			**Final Attribute Score = (Raw Score/24) x 100**	
Attribute 4: Biotic Structure				
Plant Community Composition (submetric A is not applicable for Non-Channeled meadows)				
Plant Community submetric A: Number of plant layers	Alpha: ~~B~~	Numeric:	3 layers	
Plant Community submetric B: Number of Co-dominant species	B		5 codoms	
→ *Plant Community submetric C: Percent Invasive species*	D		40%	
Plant Comm. Composition (*avg. of submetrics A-C or B-C)*				
Horizontal Interspersion	Alpha: C	Numeric:		
Plant Life Forms	D		2 life-forms	
Raw Attribute Score = sum of numeric scores			**Final Attribute Score = (Raw Score/36) x 100**	
Overall AA Score (average of four final Attribute Scores)				

Worksheet for Aquatic Area Abundance Metric

Percentage of Transect Lines that Contains Wetland or Aquatic Habitat of Any Kind	
Segment Direction	Percentage of Transect Length That is an Aquatic Feature
North	100
South	63
East	100
West	28
Average Percentage of Transect Length That Is an Aquatic Feature	73

Percent of AA with Buffer Worksheet.

In the space provided on the datasheet, make a quick sketch of the AA, or perform the assessment directly on the aerial imagery; indicate where buffer is present, estimate the percentage of the AA perimeter providing buffer functions, and record the estimate amount in the space provided.

Worksheet for calculating Average Buffer Width of AA

Line	Buffer Width (m)
A	40
B	40
C	250
D	250
E	250
F	30
G	15
H	15
Average Buffer Width	111

Channeled Wet Meadow and Channeled Forested Slope Wetland Bank Height Calculation Worksheet

The following 4 steps should be conducted for each of 3 cross-sections located in the AA at the approximate midpoints along straight riffles or glides, away from deep pools or meander bends. An attempt should be made to place them at the top, middle, and bottom of the AA.				
Steps	**Replicate Cross-sections** →	**TOP**	**MID**	**BOT**
1 Estimate bankfull width.	This is a critical step requiring familiarity with field indicators of the bankfull contour. Measure the distance between the right and left bankfull contours.			
2: Estimate max. bankfull depth.	Imagine a level line between the right and left bankfull contours; measure the height of the line above the thalweg (the deepest part of the channel).			
3: Estimate max. bank height	Identify the location of the top of bank. Measure the height between the thalweg and the top of bank location.			
4: Calculate bank height ratio.	Divide the bank height (Step 3) by the bankfull depth (Step 2). Keep two significant figures.			
5: Calculate average bank height ratio.	Calculate the average results for Step 4 for all 3 replicate cross-sections. Enter the average result here and use it in Table 14. Keep two significant figures (hundredths).			

Worksheet for Assessing Hydrologic Connectivity: Percent Dewatered for Slope Wetlands.

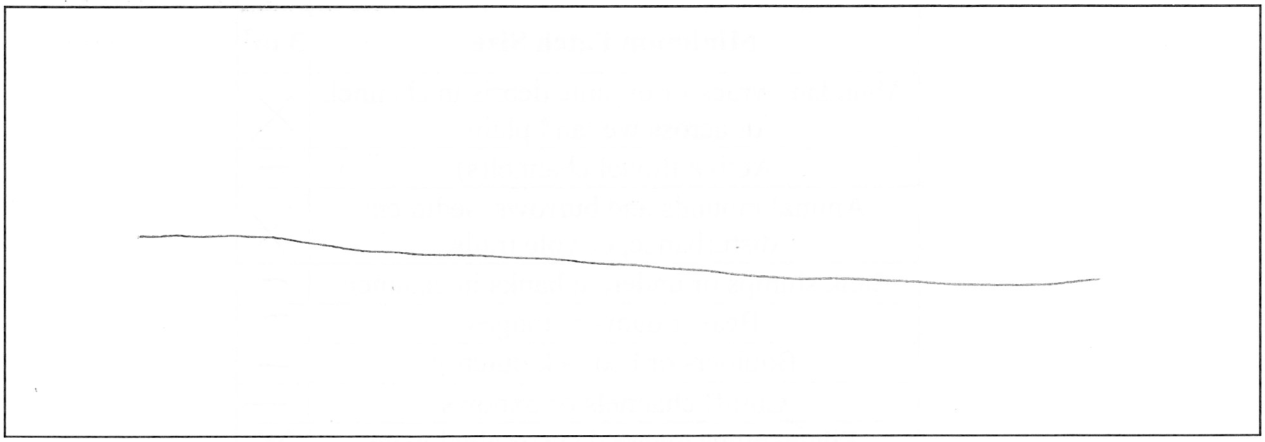
Condition	Field Indicators (check all existing conditions)
Indicators of Intact Hydrologic Connectivity	☒ No channel incision ☒ Vigor of plant species, especially hydrophytes ☑ Low or no cover of upland plant species ☒ No rill or gully development ☐ No areas of bare soil ☐ No soil cracking ☐ No changes in soil structure or moisture content ☐ Surface water present on the wetland plain late into the summer season ☐ Groundwater emerging ☐ Moist peat soil ☐ Floating fens ☐ Evidence of regular inundation on floodplain slope wetlands (wrack etc.)
Indicators of Degraded Hydrologic Connectivity (dewatering)	☐ Evidence of channel incision, including low entrenchment ratios, undercut banks, block bank failures, sloughing banks, hanging or exposed roots, channel scoured to bedrock or dense clay, active knickpoints, active gully erosion, active headcutting ☐ Stress or mortality of plants ☐ Presence of xeric plant species ☐ Development of rills or gullies on the wetland surface ☐ Areas of bare soil ☐ Areas of soil cracking ☐ Drying of peat ☐ Decrease in vigor of hydrophytes ☐ Changes in plant or animal species or communities ☐ Changes in soil structure or moisture content ☐ More than 5% cover in the AA of upland conifer species (e.g. Douglas fir (*Pseudotsuga menziesii*), Lodgepole Pine (*Pinus contorta)*, see special note) ☐ More than 5% cover in the AA of upland broadleaf tree species (e.g. tanoak (*Notholithocarpus densiflorus*), coast live oak (*Quercus agrifolia*) ☐ More than 5% cover in the AA of upland shrub species (e.g. sagebrush (*Artemisia tridentate)*, rabbitbrush (*Ericameria nauseosa)*, French broom (*Genista monspessulana*) ☐ More than 5% cover in the AA of upland vines (e.g. English ivy (*Hedera helix)*, Himalayan blackberry (*Rubus armeniacus)*, field bindweed (*Convolvulus arvensis*) ☐ More than 5% cover in the AA of upland grasses (e.g. ripgut brome (*Bromus diandrus)*, cheatgrass (*Bromus tectorum)*, needlegrass (*Stipa pulchra*) ☐ More than 5% cover in the AA of upland herbs and forbs (e.g. ragweed (*Ambrosia artemisiifolia)*, mustard (*Brassica rapa)*, yellow star thistle (*Centaurea solstitialis*)
Overall area of the wetland showing evidence of dewatering	☒ **No dewatering** ☐ **<25% dewatered** ☐ **25-50% dewatered** ☐ **>50% dewatered**

Structural Patch Type Worksheet for Slope Wetlands

STRUCTURAL PATCH TYPE (circle for presence)	Slope Wetland
Minimum Patch Size	**3 m^2**
Abundant wrack or organic debris in channel, or across wetland plain	X
Active fluvial channel(s)	–
Animal mounds and burrows, sediment disturbance, or vole trails	X
Bank slumps or undercut banks in channels	–
Beaver dams or lodges	–
Boulders or bedrock outcrop	–
Cutoff channels or oxbows	–
Filamentous macroalgae or algal mats	X
Gravel, cobble, or sand	–
Large woody debris	X
Moss	–
Non-vegetated flats or bare ground	–
Pannes or pools on wetland surface	X
Plant hummocks and/or tussocks	–
Sediment mounds around the bases of shrubs or trees	–
Sediment splays	–
Soil cracks	–
Springs or upwelling groundwater	–
Standing snags (at least 3 m tall)	–
Submerged vegetation (in channels or open water)	–
Swales	–
Thatch	X
Variegated, convoluted, or crenulated upland edge (not broadly arcuate or mostly straight)	X
Total Possible	**23**
No. Observed Patch Types (enter here and use in Table 17 below)	7

Worksheet for AA Topographic Complexity

Complete a sketch of the topographic profile of the AA along a cross section perpendicular to the overall slope of wetland within the AA. Draw the section to include both AA boundaries. Include both the ground surface and the vegetation roughness. Indicate the letter grade for each component in the space below the sketch. Note the AA boundaries and important topographic features.



Physical topographic complexity score __C__ Vegetation roughness score __A__

Plant Community Metric Worksheet: Co-dominant species richness for Channeled Wet Meadow, Channeled Forested Slope Wetlands, Non-channeled Forested Slope Wetlands, and Seeps and Springs

Floating or Canopy-forming	Invasive?	Short (<0.3 m)	Invasive?
		Lepidium draba	X
		Helminthotheca echioides	X
Medium (0.3-1.0 m)	**Invasive?**	**Tall (1.0-3.0 m)**	**Invasive?**
Western Goldenrod			
Very Tall (>3.0 m)	**Invasive?**	**Total number of co-dominant species for all layers combined (enter here and see Table 21)**	5
Red Willow			
Arroyo Willow			
		Percent Invasion (enter here and see Table 21)	2/5=40%

Correct sheet to use

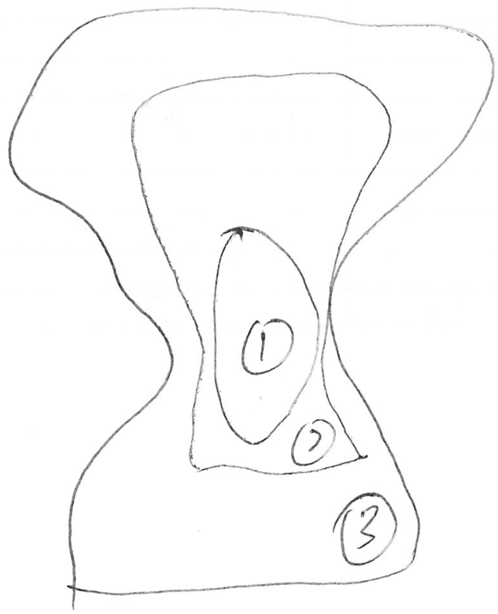
Table 22: Worksheet for Co-dominant Plant Species.

Co-dominant Species	Check if Invasive
Red willow	
Arroyo willow	
Western goldenrod	
Lepidium ~~sp~~ draba	X
Helminthotheca echioides	X
Total Number of Co-dominants	5
Total Number of Invasive Co-dominant species	2
Percent Invasive Species (round to nearest integer)	40%

Non-channeled forested uses layers

Horizontal Interspersion Worksheet

Use the spaces below to make a quick sketch of the AA in plan view, outlining the major plant zones (this should take no longer than 10 minutes). Assign the zones names and record them on the right. Based on the sketch, choose a single profile from Figure 17 that best represents the AA overall.

<table>
<tr>
<td>
</td>
<td>Assigned zones:

1)

2)

3)

4)

5)

6)</td>
</tr>
</table>

Table 24. Plant Life Forms Metric.

Life Form	Present in > 5% of AA?
Bryophytes (mosses, liverworts, hornworts)	
Coniferous Trees	
Deciduous Broadleaf Trees	✓
Evergreen Broadleaf Trees	
Ferns	
Grasses	
Herbs/Forbs	✓
Lichens or Fungi	
Sedges/Rushes	
Shrubs	
Vines	
Total Number of life forms	2

Worksheet: Stressor Checklist

HYDROLOGY ATTRIBUTE (WITHIN 50 M OF AA)	Present	Present and likely to have significant negative effect on AA
Point Source (PS) discharges (POTW, other non-stormwater discharge)		
Non-point Source (Non-PS) discharges (urban runoff, farm drainage)		
Flow diversions or unnatural inflows		
Dams (reservoirs, detention basins, recharge basins)		
Flow obstructions (culverts, paved stream crossings)		
Weir/drop structure, tide gates		
Dredged inlet/channel		
Engineered channel (riprap, armored channel bank, bed)		
Dike/levees		
Groundwater extraction		
Ditches (borrow, agricultural drainage, mosquito control, etc.)	X	
Actively managed hydrology		
Comments		

PHYSICAL STRUCTURE ATTRIBUTE (WITHIN 50 M OF AA)	Present	Present and likely to have significant negative effect on AA
Filling or dumping of sediment or soils **(N/A for restoration areas)**		
Grading/ compaction **(N/A for restoration areas)**	X	
Plowing/Discing **(N/A for restoration areas)**	X	
Resource extraction (sediment, gravel, oil and/or gas)		
Vegetation management		
Excessive sediment or organic debris from watershed		
Excessive runoff from watershed		
Nutrient impaired (PS or Non-PS pollution)	X	
Heavy metal impaired (PS or Non-PS pollution)		
Pesticides or trace organics impaired (PS or Non-PS pollution)	X	
Bacteria and pathogens impaired (PS or Non-PS pollution)	X	
Trash or refuse		
Comments		

BIOTIC STRUCTURE ATTRIBUTE (WITHIN 50 M OF AA)	Present	Present and Likely to Have Significant negative effect on AA
Mowing, grazing, excessive herbivory (within AA)	X	
Excessive human visitation		
Predation and habitat destruction by non-native vertebrates (e.g., *Virginia opossum* and domestic predators, such as feral pets)		
Tree cutting/sapling removal		
Removal of woody debris		
Treatment of non-native and nuisance plant species		
Pesticide application or vector control	X	
Biological resource extraction or stocking (fisheries, aquaculture)		
Excessive organic debris in matrix (for vernal pools)		
Lack of vegetation management to conserve natural resources	X	
Lack of treatment of invasive plants adjacent to AA or buffer	X	
Comments		

BUFFER AND LANDSCAPE CONTEXT ATTRIBUTE (WITHIN 500 M OF AA)	Present	Present and likely to have significant negative effect on AA
Urban residential		
Industrial/commercial		
Military training/Air traffic		
Dams (or other major flow regulation or disruption)		
Dryland farming		
Intensive row-crop agriculture	X	
Orchards/nurseries	X	
Commercial feedlots		
Dairies		
Ranching (enclosed livestock grazing or horse paddock or feedlot)		
Transportation corridor	X	
Rangeland (livestock rangeland also managed for native vegetation)		
Sports fields and urban parklands (golf courses, soccer fields, etc.)		
Passive recreation (bird-watching, hiking, etc.)		
Active recreation (off-road vehicles, mountain biking, hunting, fishing)		
Physical resource extraction (rock, sediment, oil/gas)		
Biological resource extraction (aquaculture, commercial fisheries)		
Comments		

Basic Information Sheet: Slope Wetlands

Assessment Area Name: AA25-SEW-03857	
Project Name: HSR JM	
Assessment Area ID#:	
Project ID#:	**Date** 4/24/19
Assessment Team Members for This AA: LSY ML	
Assessment Area Size:	
Surface water present during the assessment? ☐ Yes ☒ No **Flowing?** ☐ Yes ☒ No	
Briefly describe the hydrology of the AA (e.g., water sources, channels, swales, etc.)	
AA Category: ☐ Pre-Restoration ☐ Post-Restoration ☐ Pre-Mitigation ☐ Post-Mitigation ☒ Pre-Impact ☐ Post-Impact ☐ Ambient ☐ Reference ☐ Training ☐ Other:	
Which best describes the type of wetland? ☐ Channeled Wet Meadow (assoc. with a fluvial channel) ☒ Non-Channeled Wet Meadow ☐ Channeled Forested Slope ☐ Non-Channeled Forested Slope ☐ Seep or Spring	
Are peat soils present in the AA? ☐ Yes ☒ No	
AA Encompasses: ☐ entire wetland ☒ portion of the wetland	
Which best describes the dominant hydrologic state of the AA at the time of assessment? ☐ ponded/inundated ☐ saturated soil, but no surface water ☐ moist ☒ dry	
What is the apparent hydrologic regime of the wetland? *Perennial* slope wetlands contain surface water year-round, *seasonal* slope wetlands support surface water for 4-11 months of the year (in > 5 out of 10 years.) *Temporarily flooded* slope wetlands possess surface water between 2 weeks and 4 months of the year. ☐ perennial ☒ seasonal ☒ temporarily flooded	

Photo Identification Numbers and Description:		
	Photo ID No.	**Description**
1		Looking North into the AA
2		Looking South into the AA
3		Looking East into the AA
4		Looking West into the AA
5		
6		
7		
8		
9		
10		

Site Location Description (including County and USGS Topographic Quadrangle if known):

Comments:

Scoring Sheet: Slope Wetlands

AA Name: AA25			Date	4/24/19

Attribute 1: Buffer and Landscape Context	Alpha	Numeric	Comments
Aquatic Area Abundance (D)	A		55%
Buffer			

Buffer	Alpha	Numeric	Comments
Buffer submetric A: Percent of AA with Buffer	A		100%
Buffer submetric B: Average Buffer Width	B		166m
Buffer submetric C: Buffer Condition	B		

Raw Attribute Score = D+[C x (A x B)½]½ (do not round)		**Final Attribute Score = (Raw Score/24) x 100**	

Attribute 2: Hydrology	Alpha	Numeric	Comments
Water Source	C		
Hydroperiod	A		
Hydrologic Connectivity (all but Channeled)	~~A~~B		

	Alpha	Numeric	Comments
Hydro Connectivity submetric A: Bank Height Ratio			
Hydro Connectivity submetric B: Percent Dewatered			
Hydrologic Connectivity for Channeled (*avg. of submetrics A-B*)			

Raw Attribute Score = sum of numeric scores		**Final Attribute Score = (Raw Score/36) x 100**	

Attribute 3: Physical Structure	Alpha	Numeric	Comments
Structural Patch Richness	C		6 patches
Topographic Complexity	C		C topo C roughness

Raw Attribute Score = sum of numeric scores		**Final Attribute Score = (Raw Score/24) x 100**	

Attribute 4: Biotic Structure	Alpha	Numeric	Comments
Plant Community Composition (submetric A is not applicable for Non-Channeled meadows)			
Plant Community submetric A: Number of plant layers			
Plant Community submetric B: Number of Co-dominant species	D		3 codoms
Plant Community submetric C: Percent Invasive species	D		67% invasive
Plant Comm. Composition (*avg. of submetrics A-C or B-C*)			
Horizontal Interspersion	D		
Plant Life Forms	D		

Raw Attribute Score = sum of numeric scores		**Final Attribute Score = (Raw Score/36) x 100**	
Overall AA Score (average of four final Attribute Scores)			

2 pics on LSC phone
1 facing east
2 facing west

Worksheet for Aquatic Area Abundance Metric

Percentage of Transect Lines that Contains Wetland or Aquatic Habitat of Any Kind	
Segment Direction	Percentage of Transect Length That is an Aquatic Feature
North	48%
South	68%
East	100%
West	20%
Average Percentage of Transect Length That Is an Aquatic Feature	55%

Percent of AA with Buffer Worksheet.

In the space provided on the datasheet, make a quick sketch of the AA, or perform the assessment directly on the aerial imagery; indicate where buffer is present, estimate the percentage of the AA perimeter providing buffer functions, and record the estimate amount in the space provided.

Worksheet for calculating Average Buffer Width of AA

Line	Buffer Width (m)
A	35
B	90
C	250
D	250
E	250
F	125
G	75
H	250
Average Buffer Width	165.6 - 166

Channeled Wet Meadow and Channeled Forested Slope Wetland Bank Height Calculation Worksheet

The following 4 steps should be conducted for each of 3 cross-sections located in the AA at the approximate midpoints along straight riffles or glides, away from deep pools or meander bends. An attempt should be made to place them at the top, middle, and bottom of the AA.				
Steps	**Replicate Cross-sections** ⟶	**TOP**	**MID**	**BOT**
1 Estimate bankfull width.	This is a critical step requiring familiarity with field indicators of the bankfull contour. Measure the distance between the right and left bankfull contours.			
2: Estimate max. bankfull depth.	Imagine a level line between the right and left bankfull contours; measure the height of the line above the thalweg (the deepest part of the channel).			
3: Estimate max. bank height	Identify the location of the top of bank. Measure the height between the thalweg and the top of bank location.			
4: Calculate bank height ratio.	Divide the bank height (Step 3) by the bankfull depth (Step 2). Keep two significant figures.			
5: Calculate average bank height ratio.	Calculate the average results for Step 4 for all 3 replicate cross-sections. Enter the average result here and use it in Table 14. Keep two significant figures (hundredths).			

Worksheet for Assessing Hydrologic Connectivity: Percent Dewatered for Slope Wetlands.

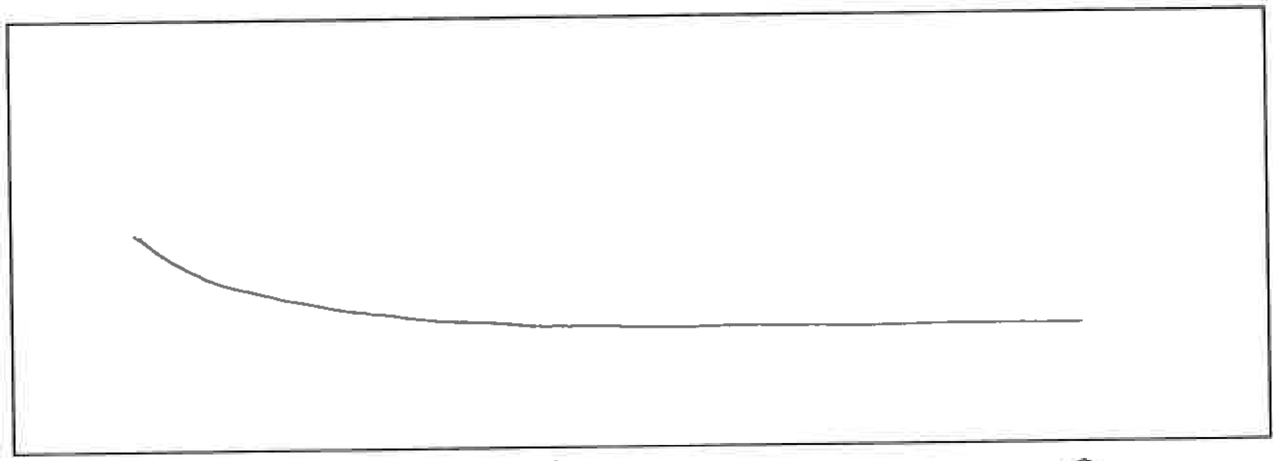
Condition	Field Indicators (check all existing conditions)
Indicators of Intact Hydrologic Connectivity	☐ No channel incision ☐ Vigor of plant species, especially hydrophytes ☐ Low or no cover of upland plant species ☐ No rill or gully development ☐ No areas of bare soil ☐ No soil cracking ☐ No changes in soil structure or moisture content ☐ Surface water present on the wetland plain late into the summer season ☐ Groundwater emerging ☐ Moist peat soil ☐ Floating fens ☐ Evidence of regular inundation on floodplain slope wetlands (wrack etc.)
Indicators of Degraded Hydrologic Connectivity (dewatering)	☐ Evidence of channel incision, including low entrenchment ratios, undercut banks, block bank failures, sloughing banks, hanging or exposed roots, channel scoured to bedrock or dense clay, active knickpoints, active gully erosion, active headcutting ☐ Stress or mortality of plants ☐ Presence of xeric plant species ☒ Development of rills or gullies on the wetland surface ☒ Areas of bare soil ☒ Areas of soil cracking ☐ Drying of peat ☐ Decrease in vigor of hydrophytes ☒ Changes in plant or animal species or communities ☐ Changes in soil structure or moisture content ☐ More than 5% cover in the AA of upland conifer species (e.g. Douglas fir (*Pseudotsuga menziesii*), Lodgepole Pine (*Pinus contorta)*, see special note) ☐ More than 5% cover in the AA of upland broadleaf tree species (e.g. tanoak (*Notholithocarpus densiflorus*), coast live oak (*Quercus agrifolia*) ☐ More than 5% cover in the AA of upland shrub species (e.g. sagebrush (*Artemisia tridentate)*, rabbitbrush (*Ericameria nauseosa)*, French broom (*Genista monspessulana*) ☐ More than 5% cover in the AA of upland vines (e.g. English ivy (*Hedera helix)*, Himalayan blackberry (*Rubus armeniacus)*, field bindweed (*Convolvulus arvensis*) ☒ More than 5% cover in the AA of upland grasses (e.g. ripgut brome (*Bromus diandrus)*, cheatgrass (*Bromus tectorum)*, needlegrass (*Stipa pulchra*) ☐ More than 5% cover in the AA of upland herbs and forbs (e.g. ragweed (*Ambrosia artemisiifolia)*, mustard (*Brassica rapa)*, yellow star thistle (*Centaurea solstitialis*)
Overall area of the wetland showing evidence of dewatering	☐ **No dewatering** ☒ **<25% dewatered** ☐ **25-50% dewatered** ☐ **>50% dewatered**

Structural Patch Type Worksheet for Slope Wetlands

STRUCTURAL PATCH TYPE (circle for presence)	Slope Wetland
Minimum Patch Size	3 m^2
Abundant wrack or organic debris in channel, or across wetland plain	–
Active fluvial channel(s)	–
Animal mounds and burrows, sediment disturbance, or vole trails	X
Bank slumps or undercut banks in channels	–
Beaver dams or lodges	–
Boulders or bedrock outcrop	–
Cutoff channels or oxbows	–
Filamentous macroalgae or algal mats	X
Gravel, cobble, or sand	–
Large woody debris	–
Moss	–
Non-vegetated flats or bare ground	–
Pannes or pools on wetland surface	X
Plant hummocks and/or tussocks	–
Sediment mounds around the bases of shrubs or trees	–
Sediment splays	–
Soil cracks	X
Springs or upwelling groundwater	
Standing snags (at least 3 m tall)	–
Submerged vegetation (in channels or open water)	–
Swales	–
Thatch	X
Variegated, convoluted, or crenulated upland edge (not broadly arcuate or mostly straight)	X
Total Possible	**23**
No. Observed Patch Types (enter here and use in Table 17 below)	6

Worksheet for AA Topographic Complexity

Complete a sketch of the topographic profile of the AA along a cross section perpendicular to the overall slope of wetland within the AA. Draw the section to include both AA boundaries. Include both the ground surface and the vegetation roughness. Indicate the letter grade for each component in the space below the sketch. Note the AA boundaries and important topographic features.



Physical topographic complexity score C   Vegetation roughness score C

Plant Community Metric Worksheet: Co-dominant species richness for Channeled Wet Meadow, Channeled Forested Slope Wetlands, Non-channeled Forested Slope Wetlands, and Seeps and Springs

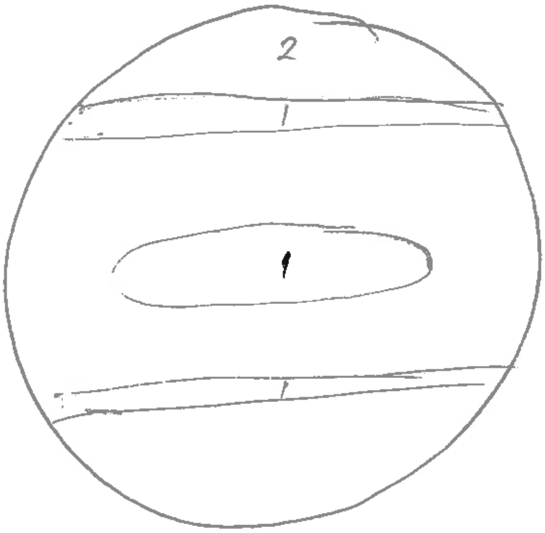
Floating or Canopy-forming	Invasive?	Short (<0.3 m)	Invasive?
Medium (0.3-1.0 m)	**Invasive?**	**Tall (1.0-3.0 m)**	**Invasive?**
Very Tall (>3.0 m)	**Invasive?**	**Total number of co-dominant species for all layers combined (enter here and see Table 21)**	
		Percent Invasion (enter here and see Table 21)	

Table 22: Worksheet for Co-dominant Plant Species.

Co-dominant Species	Check if Invasive
Spergularia sp.	
Hordeum marinum	X
Polypogon draba	X
Total Number of Co-dominants	3
Total Number of Invasive Co-dominant species	2
Percent Invasive Species (round to nearest integer)	67%

Horizontal Interspersion Worksheet

Use the spaces below to make a quick sketch of the AA in plan view, outlining the major plant zones (this should take no longer than 10 minutes). Assign the zones names and record them on the right. Based on the sketch, choose a single profile from Figure 17 that best represents the AA overall.



Assigned zones:

1)

2)

3)

4)

5)

6)

Table 24. Plant Life Forms Metric.

Life Form	Present in > 5% of AA?
Bryophytes (mosses, liverworts, hornworts)	
Coniferous Trees	
Deciduous Broadleaf Trees	
Evergreen Broadleaf Trees	
Ferns	
Grasses	✓
Herbs/Forbs	✓
Lichens or Fungi	
Sedges/Rushes	
Shrubs	
Vines	
Total Number of life forms	2

Worksheet: Stressor Checklist

HYDROLOGY ATTRIBUTE (WITHIN 50 M OF AA)	Present	Present and likely to have significant negative effect on AA
Point Source (PS) discharges (POTW, other non-stormwater discharge)		
Non-point Source (Non-PS) discharges (urban runoff, farm drainage)		
Flow diversions or unnatural inflows		
Dams (reservoirs, detention basins, recharge basins)		
Flow obstructions (culverts, paved stream crossings)		
Weir/drop structure, tide gates		
Dredged inlet/channel		
Engineered channel (riprap, armored channel bank, bed)		
Dike/levees		
Groundwater extraction		
Ditches (borrow, agricultural drainage, mosquito control, etc.)	X	
Actively managed hydrology		

Comments

PHYSICAL STRUCTURE ATTRIBUTE (WITHIN 50 M OF AA)	Present	Present and likely to have significant negative effect on AA
Filling or dumping of sediment or soils **(N/A for restoration areas)**		
Grading/ compaction **(N/A for restoration areas)**	X	
Plowing/Discing **(N/A for restoration areas)**	X	
Resource extraction (sediment, gravel, oil and/or gas)		
Vegetation management		
Excessive sediment or organic debris from watershed		
Excessive runoff from watershed		
Nutrient impaired (PS or Non-PS pollution)	X	
Heavy metal impaired (PS or Non-PS pollution)		
Pesticides or trace organics impaired (PS or Non-PS pollution)	X	
Bacteria and pathogens impaired (PS or Non-PS pollution)	X	
Trash or refuse		

Comments

BIOTIC STRUCTURE ATTRIBUTE (WITHIN 50 M OF AA)	Present	Present and Likely to Have Significant negative effect on AA
Mowing, grazing, excessive herbivory (within AA)	X	
Excessive human visitation		
Predation and habitat destruction by non-native vertebrates (e.g., *Virginia opossum* and domestic predators, such as feral pets)		
Tree cutting/sapling removal		
Removal of woody debris		
Treatment of non-native and nuisance plant species		
Pesticide application or vector control	X	
Biological resource extraction or stocking (fisheries, aquaculture)		
Excessive organic debris in matrix (for vernal pools)		
Lack of vegetation management to conserve natural resources	X	
Lack of treatment of invasive plants adjacent to AA or buffer	X	

Comments

BUFFER AND LANDSCAPE CONTEXT ATTRIBUTE (WITHIN 500 M OF AA)	Present	Present and likely to have significant negative effect on AA
Urban residential		
Industrial/commercial		
Military training/Air traffic		
Dams (or other major flow regulation or disruption)		
Dryland farming		
Intensive row-crop agriculture	X	
Orchards/nurseries	X	
Commercial feedlots		
Dairies		
Ranching (enclosed livestock grazing or horse paddock or feedlot)		
Transportation corridor	X	
Rangeland (livestock rangeland also managed for native vegetation)		
Sports fields and urban parklands (golf courses, soccer fields, etc.)		
Passive recreation (bird-watching, hiking, etc.)		
Active recreation (off-road vehicles, mountain biking, hunting, fishing)		
Physical resource extraction (rock, sediment, oil/gas)		
Biological resource extraction (aquaculture, commercial fisheries)		

Comments

Basic Information Sheet: Riverine Wetlands

Assessment Area Name: AA2u	
Project Name: HSR JM	
Assessment Area ID #:	
Project ID #:	**Date:** 4/24/19
Assessment Team Members for This AA:	
LSL, ML	
Average Bankfull Width: ~~[illegible]~~ 3	
Approximate Length of AA (10 times bankfull width, min 100 m, max 200 m): 100m	
Upstream Point Latitude:	**Longitude:**
Downstream Point Latitude:	**Longitude:**

Wetland Sub-type:

☐ Confined ☒ Non-confined

AA Category:

☐ Restoration ☐ Mitigation ☐ Impacted ☐ Ambient ☐ Reference ☐ Training

☐ Other: Pre-Impact

Did the river/stream have flowing water at the time of the assessment? ☐ yes ☒ no

What is the apparent hydrologic flow regime of the reach you are assessing?

The hydrologic flow regime of a stream describes the frequency with which the channel conducts water. *Perennial* streams conduct water all year long, whereas *ephemeral* streams conduct water only during and immediately following precipitation events. *Intermittent* streams are dry for part of the year, but conduct water for periods longer than ephemeral streams, as a function of watershed size and water source.

☐ perennial ☒ intermittent ☒ ephemeral

Photo Identification Numbers and Description:

	Photo ID No.	Description	Latitude	Longitude	Datum
1		Upstream			
2		Middle Left			
3		Middle Right			
4		Downstream			
5					
6					
7					
8					
9					
10					

Site Location Description:

Comments:

Scoring Sheet: Riverine Wetlands

AA Name: AA26			Date: 4/24/19
Attribute 1: Buffer and Landscape Context (pp. 11-19)			**Comments**
	Alpha.	Numeric	
Stream Corridor Continuity (D)	D		>200m
Buffer:			
	Alpha.	Numeric	
Buffer submetric A: Percent of AA with Buffer	A		
Buffer submetric B: Average Buffer Width	A		200m
Buffer submetric C: Buffer Condition	B		
Raw Attribute Score = $D+[C \times (A \times B)^{½}]^{½}$			**Final Attribute Score = (Raw Score/24) x 100**
Attribute 2: Hydrology (pp. 20-26)			
	Alpha.	Numeric	
Water Source	C		
Channel Stability	D		severe aggradation
Hydrologic Connectivity	D		not a chanel anymore
Raw Attribute Score = sum of numeric scores			**Final Attribute Score = (Raw Score/36) x 100**
Attribute 3: Physical Structure (pp. 27-33)			
	Alpha.	Numeric	
Structural Patch Richness	D		2 patches
Topographic Complexity	D		no benches / no micro
Raw Attribute Score = sum of numeric scores			**Final Attribute Score = (Raw Score/24) x 100**
Attribute 4: Biotic Structure (pp. 34-41)			
Plant Community Composition (based on sub-metrics A-C)			
	Alpha.	Numeric	
Plant Community submetric A: Number of plant layers	C		3 layers
Plant Community submetric B: Number of Co-dominant species	D		4 codoms
→ *Plant Community submetric C: Percent Invasion*	D		50%
Plant Community Composition Metric *(numeric average of submetrics A-C)*			
Horizontal Interspersion	D		
Vertical Biotic Structure	B		
Raw Attribute Score = sum of numeric scores			**Final Attribute Score = (Raw Score/36) x 100**
Overall AA Score (average of four final Attribute Scores)			

Worksheet for Stream Corridor Continuity Metric for Riverine Wetlands

Lengths of Non-buffer Segments For Distance of 500 m Upstream of AA		Lengths of Non-buffer Segments For Distance of 500 m Downstream of AA	
Segment No.	Length (m)	Segment No.	Length (m)
1		1	
2		2	
3		3	
4		4	
5		5	
Upstream Total Length		Downstream Total Length	>20m

Percent of AA with Buffer Worksheet

In the space provided below make a quick sketch of the AA, or perform the assessment directly on the aerial imagery; indicate where buffer is present, estimate the percentage of the AA perimeter providing buffer functions, and record the estimate amount in the space provided.

Percent of AA with Buffer: 100 %

Worksheet for calculating average buffer width of AA

Line	Buffer Width (m)
A	250
B	
C	
D	
E	
F	
G	
H	
Average Buffer Width *Round to the nearest integer*	250

Worksheet for Assessing Channel Stability for Riverine Wetlands

Condition	Field Indicators (check all existing conditions)
Indicators of Channel Equilibrium	☐ The channel (or multiple channels in braided systems) has a well-defined bankfull contour that clearly demarcates an obvious active floodplain in the cross-sectional profile of the channel throughout most of the AA.
	☐ Perennial riparian vegetation is abundant and well established along the bankfull contour, but not below it.
	☐ There is leaf litter, thatch, or wrack in most pools (if pools are present).
	☐ The channel contains embedded woody debris of the size and amount consistent with what is naturally available in the riparian area.
	☐ There is little or no active undercutting or burial of riparian vegetation.
	☐ If mid-channel bars and/or point bars are present, they are not densely vegetated with perennial vegetation.
	☐ Channel bars consist of well-sorted bed material (smaller grain size on the top and downstream end of the bar, larger grain size along the margins and upstream end of the bar).
	☐ There are channel pools, the spacing between pools tends to be regular and the bed is not planar throughout the AA
	☐ The larger bed material supports abundant mosses or periphyton.
Indicators of Active Degradation	☐ The channel is characterized by deeply undercut banks with exposed living roots of trees or shrubs.
	☐ There are abundant bank slides or slumps.
	☐ The lower banks are uniformly scoured and not vegetated.
	☐ Riparian vegetation is declining in stature or vigor, or many riparian trees and shrubs along the banks are leaning or falling into the channel.
	☐ An obvious historical floodplain has recently been abandoned, as indicated by the age structure of its riparian vegetation.
	☐ The channel bed appears scoured to bedrock or dense clay.
	☐ Recently active flow pathways appear to have coalesced into one channel (i.e. a previously braided system is no longer braided).
	☐ The channel has one or more knickpoints indicating headward erosion of the bed.
Indicators of Active Aggradation	☐ There is an active floodplain with fresh splays of coarse sediment (sand and larger that is not vegetated) deposited in the current or previous year.
	☐ There are partially buried living tree trunks or shrubs along the banks.
	☒ The bed is planar (flat or uniform gradient) overall; it lacks well-defined channel pools, or they are uncommon and irregularly spaced.
	☐ There are partially buried, or sediment-choked, culverts.
	☒ Perennial terrestrial or riparian vegetation is encroaching into the channel or onto channel bars below the bankfull contour.
	☐ There are avulsion channels on the floodplain or adjacent valley floor.
Overall	☐ **Equilibrium** ☐ **Degradation** ☒ **Aggradation**

Riverine Wetland Entrenchment Ratio Calculation Worksheet

The following 5 steps should be conducted for each of 3 cross-sections located in the AA at the approximate midpoints along straight riffles or glides, away from deep pools or meander bends. An attempt should be made to place them at the top, middle, and bottom of the AA.

Steps	Replicate Cross-sections ⟶	TOP	MID	BOT
Estimate	This is a critical step requiring familiarity with field indicators of the bankfull contour. Estimate or measure the distance between the right and left bankfull contours.	2		
2: Estimate max. bankfull depth.	Imagine a level line between the right and left bankfull contours; estimate or measure the height of the line above the thalweg (the deepest part of the channel).	0.2		
3: Estimate flood prone depth.	Double the estimate of maximum bankfull depth from Step 2.	0.4		
	Imagine a level line having a height equal to the flood prone depth from Step 3; note where the line intercepts the right and left banks; estimate or measure the length of this line.	5		
5: Calculate entrenchment ratio.	Divide the flood prone width (Step 4) by the bankfull width (Step 1).	2.5		
6: Calculate average entrenchment ratio.	Calculate the average results for Step 5 for all 3 replicate cross-sections. Enter the average result here and use it in Table 13a or 13b.			

nothing to measure, channel filled in & not defined

Structural Patch Type Worksheet for Riverine wetlands

Circle each type of patch that is observed in the AA and enter the total number of observed patches in Table below. In the case of riverine wetlands, their status as confined or non-confined must first be determined (see page 6) to determine with patches are expected in the system (indicated by a "1" in the table below). Any feature onsite should only be counted once as a patch type. If a feature appears to meet the definition of more than one patch type (i.e. swale and secondary channel) the practitioner should choose which patch type best illustrates the feature. Not all features at a site will be patch types.

Please refer to the CRAM Photo Dictionary at** *www.cramwetlands.org* **for photos of each of the following patch types.

STRUCTURAL PATCH TYPE (circle for presence)	Riverine (Non-confined)	Riverine (Confined)
Minimum Patch Size	**3 m^2**	**3 m^2**
Abundant wrackline or organic debris in channel, on floodplain	1	1
Bank slumps or undercut banks in channels or along shoreline	~~1~~	1
Cobbles and/or Boulders	~~1~~	1
Debris jams	~~1~~	1
Filamentous macroalgae or algal mats	~~1~~	1
Large woody debris	1	1
Pannes or pools on floodplain	~~1~~	N/A
Plant hummocks and/or sediment mounds	~~1~~	1
Point bars and in-channel bars	~~1~~	1
Pools or depressions in channels (wet or dry channels)	~~1~~	1
Riffles or rapids (wet or dry channels)	~~1~~	1
Secondary channels on floodplains or along shorelines	~~1~~	N/A
Standing snags (at least 3 m tall)	1	1
Submerged vegetation	~~1~~	N/A
Swales on floodplain or along shoreline	~~1~~	N/A
Variegated, convoluted, or crenulated foreshore (instead of broadly arcuate or mostly straight)	~~1~~	1
Vegetated islands (mostly above high-water)	~~1~~	N/A
Total Possible	**17**	**12**
No. Observed Patch Types (enter here and use in Table 14 below)	2	

Worksheet for AA Topographic Complexity

At three locations along the AA, make a sketch of the profile of the stream from the AA boundary down to its deepest area then back out to the other AA boundary. Try to capture the benches and the intervening micro-topographic relief. To maintain consistency, make drawings at each of the stream hydrologic connectivity measurements, always facing downstream. Include the water level, an arrow at the bankfull contour, and label the benches. Based on these sketches and the profiles in Figure 10, choose a description in Table 16 that best describes the overall topographic complexity of the AA.

Profile 1
Profile 2
Profile 3

Plant Community Metric Worksheet: Co-dominant species richness for Riverine wetlands
(A dominant species represents ≥10% *relative* cover)

Special Note:

** Combine the counts of co-dominant species from all layers to identify the total species count. Each plant species is only counted once when calculating the Number of Co-dominant Species and Percent Invasion submetric scores, regardless of the numbers of layers in which it occurs.*

Floating or Canopy-forming (non-confined only)	Invasive?	Short (<0.5 m)	Invasive?
		Lepidium ~~sp.~~ draba	X
		Conium mac	X

Medium (0.5-1.5 m)	Invasive?	Tall (1.5-3.0 m)	Invasive?
Lepidium ~~sp.~~ draba	X		
Conium mac	X		

Very Tall (>3.0 m)	Invasive?		
Red Willow		Total number of co-dominant species for all layers combined (enter here and use in Table 18)	4
Arroyo Willow			
		Percent Invasion *Round to the nearest integer* (enter here and use in Table 18)	50%

Horizontal Interspersion Worksheet.

Use the spaces below to make a quick sketch of the AA in plan view, outlining the major plant zones (this should take no longer than 10 minutes). Assign the zones names and record them on the right. Based on the sketch, choose a single profile from Figure 12 that best represents the AA overall.

1	**Assigned zones:** 1) Willows over Conium / Lepidium 2) 3) 4) 5) 6)

Worksheet for Wetland disturbances and conversions

Has a major disturbance occurred at this wetland?	Yes	No		
If yes, was it a flood, fire, landslide, or other?	flood	fire	landslide	other
If yes, then how severe is the disturbance?	likely to affect site next 5 or more years	likely to affect site next 3-5 years	likely to affect site next 1-2 years	
Has this wetland been converted from another type? If yes, then what was the previous type?	depressional	vernal pool	vernal pool system	
	non-confined riverine	confined riverine	seasonal estuarine	
	perennial saline estuarine	perennial non-saline estuarine	wet meadow	
	lacustrine	seep or spring	playa	

Stressor Checklist Worksheet

HYDROLOGY ATTRIBUTE (WITHIN 50 M OF AA)	Present	Significant negative effect on AA
Point Source (PS) discharges (POTW, other non-stormwater discharge)		
Non-point Source (Non-PS) discharges (urban runoff, farm drainage)	X	
Flow diversions or unnatural inflows		
Dams (reservoirs, detention basins, recharge basins)		
Flow obstructions (culverts, paved stream crossings)		
Weir/drop structure, tide gates		
Dredged inlet/channel		
Engineered channel (riprap, armored channel bank, bed)		
Dike/levees		
Groundwater extraction		
Ditches (borrow, agricultural drainage, mosquito control, etc.)	X	
Actively managed hydrology		
Comments		

PHYSICAL STRUCTURE ATTRIBUTE (WITHIN 50 M OF AA)	Present	Significant negative effect on AA
Filling or dumping of sediment or soils **(N/A for restoration areas)**		
Grading/ compaction **(N/A for restoration areas)**		
Plowing/Discing **(N/A for restoration areas)**	X	
Resource extraction (sediment, gravel, oil and/or gas)		
Vegetation management		
Excessive sediment or organic debris from watershed		
Excessive runoff from watershed		
Nutrient impaired (PS or Non-PS pollution)	X	
Heavy metal impaired (PS or Non-PS pollution)		
Pesticides or trace organics impaired (PS or Non-PS pollution)	X	
Bacteria and pathogens impaired (PS or Non-PS pollution)	X	
Trash or refuse		
Comments		

BIOTIC STRUCTURE ATTRIBUTE (WITHIN 50 M OF AA)	Present	Significant negative effect on AA
Mowing, grazing, excessive herbivory (within AA)	X	
Excessive human visitation		
Predation and habitat destruction by non-native vertebrates (e.g., *Virginia opossum* and domestic predators, such as feral pets)		
Tree cutting/sapling removal		
Removal of woody debris		
Treatment of non-native and nuisance plant species		
Pesticide application or vector control	X	
Biological resource extraction or stocking (fisheries, aquaculture)		
Excessive organic debris in matrix (for vernal pools)		
Lack of vegetation management to conserve natural resources	X	
Lack of treatment of invasive plants adjacent to AA or buffer	X	
Comments		

BUFFER AND LANDSCAPE CONTEXT ATTRIBUTE (WITHIN 500 M OF AA)	Present	Significant negative effect on AA
Urban residential		
Industrial/commercial		
Military training/Air traffic		
Dams (or other major flow regulation or disruption)		
Dryland farming		
Intensive row-crop agriculture	X	
Orchards/nurseries		
Commercial feedlots		
Dairies		
Ranching (enclosed livestock grazing or horse paddock or feedlot)		
Transportation corridor		
Rangeland (livestock rangeland also managed for native vegetation)		
Sports fields and urban parklands (golf courses, soccer fields, etc.)		
Passive recreation (bird-watching, hiking, etc.)		
Active recreation (off-road vehicles, mountain biking, hunting, fishing)		
Physical resource extraction (rock, sediment, oil/gas)		
Biological resource extraction (aquaculture, commercial fisheries)		
Comments		

Basic Information Sheet: Riverine Wetlands

Assessment Area Name: AA28-NAW-02972	
Project Name: HSR JN	
Assessment Area ID #:	
Project ID #:	**Date:** 4/24/19
Assessment Team Members for This AA:	
LSL, ML	
Average Bankfull Width: 1m	
Approximate Length of AA (10 times bankfull width, min 100 m, max 200 m): 100m	
Upstream Point Latitude:	**Longitude:**
Downstream Point Latitude:	**Longitude:**

Wetland Sub-type:

☒ Confined ☐ Non-confined

AA Category:

☐ Restoration ☐ Mitigation ☐ Impacted ☐ Ambient ☐ Reference ☐ Training

☐ Other: X Pre-Impact

Did the river/stream have flowing water at the time of the assessment? ☒ yes ☒ no

What is the apparent hydrologic flow regime of the reach you are assessing?

The hydrologic flow regime of a stream describes the frequency with which the channel conducts water. *Perennial* streams conduct water all year long, whereas *ephemeral* streams conduct water only during and immediately following precipitation events. *Intermittent* streams are dry for part of the year, but conduct water for periods longer than ephemeral streams, as a function of watershed size and water source.

☐ perennial ☒ intermittent ☒ ephemeral

Photo Identification Numbers and Description:

	Photo ID No.	Description	Latitude	Longitude	Datum
1		Upstream			
2		Middle Left			
3		Middle Right			
4		Downstream			
5					
6					
7					
8					
9					
10					

Site Location Description:

Comments:

2 pics on LSL phone

1 - facing downstream

2 - facing upstream

Scoring Sheet: Riverine Wetlands

AA Name: AA28			Date: 4/24/19
Attribute 1: Buffer and Landscape Context (pp. 11-19)			**Comments**
	Alpha.	Numeric	
Stream Corridor Continuity (D)	A		0 breaks
Buffer:			
	Alpha.	Numeric	
Buffer submetric A: Percent of AA with Buffer	A		100%
Buffer submetric B: Average Buffer Width	A		250m
Buffer submetric C: Buffer Condition	B		
Raw Attribute Score = D+[C x (A x B)½]½			**Final Attribute Score = (Raw Score/24) x 100**
Attribute 2: Hydrology (pp. 20-26)			
	Alpha.	Numeric	
Water Source	A		
Channel Stability	B		
Hydrologic Connectivity	A		2.0
Raw Attribute Score = sum of numeric scores			**Final Attribute Score = (Raw Score/36) x 100**
Attribute 3: Physical Structure (pp. 27-33)			
	Alpha.	Numeric	
Structural Patch Richness	A		8 patches
Topographic Complexity	D		no benches but lots of micro
Raw Attribute Score = sum of numeric scores			**Final Attribute Score = (Raw Score/24) x 100**
Attribute 4: Biotic Structure (pp. 34-41)			
Plant Community Composition (based on sub-metrics A-C)			
	Alpha.	Numeric	
Plant Community submetric A: Number of plant layers	C		2 layers
Plant Community submetric B: Number of Co-dominant species	C		5 co doms
Plant Community submetric C: Percent Invasion	B		20% invasion
Plant Community Composition Metric *(numeric average of submetrics A-C)*			
Horizontal Interspersion	D		
Vertical Biotic Structure	C		
Raw Attribute Score = sum of numeric scores			**Final Attribute Score = (Raw Score/36) x 100**
Overall AA Score (average of four final Attribute Scores)			

Worksheet for Stream Corridor Continuity Metric for Riverine Wetlands

Lengths of Non-buffer Segments For Distance of 500 m Upstream of AA		Lengths of Non-buffer Segments For Distance of 500 m Downstream of AA	
Segment No.	Length (m)	Segment No.	Length (m)
1		1	
2		2	
3		3	
4		4	
5		5	
Upstream Total Length	0	Downstream Total Length	0

Percent of AA with Buffer Worksheet

In the space provided below make a quick sketch of the AA, or perform the assessment directly on the aerial imagery; indicate where buffer is present, estimate the percentage of the AA perimeter providing buffer functions, and record the estimate amount in the space provided.

Percent of AA with Buffer: 100 %

Worksheet for calculating average buffer width of AA

Line	Buffer Width (m)
A	250
B	
C	
D	
E	
F	
G	
H	
Average Buffer Width *Round to the nearest integer*	250

Worksheet for Assessing Channel Stability for Riverine Wetlands

Condition	Field Indicators (check all existing conditions)
Indicators of Channel Equilibrium	☐ The channel (or multiple channels in braided systems) has a well-defined bankfull contour that clearly demarcates an obvious active floodplain in the cross-sectional profile of the channel throughout most of the AA. ☒ Perennial riparian vegetation is abundant and well established along the bankfull contour, but not below it. ☒ There is leaf litter, thatch, or wrack in most pools (if pools are present). ☒ The channel contains embedded woody debris of the size and amount consistent with what is naturally available in the riparian area. ☒ There is little or no active undercutting or burial of riparian vegetation. ☐ If mid-channel bars and/or point bars are present, they are not densely vegetated with perennial vegetation. ☐ Channel bars consist of well-sorted bed material (smaller grain size on the top and downstream end of the bar, larger grain size along the margins and upstream end of the bar). ☐ There are channel pools, the spacing between pools tends to be regular and the bed is not planar throughout the AA ☒ The larger bed material supports abundant mosses or periphyton.
Indicators of Active Degradation	☐ The channel is characterized by deeply undercut banks with exposed living roots of trees or shrubs. ☐ There are abundant bank slides or slumps. ☐ The lower banks are uniformly scoured and not vegetated. ☐ Riparian vegetation is declining in stature or vigor, or many riparian trees and shrubs along the banks are leaning or falling into the channel. ☐ An obvious historical floodplain has recently been abandoned, as indicated by the age structure of its riparian vegetation. ☒ The channel bed appears scoured to bedrock or dense clay. ☐ Recently active flow pathways appear to have coalesced into one channel (i.e. a previously braided system is no longer braided). ☒ The channel has one or more knickpoints indicating headward erosion of the bed.
Indicators of Active Aggradation	☐ There is an active floodplain with fresh splays of coarse sediment (sand and larger that is not vegetated) deposited in the current or previous year. ☐ There are partially buried living tree trunks or shrubs along the banks. ☐ The bed is planar (flat or uniform gradient) overall; it lacks well-defined channel pools, or they are uncommon and irregularly spaced. ☐ There are partially buried, or sediment-choked, culverts. ☐ Perennial terrestrial or riparian vegetation is encroaching into the channel or onto channel bars below the bankfull contour. ☐ There are avulsion channels on the floodplain or adjacent valley floor.
Overall	☒ **Equilibrium** ☒ **Degradation** ☐ **Aggradation**

Riverine Wetland Entrenchment Ratio Calculation Worksheet

The following 5 steps should be conducted for each of 3 cross-sections located in the AA at the approximate midpoints along straight riffles or glides, away from deep pools or meander bends. An attempt should be made to place them at the top, middle, and bottom of the AA.

Steps	Replicate Cross-sections ⟶	TOP	MID	BOT
1 Estimate bankfull width.	This is a critical step requiring familiarity with field indicators of the bankfull contour. Estimate or measure the distance between the right and left bankfull contours.	1m	1.5	2m
2: Estimate max. bankfull depth.	Imagine a level line between the right and left bankfull contours; estimate or measure the height of the line above the thalweg (the deepest part of the channel).	0.4	0.4	0.4
3: Estimate flood prone depth.	Double the estimate of maximum bankfull depth from Step 2.	0.8	0.8	0.8
4: Estimate flood prone width.	Imagine a level line having a height equal to the flood prone depth from Step 3; note where the line intercepts the right and left banks; estimate or measure the length of this line.	2.5	3.0	3.0
5: Calculate entrenchment ratio.	Divide the flood prone width (Step 4) by the bankfull width (Step 1).	2.5	2.0	1.5
6: Calculate average entrenchment ratio.	Calculate the average results for Step 5 for all 3 replicate cross-sections. Enter the average result here and use it in Table 13a or 13b.			2.0

Structural Patch Type Worksheet for Riverine wetlands

Circle each type of patch that is observed in the AA and enter the total number of observed patches in Table below. In the case of riverine wetlands, their status as confined or non-confined must first be determined (see page 6) to determine with patches are expected in the system (indicated by a "1" in the table below). Any feature onsite should only be counted once as a patch type. If a feature appears to meet the definition of more than one patch type (i.e. swale and secondary channel) the practitioner should choose which patch type best illustrates the feature. Not all features at a site will be patch types.

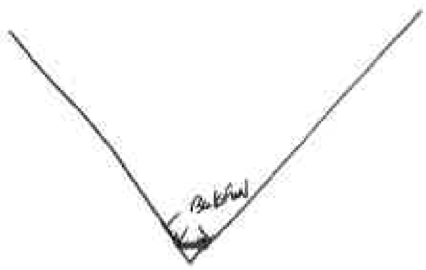
Please refer to the CRAM Photo Dictionary at** *www.cramwetlands.org* **for photos of each of the following patch types.

STRUCTURAL PATCH TYPE (circle for presence)	Riverine (Non-confined)	Riverine (Confined)
Minimum Patch Size	**3 m²**	**3 m²**
Abundant wrackline or organic debris in channel, on floodplain	1	1
Bank slumps or undercut banks in channels or along shoreline	1	~~1~~
Cobbles and/or Boulders	1	1
Debris jams	1	~~1~~
Filamentous macroalgae or algal mats	1	~~1~~
Large woody debris	1	1
Pannes or pools on floodplain	1	N/A
Plant hummocks and/or sediment mounds	1	~~1~~
Point bars and in-channel bars	1	~~1~~
Pools or depressions in channels (wet or dry channels)	1	1
Riffles or rapids (wet or dry channels)	1	1
Secondary channels on floodplains or along shorelines	1	N/A
Standing snags (at least 3 m tall)	1	1
Submerged vegetation	1	N/A
Swales on floodplain or along shoreline	1	N/A
Variegated, convoluted, or crenulated foreshore (instead of broadly arcuate or mostly straight)	1	1
Vegetated islands (mostly above high-water)	1	N/A
Total Possible	**17**	**12**
No. Observed Patch Types (enter here and use in Table 14 below)		8

Worksheet for AA Topographic Complexity

At three locations along the AA, make a sketch of the profile of the stream from the AA boundary down to its deepest area then back out to the other AA boundary. Try to capture the benches and the intervening micro-topographic relief. To maintain consistency, make drawings at each of the stream hydrologic connectivity measurements, always facing downstream. Include the water level, an arrow at the bankfull contour, and label the benches. Based on these sketches and the profiles in Figure 10, choose a description in Table 16 that best describes the overall topographic complexity of the AA.

Profile 1



Profile 2

Same

Profile 3

Plant Community Metric Worksheet: Co-dominant species richness for Riverine wetlands
(A dominant species represents ≥10% *relative* cover)

Special Note:

* *Combine the counts of co-dominant species from all layers to identify the total species count. Each plant species is only counted once when calculating the Number of Co-dominant Species and Percent Invasion submetric scores, regardless of the numbers of layers in which it occurs.*

Floating or Canopy-forming (non-confined only)	Invasive?	Short (<0.5 m)	Invasive?
Medium (0.5-1.5 m)	**Invasive?**	**Tall (1.5-3.0 m)**	**Invasive?**
Poison oak			
Artemisia cal			
Avena barbata	X		
Very Tall (>3.0 m)	**Invasive?**	**Total number of co-dominant species for all layers combined (enter here and use in Table 18)**	5
Coast live oak			
Blue oak			
		Percent Invasion *Round to the nearest integer* (enter here and use in Table 18)	20%

Horizontal Interspersion Worksheet.

Use the spaces below to make a quick sketch of the AA in plan view, outlining the major plant zones (this should take no longer than 10 minutes). Assign the zones names and record them on the right. Based on the sketch, choose a single profile from Figure 12 that best represents the AA overall.

	Assigned zones:
	1)
	2)
	3)
	4)
	5)
	6)

Worksheet for Wetland disturbances and conversions

Has a major disturbance occurred at this wetland?	Yes	No		
If yes, was it a flood, fire, landslide, or other?	flood	fire	landslide	other
If yes, then how severe is the disturbance?	likely to affect site next 5 or more years	likely to affect site next 3-5 years	likely to affect site next 1-2 years	
Has this wetland been converted from another type? If yes, then what was the previous type?	depressional	vernal pool	vernal pool system	
	non-confined riverine	confined riverine	seasonal estuarine	
	perennial saline estuarine	perennial non-saline estuarine	wet meadow	
	lacustrine	seep or spring	playa	

Stressor Checklist Worksheet

HYDROLOGY ATTRIBUTE (WITHIN 50 M OF AA)	Present	Significant negative effect on AA
Point Source (PS) discharges (POTW, other non-stormwater discharge)		
Non-point Source (Non-PS) discharges (urban runoff, farm drainage)		
Flow diversions or unnatural inflows		
Dams (reservoirs, detention basins, recharge basins)		
Flow obstructions (culverts, paved stream crossings)		
Weir/drop structure, tide gates		
Dredged inlet/channel		
Engineered channel (riprap, armored channel bank, bed)		
Dike/levees		
Groundwater extraction		
Ditches (borrow, agricultural drainage, mosquito control, etc.)		
Actively managed hydrology		
Comments		

PHYSICAL STRUCTURE ATTRIBUTE (WITHIN 50 M OF AA)	Present	Significant negative effect on AA
Filling or dumping of sediment or soils **(N/A for restoration areas)**		
Grading/ compaction **(N/A for restoration areas)**		
Plowing/Discing **(N/A for restoration areas)**		
Resource extraction (sediment, gravel, oil and/or gas)		
Vegetation management		
Excessive sediment or organic debris from watershed		
Excessive runoff from watershed		
Nutrient impaired (PS or Non-PS pollution)		
Heavy metal impaired (PS or Non-PS pollution)		
Pesticides or trace organics impaired (PS or Non-PS pollution)		
Bacteria and pathogens impaired (PS or Non-PS pollution)		
Trash or refuse		
Comments		

BIOTIC STRUCTURE ATTRIBUTE (WITHIN 50 M OF AA)	Present	Significant negative effect on AA
Mowing, grazing, excessive herbivory (within AA)		
Excessive human visitation		
Predation and habitat destruction by non-native vertebrates (e.g., *Virginia opossum* and domestic predators, such as feral pets) pigs	X	
Tree cutting/sapling removal		
Removal of woody debris		
Treatment of non-native and nuisance plant species		
Pesticide application or vector control		
Biological resource extraction or stocking (fisheries, aquaculture)		
Excessive organic debris in matrix (for vernal pools)		
Lack of vegetation management to conserve natural resources	X	
Lack of treatment of invasive plants adjacent to AA or buffer	X	

Comments

BUFFER AND LANDSCAPE CONTEXT ATTRIBUTE (WITHIN 500 M OF AA)	Present	Significant negative effect on AA
Urban residential		
Industrial/commercial		
Military training/Air traffic		
Dams (or other major flow regulation or disruption)		
Dryland farming		
Intensive row-crop agriculture		
Orchards/nurseries		
Commercial feedlots		
Dairies		
Ranching (enclosed livestock grazing or horse paddock or feedlot)		
Transportation corridor		
Rangeland (livestock rangeland also managed for native vegetation)		
Sports fields and urban parklands (golf courses, soccer fields, etc.)		
Passive recreation (bird-watching, hiking, etc.)	X	
Active recreation (off-road vehicles, mountain biking, hunting, fishing)		
Physical resource extraction (rock, sediment, oil/gas)		
Biological resource extraction (aquaculture, commercial fisheries)		

Comments

Basic Information Sheet: Riverine Wetlands

Assessment Area Name: AA-29	
Project Name: HSR -JM	
Assessment Area ID #:	
Project ID #:	Date: 4/23/19
Assessment Team Members for This AA:	
L. Cervants. M. Lewis	
Average Bankfull Width: 4m	
Approximate Length of AA (10 times bankfull width, min 100 m, max 200 m): 100	
Upstream Point Latitude:	Longitude:
Downstream Point Latitude:	Longitude:
Wetland Sub-type: ☐ Confined ☒ Non-confined	
AA Category: ☐ Restoration ☐ Mitigation ☒ Impacted ☐ Ambient ☐ Reference ☐ Training ☐ Other:	
Did the river/stream have flowing water at the time of the assessment? ☐ yes ☒ no	
What is the apparent hydrologic flow regime of the reach you are assessing? The hydrologic flow regime of a stream describes the frequency with which the channel conducts water. *Perennial* streams conduct water all year long, whereas *ephemeral* streams conduct water only during and immediately following precipitation events. *Intermittent* streams are dry for part of the year, but conduct water for periods longer than ephemeral streams, as a function of watershed size and water source. ☐ perennial ☐ intermittent ☒ ephemeral	

Photo Identification Numbers and Description:

	Photo ID No.	Description	Latitude	Longitude	Datum
1		Upstream			
2		Middle Left			
3		Middle Right			
4		Downstream			
5					
6					
7					
8					
9					
10					

Site Location Description:

Comments:

Scoring Sheet: Riverine Wetlands

AA Name: AA29

Date: 4/23/19

Attribute 1: Buffer and Landscape Context (pp. 11-19)	Alpha.	Numeric			Comments
Stream Corridor Continuity (D)			A	12	
Buffer:					
Buffer submetric A: Percent of AA with Buffer	A	12			100% buffer
Buffer submetric B: Average Buffer Width	A	12			250 m avg.
Buffer submetric C: Buffer Condition	B	9			50% nonnatives.
Raw Attribute Score = D+[C x (A x B)^{½}]^{½}					**Final Attribute Score = (Raw Score/24) x 100**

Attribute 2: Hydrology (pp. 20-26)	Alpha.	Numeric	Comments
Water Source	A	12	all natural
Channel Stability	A	12	Equilibrium w/ little degrad.
Hydrologic Connectivity	A	12	3.6 ratio
Raw Attribute Score = sum of numeric scores			**Final Attribute Score = (Raw Score/36) x 100**

Attribute 3: Physical Structure (pp. 27-33)	Alpha.	Numeric	Comments
Structural Patch Richness	D	3	5 patches
Topographic Complexity	C	6	1 bench lacks micro
Raw Attribute Score = sum of numeric scores			**Final Attribute Score = (Raw Score/24) x 100**

Attribute 4: Biotic Structure (pp. 34-41)	Alpha.	Numeric			Comments
Plant Community Composition (based on sub-metrics A-C)					
Plant Community submetric A: Number of plant layers	B	9			3 layers
Plant Community submetric B: Number of Co-dominant species	D	3			5 co dom
Plant Community submetric C: Percent Invasion	C	6			40% invasive
Plant Community Composition Metric *(numeric average of submetrics A-C)*					
Horizontal Interspersion			C	6	
Vertical Biotic Structure			C	6	725% overlap
Raw Attribute Score = sum of numeric scores					**Final Attribute Score = (Raw Score/36) x 100**

Overall AA Score (average of four final Attribute Scores)	

Worksheet for Stream Corridor Continuity Metric for Riverine Wetlands

Lengths of Non-buffer Segments For Distance of 500 m Upstream of AA		Lengths of Non-buffer Segments For Distance of 500 m Downstream of AA	
Segment No.	Length (m)	Segment No.	Length (m)
1	0	1	0
2		2	
3		3	
4		4	
5		5	
Upstream Total Length	0	Downstream Total Length	0

Percent of AA with Buffer Worksheet

In the space provided below make a quick sketch of the AA, or perform the assessment directly on the aerial imagery; indicate where buffer is present, estimate the percentage of the AA perimeter providing buffer functions, and record the estimate amount in the space provided.

Percent of AA with Buffer: 100 %

Worksheet for calculating average buffer width of AA

Line	Buffer Width (m)
A	250
B	
C	
D	
E	
F	
G	
H	
Average Buffer Width *Round to the nearest integer*	250

Worksheet for Assessing Channel Stability for Riverine Wetlands

Condition	Field Indicators (check all existing conditions)
Indicators of Channel Equilibrium	☒ The channel (or multiple channels in braided systems) has a well-defined bankfull contour that clearly demarcates an obvious active floodplain in the cross-sectional profile of the channel throughout most of the AA. ☒ Perennial riparian vegetation is abundant and well established along the bankfull contour, but not below it. ☐ There is leaf litter, thatch, or wrack in most pools (if pools are present). ☐ The channel contains embedded woody debris of the size and amount consistent with what is naturally available in the riparian area. ☒ There is little or no active undercutting or burial of riparian vegetation. ☒ If mid-channel bars and/or point bars are present, they are not densely vegetated with perennial vegetation. ☒ Channel bars consist of well-sorted bed material (smaller grain size on the top and downstream end of the bar, larger grain size along the margins and upstream end of the bar). ☐ There are channel pools, the spacing between pools tends to be regular and the bed is not planar throughout the AA ☐ The larger bed material supports abundant mosses or periphyton.
Indicators of Active Degradation	☐ The channel is characterized by deeply undercut banks with exposed living roots of trees or shrubs. ☐ There are abundant bank slides or slumps. ☐ The lower banks are uniformly scoured and not vegetated. ☐ Riparian vegetation is declining in stature or vigor, or many riparian trees and shrubs along the banks are leaning or falling into the channel. ☐ An obvious historical floodplain has recently been abandoned, as indicated by the age structure of its riparian vegetation. ☐ The channel bed appears scoured to bedrock or dense clay. ☐ Recently active flow pathways appear to have coalesced into one channel (i.e. a previously braided system is no longer braided). ☐ The channel has one or more knickpoints indicating headward erosion of the bed.
Indicators of Active Aggradation	☐ There is an active floodplain with fresh splays of coarse sediment (sand and larger that is not vegetated) deposited in the current or previous year. ☐ There are partially buried living tree trunks or shrubs along the banks. ☒ The bed is planar (flat or uniform gradient) overall; it lacks well-defined channel pools, or they are uncommon and irregularly spaced. ☐ There are partially buried, or sediment-choked, culverts. ☐ Perennial terrestrial or riparian vegetation is encroaching into the channel or onto channel bars below the bankfull contour. ☐ There are avulsion channels on the floodplain or adjacent valley floor.
Overall	☒ **Equilibrium** ☐ **Degradation** ☐ **Aggradation**

Riverine Wetland Entrenchment Ratio Calculation Worksheet

The following 5 steps should be conducted for each of 3 cross-sections located in the AA at the approximate midpoints along straight riffles or glides, away from deep pools or meander bends. An attempt should be made to place them at the top, middle, and bottom of the AA.				
Steps	**Replicate Cross-sections** →	**TOP**	**MID**	**BOT**
1 Estimate bankfull width.	This is a critical step requiring familiarity with field indicators of the bankfull contour. Estimate or measure the distance between the right and left bankfull contours.	4.25	2	3.25
2: Estimate max. bankfull depth.	Imagine a level line between the right and left bankfull contours; estimate or measure the height of the line above the thalweg (the deepest part of the channel).	0.5	0.2	0.35
3: Estimate flood prone depth.	Double the estimate of maximum bankfull depth from Step 2.	1.0	0.4	0.7
4: Estimate flood prone width.	Imagine a level line having a height equal to the flood prone depth from Step 3; note where the line intercepts the right and left banks; estimate or measure the length of this line.	7	8	17
5: Calculate entrenchment ratio.	Divide the flood prone width (Step 4) by the bankfull width (Step 1).	1.65	4	5.23
6: Calculate average entrenchment ratio.	Calculate the average results for Step 5 for all 3 replicate cross-sections. Enter the average result here and use it in Table 13a or 13b.	3.6		

Structural Patch Type Worksheet for Riverine wetlands

Circle each type of patch that is observed in the AA and enter the total number of observed patches in Table below. In the case of riverine wetlands, their status as confined or non-confined must first be determined (see page 6) to determine with patches are expected in the system (indicated by a "1" in the table below). Any feature onsite should only be counted once as a patch type. If a feature appears to meet the definition of more than one patch type (i.e. swale and secondary channel) the practitioner should choose which patch type best illustrates the feature. Not all features at a site will be patch types.

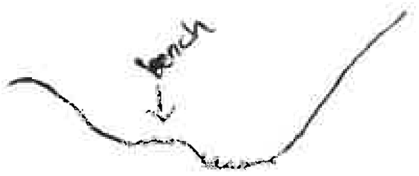
Please refer to the CRAM Photo Dictionary at** *www.cramwetlands.org* **for photos of each of the following patch types.

STRUCTURAL PATCH TYPE** (circle for presence)	Riverine (Non-confined)	Riverine (Confined)
Minimum Patch Size	**3 m²**	**3 m²**
Abundant wrackline or organic debris in channel, on floodplain	1	1
Bank slumps or undercut banks in channels or along shoreline	1	1
Cobbles and/or Boulders	1	1
Debris jams	1	1
Filamentous macroalgae or algal mats	1	1
Large woody debris	1	1
Pannes or pools on floodplain	1	N/A
Plant hummocks and/or sediment mounds	1	1
Point bars and in-channel bars	1	1
Pools or depressions in channels (wet or dry channels)	1	1
Riffles or rapids (wet or dry channels)	1	1
Secondary channels on floodplains or along shorelines	1	N/A
Standing snags (at least 3 m tall)	1	1
Submerged vegetation	1	N/A
Swales on floodplain or along shoreline	1	N/A
Variegated, convoluted, or crenulated foreshore (instead of broadly arcuate or mostly straight)	1	1
Vegetated islands (mostly above high-water)	1	N/A
Total Possible	17	12
No. Observed Patch Types (enter here and use in Table 14 below)	5	

Worksheet for AA Topographic Complexity

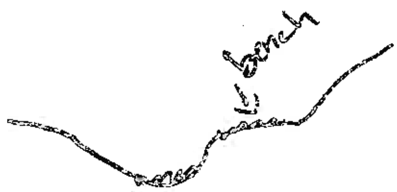
At three locations along the AA, make a sketch of the profile of the stream from the AA boundary down to its deepest area then back out to the other AA boundary. Try to capture the benches and the intervening micro-topographic relief. To maintain consistency, make drawings at each of the stream hydrologic connectivity measurements, always facing downstream. Include the water level, an arrow at the bankfull contour, and label the benches. Based on these sketches and the profiles in Figure 10, choose a description in Table 16 that best describes the overall topographic complexity of the AA.

Profile 1



Profile 2

Profile 3



Plant Community Metric Worksheet: Co-dominant species richness for Riverine wetlands

(A dominant species represents ≥10% *relative* cover)

Special Note:

** Combine the counts of co-dominant species from all layers to identify the total species count. Each plant species is only counted once when calculating the Number of Co-dominant Species and Percent Invasion submetric scores, regardless of the numbers of layers in which it occurs.*

Floating or Canopy-forming (non-confined only)	Invasive?	Short (<0.5 m)	Invasive?
		Italian thistle	✓

Medium (0.5-1.5 m)	Invasive?	Tall (1.5-3.0 m)	Invasive?
Avena sp	✓		
~~[illegible]~~	~~[illegible]~~		
Lathyrus vestitus			

Very Tall (>3.0 m)	Invasive?		
~~[illegible]~~		Total number of co-dominant species for all layers combined (enter here and use in Table 18)	5
Salix laevigata			
Quercus wislizeni		Percent Invasion *Round to the nearest integer* (enter here and use in Table 18)	40%

Horizontal Interspersion Worksheet.

Use the spaces below to make a quick sketch of the AA in plan view, outlining the major plant zones (this should take no longer than 10 minutes). Assign the zones names and record them on the right. Based on the sketch, choose a single profile from Figure 12 that best represents the AA overall.

Assigned zones:

1) oaks

2) molefoot

3) Avena/pea

4) willows

5)

6)

Worksheet for Wetland disturbances and conversions

Has a major disturbance occurred at this wetland?	Yes	No		
If yes, was it a flood, fire, landslide, or other?	flood	fire	landslide	other
If yes, then how severe is the disturbance?	likely to affect site next 5 or more years	likely to affect site next 3-5 years	likely to affect site next 1-2 years	
Has this wetland been converted from another type? If yes, then what was the previous type?	depressional	vernal pool	vernal pool system	
	non-confined riverine	confined riverine	seasonal estuarine	
	perennial saline estuarine	perennial non-saline estuarine	wet meadow	
	lacustrine	seep or spring	playa	

Stressor Checklist Worksheet

HYDROLOGY ATTRIBUTE (WITHIN 50 M OF AA)	Present	Significant negative effect on AA
Point Source (PS) discharges (POTW, other non-stormwater discharge)		
Non-point Source (Non-PS) discharges (urban runoff, farm drainage)		
Flow diversions or unnatural inflows		
Dams (reservoirs, detention basins, recharge basins)		
Flow obstructions (culverts, paved stream crossings)		
Weir/drop structure, tide gates		
Dredged inlet/channel		
Engineered channel (riprap, armored channel bank, bed)		
Dike/levees		
Groundwater extraction		
Ditches (borrow, agricultural drainage, mosquito control, etc.)		
Actively managed hydrology		

Comments

N/A

PHYSICAL STRUCTURE ATTRIBUTE (WITHIN 50 M OF AA)	Present	Significant negative effect on AA
Filling or dumping of sediment or soils **(N/A for restoration areas)**		
Grading/ compaction **(N/A for restoration areas)**		
Plowing/Discing **(N/A for restoration areas)**		
Resource extraction (sediment, gravel, oil and/or gas)		
Vegetation management		
Excessive sediment or organic debris from watershed		
Excessive runoff from watershed		
Nutrient impaired (PS or Non-PS pollution)		
Heavy metal impaired (PS or Non-PS pollution)		
Pesticides or trace organics impaired (PS or Non-PS pollution)		
Bacteria and pathogens impaired (PS or Non-PS pollution)		
Trash or refuse	X	

Comments

BIOTIC STRUCTURE ATTRIBUTE (WITHIN 50 M OF AA)	Present	Significant negative effect on AA
Mowing, grazing, excessive herbivory (within AA)		
Excessive human visitation		
Predation and habitat destruction by non-native vertebrates (e.g., *Virginia opossum* and domestic predators, such as feral pets)	X	X
Tree cutting/sapling removal		
Removal of woody debris		
Treatment of non-native and nuisance plant species		
Pesticide application or vector control		
Biological resource extraction or stocking (fisheries, aquaculture)		
Excessive organic debris in matrix (for vernal pools)		
Lack of vegetation management to conserve natural resources		
Lack of treatment of invasive plants adjacent to AA or buffer	X	
Comments		

BUFFER AND LANDSCAPE CONTEXT ATTRIBUTE (WITHIN 500 M OF AA)	Present	Significant negative effect on AA
Urban residential		
Industrial/commercial		
Military training/Air traffic		
Dams (or other major flow regulation or disruption)		
Dryland farming		
Intensive row-crop agriculture		
Orchards/nurseries		
Commercial feedlots		
Dairies		
Ranching (enclosed livestock grazing or horse paddock or feedlot)		
Transportation corridor		
Rangeland (livestock rangeland also managed for native vegetation)		
Sports fields and urban parklands (golf courses, soccer fields, etc.)		
Passive recreation (bird-watching, hiking, etc.)		
Active recreation (off-road vehicles, mountain biking, hunting, fishing)	X	
Physical resource extraction (rock, sediment, oil/gas)		
Biological resource extraction (aquaculture, commercial fisheries)		
Comments		

Basic Information Sheet: Riverine Wetlands

Assessment Area Name: AA-30
Project Name: HSR-JM
Assessment Area ID #:
Project ID #:
Date: 4/23/2019
Assessment Team Members for This AA: Lanika Cervantes
Marty Lewis

Average Bankfull Width: 5 meters

Approximate Length of AA (10 times bankfull width, min 100 m, max 200 m): 100m

Upstream Point Latitude: **Longitude:**

Downstream Point Latitude: **Longitude:**

Wetland Sub-type:

☒ Confined ☐ Non-confined

AA Category:

☐ Restoration ☐ Mitigation ☒ Impacted ☐ Ambient ☐ Reference ☐ Training
☐ Other:

Did the river/stream have flowing water at the time of the assessment? ☐ yes ☒ no

What is the apparent hydrologic flow regime of the reach you are assessing?

The hydrologic flow regime of a stream describes the frequency with which the channel conducts water. *Perennial* streams conduct water all year long, whereas *ephemeral* streams conduct water only during and immediately following precipitation events. *Intermittent* streams are dry for part of the year, but conduct water for periods longer than ephemeral streams, as a function of watershed size and water source.

☐ perennial ☐ intermittent ☒ ephemeral

Photo Identification Numbers and Description:

	Photo ID No.	Description	Latitude	Longitude	Datum
1		Upstream			
2		Middle Left			
3		Middle Right			
4		Downstream			
5					
6					
7					
8					
9					
10					

Site Location Description:

Comments:

Scoring Sheet: Riverine Wetlands

AA Name: AA30			**Date:** 4/23/19
Attribute 1: Buffer and Landscape Context (pp. 11-19)			**Comments**
Stream Corridor Continuity (D)	Alpha.	Numeric	
	A	12	contiguous
Buffer:			
Buffer submetric A: Percent of AA with Buffer	Alpha. A	Numeric 12	100% buffer
Buffer submetric B: Average Buffer Width	A	12	250m avg
Buffer submetric C: Buffer Condition	B	9	60-70% nonnatives
Raw Attribute Score = $D+[C \times (A \times B)^{1/2}]^{1/2}$			**Final Attribute Score = (Raw Score/24) x 100**
Attribute 2: Hydrology (pp. 20-26)			
	Alpha.	Numeric	
Water Source	A	12	all natural
Channel Stability	B	9	~~[illegible]~~ equal w/ degrad
Hydrologic Connectivity	B	9	1.8 ratio
Raw Attribute Score = sum of numeric scores			**Final Attribute Score = (Raw Score/36) x 100**
Attribute 3: Physical Structure (pp. 27-33)			
	Alpha.	Numeric	
Structural Patch Richness	C	6	5 patches
Topographic Complexity	B	9	1 bench w/ lots of micro
Raw Attribute Score = sum of numeric scores			**Final Attribute Score = (Raw Score/24) x 100**
Attribute 4: Biotic Structure (pp. 34-41)			
Plant Community Composition (based on sub-metrics A-C)			
	Alpha.	Numeric	
Plant Community submetric A: Number of plant layers	A	12	4 plant layers
Plant Community submetric B: Number of Co-dominant species	B	9	8 codom
Plant Community submetric C: Percent Invasion	B	9	25% invasion
Plant Community Composition Metric *(numeric average of submetrics A-C)*			
Horizontal Interspersion	C	6	low interspersion
Vertical Biotic Structure	B	9	~60% overlap of 2 layers
Raw Attribute Score = sum of numeric scores			**Final Attribute Score = (Raw Score/36) x 100**
Overall AA Score (average of four final Attribute Scores)			

Worksheet for Stream Corridor Continuity Metric for Riverine Wetlands

Lengths of Non-buffer Segments For Distance of 500 m Upstream of AA		Lengths of Non-buffer Segments For Distance of 500 m Downstream of AA	
Segment No.	Length (m)	Segment No.	Length (m)
1		1	
2		2	
3		3	
4		4	
5		5	
Upstream Total Length	0	Downstream Total Length	0

Percent of AA with Buffer Worksheet

In the space provided below make a quick sketch of the AA, or perform the assessment directly on the aerial imagery; indicate where buffer is present, estimate the percentage of the AA perimeter providing buffer functions, and record the estimate amount in the space provided.

Percent of AA with Buffer: 100 **%**

Worksheet for calculating average buffer width of AA

Line	Buffer Width (m)
A	250
B	
C	
D	
E	
F	
G	
H	
Average Buffer Width ***Round to the nearest integer***	250

Worksheet for Assessing Channel Stability for Riverine Wetlands

Condition	Field Indicators (check all existing conditions)
Indicators of Channel Equilibrium	☐ The channel (or multiple channels in braided systems) has a well-defined bankfull contour that clearly demarcates an obvious active floodplain in the cross-sectional profile of the channel throughout most of the AA. ☑ Perennial riparian vegetation is abundant and well established along the bankfull contour, but not below it. ☑ There is leaf litter, thatch, or wrack in most pools (if pools are present). ☐ The channel contains embedded woody debris of the size and amount consistent with what is naturally available in the riparian area. ☐ There is little or no active undercutting or burial of riparian vegetation. ☐ If mid-channel bars and/or point bars are present, they are not densely vegetated with perennial vegetation. ☐ Channel bars consist of well-sorted bed material (smaller grain size on the top and downstream end of the bar, larger grain size along the margins and upstream end of the bar). ☐ There are channel pools, the spacing between pools tends to be regular and the bed is not planar throughout the AA ☐ The larger bed material supports abundant mosses or periphyton.
Indicators of Active Degradation	☐ The channel is characterized by deeply undercut banks with exposed living roots of trees or shrubs. ☐ There are abundant bank slides or slumps. ☐ The lower banks are uniformly scoured and not vegetated. ☑ Riparian vegetation is declining in stature or vigor, or many riparian trees and shrubs along the banks are leaning or falling into the channel. ☐ An obvious historical floodplain has recently been abandoned, as indicated by the age structure of its riparian vegetation. ☐ The channel bed appears scoured to bedrock or dense clay. ☐ Recently active flow pathways appear to have coalesced into one channel (i.e. a previously braided system is no longer braided). ☑ The channel has one or more knickpoints indicating headward erosion of the bed.
Indicators of Active Aggradation	☐ There is an active floodplain with fresh splays of coarse sediment (sand and larger that is not vegetated) deposited in the current or previous year. ☐ There are partially buried living tree trunks or shrubs along the banks. ☐ The bed is planar (flat or uniform gradient) overall; it lacks well-defined channel pools, or they are uncommon and irregularly spaced. ☐ There are partially buried, or sediment-choked, culverts. ☐ Perennial terrestrial or riparian vegetation is encroaching into the channel or onto channel bars below the bankfull contour. ☐ There are avulsion channels on the floodplain or adjacent valley floor.
Overall	☑ **Equilibrium** ☑ **Degradation** ☐ **Aggradation**

Riverine Wetland Entrenchment Ratio Calculation Worksheet

The following 5 steps should be conducted for each of 3 cross-sections located in the AA at the approximate midpoints along straight riffles or glides, away from deep pools or meander bends. An attempt should be made to place them at the top, middle, and bottom of the AA.

Steps	Replicate Cross-sections ⟶	TOP	MID	BOT
1 Estimate bankfull width.	This is a critical step requiring familiarity with field indicators of the bankfull contour. Estimate or measure the distance between the right and left bankfull contours.	3.75	4.5	2.78
2: Estimate max. bankfull depth.	Imagine a level line between the right and left bankfull contours; estimate or measure the height of the line above the thalweg (the deepest part of the channel).	0.3	0.5	0.4
3: Estimate flood prone depth.	Double the estimate of maximum bankfull depth from Step 2.	0.6	1.0	0.8
4: Estimate flood prone width.	Imagine a level line having a height equal to the flood prone depth from Step 3; note where the line intercepts the right and left banks; estimate or measure the length of this line.	4	9	6.5
5: Calculate entrenchment ratio.	Divide the flood prone width (Step 4) by the bankfull width (Step 1).	1.1	2.0	2.36
6: Calculate average entrenchment ratio.	Calculate the average results for Step 5 for all 3 replicate cross-sections. Enter the average result here and use it in Table 13a or 13b.			1.8

Structural Patch Type Worksheet for Riverine wetlands

Circle each type of patch that is observed in the AA and enter the total number of observed patches in Table below. In the case of riverine wetlands, their status as confined or non-confined must first be determined (see page 6) to determine with patches are expected in the system (indicated by a "1" in the table below). Any feature onsite should only be counted once as a patch type. If a feature appears to meet the definition of more than one patch type (i.e. swale and secondary channel) the practitioner should choose which patch type best illustrates the feature. Not all features at a site will be patch types.

Please refer to the CRAM Photo Dictionary at www.cramwetlands.org for photos of each of the following patch types.

STRUCTURAL PATCH TYPE (circle for presence)	Riverine (Non-confined)	Riverine (Confined)
Minimum Patch Size	3 m^2	3 m^2
Abundant wrackline or organic debris in channel, on floodplain	1	1
Bank slumps or undercut banks in channels or along shoreline	1	1
Cobbles and/or Boulders	1	1
Debris jams	1	1
Filamentous macroalgae or algal mats	1	1
Large woody debris	1	1
Pannes or pools on floodplain	1	N/A
Plant hummocks and/or sediment mounds	1	1
Point bars and in-channel bars	1	1
Pools or depressions in channels (wet or dry channels)	1	1
Riffles or rapids (wet or dry channels)	1	1
Secondary channels on floodplains or along shorelines	1	N/A
Standing snags (at least 3 m tall)	1	1
Submerged vegetation	1	N/A
Swales on floodplain or along shoreline	1	N/A
Variegated, convoluted, or crenulated foreshore (instead of broadly arcuate or mostly straight)	1	1
Vegetated islands (mostly above high-water)	1	N/A
Total Possible	17	12
No. Observed Patch Types (enter here and use in Table 14 below)		5

Worksheet for AA Topographic Complexity

At three locations along the AA, make a sketch of the profile of the stream from the AA boundary down to its deepest area then back out to the other AA boundary. Try to capture the benches and the intervening micro-topographic relief. To maintain consistency, make drawings at each of the stream hydrologic connectivity measurements, always facing downstream. Include the water level, an arrow at the bankfull contour, and label the benches. Based on these sketches and the profiles in Figure 10, choose a description in Table 16 that best describes the overall topographic complexity of the AA.

Profile 1

Profile 2

Profile 3

Plant Community Metric Worksheet: Co-dominant species richness for Riverine wetlands

(A dominant species represents ≥10% *relative* cover)

Special Note:

* *Combine the counts of co-dominant species from all layers to identify the total species count. Each plant species is only counted once when calculating the Number of Co-dominant Species and Percent Invasion submetric scores, regardless of the numbers of layers in which it occurs.*

Floating or Canopy-forming (non-confined only)	Invasive?	Short (<0.5 m)	Invasive?
		Italian thistle	Y
		Claytonia	

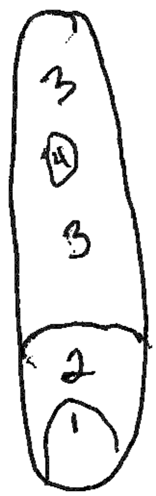
Medium (0.5-1.5 m)	Invasive?	Tall (1.5-3.0 m)	Invasive?
Artemisia californica		Poison Oak	
Avena sp.	Y	Bac salicifolia	

Very Tall (>3.0 m)	Invasive?
~~[illegible]~~	
~~[illegible] (?)~~	
Salix laeviagata	
Quercus wislezeni	

Total number of co-dominant species for all layers combined (enter here and use in Table 18)	8
Percent Invasion *Round to the nearest integer* (enter here and use in Table 18)	25%

Horizontal Interspersion Worksheet.

Use the spaces below to make a quick sketch of the AA in plan view, outlining the major plant zones (this should take no longer than 10 minutes). Assign the zones names and record them on the right. Based on the sketch, choose a single profile from Figure 12 that best represents the AA overall.



Assigned zones:

1) Baccharis / mugwort

2) Willows

3) Oak + poison oak

4) Toyon

5)

6)

Worksheet for Wetland disturbances and conversions

Has a major disturbance occurred at this wetland?	Yes	No		
If yes, was it a flood, fire, landslide, or other?	flood	fire	landslide	other
If yes, then how severe is the disturbance?	likely to affect site next 5 or more years	likely to affect site next 3-5 years	likely to affect site next 1-2 years	
Has this wetland been converted from another type? If yes, then what was the previous type?	depressional	vernal pool	vernal pool system	
	non-confined riverine	confined riverine	seasonal estuarine	
	perennial saline estuarine	perennial non-saline estuarine	wet meadow	
	lacustrine	seep or spring	playa	

Stressor Checklist Worksheet

HYDROLOGY ATTRIBUTE (WITHIN 50 M OF AA)	Present	Significant negative effect on AA
Point Source (PS) discharges (POTW, other non-stormwater discharge)		
Non-point Source (Non-PS) discharges (urban runoff, farm drainage)		
Flow diversions or unnatural inflows		
Dams (reservoirs, detention basins, recharge basins)		
Flow obstructions (culverts, paved stream crossings)		
Weir/drop structure, tide gates		
Dredged inlet/channel		
Engineered channel (riprap, armored channel bank, bed)		
Dike/levees		
Groundwater extraction		
Ditches (borrow, agricultural drainage, mosquito control, etc.)		
Actively managed hydrology		

Comments

n/A

PHYSICAL STRUCTURE ATTRIBUTE (WITHIN 50 M OF AA)	Present	Significant negative effect on AA
Filling or dumping of sediment or soils **(N/A for restoration areas)**		
Grading/ compaction **(N/A for restoration areas)**		
Plowing/Discing **(N/A for restoration areas)**		
Resource extraction (sediment, gravel, oil and/or gas)		
Vegetation management		
Excessive sediment or organic debris from watershed		
Excessive runoff from watershed		
Nutrient impaired (PS or Non-PS pollution)		
Heavy metal impaired (PS or Non-PS pollution)		
Pesticides or trace organics impaired (PS or Non-PS pollution)		
Bacteria and pathogens impaired (PS or Non-PS pollution)		
Trash or refuse	X	

Comments

n/A

BIOTIC STRUCTURE ATTRIBUTE (WITHIN 50 M OF AA)	Present	Significant negative effect on AA
Mowing, grazing, excessive herbivory (within AA)		
Excessive human visitation		
Predation and habitat destruction by non-native vertebrates (e.g., *Virginia opossum* and domestic predators, such as feral pets)	X	
Tree cutting/sapling removal		
Removal of woody debris		
Treatment of non-native and nuisance plant species		
Pesticide application or vector control		
Biological resource extraction or stocking (fisheries, aquaculture)		
Excessive organic debris in matrix (for vernal pools)		
Lack of vegetation management to conserve natural resources		
Lack of treatment of invasive plants adjacent to AA or buffer	X	

Comments

BUFFER AND LANDSCAPE CONTEXT ATTRIBUTE (WITHIN 500 M OF AA)	Present	Significant negative effect on AA
Urban residential		
Industrial/commercial		
Military training/Air traffic		
Dams (or other major flow regulation or disruption)		
Dryland farming		
Intensive row-crop agriculture		
Orchards/nurseries		
Commercial feedlots		
Dairies		
Ranching (enclosed livestock grazing or horse paddock or feedlot)		
Transportation corridor		
Rangeland (livestock rangeland also managed for native vegetation)		
Sports fields and urban parklands (golf courses, soccer fields, etc.)		
Passive recreation (bird-watching, hiking, etc.)		
Active recreation (off-road vehicles, mountain biking, hunting, fishing)	X	
Physical resource extraction (rock, sediment, oil/gas)		
Biological resource extraction (aquaculture, commercial fisheries)		

Comments N/A

Basic Information Sheet: Riverine Wetlands

Assessment Area Name: AA31
Project Name: ASR -JM
Assessment Area ID #: AA-31
Project ID #:
Date: 4/23/19
Assessment Team Members for This AA:
L. Cervantes , Marty Lewis

Average Bankfull Width: 1.75 meter
Approximate Length of AA (10 times bankfull width, min 100 m, max 200 m): 100m
Upstream Point Latitude: **Longitude:**
Downstream Point Latitude: **Longitude:**

Wetland Sub-type:

☒ Confined ☐ Non-confined

AA Category:

☐ Restoration ☐ Mitigation ☒ Impacted ☐ Ambient ☐ Reference ☐ Training
☐ Other:

Did the river/stream have flowing water at the time of the assessment? ~~☒ yes~~ ☒ no

What is the apparent hydrologic flow regime of the reach you are assessing?

The hydrologic flow regime of a stream describes the frequency with which the channel conducts water. *Perennial* streams conduct water all year long, whereas *ephemeral* streams conduct water only during and immediately following precipitation events. *Intermittent* streams are dry for part of the year, but conduct water for periods longer than ephemeral streams, as a function of watershed size and water source.

☐ perennial ~~☒ intermittent~~ ☒ ephemeral

Photo Identification Numbers and Description:

	Photo ID No.	Description	Latitude	Longitude	Datum
1	1	Upstream			
2		Middle Left			
3		Middle Right			
4		Downstream			
5					
6					
7					
8					
9					
10					

Site Location Description:

Near head water of drainage. ~~Flowing water~~ ~~drying sweep~~ Small ephemeral drainage

Comments:

Scoring Sheet: Riverine Wetlands

AA Name: AA31			Date: 4/23/19
Attribute 1: Buffer and Landscape Context (pp. 11-19)			**Comments**
Stream Corridor Continuity (D)	Alpha.	Numeric	
	A	12	Continuous + no breaks
Buffer:			
Buffer submetric A: Percent of AA with Buffer	A	12	100% buffer
Buffer submetric B: Average Buffer Width	A	12	250m avg buffer
Buffer submetric C: Buffer Condition	C	6	>75% nonative.
Raw Attribute Score = D+[C x (A x B)$^{1/2}$]$^{1/2}$			**Final Attribute Score = (Raw Score/24) x 100**
Attribute 2: Hydrology (pp. 20-26)			
	Alpha.	Numeric	
Water Source	A	12	no unnatural sources near headwaters
Channel Stability	A	12	equilibrium w/little agradation
Hydrologic Connectivity	A	12	2.0 entrinchment
Raw Attribute Score = sum of numeric scores			**Final Attribute Score = (Raw Score/36) x 100**
Attribute 3: Physical Structure (pp. 27-33)			
	Alpha.	Numeric	
Structural Patch Richness	C	6	5 patches
Topographic Complexity	C	6	micro and part of AA has a bench
Raw Attribute Score = sum of numeric scores			**Final Attribute Score = (Raw Score/24) x 100**
Attribute 4: Biotic Structure (pp. 34-41)			
Plant Community Composition (based on sub-metrics A-C)			
	Alpha.	Numeric	
Plant Community submetric A: Number of plant layers	A	12	4 layers
Plant Community submetric B: Number of Co-dominant species	C	6	5 codominate
Plant Community submetric C: Percent Invasion	C	6	40% invasion
Plant Community Composition Metric *(numeric average of submetrics A-C)*			
Horizontal Interspersion	D	3	low interspesion
Vertical Biotic Structure	C	6	25-50% overlap
Raw Attribute Score = sum of numeric scores			**Final Attribute Score = (Raw Score/36) x 100**
Overall AA Score (average of four final Attribute Scores)			

Worksheet for Stream Corridor Continuity Metric for Riverine Wetlands

Lengths of Non-buffer Segments For Distance of 500 m Upstream of AA		Lengths of Non-buffer Segments For Distance of 500 m Downstream of AA	
Segment No.	Length (m)	Segment No.	Length (m)
1	0	1	0
2		2	
3		3	
4		4	
5		5	
Upstream Total Length	0	Downstream Total Length	0

Percent of AA with Buffer Worksheet

In the space provided below make a quick sketch of the AA, or perform the assessment directly on the aerial imagery; indicate where buffer is present, estimate the percentage of the AA perimeter providing buffer functions, and record the estimate amount in the space provided.

Full buffer

Percent of AA with Buffer: 100 %

Worksheet for calculating average buffer width of AA

Line	Buffer Width (m)
A	250
B	
C	
D	
E	
F	
G	
H	
Average Buffer Width *Round to the nearest integer*	250

Worksheet for Assessing Channel Stability for Riverine Wetlands

Condition	Field Indicators (check all existing conditions)
Indicators of Channel Equilibrium	☒ The channel (or multiple channels in braided systems) has a well-defined bankfull contour that clearly demarcates an obvious active floodplain in the cross-sectional profile of the channel throughout most of the AA. ☐ Perennial riparian vegetation is abundant and well established along the bankfull contour, but not below it. ☒ There is leaf litter, thatch, or wrack in most pools (if pools are present). ☐ The channel contains embedded woody debris of the size and amount consistent with what is naturally available in the riparian area. ☐ There is little or no active undercutting or burial of riparian vegetation. ☐ If mid-channel bars and/or point bars are present, they are not densely vegetated with perennial vegetation. ☐ Channel bars consist of well-sorted bed material (smaller grain size on the top and downstream end of the bar, larger grain size along the margins and upstream end of the bar). ☒ There are channel pools, the spacing between pools tends to be regular and the bed is not planar throughout the AA ☐ The larger bed material supports abundant mosses or periphyton.
Indicators of Active Degradation	☐ The channel is characterized by deeply undercut banks with exposed living roots of trees or shrubs. ☐ There are abundant bank slides or slumps. ☐ The lower banks are uniformly scoured and not vegetated. ☐ Riparian vegetation is declining in stature or vigor, or many riparian trees and shrubs along the banks are leaning or falling into the channel. ☐ An obvious historical floodplain has recently been abandoned, as indicated by the age structure of its riparian vegetation. ☐ The channel bed appears scoured to bedrock or dense clay. ☐ Recently active flow pathways appear to have coalesced into one channel (i.e. a previously braided system is no longer braided). ☐ The channel has one or more knickpoints indicating headward erosion of the bed.
Indicators of Active Aggradation	☐ There is an active floodplain with fresh splays of coarse sediment (sand and larger that is not vegetated) deposited in the current or previous year. ☐ There are partially buried living tree trunks or shrubs along the banks. ☐ The bed is planar (flat or uniform gradient) overall; it lacks well-defined channel pools, or they are uncommon and irregularly spaced. ☐ There are partially buried, or sediment-choked, culverts. ☒ Perennial terrestrial or riparian vegetation is encroaching into the channel or onto channel bars below the bankfull contour. ☐ There are avulsion channels on the floodplain or adjacent valley floor.
Overall	☒ **Equilibrium** ☐ **Degradation** ☐ **Aggradation**

Riverine Wetland Entrenchment Ratio Calculation Worksheet

The following 5 steps should be conducted for each of 3 cross-sections located in the AA at the approximate midpoints along straight riffles or glides, away from deep pools or meander bends. An attempt should be made to place them at the top, middle, and bottom of the AA.

Steps	Replicate Cross-sections ⟶	TOP	MID	BOT
1 Estimate bankfull width.	This is a critical step requiring familiarity with field indicators of the bankfull contour. Estimate or measure the distance between the right and left bankfull contours.	1.75	1.25	1.5
2: Estimate max. bankfull depth.	Imagine a level line between the right and left bankfull contours; estimate or measure the height of the line above the thalweg (the deepest part of the channel).	.15	.35	.35
3: Estimate flood prone depth.	Double the estimate of maximum bankfull depth from Step 2.	.30	.70	.70
4: Estimate flood prone width.	Imagine a level line having a height equal to the flood prone depth from Step 3; note where the line intercepts the right and left banks; estimate or measure the length of this line.	2.75	3.25	3.0
5: Calculate entrenchment ratio.	Divide the flood prone width (Step 4) by the bankfull width (Step 1). 1.5		2.6	2
6: Calculate average entrenchment ratio.	Calculate the average results for Step 5 for all 3 replicate cross-sections. Enter the average result here and use it in Table 13a or 13b.			2.0

Structural Patch Type Worksheet for Riverine wetlands

Circle each type of patch that is observed in the AA and enter the total number of observed patches in Table below. In the case of riverine wetlands, their status as confined or non-confined must first be determined (see page 6) to determine with patches are expected in the system (indicated by a "1" in the table below). Any feature onsite should only be counted once as a patch type. If a feature appears to meet the definition of more than one patch type (i.e. swale and secondary channel) the practitioner should choose which patch type best illustrates the feature. Not all features at a site will be patch types.

Please refer to the CRAM Photo Dictionary at *www.cramwetlands.org* for photos of each of the following patch types.

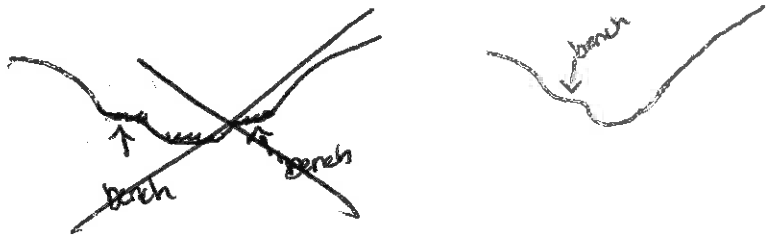
STRUCTURAL PATCH TYPE (circle for presence)	Riverine (Non-confined)	Riverine (Confined)
Minimum Patch Size	3 m²	3 m²
Abundant wrackline or organic debris in channel, on floodplain	1	1
Bank slumps or undercut banks in channels or along shoreline	1	1
Cobbles and/or Boulders	1	1
Debris jams	1	1
Filamentous macroalgae or algal mats	1	1
Large woody debris	1	1
Pannes or pools on floodplain	1	N/A
Plant hummocks and/or sediment mounds	1	1
Point bars and in-channel bars	1	1
Pools or depressions in channels (wet or dry channels)	1	1
Riffles or rapids (wet or dry channels)	1	1
Secondary channels on floodplains or along shorelines	1	N/A
Standing snags (at least 3 m tall)	1	1
Submerged vegetation	1	N/A
Swales on floodplain or along shoreline	1	N/A
Variegated, convoluted, or crenulated foreshore (instead of broadly arcuate or mostly straight)	1	1
Vegetated islands (mostly above high-water)	1	N/A
Total Possible	17	12
No. Observed Patch Types (enter here and use in Table 14 below)		5

Worksheet for AA Topographic Complexity

At three locations along the AA, make a sketch of the profile of the stream from the AA boundary down to its deepest area then back out to the other AA boundary. Try to capture the benches and the intervening micro-topographic relief. To maintain consistency, make drawings at each of the stream hydrologic connectivity measurements, always facing downstream. Include the water level, an arrow at the bankfull contour, and label the benches. Based on these sketches and the profiles in Figure 10, choose a description in Table 16 that best describes the overall topographic complexity of the AA.

Profile 1

Top



Profile 2

Mid

Profile 3

Bottom

Plant Community Metric Worksheet: Co-dominant species richness for Riverine wetlands

(A dominant species represents ≥10% *relative* cover)

Special Note:

** Combine the counts of co-dominant species from all layers to identify the total species count. Each plant species is only counted once when calculating the Number of Co-dominant Species and Percent Invasion submetric scores, regardless of the numbers of layers in which it occurs.*

Floating or Canopy-forming (non-confined only)	Invasive?	Short (<0.5 m)	Invasive?
		Claytonia perfoliata	
		Italian thistle	✓

Medium (0.5-1.5 m)	Invasive?	Tall (1.5-3.0 m)	Invasive?
Avena fatua(?)	✓	Artemesia californica	

Very Tall (>3.0 m)	Invasive?
~~Engelmann Oak~~	
Quercus wislezeni	

Total number of co-dominant species for all layers combined (enter here and use in Table 18)	5
Percent Invasion *Round to the nearest integer* (enter here and use in Table 18)	40%

Horizontal Interspersion Worksheet.

Use the spaces below to make a quick sketch of the AA in plan view, outlining the major plant zones (this should take no longer than 10 minutes). Assign the zones names and record them on the right. Based on the sketch, choose a single profile from Figure 12 that best represents the AA overall.

Assigned zones:

1) Oaks

2) Art cal

3) Oats + claytonia

4)

5)

6)

Worksheet for Wetland disturbances and conversions

Has a major disturbance occurred at this wetland?	Yes	No		
If yes, was it a flood, fire, landslide, or other?	flood	fire	landslide	other
If yes, then how severe is the disturbance?	likely to affect site next 5 or more years	likely to affect site next 3-5 years	likely to affect site next 1-2 years	
Has this wetland been converted from another type? If yes, then what was the previous type?	depressional	vernal pool	vernal pool system	
	non-confined riverine	confined riverine	seasonal estuarine	
	perennial saline estuarine	perennial non-saline estuarine	wet meadow	
	lacustrine	seep or spring	playa	

Stressor Checklist Worksheet

HYDROLOGY ATTRIBUTE (WITHIN 50 M OF AA)	Present	Significant negative effect on AA
Point Source (PS) discharges (POTW, other non-stormwater discharge)		
Non-point Source (Non-PS) discharges (urban runoff, farm drainage)		
Flow diversions or unnatural inflows		
Dams (reservoirs, detention basins, recharge basins)		
Flow obstructions (culverts, paved stream crossings)		
Weir/drop structure, tide gates		
Dredged inlet/channel		
Engineered channel (riprap, armored channel bank, bed)		
Dike/levees		
Groundwater extraction		
Ditches (borrow, agricultural drainage, mosquito control, etc.)		
Actively managed hydrology		
Comments		

PHYSICAL STRUCTURE ATTRIBUTE (WITHIN 50 M OF AA)	Present	Significant negative effect on AA
Filling or dumping of sediment or soils **(N/A for restoration areas)**		
Grading/ compaction **(N/A for restoration areas)**		
Plowing/Discing **(N/A for restoration areas)**		
Resource extraction (sediment, gravel, oil and/or gas)		
Vegetation management		
Excessive sediment or organic debris from watershed		
Excessive runoff from watershed		
Nutrient impaired (PS or Non-PS pollution)		
Heavy metal impaired (PS or Non-PS pollution)		
Pesticides or trace organics impaired (PS or Non-PS pollution)		
Bacteria and pathogens impaired (PS or Non-PS pollution)		
Trash or refuse		
Comments		

BIOTIC STRUCTURE ATTRIBUTE (WITHIN 50 M OF AA)	Present	Significant negative effect on AA
Mowing, grazing, excessive herbivory (within AA)		
Excessive human visitation		
Predation and habitat destruction by non-native vertebrates (e.g., *Virginia opossum* and domestic predators, such as feral pets)	✓	
Tree cutting/sapling removal		
Removal of woody debris		
Treatment of non-native and nuisance plant species		
Pesticide application or vector control		
Biological resource extraction or stocking (fisheries, aquaculture)		
Excessive organic debris in matrix (for vernal pools)		
Lack of vegetation management to conserve natural resources		
Lack of treatment of invasive plants adjacent to AA or buffer	✓	

Comments

Wild ~~bee~~ pigs in area.

BUFFER AND LANDSCAPE CONTEXT ATTRIBUTE (WITHIN 500 M OF AA)	Present	Significant negative effect on AA
Urban residential		
Industrial/commercial		
Military training/Air traffic		
Dams (or other major flow regulation or disruption)		
Dryland farming		
Intensive row-crop agriculture		
Orchards/nurseries		
Commercial feedlots		
Dairies		
Ranching (enclosed livestock grazing or horse paddock or feedlot)		
Transportation corridor		
Rangeland (livestock rangeland also managed for native vegetation)		
Sports fields and urban parklands (golf courses, soccer fields, etc.)		
Passive recreation (bird-watching, hiking, etc.)		
Active recreation (off-road vehicles, mountain biking, hunting, fishing)	✓	
Physical resource extraction (rock, sediment, oil/gas)		
Biological resource extraction (aquaculture, commercial fisheries)		

Comments N/A

Basic Information Sheet: Riverine Wetlands

Assessment Area Name: AA32 -NAW - 05133	
Project Name: HSR JM	
Assessment Area ID #:	
Project ID #:	**Date:** 4/23/19
Assessment Team Members for This AA:	
LSL, KK	
Average Bankfull Width: 8m	
Approximate Length of AA (10 times bankfull width, min 100 m, max 200 m): 100m	
Upstream Point Latitude:	**Longitude:**
Downstream Point Latitude:	**Longitude:**

Wetland Sub-type:

☐ Confined ☒ Non-confined

AA Category:

☐ Restoration ☐ Mitigation ☒ Impacted ☐ Ambient ☐ Reference ☐ Training

☐ Other:

Did the river/stream have flowing water at the time of the assessment? ☐ yes ☒ no

What is the apparent hydrologic flow regime of the reach you are assessing?

The hydrologic flow regime of a stream describes the frequency with which the channel conducts water. *Perennial* streams conduct water all year long, whereas *ephemeral* streams conduct water only during and immediately following precipitation events. *Intermittent* streams are dry for part of the year, but conduct water for periods longer than ephemeral streams, as a function of watershed size and water source.

☐ perennial ☒ intermittent ☒ ephemeral

Photo Identification Numbers and Description:

	Photo ID No.	Description	Latitude	Longitude	Datum
1		Upstream			
2		Middle Left			
3		Middle Right			
4		Downstream			
5					
6					
7					
8					
9					
10					

Site Location Description:

Comments:

2 photos on KK phone
1 facing upstream
2 facing downstream

Scoring Sheet: Riverine Wetlands

AA Name: AA32			Date: 4/23/19
Attribute 1: Buffer and Landscape Context (pp. 11-19)			Comments
	Alpha.	Numeric	
Stream Corridor Continuity (D)	D		7350m ~~upstream~~ downstream break
Buffer:			
Buffer submetric A: Percent of AA with Buffer	A		100%
Buffer submetric B: Average Buffer Width	B		133m
Buffer submetric C: Buffer Condition	B		
Raw Attribute Score = D+[C x (A x B)½]½			**Final Attribute Score = (Raw Score/24) x 100**
Attribute 2: Hydrology (pp. 20-26)			
	Alpha.	Numeric	
Water Source	C		
Channel Stability	B		
Hydrologic Connectivity	A		
Raw Attribute Score = sum of numeric scores			**Final Attribute Score = (Raw Score/36) x 100**
Attribute 3: Physical Structure (pp. 27-33)			
	Alpha.	Numeric	
Structural Patch Richness	C		8 patches
Topographic Complexity	D		no benches
Raw Attribute Score = sum of numeric scores			**Final Attribute Score = (Raw Score/24) x 100**
Attribute 4: Biotic Structure (pp. 34-41)			
Plant Community Composition (based on sub-metrics A-C)			
	Alpha.	Numeric	
Plant Community submetric A: Number of plant layers	C		2 layers
Plant Community submetric B: Number of Co-dominant species	D		4 codoms
Plant Community submetric C: Percent Invasion	D		75% invasion
Plant Community Composition Metric *(numeric average of submetrics A-C)*			
Horizontal Interspersion	D		
Vertical Biotic Structure	D		
Raw Attribute Score = sum of numeric scores			**Final Attribute Score = (Raw Score/36) x 100**
Overall AA Score (average of four final Attribute Scores)			

Worksheet for Stream Corridor Continuity Metric for Riverine Wetlands

Lengths of Non-buffer Segments For Distance of 500 m Upstream of AA		Lengths of Non-buffer Segments For Distance of 500 m Downstream of AA	
Segment No.	Length (m)	Segment No.	Length (m)
1		1	
2		2	
3		3	
4		4	
5		5	
Upstream Total Length		Downstream Total Length	350m

Percent of AA with Buffer Worksheet

In the space provided below make a quick sketch of the AA, or perform the assessment directly on the aerial imagery; indicate where buffer is present, estimate the percentage of the AA perimeter providing buffer functions, and record the estimate amount in the space provided.

Percent of AA with Buffer: 100 %

Worksheet for calculating average buffer width of AA

Line	Buffer Width (m)
A	250
B	250
C	250
D	250
E	10
F	15
G	25
H	15
Average Buffer Width ***Round to the nearest integer***	133.1

Worksheet for Assessing Channel Stability for Riverine Wetlands

Condition	Field Indicators (check all existing conditions)
Indicators of Channel Equilibrium	☐ The channel (or multiple channels in braided systems) has a well-defined bankfull contour that clearly demarcates an obvious active floodplain in the cross-sectional profile of the channel throughout most of the AA. ☐ Perennial riparian vegetation is abundant and well established along the bankfull contour, but not below it. ☐ There is leaf litter, thatch, or wrack in most pools (if pools are present). ☐ The channel contains embedded woody debris of the size and amount consistent with what is naturally available in the riparian area. ☒ There is little or no active undercutting or burial of riparian vegetation. ☐ If mid-channel bars and/or point bars are present, they are not densely vegetated with perennial vegetation. ☐ Channel bars consist of well-sorted bed material (smaller grain size on the top and downstream end of the bar, larger grain size along the margins and upstream end of the bar). ☐ There are channel pools, the spacing between pools tends to be regular and the bed is not planar throughout the AA ☐ The larger bed material supports abundant mosses or periphyton.
Indicators of Active Degradation	☐ The channel is characterized by deeply undercut banks with exposed living roots of trees or shrubs. ☐ There are abundant bank slides or slumps. ☐ The lower banks are uniformly scoured and not vegetated. ☐ Riparian vegetation is declining in stature or vigor, or many riparian trees and shrubs along the banks are leaning or falling into the channel. ☐ An obvious historical floodplain has recently been abandoned, as indicated by the age structure of its riparian vegetation. ☐ The channel bed appears scoured to bedrock or dense clay. ☐ Recently active flow pathways appear to have coalesced into one channel (i.e. a previously braided system is no longer braided). ☐ The channel has one or more knickpoints indicating headward erosion of the bed.
Indicators of Active Aggradation	☐ There is an active floodplain with fresh splays of coarse sediment (sand and larger that is not vegetated) deposited in the current or previous year. ☐ There are partially buried living tree trunks or shrubs along the banks. ☒ The bed is planar (flat or uniform gradient) overall; it lacks well-defined channel pools, or they are uncommon and irregularly spaced. ☐ There are partially buried, or sediment-choked, culverts. ☐ Perennial terrestrial or riparian vegetation is encroaching into the channel or onto channel bars below the bankfull contour. ☐ There are avulsion channels on the floodplain or adjacent valley floor.
Overall	☒ **Equilibrium** ☐ **Degradation** ☒ **Aggradation**

Riverine Wetland Entrenchment Ratio Calculation Worksheet

The following 5 steps should be conducted for each of 3 cross-sections located in the AA at the approximate midpoints along straight riffles or glides, away from deep pools or meander bends. An attempt should be made to place them at the top, middle, and bottom of the AA.				
		TOP	MID	BOT
Steps	Replicate Cross-sections ⟶			
1 Estimate bankfull width.	This is a critical step requiring familiarity with field indicators of the bankfull contour. Estimate or measure the distance between the right and left bankfull contours.	8	8	8
2: Estimate max. bankfull depth.	Imagine a level line between the right and left bankfull contours; estimate or measure the height of the line above the thalweg (the deepest part of the channel).			
3: Estimate flood prone depth.	Double the estimate of maximum bankfull depth from Step 2.			
4: Estimate flood prone width.	Imagine a level line having a height equal to the flood prone depth from Step 3; note where the line intercepts the right and left banks; estimate or measure the length of this line.	50mt	50mt	50mt
5: Calculate entrenchment ratio.	Divide the flood prone width (Step 4) by the bankfull width (Step 1).	>2.2	>2.2	>2.2
6: Calculate average entrenchment ratio.	Calculate the average results for Step 5 for all 3 replicate cross-sections. Enter the average result here and use it in Table 13a or 13b.			>2.2

Structural Patch Type Worksheet for Riverine wetlands

Circle each type of patch that is observed in the AA and enter the total number of observed patches in Table below. In the case of riverine wetlands, their status as confined or non-confined must first be determined (see page 6) to determine with patches are expected in the system (indicated by a "1" in the table below). Any feature onsite should only be counted once as a patch type. If a feature appears to meet the definition of more than one patch type (i.e. swale and secondary channel) the practitioner should choose which patch type best illustrates the feature. Not all features at a site will be patch types.

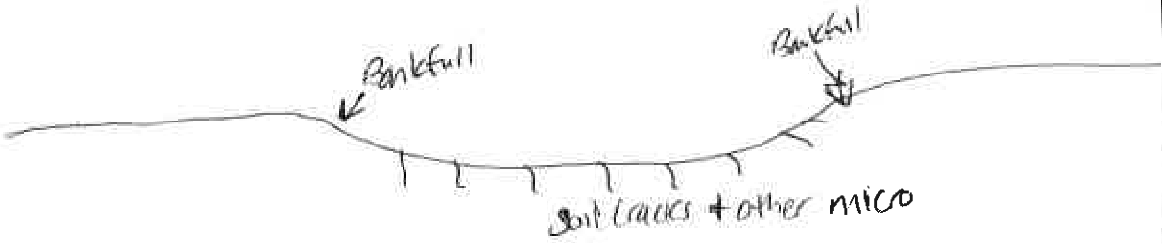
Please refer to the CRAM Photo Dictionary at** *www.cramwetlands.org* **for photos of each of the following patch types.

STRUCTURAL PATCH TYPE (circle for presence)	Riverine (Non-confined)	Riverine (Confined)
Minimum Patch Size	**3 m²**	**3 m²**
Abundant wrackline or organic debris in channel, on floodplain	1	1
Bank slumps or undercut banks in channels or along shoreline	1	1
Cobbles and/or Boulders	1	1
Debris jams	1	1
Filamentous macroalgae or algal mats	1	1
Large woody debris	1	1
Pannes or pools on floodplain	1	N/A
Plant hummocks and/or sediment mounds	1	1
Point bars and in-channel bars	1	1
Pools or depressions in channels (wet or dry channels)	1	1
Riffles or rapids (wet or dry channels)	1	1
Secondary channels on floodplains or along shorelines	1	N/A
Standing snags (at least 3 m tall)	1	1
Submerged vegetation	1	N/A
Swales on floodplain or along shoreline	1	N/A
Variegated, convoluted, or crenulated foreshore (instead of broadly arcuate or mostly straight)	1	1
Vegetated islands (mostly above high-water)	1	N/A
Total Possible	**17**	**12**
No. Observed Patch Types (enter here and use in Table 14 below)	8	

Worksheet for AA Topographic Complexity

At three locations along the AA, make a sketch of the profile of the stream from the AA boundary down to its deepest area then back out to the other AA boundary. Try to capture the benches and the intervening micro-topographic relief. To maintain consistency, make drawings at each of the stream hydrologic connectivity measurements, always facing downstream. Include the water level, an arrow at the bankfull contour, and label the benches. Based on these sketches and the profiles in Figure 10, choose a description in Table 16 that best describes the overall topographic complexity of the AA.

Profile 1



Profile 2

Profile 3

Plant Community Metric Worksheet: Co-dominant species richness for Riverine wetlands
(A dominant species represents ≥10% *relative* cover)

Special Note:

* *Combine the counts of co-dominant species from all layers to identify the total species count. Each plant species is only counted once when calculating the Number of Co-dominant Species and Percent Invasion submetric scores, regardless of the numbers of layers in which it occurs.*

Floating or Canopy-forming (non-confined only)	Invasive?

Short (<0.5 m)	Invasive?
Hordeum ~~sp~~ marinum	X

Medium (0.5-1.5 m)	Invasive?
Polypogon ~~sp~~ monspeliensis	X
Rumex conglomeratus	
Festuca perennis	X

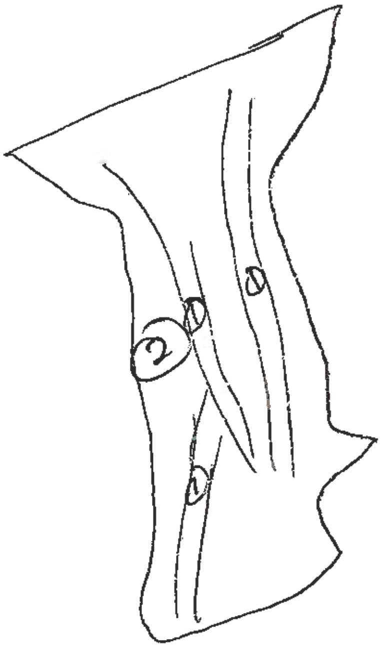
Tall (1.5-3.0 m)	Invasive?

Very Tall (>3.0 m)	Invasive?

Total number of co-dominant species for all layers combined (enter here and use in Table 18)	4
Percent Invasion *Round to the nearest integer* (enter here and use in Table 18)	75%

Horizontal Interspersion Worksheet.

Use the spaces below to make a quick sketch of the AA in plan view, outlining the major plant zones (this should take no longer than 10 minutes). Assign the zones names and record them on the right. Based on the sketch, choose a single profile from Figure 12 that best represents the AA overall.



Assigned zones:

1) open channel w/ Rumex

2) upland

3)

4)

5)

6)

Worksheet for Wetland disturbances and conversions

Has a major disturbance occurred at this wetland?	Yes	No		
If yes, was it a flood, fire, landslide, or other?	flood	fire	landslide	other
If yes, then how severe is the disturbance?	likely to affect site next 5 or more years	likely to affect site next 3-5 years	likely to affect site next 1-2 years	
Has this wetland been converted from another type? If yes, then what was the previous type?	depressional	vernal pool	vernal pool system	
	non-confined riverine	confined riverine	seasonal estuarine	
	perennial saline estuarine	perennial non-saline estuarine	wet meadow	
	lacustrine	seep or spring	playa	

Stressor Checklist Worksheet

HYDROLOGY ATTRIBUTE (WITHIN 50 M OF AA)	Present	Significant negative effect on AA
Point Source (PS) discharges (POTW, other non-stormwater discharge)		
Non-point Source (Non-PS) discharges (urban runoff, farm drainage)	X	
Flow diversions or unnatural inflows	X	
Dams (reservoirs, detention basins, recharge basins)		
Flow obstructions (culverts, paved stream crossings)	X	
Weir/drop structure, tide gates		
Dredged inlet/channel		
Engineered channel (riprap, armored channel bank, bed)	X	
Dike/levees	X	
Groundwater extraction	X	
Ditches (borrow, agricultural drainage, mosquito control, etc.)	X	
Actively managed hydrology	X	

Comments

PHYSICAL STRUCTURE ATTRIBUTE (WITHIN 50 M OF AA)	Present	Significant negative effect on AA
Filling or dumping of sediment or soils **(N/A for restoration areas)**		
Grading/ compaction **(N/A for restoration areas)**	X	
Plowing/Discing **(N/A for restoration areas)**	X	
Resource extraction (sediment, gravel, oil and/or gas)		
Vegetation management		
Excessive sediment or organic debris from watershed		
Excessive runoff from watershed		
Nutrient impaired (PS or Non-PS pollution)	X	
Heavy metal impaired (PS or Non-PS pollution)		
Pesticides or trace organics impaired (PS or Non-PS pollution)	X	
Bacteria and pathogens impaired (PS or Non-PS pollution)	X	
Trash or refuse		

Comments

BIOTIC STRUCTURE ATTRIBUTE (WITHIN 50 M OF AA)	Present	Significant negative effect on AA
Mowing, grazing, excessive herbivory (within AA)	X	
Excessive human visitation		
Predation and habitat destruction by non-native vertebrates (e.g., *Virginia opossum* and domestic predators, such as feral pets)		
Tree cutting/sapling removal		
Removal of woody debris		
Treatment of non-native and nuisance plant species		
Pesticide application or vector control	X	
Biological resource extraction or stocking (fisheries, aquaculture)		
Excessive organic debris in matrix (for vernal pools)		
Lack of vegetation management to conserve natural resources	X	
Lack of treatment of invasive plants adjacent to AA or buffer	X	

Comments

BUFFER AND LANDSCAPE CONTEXT ATTRIBUTE (WITHIN 500 M OF AA)	Present	Significant negative effect on AA
Urban residential	X	
Industrial/commercial	X	
Military training/Air traffic		
Dams (or other major flow regulation or disruption)		
Dryland farming		
Intensive row-crop agriculture	X	
Orchards/nurseries	X	
Commercial feedlots		
Dairies		
Ranching (enclosed livestock grazing or horse paddock or feedlot)		
Transportation corridor	X	
Rangeland (livestock rangeland also managed for native vegetation)		
Sports fields and urban parklands (golf courses, soccer fields, etc.)		
Passive recreation (bird-watching, hiking, etc.)		
Active recreation (off-road vehicles, mountain biking, hunting, fishing)		
Physical resource extraction (rock, sediment, oil/gas)		
Biological resource extraction (aquaculture, commercial fisheries)		

Comments

Basic Information Sheet: Depressional Wetlands

Assessment Area Name: AA23 - ASW - 05122	
Project Name: HSR JM	
Assessment Area ID #:	
Project ID #:	**Date:** 4/23/19
Assessment Team Members for This AA	
LSL, KK	

AA Category:

☐ Pre-Restoration ☐ Post-Restoration ☐ Pre-Mitigation ☐ Post-Mitigation

☒ Pre-Impact ☐ Post-Impact ☐ Training ☐ Ambient

☐ Reference ☐ Other:

Origin of Wetland (if known):

☒ Natural system ☐ Artificial system

Type of Management (if known):

☐ waterfowl/birds ☐ amphibians ☐ general wildlife ☐ sediment ☐ water quality ☐ stormwater

☐ water supply (agriculture) ☐ water supply (livestock) ☒ not managed ☐ other:

Which best describes the type of depressional wetland?

☐ freshwater marsh ☒ alkaline marsh ☐ brackish marsh

☐ other (specify):

AA Encompasses:

☒ entire wetland ☐ portion of the wetland

Which best describes the hydrologic state of the wetland at the time of assessment?

☐ ponded/inundated ☐ saturated soil, but no surface water ☒ dry

What is the apparent hydrologic regime of the wetland?

Perennially flooded systems contain surface water year-round, *seasonally flooded* depressional wetlands are defined as supporting surface water for 4-11 months of the year (in > 5 out of 10 years.) *Temporarily flooded* depressional wetlands possess surface water between 2 weeks and 4 months of the year.

☐ perennially flooded ☐ seasonally flooded ☒ temporarily flooded

Does your wetland connect with the floodplain of a nearby stream? ☐ yes ☐ no

(system subject to overbank flow, a dammed stream does not count)

Does the wetland have a defined on undefined outlet? ☐ defined ☐ undefined

Does the wetland have a defined on undefined inlet? ☐ defined ☐ undefined

Are the inlet and outlet at the same location? ☐ yes ☐ no

Is the topographic basin of the wetland ☐ distinct **or** ☐ indistinct **?**

An *indistinct* topographic basin is one that lacks obvious boundaries between wetland and upland. Examples of such features are seasonal, depressional wetlands in very low-gradient landscapes.

Photo Identification Numbers and Description:

Photos should be taken from edge of AA looking toward the centroid of AA

	Photo ID No.	Description	Latitude	Longitude	Datum
1		(to) North			
2		(to) East			
3		(to) South			
4		(to) West			
5					
6					
7					
8					
9					
10					

Site Location Description and Land Use:

Comments:

1 pic on KK phone

Scoring Sheet: Depressional Wetlands

AA Name: AA33			Date: 4/23/19
Attribute 1: Buffer and Landscape Context (pp. 8-15)			**Comments**
	Alpha.	Numeric	
Aquatic Area Abundance Score (D)	C		26%
Buffer:			
	Alpha.	Numeric	
Buffer submetric A: Percent of AA with Buffer	A		100%
Buffer submetric B: Average Buffer Width	B		151 m
Buffer submetric C: Buffer Condition	B		
Raw Attribute Score = D+[C x (A x B)$^{1/2}$]$^{1/2}$			**Final Attribute Score = (Raw Score/24) x 100**
Attribute 2: Hydrology (pp. 16-21)			
	Alpha.	Numeric	
Water Source	C		
Hydroperiod	A		
Hydrologic Connectivity	A		
Raw Attribute Score = sum of numeric scores			**Final Attribute Score = (Raw Score/36) x 100**
Attribute 3: Physical Structure (pp. 22-28)			
	Alpha.	Numeric	
Structural Patch Richness	D		3 patches
Topographic Complexity	D		no benches, minimal micro
Raw Attribute Score = sum of numeric scores			**Final Attribute Score = (Raw Score/24) x 100**
Attribute 4: Biotic Structure (pp. 29-39)			
Plant Community Composition (based on submetrics A-C)			
	Alpha.	Numeric	
Plant Community submetric A: Number of plant layers	D		1 layer
Plant Community submetric B: Number of Co-dominant species	D		3 codoms
Plant Community submetric C: Percent Invasion	D		67% invasion
Plant Community Composition Metric *(numeric average of submetrics A-C)*			
Horizontal Interspersion	D		
Vertical Biotic Structure	D		
Raw Attribute Score = sum of numeric scores			**Final Attribute Score = (Raw Score/36) x 100**
Overall AA Score (average of four final Attribute Scores)			

Worksheet for Aquatic Area Abundance Metric (Method 1)

Percentage of Transect Lines that Contains Aquatic Area of Any Kind	
Segment Direction	Percentage of Transect Length That is an Aquatic Feature
North	40m = 8%
South	320m = 64%
East	50m = 10%
West	100m = 20%
Average Percentage of Transect Length That Is an Aquatic Feature	25.5 - 26%

Percent of AA with Buffer Worksheet.

In the space provided below make a quick sketch of the AA, or perform the assessment directly on the aerial imagery; indicate where buffer is present, estimate the percentage of the AA perimeter providing buffer functions, and record the estimate amount in the space provided.

Percent of AA with Buffer: 100 %

Worksheet for calculating average buffer width of AA

Line	Buffer Width (m)
A	250
B	250
C	250
D	130
E	100
F	90
G	60
H	80
Average Buffer Width ***Round to the nearest whole number (integer)***	151m

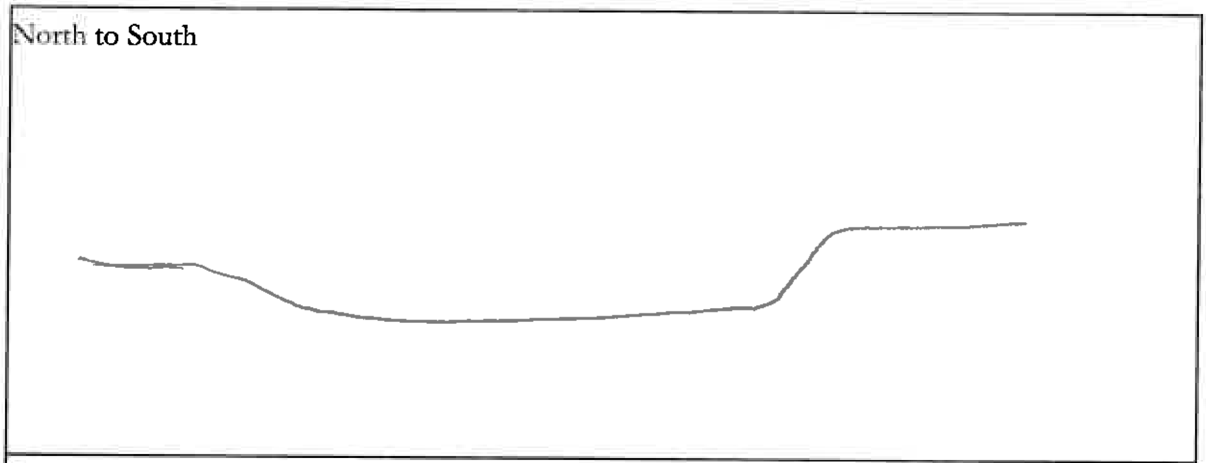
Structural Patch Type Worksheet for Depressional Wetlands

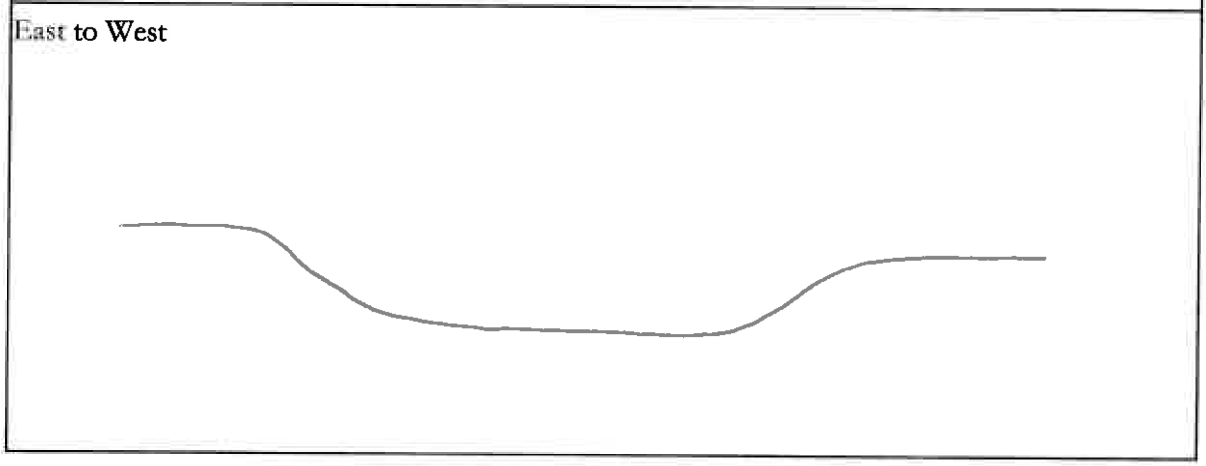
Check each type of patch that is observed in the AA and use the total number of observed patches in Table 15.

STRUCTURAL PATCH TYPE (circle for presence)	Depressional
Minimum Patch Size	**3 m^2**
Abundant wrack or organic debris in channel, on floodplain, or across depressional wetland plain	
Animal mounds and burrows	
Bank slumps or undercut banks in channels or along shoreline	
Cobbles and Boulders	
Concentric or parallel high water marks	
Filamentous macroalgae or algal mats	
Islands (mostly above high-water)	
Large woody debris	
Non-vegetated flats or bare ground (sandflats, mudflats, gravel flats, etc.)	X
Open water	
Plant hummocks and/or sediment mounds	
Soil cracks	X
Standing snag(s) (1 or more at least 3 m tall)	
Submerged vegetation	
Swales on floodplain or along shoreline	
Variegated, convoluted, or crenulated foreshore (instead of broadly arcuate or mostly straight)	X
Woody vegetation in water	
Total Possible	17
No. Observed Patch Types (enter here and use in Table 15 below)	3

Worksheet for AA Topographic Complexity

At two locations in the AA, make a sketch of the profile from the AA boundary to AA boundary. Try to capture the major topographic features, slopes and intervening micro-topographic relief. Based on these sketches and the profiles in Figure 7, choose a description in Table 17 that best describes the overall topographic complexity of the AA.





Plant Community Metric Worksheet 2 of 8: Co-dominant species richness
(A dominant species represents ≥10% *relative* cover)

* *Combine the counts of co-dominant species from all layers to identify the total species count. Each plant species is only counted once when calculating the Number of Co-dominant Species and Percent Invasion submetric scores, regardless of the numbers of layers in which it occurs.*

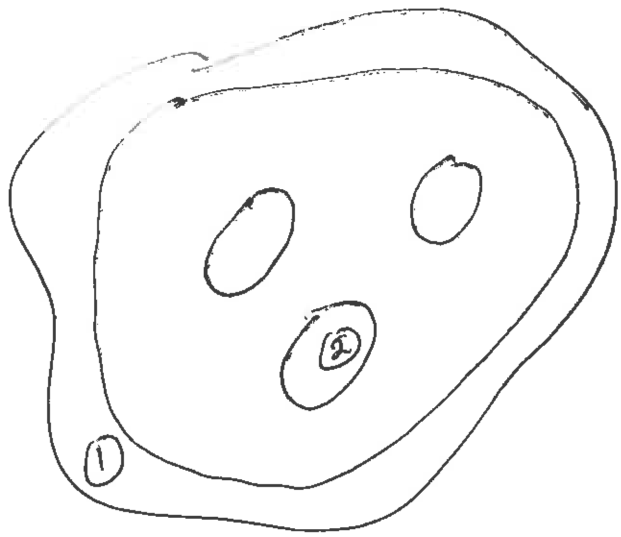
Floating or Canopy-forming	Invasive?	Short (<0.5 m)	Invasive?
		Bromus hordeaceous	X
		Hordeum marinum	X
		Atriplex / Sueada	

Medium (0.5 – 1.5 m)	Invasive?	Tall (1.5 – 3.0 m)	Invasive?

Very Tall (>3.0 m)	Invasive?		
		Total number of co-dominant species for all layers combined (enter here and use in Table 19)	3
		Percent Invasion *Round to the nearest whole number (integer)* (enter here and use in Table 19)	67%

Horizontal Interspersion Worksheet

Use the spaces below to make a sketch of the AA in plan view, outlining the major plant zones (this should take no longer than 10 minutes). Assign names to the zones and record them on the right. Based on the sketch, choose a single profile from Figure 8 that best represents the AA overall.



Assigned zones:

1) grasses

2) atriplex | suaeda

3)

4)

5)

6)

Wetland disturbances and conversions Worksheet

<table>
<tr><td>Has a major disturbance occurred at this wetland?</td><td>Yes</td><td colspan="2">No</td><td></td><td></td></tr>
<tr><td>If yes, was it a flood, fire, landslide, or other?</td><td>flood</td><td colspan="2">fire</td><td>landslide</td><td>other</td></tr>
<tr><td>If yes, then how severe is the disturbance?</td><td>likely to affect site next 5 or more years</td><td colspan="2">likely to affect site next 3-5 years</td><td colspan="2">likely to affect site next 1-2 years</td></tr>
<tr><td rowspan="4">Has this wetland been converted from another type? If yes, then what was the previous type?</td><td>depressional</td><td colspan="2">vernal pool</td><td colspan="2">vernal pool system</td></tr>
<tr><td>non-confined riverine</td><td colspan="2">confined riverine</td><td colspan="2">bar-built estuarine</td></tr>
<tr><td>perennial saline estuarine</td><td colspan="2">perennial non-saline estuarine</td><td colspan="2">wet meadow</td></tr>
<tr><td>lacustrine</td><td colspan="2">seep or spring</td><td colspan="2">playa</td></tr>
</table>

Stressor Checklist Worksheet

HYDROLOGY ATTRIBUTE (WITHIN 50 M OF AA)	Present	Significant negative effect on AA
Point Source (PS) discharges (POTW, other non-stormwater discharge)		
Non-point Source (Non-PS) discharges (urban runoff, farm drainage)	X	
Flow diversions or unnatural inflows		
Dams (reservoirs, detention basins, recharge basins)		
Flow obstructions (culverts, paved stream crossings)	X	
Weir/drop structure, tide gates		
Dredged inlet/channel		
Engineered channel (riprap, armored channel bank, bed)		
Dike/levees	X	
Groundwater extraction	X	
Ditches (borrow, agricultural drainage, mosquito control, etc.)	X	
Actively managed hydrology	X	
Comments		

PHYSICAL STRUCTURE ATTRIBUTE (WITHIN 50 M OF AA)	Present	Significant negative effect on AA
Filling or dumping of sediment or soils **(N/A for restoration areas)**		
Grading/ compaction **(N/A for restoration areas)**	X	
Plowing/Discing **(N/A for restoration areas)**	X	
Resource extraction (sediment, gravel, oil and/or gas)		
Vegetation management		
Excessive sediment or organic debris from watershed		
Excessive runoff from watershed		
Nutrient impaired (PS or Non-PS pollution)	X	
Heavy metal impaired (PS or Non-PS pollution)		
Pesticides or trace organics impaired (PS or Non-PS pollution)	X	
Bacteria and pathogens impaired (PS or Non-PS pollution)	X	
Trash or refuse		
Comments		

BIOTIC STRUCTURE ATTRIBUTE (WITHIN 50 M OF AA)	Present	Significant negative effect on AA
Mowing, grazing, excessive herbivory (within AA)	X	
Excessive human visitation		
Predation and habitat destruction by non-native vertebrates (e.g., *Virginia opossum* and domestic predators, such as feral pets)		
Tree cutting/sapling removal		
Removal of woody debris		
Treatment of non-native and nuisance plant species		
Pesticide application or vector control	X	
Biological resource extraction or stocking (fisheries, aquaculture)		
Excessive organic debris in matrix (for vernal pools)		
Lack of vegetation management to conserve natural resources	X	
Lack of treatment of invasive plants adjacent to AA or buffer	X	
Comments		

BUFFER AND LANDSCAPE CONTEXT ATTRIBUTE (WITHIN 500 M OF AA)	Present	Significant negative effect on AA
Urban residential	X	
Industrial/commercial	X	
Military training/Air traffic		
Dams (or other major flow regulation or disruption)		
Dryland farming		
Intensive row-crop agriculture	X	
Orchards/nurseries	X	
Commercial feedlots		
Dairies		
Ranching (enclosed livestock grazing or horse paddock or feedlot)		
Transportation corridor	X	
Rangeland (livestock rangeland also managed for native vegetation)		
Sports fields and urban parklands (golf courses, soccer fields, etc.)		
Passive recreation (bird-watching, hiking, etc.)		
Active recreation (off-road vehicles, mountain biking, hunting, fishing)		
Physical resource extraction (rock, sediment, oil/gas)		
Biological resource extraction (aquaculture, commercial fisheries)		
Comments		

Basic Information Sheet: Depressional Wetlands

Assessment Area Name: AA34 -ASW-05135	
Project Name: HSR JM	
Assessment Area ID #:	
Project ID #:	Date: 4/23/19
Assessment Team Members for This AA	
LSL, KK	

AA Category:

☐ Pre-Restoration ☐ Post-Restoration ☐ Pre-Mitigation ☐ Post-Mitigation

☒ Pre-Impact ☐ Post-Impact ☐ Training ☐ Ambient

☐ Reference ☐ Other:

Origin of Wetland (if known):

☒ Natural system ☐ Artificial system

Type of Management (if known):

☐ waterfowl/birds ☐ amphibians ☐ general wildlife ☐ sediment ☐ water quality ☐ stormwater ☐ water supply (agriculture) ☐ water supply (livestock) ☒ not managed ☐ other:

Which best describes the type of depressional wetland?

☐ freshwater marsh ☒ alkaline marsh ☐ brackish marsh

☐ other (specify):

AA Encompasses:

☒ entire wetland ☐ portion of the wetland

Which best describes the hydrologic state of the wetland at the time of assessment?

☐ ponded/inundated ☐ saturated soil, but no surface water ☒ dry

What is the apparent hydrologic regime of the wetland?

Perennially flooded systems contain surface water year-round, *seasonally flooded* depressional wetlands are defined as supporting surface water for 4-11 months of the year (in > 5 out of 10 years.) *Temporarily flooded* depressional wetlands possess surface water between 2 weeks and 4 months of the year.

☐ perennially flooded ☐ seasonally flooded ☒ temporarily flooded

Does your wetland connect with the floodplain of a nearby stream? ☐ yes ☐ no

(system subject to overbank flow, a dammed stream does not count)

Does the wetland have a defined on undefined outlet? ☐ defined ☐ undefined

Does the wetland have a defined on undefined inlet? ☐ defined ☐ undefined

Are the inlet and outlet at the same location? ☐ yes ☐ no

Is the topographic basin of the wetland ☐ distinct **or** ☐ indistinct **?**

An *indistinct* topographic basin is one that lacks obvious boundaries between wetland and upland. Examples of such features are seasonal, depressional wetlands in very low-gradient landscapes.

Photo Identification Numbers and Description:

Photos should be taken from edge of AA looking toward the centroid of AA

	Photo ID No.	Description	Latitude	Longitude	Datum
1		(to) North			
2		(to) East			
3		(to) South			
4		(to) West			
5					
6					
7					
8					
9					
10					

Site Location Description and Land Use:

Comments:

1 pic on KK phone

Scoring Sheet: Depressional Wetlands

AA Name: AA34			**Date:** 4/23/19	
Attribute 1: Buffer and Landscape Context (pp. 8-15)			**Comments**	
Aquatic Area Abundance Score (D)	Alpha. C	Numeric	28%	
Buffer:				
Buffer submetric A: Percent of AA with Buffer	Alpha. A	Numeric	100%	
Buffer submetric B: Average Buffer Width	B		158m	
Buffer submetric C: Buffer Condition	B			
Raw Attribute Score = D+[C x (A x B)^{½}]^{½}			**Final Attribute Score = (Raw Score/24) x 100**	
Attribute 2: Hydrology (pp. 16-21)	Alpha.	Numeric		
Water Source	C			
Hydroperiod	A			
Hydrologic Connectivity	A			
Raw Attribute Score = sum of numeric scores			**Final Attribute Score = (Raw Score/36) x 100**	
Attribute 3: Physical Structure (pp. 22-28)	Alpha.	Numeric		
Structural Patch Richness	C		4 patches	
Topographic Complexity	CB		no benches but micro	
Raw Attribute Score = sum of numeric scores			**Final Attribute Score = (Raw Score/24) x 100**	
Attribute 4: Biotic Structure (pp. 29-39)				
Plant Community Composition (based on submetrics A-C)	Alpha.	Numeric		
Plant Community submetric A: Number of plant layers	D		1 layer	
Plant Community submetric B: Number of Co-dominant species	D		2 codoms	
Plant Community submetric C: Percent Invasion	D		53% invasion	
Plant Community Composition Metric *(numeric average of submetrics A-C)*				
Horizontal Interspersion	D			
Vertical Biotic Structure	D			
Raw Attribute Score = sum of numeric scores			**Final Attribute Score = (Raw Score/36) x 100**	
Overall AA Score (average of four final Attribute Scores)				

Worksheet for Aquatic Area Abundance Metric (Method 1)

Percentage of Transect Lines that Contains Aquatic Area of Any Kind	
Segment Direction	Percentage of Transect Length That is an Aquatic Feature
North	50m = 10%
South	350m = 70%
East	50m = 10%
West	100m = 20%
Average Percentage of Transect Length That Is an Aquatic Feature	27.5 - 28%

Percent of AA with Buffer Worksheet.

In the space provided below make a quick sketch of the AA, or perform the assessment directly on the aerial imagery; indicate where buffer is present, estimate the percentage of the AA perimeter providing buffer functions, and record the estimate amount in the space provided.

Percent of AA with Buffer: 100 %

Worksheet for calculating average buffer width of AA

Line	Buffer Width (m)
A	115
B	60
C	100
D	250
E	250
F	250
G	130
H	105
Average Buffer Width ***Round to the nearest whole number (integer)***	158

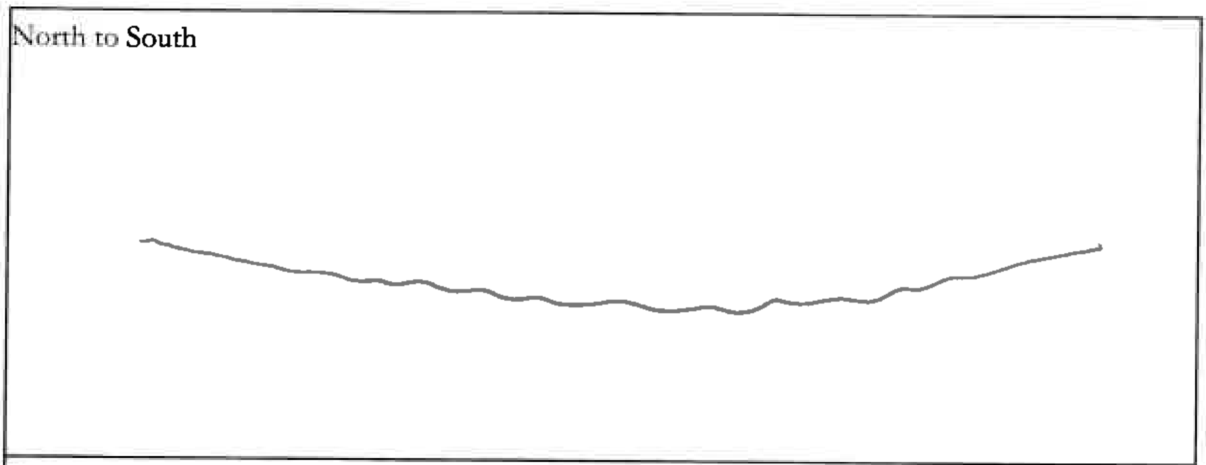
Structural Patch Type Worksheet for Depressional Wetlands

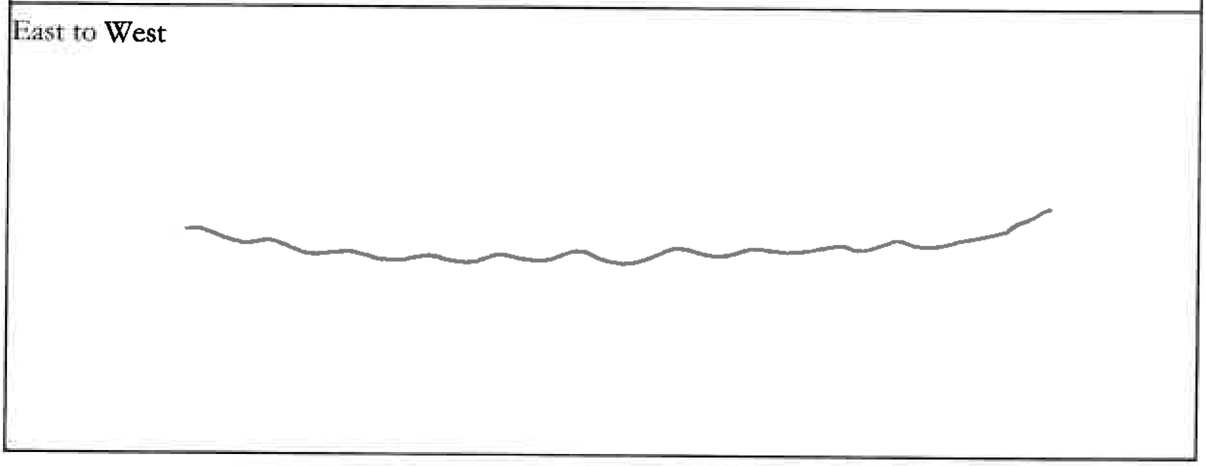
Check each type of patch that is observed in the AA and use the total number of observed patches in Table 15.

STRUCTURAL PATCH TYPE (circle for presence)	Depressional
Minimum Patch Size	3 m^2
Abundant wrack or organic debris in channel, on floodplain, or across depressional wetland plain	X
Animal mounds and burrows	
Bank slumps or undercut banks in channels or along shoreline	
Cobbles and Boulders	
Concentric or parallel high water marks	
Filamentous macroalgae or algal mats	
Islands (mostly above high-water)	
Large woody debris	
Non-vegetated flats or bare ground (sandflats, mudflats, gravel flats, etc.)	X
Open water	
Plant hummocks and/or sediment mounds	
Soil cracks	X
Standing snag(s) (1 or more at least 3 m tall)	
Submerged vegetation	
Swales on floodplain or along shoreline	
Variegated, convoluted, or crenulated foreshore (instead of broadly arcuate or mostly straight)	X
Woody vegetation in water	
Total Possible	**17**
No. Observed Patch Types (enter here and use in Table 15 below)	4

Worksheet for AA Topographic Complexity

At two locations in the AA, make a sketch of the profile from the AA boundary to AA boundary. Try to capture the major topographic features, slopes and intervening micro-topographic relief. Based on these sketches and the profiles in Figure 7, choose a description in Table 17 that best describes the overall topographic complexity of the AA.





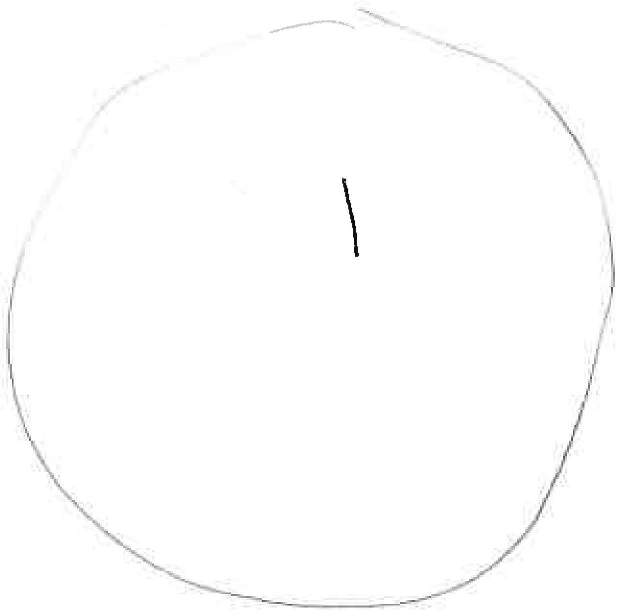
Plant Community Metric Worksheet 2 of 8: Co-dominant species richness
(A dominant species represents ≥10% *relative* cover)

** Combine the counts of co-dominant species from all layers to identify the total species count. Each plant species is only counted once when calculating the Number of Co-dominant Species and Percent Invasion submetric scores, regardless of the numbers of layers in which it occurs.*

Floating or Canopy-forming	Invasive?	Short (<0.5 m)	Invasive?
		Hordeum marinum	X
		Atriplex / Suaeda	
Medium (0.5 – 1.5 m)	**Invasive?**	**Tall (1.5 – 3.0 m)**	**Invasive?**
Very Tall (>3.0 m)	**Invasive?**		
		Total number of co-dominant species for all layers combined (enter here and use in Table 19)	2
		Percent Invasion *Round to the nearest whole number (integer)* (enter here and use in Table 19)	50%

Horizontal Interspersion Worksheet

Use the spaces below to make a sketch of the AA in plan view, outlining the major plant zones (this should take no longer than 10 minutes). Assign names to the zones and record them on the right. Based on the sketch, choose a single profile from Figure 8 that best represents the AA overall.

	**Assigned zones:** 1) Hordeum/Atriplex 2) 3) 4) 5) 6)

Wetland disturbances and conversions Worksheet

Has a major disturbance occurred at this wetland?	Yes	No		
If yes, was it a flood, fire, landslide, or other?	flood	fire	landslide	other
If yes, then how severe is the disturbance?	likely to affect site next 5 or more years	likely to affect site next 3-5 years	likely to affect site next 1-2 years	
Has this wetland been converted from another type? If yes, then what was the previous type?	depressional	vernal pool	vernal pool system	
	non-confined riverine	confined riverine	bar-built estuarine	
	perennial saline estuarine	perennial non-saline estuarine	wet meadow	
	lacustrine	seep or spring	playa	

Stressor Checklist Worksheet

HYDROLOGY ATTRIBUTE (WITHIN 50 M OF AA)	Present	Significant negative effect on AA
Point Source (PS) discharges (POTW, other non-stormwater discharge)		
Non-point Source (Non-PS) discharges (urban runoff, farm drainage)	X	
Flow diversions or unnatural inflows		
Dams (reservoirs, detention basins, recharge basins)		
Flow obstructions (culverts, paved stream crossings)	X	
Weir/drop structure, tide gates		
Dredged inlet/channel		
Engineered channel (riprap, armored channel bank, bed)		
Dike/levees	X	
Groundwater extraction	X	
Ditches (borrow, agricultural drainage, mosquito control, etc.)	X	
Actively managed hydrology	X	
Comments		

PHYSICAL STRUCTURE ATTRIBUTE (WITHIN 50 M OF AA)	Present	Significant negative effect on AA
Filling or dumping of sediment or soils **(N/A for restoration areas)**		
Grading/ compaction **(N/A for restoration areas)**	X	
Plowing/Discing **(N/A for restoration areas)**	X	
Resource extraction (sediment, gravel, oil and/or gas)		
Vegetation management		
Excessive sediment or organic debris from watershed		
Excessive runoff from watershed		
Nutrient impaired (PS or Non-PS pollution)	X	
Heavy metal impaired (PS or Non-PS pollution)		
Pesticides or trace organics impaired (PS or Non-PS pollution)	X	
Bacteria and pathogens impaired (PS or Non-PS pollution)	X	
Trash or refuse		
Comments		

BIOTIC STRUCTURE ATTRIBUTE (WITHIN 50 M OF AA)	Present	Significant negative effect on AA
Mowing, grazing, excessive herbivory (within AA)	X	
Excessive human visitation		
Predation and habitat destruction by non-native vertebrates (e.g., *Virginia opossum* and domestic predators, such as feral pets)		
Tree cutting/sapling removal		
Removal of woody debris		
Treatment of non-native and nuisance plant species		
Pesticide application or vector control	X	
Biological resource extraction or stocking (fisheries, aquaculture)		
Excessive organic debris in matrix (for vernal pools)		
Lack of vegetation management to conserve natural resources	X	
Lack of treatment of invasive plants adjacent to AA or buffer	X	
Comments		

BUFFER AND LANDSCAPE CONTEXT ATTRIBUTE (WITHIN 500 M OF AA)	Present	Significant negative effect on AA
Urban residential	X	
Industrial/commercial	X	
Military training/Air traffic		
Dams (or other major flow regulation or disruption)		
Dryland farming		
Intensive row-crop agriculture	X	
Orchards/nurseries	X	
Commercial feedlots		
Dairies		
Ranching (enclosed livestock grazing or horse paddock or feedlot)		
Transportation corridor	X	
Rangeland (livestock rangeland also managed for native vegetation)		
Sports fields and urban parklands (golf courses, soccer fields, etc.)		
Passive recreation (bird-watching, hiking, etc.)		
Active recreation (off-road vehicles, mountain biking, hunting, fishing)		
Physical resource extraction (rock, sediment, oil/gas)		
Biological resource extraction (aquaculture, commercial fisheries)		
Comments		

Basic Information Sheet: Depressional Wetlands

Assessment Area Name: AA35 - ASW-05124	
Project Name: HSR JM	
Assessment Area ID #:	
Project ID #:	**Date:** 4/23/19
Assessment Team Members for This AA	
LSL/KK	

AA Category:

☐ Pre-Restoration ☐ Post-Restoration ☐ Pre-Mitigation ☐ Post-Mitigation

☒ Pre-Impact ☐ Post-Impact ☐ Training ☐ Ambient

☐ Reference ☐ Other:

Origin of Wetland (if known):

☒ Natural system ☐ Artificial system

Type of Management (if known):

☐ waterfowl/birds ☐ amphibians ☐ general wildlife ☐ sediment ☐ water quality ☐ stormwater

☐ water supply (agriculture) ☐ water supply (livestock) ☒ not managed ☐ other:

Which best describes the type of depressional wetland?

☐ freshwater marsh ☒ alkaline marsh ☐ brackish marsh

☐ other (specify):

AA Encompasses:

☒ entire wetland ☐ portion of the wetland

Which best describes the hydrologic state of the wetland at the time of assessment?

☐ ponded/inundated ☐ saturated soil, but no surface water ☒ dry

What is the apparent hydrologic regime of the wetland?

Perennially flooded systems contain surface water year-round, *seasonally flooded* depressional wetlands are defined as supporting surface water for 4-11 months of the year (in > 5 out of 10 years.) *Temporarily flooded* depressional wetlands possess surface water between 2 weeks and 4 months of the year.

☐ perennially flooded ☐ seasonally flooded ☒ temporarily flooded

Does your wetland connect with the floodplain of a nearby stream? ☐ yes ☐ no

(system subject to overbank flow, a dammed stream does not count)

Does the wetland have a defined on undefined outlet? ☐ defined ☐ undefined

Does the wetland have a defined on undefined inlet? ☐ defined ☐ undefined

Are the inlet and outlet at the same location? ☐ yes ☐ no

Is the topographic basin of the wetland ☐ distinct **or** ☐ indistinct **?**

An *indistinct* topographic basin is one that lacks obvious boundaries between wetland and upland. Examples of such features are seasonal, depressional wetlands in very low-gradient landscapes.

Photo Identification Numbers and Description:

Photos should be taken from edge of AA looking toward the centroid of AA

	Photo ID No.	Description	Latitude	Longitude	Datum
1		(to) North			
2		(to) East			
3		(to) South			
4		(to) West			
5					
6					
7					
8					
9					
10					

Site Location Description and Land Use:

Comments:

1 pic on KK phone

Scoring Sheet: Depressional Wetlands

AA Name: AA35 **Date:** 4/23/19

Attribute 1: Buffer and Landscape Context (pp. 8-15)	Alpha.	Numeric	**Comments**
Aquatic Area Abundance Score (D)	C		28%
Buffer:			
	Alpha.	Numeric	
Buffer submetric A: Percent of AA with Buffer	A		100%
Buffer submetric B: Average Buffer Width	B		142m
Buffer submetric C: Buffer Condition	B		
Raw Attribute Score = D+[C x (A x B)^{½}]^{½}			**Final Attribute Score = (Raw Score/24) x 100**
Attribute 2: Hydrology (pp. 16-21)			
	Alpha.	Numeric	
Water Source	C		
Hydroperiod	A		
Hydrologic Connectivity	A		
Raw Attribute Score = sum of numeric scores			**Final Attribute Score = (Raw Score/36) x 100**
Attribute 3: Physical Structure (pp. 22-28)			
	Alpha.	Numeric	
Structural Patch Richness	C		5 patches
Topographic Complexity	C		no benches, but micro
Raw Attribute Score = sum of numeric scores			**Final Attribute Score = (Raw Score/24) x 100**
Attribute 4: Biotic Structure (pp. 29-39)			
Plant Community Composition (based on submetrics A-C)			
	Alpha.	Numeric	
Plant Community submetric A: Number of plant layers	C		2 layers
Plant Community submetric B: Number of Co-dominant species	D		4 codoms
Plant Community submetric C: Percent Invasion	C		25% invasia
Plant Community Composition Metric *(numeric average of submetrics A-C)*			
Horizontal Interspersion	C		
Vertical Biotic Structure	D		
Raw Attribute Score = sum of numeric scores			**Final Attribute Score = (Raw Score/36) x 100**
Overall AA Score (average of four final Attribute Scores)			

Worksheet for Aquatic Area Abundance Metric (Method 1)

Percentage of Transect Lines that Contains Aquatic Area of Any Kind	
Segment Direction	Percentage of Transect Length That is an Aquatic Feature
North	100m = 20%
South	380m = ~~[illegible]~~ 76%
East	0% 1
West	70m = 14%
Average Percentage of Transect Length That Is an Aquatic Feature	21.5 - 28%

Percent of AA with Buffer Worksheet.

In the space provided below make a quick sketch of the AA, or perform the assessment directly on the aerial imagery; indicate where buffer is present, estimate the percentage of the AA perimeter providing buffer functions, and record the estimate amount in the space provided.

Percent of AA with Buffer: 100 %

Worksheet for calculating average buffer width of AA

Line	Buffer Width (m)
A	20
B	10
C	25
D	230
E	250
F	250
G	200
H	150
Average Buffer Width ***Round to the nearest whole number (integer)***	142

Structural Patch Type Worksheet for Depressional Wetlands

Check each type of patch that is observed in the AA and use the total number of observed patches in Table 15.

STRUCTURAL PATCH TYPE (circle for presence)	Depressional
Minimum Patch Size	**3 m^2**
Abundant wrack or organic debris in channel, on floodplain, or across depressional wetland plain	X
Animal mounds and burrows	
Bank slumps or undercut banks in channels or along shoreline	
Cobbles and Boulders	
Concentric or parallel high water marks	
Filamentous macroalgae or algal mats	
Islands (mostly above high-water)	
Large woody debris	X
Non-vegetated flats or bare ground (sandflats, mudflats, gravel flats, etc.)	X
Open water	
Plant hummocks and/or sediment mounds	
Soil cracks	X
Standing snag(s) (1 or more at least 3 m tall)	
Submerged vegetation	
Swales on floodplain or along shoreline	
Variegated, convoluted, or crenulated foreshore (instead of broadly arcuate or mostly straight)	X
Woody vegetation in water	
Total Possible	**17**
No. Observed Patch Types (enter here and use in Table 15 below)	5

Worksheet for AA Topographic Complexity

At two locations in the AA, make a sketch of the profile from the AA boundary to AA boundary. Try to capture the major topographic features, slopes and intervening micro-topographic relief. Based on these sketches and the profiles in Figure 7, choose a description in Table 17 that best describes the overall topographic complexity of the AA.

North to South

East to West

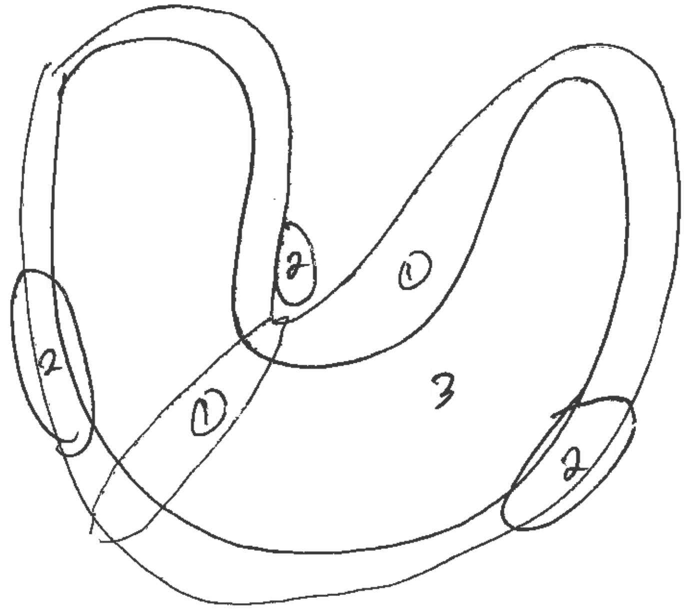
Plant Community Metric Worksheet 2 of 8: Co-dominant species richness
(A dominant species represents ≥10% *relative* cover)

* *Combine the counts of co-dominant species from all layers to identify the total species count. Each plant species is only counted once when calculating the Number of Co-dominant Species and Percent Invasion submetric scores, regardless of the numbers of layers in which it occurs.*

Floating or Canopy-forming	Invasive?	Short (<0.5 m)	Invasive?
		Hordeum marinum	X
		Atriplex / Suaeda	
		Crassula connata	
Medium (0.5 – 1.5 m)	**Invasive?**	**Tall (1.5 – 3.0 m)**	**Invasive?**
Atriplex canescens (4-wing)			
Very Tall (>3.0 m)	**Invasive?**		
		Total number of co-dominant species for all layers combined (enter here and use in Table 19)	4
		Percent Invasion *Round to the nearest whole number (integer)* (enter here and use in Table 19)	25%

Horizontal Interspersion Worksheet

Use the spaces below to make a sketch of the AA in plan view, outlining the major plant zones (this should take no longer than 10 minutes). Assign names to the zones and record them on the right. Based on the sketch, choose a single profile from Figure 8 that best represents the AA overall.



Assigned zones:

1) grass

2) Shrubs

3) atriplex / bare

4)

5)

6)

Wetland disturbances and conversions Worksheet

Has a major disturbance occurred at this wetland?	Yes	No		
If yes, was it a flood, fire, landslide, or other?	flood	fire	landslide	other
If yes, then how severe is the disturbance?	likely to affect site next 5 or more years	likely to affect site next 3-5 years	likely to affect site next 1-2 years	
Has this wetland been converted from another type? If yes, then what was the previous type?	depressional	vernal pool	vernal pool system	
	non-confined riverine	confined riverine	bar-built estuarine	
	perennial saline estuarine	perennial non-saline estuarine	wet meadow	
	lacustrine	seep or spring	playa	

Stressor Checklist Worksheet

HYDROLOGY ATTRIBUTE (WITHIN 50 M OF AA)	Present	Significant negative effect on AA
Point Source (PS) discharges (POTW, other non-stormwater discharge)		
Non-point Source (Non-PS) discharges (urban runoff, farm drainage)	X	
Flow diversions or unnatural inflows		
Dams (reservoirs, detention basins, recharge basins)		
Flow obstructions (culverts, paved stream crossings)	X	
Weir/drop structure, tide gates		
Dredged inlet/channel		
Engineered channel (riprap, armored channel bank, bed)		
Dike/levees	X	
Groundwater extraction	X	
Ditches (borrow, agricultural drainage, mosquito control, etc.)	X	
Actively managed hydrology	X	
Comments		

PHYSICAL STRUCTURE ATTRIBUTE (WITHIN 50 M OF AA)	Present	Significant negative effect on AA
Filling or dumping of sediment or soils **(N/A for restoration areas)**		
Grading/ compaction **(N/A for restoration areas)**	X	
Plowing/Discing **(N/A for restoration areas)**	X	
Resource extraction (sediment, gravel, oil and/or gas)		
Vegetation management		
Excessive sediment or organic debris from watershed		
Excessive runoff from watershed		
Nutrient impaired (PS or Non-PS pollution)	X	
Heavy metal impaired (PS or Non-PS pollution)		
Pesticides or trace organics impaired (PS or Non-PS pollution)	X	
Bacteria and pathogens impaired (PS or Non-PS pollution)	X	
Trash or refuse		
Comments		

BIOTIC STRUCTURE ATTRIBUTE (WITHIN 50 M OF AA)	Present	Significant negative effect on AA
Mowing, grazing, excessive herbivory (within AA)	X	
Excessive human visitation		
Predation and habitat destruction by non-native vertebrates (e.g., *Virginia opossum* and domestic predators, such as feral pets)		
Tree cutting/sapling removal		
Removal of woody debris		
Treatment of non-native and nuisance plant species		
Pesticide application or vector control	X	
Biological resource extraction or stocking (fisheries, aquaculture)		
Excessive organic debris in matrix (for vernal pools)		
Lack of vegetation management to conserve natural resources	X	
Lack of treatment of invasive plants adjacent to AA or buffer	X	
Comments		

BUFFER AND LANDSCAPE CONTEXT ATTRIBUTE (WITHIN 500 M OF AA)	Present	Significant negative effect on AA
Urban residential	X	
Industrial/commercial	X	
Military training/Air traffic		
Dams (or other major flow regulation or disruption)		
Dryland farming		
Intensive row-crop agriculture	X	
Orchards/nurseries	X	
Commercial feedlots		
Dairies		
Ranching (enclosed livestock grazing or horse paddock or feedlot)		
Transportation corridor	X	
Rangeland (livestock rangeland also managed for native vegetation)		
Sports fields and urban parklands (golf courses, soccer fields, etc.)		
Passive recreation (bird-watching, hiking, etc.)		
Active recreation (off-road vehicles, mountain biking, hunting, fishing)		
Physical resource extraction (rock, sediment, oil/gas)		
Biological resource extraction (aquaculture, commercial fisheries)		
Comments		

Basic Information Sheet: Riverine Wetlands

Assessment Area Name: 36-COW-02313	
Project Name: HSR	
Assessment Area ID #: 36	
Project ID #:	**Date:** 4/23/19
Assessment Team Members for This AA:	
RJ, DM	
Average Bankfull Width: 1m	
Approximate Length of AA (10 times bankfull width, min 100 m, max 200 m): 100m	
Upstream Point Latitude: 37.098967	**Longitude:** -120.845170
Downstream Point Latitude: 37.099684	**Longitude:** -120.845192
Wetland Sub-type: ☐ Confined ☐ Non-confined — Concrete channel. Cannot migrate?	
AA Category: ☐ Restoration ☐ Mitigation ☐ Impacted ☐ Ambient ☐ Reference ☐ Training ☒ Other: Pre-project	
Did the river/stream have flowing water at the time of the assessment? ☐ yes ☒ no	
What is the apparent hydrologic flow regime of the reach you are assessing? The hydrologic flow regime of a stream describes the frequency with which the channel conducts water. *Perennial* streams conduct water all year long, whereas *ephemeral* streams conduct water only during and immediately following precipitation events. *Intermittent* streams are dry for part of the year, but conduct water for periods longer than ephemeral streams, as a function of watershed size and water source. ☐ perennial ☐ intermittent ☒ ephemeral	

Photo Identification Numbers and Description:

	Photo ID No.	Description	Latitude	Longitude	Datum
1		Upstream			
2		Middle Left			
3		Middle Right			
4		Downstream			
5					
6					
7					
8					
9					
10					

Site Location Description:

Concrete ag ditch

Comments:

Scoring Sheet: Riverine Wetlands

AA Name: AA36					**Date:** 4/23/19	
Attribute 1: Buffer and Landscape Context (pp. 11-19)					**Comments**	
Stream Corridor Continuity (D)			Alpha.	Numeric		
			D			
Buffer:						
Buffer submetric A: Percent of AA with Buffer	Alpha.	Numeric				
	A				100%	
Buffer submetric B: Average Buffer Width	D				7m	
Buffer submetric C: Buffer Condition	D					
Raw Attribute Score = $D+[C \times (A \times B)^{1/2}]^{1/2}$					**Final Attribute Score = (Raw Score/24) x 100**	
Attribute 2: Hydrology (pp. 20-26)						
			Alpha.	Numeric		
Water Source			C			
Channel Stability			D		Concrete	
Hydrologic Connectivity			A			
Raw Attribute Score = sum of numeric scores					**Final Attribute Score = (Raw Score/36) x 100**	
Attribute 3: Physical Structure (pp. 27-33)						
			Alpha.	Numeric		
Structural Patch Richness			D			
Topographic Complexity			D			
Raw Attribute Score = sum of numeric scores					**Final Attribute Score = (Raw Score/24) x 100**	
Attribute 4: Biotic Structure (pp. 34-41)						
Plant Community Composition (based on sub-metrics A-C)						
	Alpha.	Numeric				
Plant Community submetric A: Number of plant layers	D				No plants	
Plant Community submetric B: Number of Co-dominant species	D					
Plant Community submetric C: Percent Invasion	D					
Plant Community Composition Metric *(numeric average of submetrics A-C)*						
Horizontal Interspersion			D			
Vertical Biotic Structure			D			
Raw Attribute Score = sum of numeric scores					**Final Attribute Score = (Raw Score/36) x 100**	
Overall AA Score (average of four final Attribute Scores)						

Worksheet for Stream Corridor Continuity Metric for Riverine Wetlands

Lengths of Non-buffer Segments For Distance of 500 m Upstream of AA		Lengths of Non-buffer Segments For Distance of 500 m Downstream of AA	
Segment No.	Length (m)	Segment No.	Length (m)
1		1	
2		2	
3		3	
4		4	
5		5	
Upstream Total Length	500m	Downstream Total Length	

Percent of AA with Buffer Worksheet

In the space provided below make a quick sketch of the AA, or perform the assessment directly on the aerial imagery; indicate where buffer is present, estimate the percentage of the AA perimeter providing buffer functions, and record the estimate amount in the space provided.

Percent of AA with Buffer: 100 %

Worksheet for calculating average buffer width of AA

Line	Buffer Width (m)
A	7
B	7
C	7
D	7
E	7
F	7
G	7
H	7
Average Buffer Width *Round to the nearest integer*	7

Worksheet for Assessing Channel Stability for Riverine Wetlands

Condition	Field Indicators (check all existing conditions)
Indicators of Channel Equilibrium	☐ The channel (or multiple channels in braided systems) has a well-defined bankfull contour that clearly demarcates an obvious active floodplain in the cross-sectional profile of the channel throughout most of the AA. ☐ Perennial riparian vegetation is abundant and well established along the bankfull contour, but not below it. ☐ There is leaf litter, thatch, or wrack in most pools (if pools are present). ☐ The channel contains embedded woody debris of the size and amount consistent with what is naturally available in the riparian area. ☐ There is little or no active undercutting or burial of riparian vegetation. ☐ If mid-channel bars and/or point bars are present, they are not densely vegetated with perennial vegetation. ☐ Channel bars consist of well-sorted bed material (smaller grain size on the top and downstream end of the bar, larger grain size along the margins and upstream end of the bar). ☐ There are channel pools, the spacing between pools tends to be regular and the bed is not planar throughout the AA ☐ The larger bed material supports abundant mosses or periphyton.
Indicators of Active Degradation	☐ The channel is characterized by deeply undercut banks with exposed living roots of trees or shrubs. ☐ There are abundant bank slides or slumps. ☐ The lower banks are uniformly scoured and not vegetated. ☐ Riparian vegetation is declining in stature or vigor, or many riparian trees and shrubs along the banks are leaning or falling into the channel. ☐ An obvious historical floodplain has recently been abandoned, as indicated by the age structure of its riparian vegetation. ☐ The channel bed appears scoured to bedrock or dense clay. ☐ Recently active flow pathways appear to have coalesced into one channel (i.e. a previously braided system is no longer braided). ☐ The channel has one or more knickpoints indicating headward erosion of the bed.
Indicators of Active Aggradation	☐ There is an active floodplain with fresh splays of coarse sediment (sand and larger that is not vegetated) deposited in the current or previous year. ☐ There are partially buried living tree trunks or shrubs along the banks. ☐ The bed is planar (flat or uniform gradient) overall; it lacks well-defined channel pools, or they are uncommon and irregularly spaced. ☐ There are partially buried, or sediment-choked, culverts. ☐ Perennial terrestrial or riparian vegetation is encroaching into the channel or onto channel bars below the bankfull contour. ☐ There are avulsion channels on the floodplain or adjacent valley floor.
Overall	☐ **Equilibrium** ☐ **Degradation** ☐ **Aggradation**

None of these

Riverine Wetland Entrenchment Ratio Calculation Worksheet

The following 5 steps should be conducted for each of 3 cross-sections located in the AA at the approximate midpoints along straight riffles or glides, away from deep pools or meander bends. An attempt should be made to place them at the top, middle, and bottom of the AA.

Steps	Replicate Cross-sections →	TOP	MID	BOT
1 Estimate bankfull width.	This is a critical step requiring familiarity with field indicators of the bankfull contour. Estimate or measure the distance between the right and left bankfull contours.	1m		
2: Estimate max. bankfull depth.	Imagine a level line between the right and left bankfull contours; estimate or measure the height of the line above the thalweg (the deepest part of the channel).	.75m		
3: Estimate flood prone depth.	Double the estimate of maximum bankfull depth from Step 2.	1.5m		
4: Estimate flood prone width.	Imagine a level line having a height equal to the flood prone depth from Step 3; note where the line intercepts the right and left banks; estimate or measure the length of this line.	>200m		
5: Calculate entrenchment ratio.	Divide the flood prone width (Step 4) by the bankfull width (Step 1).	200m+	same	same
6: Calculate average entrenchment ratio.	Calculate the average results for Step 5 for all 3 replicate cross-sections. Enter the average result here and use it in Table 13a or 13b.			>>2.2

Structural Patch Type Worksheet for Riverine wetlands

Circle each type of patch that is observed in the AA and enter the total number of observed patches in Table below. In the case of riverine wetlands, their status as confined or non-confined must first be determined (see page 6) to determine with patches are expected in the system (indicated by a "1" in the table below). Any feature onsite should only be counted once as a patch type. If a feature appears to meet the definition of more than one patch type (i.e. swale and secondary channel) the practitioner should choose which patch type best illustrates the feature. Not all features at a site will be patch types.

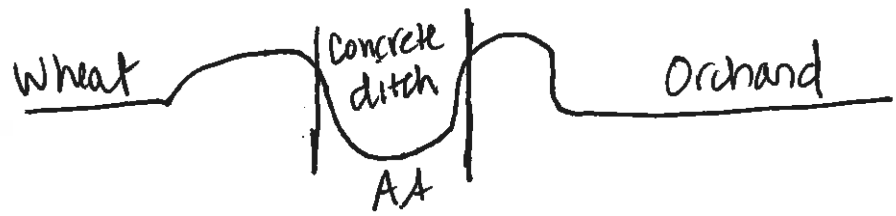
Please refer to the CRAM Photo Dictionary at www.cramwetlands.org for photos of each of the following patch types.

STRUCTURAL PATCH TYPE (circle for presence)	**Riverine (Non-confined)**	**Riverine (Confined)**
Minimum Patch Size	**3 m²**	**3 m²**
Abundant wrackline or organic debris in channel, on floodplain	1	1
Bank slumps or undercut banks in channels or along shoreline	1	1
Cobbles and/or Boulders	1	1
Debris jams	1	1
Filamentous macroalgae or algal mats	1	1
Large woody debris	1	1
Pannes or pools on floodplain	1	N/A
Plant hummocks and/or sediment mounds	1	1
Point bars and in-channel bars	1	1
Pools or depressions in channels (wet or dry channels)	1	1
Riffles or rapids (wet or dry channels)	1	1
Secondary channels on floodplains or along shorelines	1	N/A
Standing snags (at least 3 m tall)	1	1
Submerged vegetation	1	N/A
Swales on floodplain or along shoreline	1	N/A
Variegated, convoluted, or crenulated foreshore (instead of broadly arcuate or mostly straight)	1	1
Vegetated islands (mostly above high-water)	1	N/A
Total Possible	**17**	**12**
No. Observed Patch Types (enter here and use in Table 14 below)	Ø	Ø

Worksheet for AA Topographic Complexity

At three locations along the AA, make a sketch of the profile of the stream from the AA boundary down to its deepest area then back out to the other AA boundary. Try to capture the benches and the intervening micro-topographic relief. To maintain consistency, make drawings at each of the stream hydrologic connectivity measurements, always facing downstream. Include the water level, an arrow at the bankfull contour, and label the benches. Based on these sketches and the profiles in Figure 10, choose a description in Table 16 that best describes the overall topographic complexity of the AA.

Profile 1



Profile 2

Profile 3

Plant Community Metric Worksheet: Co-dominant species richness for Riverine wetlands
(A dominant species represents ≥10% *relative* cover)

Special Note:

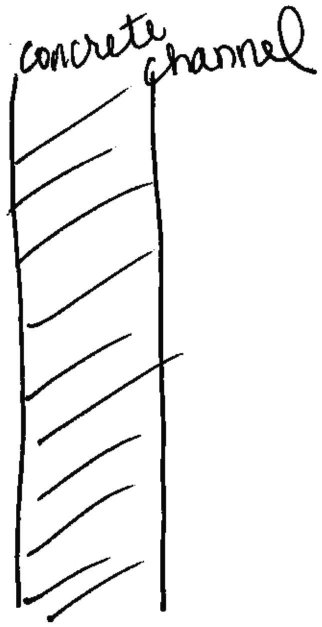
** Combine the counts of co-dominant species from all layers to identify the total species count. Each plant species is only counted once when calculating the Number of Co-dominant Species and Percent Invasion submetric scores, regardless of the numbers of layers in which it occurs.*

No plants

Floating or Canopy-forming (non-confined only)	Invasive?	Short (<0.5 m)	Invasive?
Medium (0.5-1.5 m)	**Invasive?**	**Tall (1.5-3.0 m)**	**Invasive?**
Very Tall (>3.0 m)	**Invasive?**	**Total number of co-dominant species for all layers combined (enter here and use in Table 18)**	
		Percent Invasion *Round to the nearest integer* (enter here and use in Table 18)	

Horizontal Interspersion Worksheet.

Use the spaces below to make a quick sketch of the AA in plan view, outlining the major plant zones (this should take no longer than 10 minutes). Assign the zones names and record them on the right. Based on the sketch, choose a single profile from Figure 12 that best represents the AA overall.



Assigned zones:

1)

2)

3)

4)

5)

6)

Worksheet for Wetland disturbances and conversions

<table>
<tr><td>Has a major disturbance occurred at this wetland?</td><td colspan="3">Yes</td><td colspan="3">No</td><td colspan="3"></td><td colspan="3"></td></tr>
<tr><td>If yes, was it a flood, fire, landslide, or other?</td><td colspan="3">flood</td><td colspan="3">fire</td><td colspan="3">landslide</td><td colspan="3">other</td></tr>
<tr><td>If yes, then how severe is the disturbance?</td><td colspan="4">likely to affect site next 5 or more years</td><td colspan="4">likely to affect site next 3-5 years</td><td colspan="4">likely to affect site next 1-2 years</td></tr>
<tr><td rowspan="4">Has this wetland been converted from another type? If yes, then what was the previous type?</td><td colspan="4">depressional</td><td colspan="4">vernal pool</td><td colspan="4">vernal pool system</td></tr>
<tr><td colspan="4">non-confined riverine</td><td colspan="4">confined riverine</td><td colspan="4">seasonal estuarine</td></tr>
<tr><td colspan="4">perennial saline estuarine</td><td colspan="4">perennial non-saline estuarine</td><td colspan="4">wet meadow</td></tr>
<tr><td colspan="4">lacustrine</td><td colspan="4">seep or spring</td><td colspan="4">playa</td></tr>
</table>

Stressor Checklist Worksheet

HYDROLOGY ATTRIBUTE (WITHIN 50 M OF AA)	Present	Significant negative effect on AA
Point Source (PS) discharges (POTW, other non-stormwater discharge)		
Non-point Source (Non-PS) discharges (urban runoff, farm drainage)	X	
Flow diversions or unnatural inflows		
Dams (reservoirs, detention basins, recharge basins)		
Flow obstructions (culverts, paved stream crossings)		
Weir/drop structure, tide gates		
Dredged inlet/channel		
Engineered channel (riprap, armored channel bank, bed)	X	
Dike/levees		
Groundwater extraction		
Ditches (borrow, agricultural drainage, mosquito control, etc.)	X	
Actively managed hydrology	X	
Comments		

PHYSICAL STRUCTURE ATTRIBUTE (WITHIN 50 M OF AA)	Present	Significant negative effect on AA
Filling or dumping of sediment or soils **(N/A for restoration areas)**		
Grading/ compaction **(N/A for restoration areas)**	X	
Plowing/Discing **(N/A for restoration areas)**	X	
Resource extraction (sediment, gravel, oil and/or gas)		
Vegetation management		
Excessive sediment or organic debris from watershed		
Excessive runoff from watershed		
Nutrient impaired (PS or Non-PS pollution)	X	
Heavy metal impaired (PS or Non-PS pollution)		
Pesticides or trace organics impaired (PS or Non-PS pollution)	X	
Bacteria and pathogens impaired (PS or Non-PS pollution)	X	
Trash or refuse		
Comments		

BIOTIC STRUCTURE ATTRIBUTE (WITHIN 50 M OF AA)	Present	Significant negative effect on AA
Mowing, grazing, excessive herbivory (within AA)		
Excessive human visitation		
Predation and habitat destruction by non-native vertebrates (e.g., *Virginia opossum* and domestic predators, such as feral pets)		
Tree cutting/sapling removal		
Removal of woody debris		
Treatment of non-native and nuisance plant species		
Pesticide application or vector control	X	
Biological resource extraction or stocking (fisheries, aquaculture)		
Excessive organic debris in matrix (for vernal pools)		
Lack of vegetation management to conserve natural resources		
Lack of treatment of invasive plants adjacent to AA or buffer		
Comments		

BUFFER AND LANDSCAPE CONTEXT ATTRIBUTE (WITHIN 500 M OF AA)	Present	Significant negative effect on AA
Urban residential		
Industrial/commercial		
Military training/Air traffic		
Dams (or other major flow regulation or disruption)		
Dryland farming		
Intensive row-crop agriculture	X	
Orchards/nurseries	X	
Commercial feedlots		
Dairies		
Ranching (enclosed livestock grazing or horse paddock or feedlot)		
Transportation corridor	X	
Rangeland (livestock rangeland also managed for native vegetation)		
Sports fields and urban parklands (golf courses, soccer fields, etc.)		
Passive recreation (bird-watching, hiking, etc.)		
Active recreation (off-road vehicles, mountain biking, hunting, fishing)		
Physical resource extraction (rock, sediment, oil/gas)		
Biological resource extraction (aquaculture, commercial fisheries)		
Comments		

Basic Information Sheet: Riverine Wetlands

Assessment Area Name:	
Project Name: HSR	
Assessment Area ID #: 37 COW-02329	
Project ID #:	**Date:** 4/23/19
Assessment Team Members for This AA:	
RJ, D.Mancocchio	
Average Bankfull Width: 2m	
Approximate Length of AA (10 times bankfull width, min 100 m, max 200 m):	
Upstream Point Latitude: 37.184078	**Longitude:** -120.835469
Downstream Point Latitude: 37.103355	**Longitude:** -120.835293

Wetland Sub-type:

☐ Confined ☒ Non-confined

AA Category:

☐ Restoration ☐ Mitigation ☐ Impacted ☐ Ambient ☐ Reference ☐ Training

☒ Other: Pre-project - ditch

Did the river/stream have flowing water at the time of the assessment? ☐ yes ☒ no

What is the apparent hydrologic flow regime of the reach you are assessing?

The hydrologic flow regime of a stream describes the frequency with which the channel conducts water. *Perennial* streams conduct water all year long, whereas *ephemeral* streams conduct water only during and immediately following precipitation events. *Intermittent* streams are dry for part of the year, but conduct water for periods longer than ephemeral streams, as a function of watershed size and water source.

☐ perennial ☐ intermittent ☒ ephemeral

Photo Identification Numbers and Description:

	Photo ID No.	Description	Latitude	Longitude	Datum
1		Upstream			
2		Middle Left			
3		Middle Right			
4		Downstream			
5					
6					
7					
8					
9					
10					

Site Location Description:

Comments:

Scoring Sheet: Riverine Wetlands

AA Name: AA37			Date: 4/23/A	
Attribute 1: Buffer and Landscape Context (pp. 11-19)			**Comments**	
	Alpha.	Numeric		
Stream Corridor Continuity (D)	D		375m break	
Buffer:				
	Alpha.	Numeric		
Buffer submetric A: Percent of AA with Buffer	C		40%	
Buffer submetric B: Average Buffer Width	A		250m	
Buffer submetric C: Buffer Condition	C			
Raw Attribute Score = D+[C x (A x B)^{½}]^{½}			**Final Attribute Score = (Raw Score/24) x 100**	
Attribute 2: Hydrology (pp. 20-26)				
	Alpha.	Numeric		
Water Source	C			
Channel Stability	B		No flows so no severe degradation or aggradation	
Hydrologic Connectivity	A			
Raw Attribute Score = sum of numeric scores			**Final Attribute Score = (Raw Score/36) x 100**	
Attribute 3: Physical Structure (pp. 27-33)				
	Alpha.	Numeric		
Structural Patch Richness	D			
Topographic Complexity	D			
Raw Attribute Score = sum of numeric scores			**Final Attribute Score = (Raw Score/24) x 100**	
Attribute 4: Biotic Structure (pp. 34-41)				
Plant Community Composition (based on sub-metrics A-C)				
	Alpha.	Numeric		
Plant Community submetric A: Number of plant layers	C			
Plant Community submetric B: Number of Co-dominant species	D			
Plant Community submetric C: Percent Invasion	D			
Plant Community Composition Metric *(numeric average of submetrics A-C)*				
Horizontal Interspersion	D			
Vertical Biotic Structure	B			
Raw Attribute Score = sum of numeric scores			**Final Attribute Score = (Raw Score/36) x 100**	
Overall AA Score (average of four final Attribute Scores)				

Worksheet for Stream Corridor Continuity Metric for Riverine Wetlands

Lengths of Non-buffer Segments For Distance of 500 m Upstream of AA		Lengths of Non-buffer Segments For Distance of 500 m Downstream of AA	
Segment No.	Length (m)	Segment No.	Length (m)
1		1	
2		2	
3		3	
4		4	
5		5	
Upstream Total Length	375	Downstream Total Length	

Percent of AA with Buffer Worksheet

In the space provided below make a quick sketch of the AA, or perform the assessment directly on the aerial imagery; indicate where buffer is present, estimate the percentage of the AA perimeter providing buffer functions, and record the estimate amount in the space provided.

Percent of AA with Buffer: 40 %

Worksheet for calculating average buffer width of AA

Line	Buffer Width (m)
A	250
B	
C	
D	
E	
F	
G	
H	
Average Buffer Width *Round to the nearest integer*	250

Worksheet for Assessing Channel Stability for Riverine Wetlands

Condition	Field Indicators (check all existing conditions)
Indicators of Channel Equilibrium	☐ The channel (or multiple channels in braided systems) has a well-defined bankfull contour that clearly demarcates an obvious active floodplain in the cross-sectional profile of the channel throughout most of the AA. ☐ Perennial riparian vegetation is abundant and well established along the bankfull contour, but not below it. ☐ There is leaf litter, thatch, or wrack in most pools (if pools are present). ☐ The channel contains embedded woody debris of the size and amount consistent with what is naturally available in the riparian area. ☐ There is little or no active undercutting or burial of riparian vegetation. ☐ If mid-channel bars and/or point bars are present, they are not densely vegetated with perennial vegetation. ☐ Channel bars consist of well-sorted bed material (smaller grain size on the top and downstream end of the bar, larger grain size along the margins and upstream end of the bar). ☐ There are channel pools, the spacing between pools tends to be regular and the bed is not planar throughout the AA ☐ The larger bed material supports abundant mosses or periphyton.
Indicators of Active Degradation	☐ The channel is characterized by deeply undercut banks with exposed living roots of trees or shrubs. ☐ There are abundant bank slides or slumps. ☐ The lower banks are uniformly scoured and not vegetated. ☐ Riparian vegetation is declining in stature or vigor, or many riparian trees and shrubs along the banks are leaning or falling into the channel. ☐ An obvious historical floodplain has recently been abandoned, as indicated by the age structure of its riparian vegetation. ☐ The channel bed appears scoured to bedrock or dense clay. ☐ Recently active flow pathways appear to have coalesced into one channel (i.e. a previously braided system is no longer braided). ☐ The channel has one or more knickpoints indicating headward erosion of the bed.
Indicators of Active Aggradation	☐ There is an active floodplain with fresh splays of coarse sediment (sand and larger that is not vegetated) deposited in the current or previous year. ☐ There are partially buried living tree trunks or shrubs along the banks. ☒ The bed is planar (flat or uniform gradient) overall; it lacks well-defined channel pools, or they are uncommon and irregularly spaced. ☐ There are partially buried, or sediment-choked, culverts. ☒ Perennial terrestrial or riparian vegetation is encroaching into the channel or onto channel bars below the bankfull contour. ☐ There are avulsion channels on the floodplain or adjacent valley floor.
Overall	☐ **Equilibrium** ☐ **Degradation** ☒ **Aggradation**

Riverine Wetland Entrenchment Ratio Calculation Worksheet

The following 5 steps should be conducted for each of 3 cross-sections located in the AA at the approximate midpoints along straight riffles or glides, away from deep pools or meander bends. An attempt should be made to place them at the top, middle, and bottom of the AA.

Steps	Replicate Cross-sections →	TOP	MID	BOT
1 Estimate bankfull width.	This is a critical step requiring familiarity with field indicators of the bankfull contour. Estimate or measure the distance between the right and left bankfull contours.	2m		
2: Estimate max. bankfull depth.	Imagine a level line between the right and left bankfull contours; estimate or measure the height of the line above the thalweg (the deepest part of the channel).	1m		
3: Estimate flood prone depth.	Double the estimate of maximum bankfull depth from Step 2.	2m		
4: Estimate flood prone width.	Imagine a level line having a height equal to the flood prone depth from Step 3; note where the line intercepts the right and left banks; estimate or measure the length of this line.	200m*		
5: Calculate entrenchment ratio.	Divide the flood prone width (Step 4) by the bankfull width (Step 1).	100m	Same	Same
6: Calculate average entrenchment ratio.	Calculate the average results for Step 5 for all 3 replicate cross-sections. Enter the average result here and use it in Table 13a or 13b.			>>2.2

Structural Patch Type Worksheet for Riverine wetlands

Circle each type of patch that is observed in the AA and enter the total number of observed patches in Table below. In the case of riverine wetlands, their status as confined or non-confined must first be determined (see page 6) to determine with patches are expected in the system (indicated by a "1" in the table below). Any feature onsite should only be counted once as a patch type. If a feature appears to meet the definition of more than one patch type (i.e. swale and secondary channel) the practitioner should choose which patch type best illustrates the feature. Not all features at a site will be patch types.

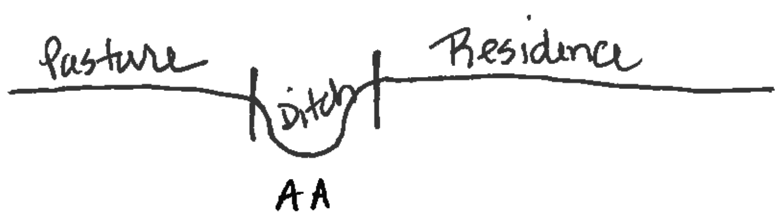
Please refer to the CRAM Photo Dictionary at** *www.cramwetlands.org* **for photos of each of the following patch types.

STRUCTURAL PATCH TYPE (circle for presence)	Riverine (Non-confined)	Riverine (Confined)
Minimum Patch Size	3 m^2	3 m^2
Abundant wrackline or organic debris in channel, on floodplain	1	1
Bank slumps or undercut banks in channels or along shoreline	1	1
Cobbles and/or Boulders	1	1
Debris jams	1	1
Filamentous macroalgae or algal mats	1	1
Large woody debris	1	1
Pannes or pools on floodplain	1	N/A
Plant hummocks and/or sediment mounds	1	1
Point bars and in-channel bars	1	1
Pools or depressions in channels (wet or dry channels)	1	1
Riffles or rapids (wet or dry channels)	1	1
Secondary channels on floodplains or along shorelines	1	N/A
Standing snags (at least 3 m tall)	1	1
Submerged vegetation	1	N/A
Swales on floodplain or along shoreline	1	N/A
Variegated, convoluted, or crenulated foreshore (instead of broadly arcuate or mostly straight)	1	1
Vegetated islands (mostly above high-water)	1	N/A
Total Possible	17	12
No. Observed Patch Types (enter here and use in Table 14 below)	1	

Worksheet for AA Topographic Complexity

At three locations along the AA, make a sketch of the profile of the stream from the AA boundary down to its deepest area then back out to the other AA boundary. Try to capture the benches and the intervening micro-topographic relief. To maintain consistency, make drawings at each of the stream hydrologic connectivity measurements, always facing downstream. Include the water level, an arrow at the bankfull contour, and label the benches. Based on these sketches and the profiles in Figure 10, choose a description in Table 16 that best describes the overall topographic complexity of the AA.

Profile 1



Profile 2

Profile 3

Plant Community Metric Worksheet: Co-dominant species richness for Riverine wetlands
(A dominant species represents ≥10% *relative* cover)

Special Note:

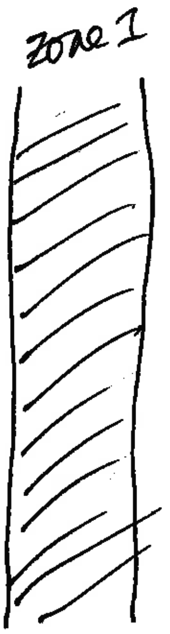
** Combine the counts of co-dominant species from all layers to identify the total species count. Each plant species is only counted once when calculating the Number of Co-dominant Species and Percent Invasion submetric scores, regardless of the numbers of layers in which it occurs.*

Floating or Canopy-forming (non-confined only)	Invasive?	Short (<0.5 m)	Invasive?
Medium (0.5-1.5 m)	**Invasive?**	**Tall (1.5-3.0 m)**	**Invasive?**
~~Brome spp~~ Hordeum murinum	Y	Mustard (Brassica spp)	Y
Blessed Milkthistle (~~Bull, Italian~~)	Y		
Silybum marianum			
Triticum aestivum			
Very Tall (>3.0 m)	**Invasive?**	Total number of co-dominant species for all layers combined (enter here and use in Table 18)	
		Percent Invasion *Round to the nearest integer* (enter here and use in Table 18)	

~~Go~~

Horizontal Interspersion Worksheet.

Use the spaces below to make a quick sketch of the AA in plan view, outlining the major plant zones (this should take no longer than 10 minutes). Assign the zones names and record them on the right. Based on the sketch, choose a single profile from Figure 12 that best represents the AA overall.



Assigned zones:

1) Mustard, bromus, thistle zone

2)

3)

4)

5)

6)

Worksheet for Wetland disturbances and conversions

Has a major disturbance occurred at this wetland?	Yes	No		
If yes, was it a flood, fire, landslide, or other?	flood	fire	landslide	other
If yes, then how severe is the disturbance?	likely to affect site next 5 or more years	likely to affect site next 3-5 years	likely to affect site next 1-2 years	
Has this wetland been converted from another type? If yes, then what was the previous type?	depressional	vernal pool	vernal pool system	
	non-confined riverine	confined riverine	seasonal estuarine	
	perennial saline estuarine	perennial non-saline estuarine	wet meadow	
	lacustrine	seep or spring	playa	

Stressor Checklist Worksheet

HYDROLOGY ATTRIBUTE (WITHIN 50 M OF AA)	Present	Significant negative effect on AA
Point Source (PS) discharges (POTW, other non-stormwater discharge)		
Non-point Source (Non-PS) discharges (urban runoff, farm drainage)	X	
Flow diversions or unnatural inflows		
Dams (reservoirs, detention basins, recharge basins)		
Flow obstructions (culverts, paved stream crossings)		
Weir/drop structure, tide gates		
Dredged inlet/channel		
Engineered channel (riprap, armored channel bank, bed)		
Dike/levees		
Groundwater extraction		
Ditches (borrow, agricultural drainage, mosquito control, etc.)	X	
Actively managed hydrology		

Comments

PHYSICAL STRUCTURE ATTRIBUTE (WITHIN 50 M OF AA)	Present	Significant negative effect on AA
Filling or dumping of sediment or soils **(N/A for restoration areas)**		
Grading/ compaction **(N/A for restoration areas)**	X	
Plowing/Discing **(N/A for restoration areas)**	X	
Resource extraction (sediment, gravel, oil and/or gas)		
Vegetation management		
Excessive sediment or organic debris from watershed		
Excessive runoff from watershed		
Nutrient impaired (PS or Non-PS pollution)	X	
Heavy metal impaired (PS or Non-PS pollution)		
Pesticides or trace organics impaired (PS or Non-PS pollution)	X	
Bacteria and pathogens impaired (PS or Non-PS pollution)		
Trash or refuse		

Comments

BIOTIC STRUCTURE ATTRIBUTE (WITHIN 50 M OF AA)	Present	Significant negative effect on AA
Mowing, grazing, excessive herbivory (within AA)	X	
Excessive human visitation	X	
Predation and habitat destruction by non-native vertebrates (e.g., *Virginia opossum* and domestic predators, such as feral pets)		
Tree cutting/sapling removal		
Removal of woody debris		
Treatment of non-native and nuisance plant species		
Pesticide application or vector control		
Biological resource extraction or stocking (fisheries, aquaculture)		
Excessive organic debris in matrix (for vernal pools)		
Lack of vegetation management to conserve natural resources		
Lack of treatment of invasive plants adjacent to AA or buffer	X	
Comments		

BUFFER AND LANDSCAPE CONTEXT ATTRIBUTE (WITHIN 500 M OF AA)	Present	Significant negative effect on AA
Urban residential	X	
Industrial/commercial		
Military training/Air traffic		
Dams (or other major flow regulation or disruption)		
Dryland farming		
Intensive row-crop agriculture	X	
Orchards/nurseries		
Commercial feedlots		
Dairies		
Ranching (enclosed livestock grazing or horse paddock or feedlot)	X	
Transportation corridor	X	
Rangeland (livestock rangeland also managed for native vegetation)		
Sports fields and urban parklands (golf courses, soccer fields, etc.)		
Passive recreation (bird-watching, hiking, etc.)		
Active recreation (off-road vehicles, mountain biking, hunting, fishing)		
Physical resource extraction (rock, sediment, oil/gas)		
Biological resource extraction (aquaculture, commercial fisheries)		
Comments		

Basic Information Sheet: Riverine Wetlands

Assessment Area Name: AA38-COW-02186	
Project Name: HSR	
Assessment Area ID #: 38	
Project ID #:	**Date:** 4/23/19
Assessment Team Members for This AA: RT, Donna Maniscalco	
Average Bankfull Width: 2.5m	
Approximate Length of AA (10 times bankfull width, min 100 m, max 200 m): 100m	
Upstream Point Latitude: 37.0997	**Longitude:** -120.8235
Downstream Point Latitude:	**Longitude:**

Wetland Sub-type:

☐ Confined ☒ Non-confined

AA Category:

☐ Restoration ☐ Mitigation ☐ Impacted ☐ Ambient ☐ Reference ☐ Training

☒ Other: Pre-impact

Did the river/stream have flowing water at the time of the assessment? ☐ yes ☒ no

What is the apparent hydrologic flow regime of the reach you are assessing?

The hydrologic flow regime of a stream describes the frequency with which the channel conducts water. *Perennial* streams conduct water all year long, whereas *ephemeral* streams conduct water only during and immediately following precipitation events. *Intermittent* streams are dry for part of the year, but conduct water for periods longer than ephemeral streams, as a function of watershed size and water source.

☐ perennial ☐ intermittent ☒ ephemeral

6

Photo Identification Numbers and Description:

	Photo ID No.	Description	Latitude	Longitude	Datum
1	RJ	Upstream			
2		Middle Left			
3		Middle Right			
4	RJ	Downstream			
5					
6					
7					
8					
9					
10					

Site Location Description:

Roadside ditch

Comments:

Potentially non-jurisdictional. Appears to receive roadside runoff only

Scoring Sheet: Riverine Wetlands

AA Name: AA38			Date: 4/23/19
Attribute 1: Buffer and Landscape Context (pp. 11-19)			**Comments**
	Alpha.	Numeric	
Stream Corridor Continuity (D)	D		430m break
Buffer:			
	Alpha.	Numeric	
Buffer submetric A: Percent of AA with Buffer	D		No buffer due to road & ag on both ~~either~~ sides of ditch
Buffer submetric B: Average Buffer Width	D		
Buffer submetric C: Buffer Condition	D		
Raw Attribute Score = D+[C x (A x B)^{½}]^{½}			**Final Attribute Score = (Raw Score/24) x 100**
Attribute 2: Hydrology (pp. 20-26)			
	Alpha.	Numeric	
Water Source	C		
Channel Stability	B		Due to lack of flow no severe degradation or aggradation present
Hydrologic Connectivity	A		
Raw Attribute Score = sum of numeric scores			**Final Attribute Score = (Raw Score/36) x 100**
Attribute 3: Physical Structure (pp. 27-33)			
	Alpha.	Numeric	
Structural Patch Richness	D		
Topographic Complexity	D		
Raw Attribute Score = sum of numeric scores			**Final Attribute Score = (Raw Score/24) x 100**
Attribute 4: Biotic Structure (pp. 34-41)			
Plant Community Composition (based on sub-metrics A-C)			
	Alpha.	Numeric	
Plant Community submetric A: Number of plant layers	C		
Plant Community submetric B: Number of Co-dominant species	D		
* *Plant Community submetric C: Percent Invasion*	B		
Plant Community Composition Metric *(numeric average of submetrics A-C)*			
Horizontal Interspersion	D		
Vertical Biotic Structure	D		
Raw Attribute Score = sum of numeric scores			**Final Attribute Score = (Raw Score/36) x 100**
Overall AA Score (average of four final Attribute Scores)			

Worksheet for Stream Corridor Continuity Metric for Riverine Wetlands

Lengths of Non-buffer Segments For Distance of 500 m Upstream of AA		Lengths of Non-buffer Segments For Distance of 500 m Downstream of AA	
Segment No.	Length (m)	Segment No.	Length (m)
1	10 m	1	430 m
2		2	
3		3	
4		4	
5		5	
Upstream Total Length		Downstream Total Length	

Percent of AA with Buffer Worksheet

In the space provided below make a quick sketch of the AA, or perform the assessment directly on the aerial imagery; indicate where buffer is present, estimate the percentage of the AA perimeter providing buffer functions, and record the estimate amount in the space provided.

Percent of AA with Buffer: 0 **%**

Worksheet for calculating average buffer width of AA

Line	Buffer Width (m)
A	
B	
C	
D	
E	
F	
G	
H	
Average Buffer Width *Round to the nearest integer*	0

Worksheet for Assessing Channel Stability for Riverine Wetlands

Condition	Field Indicators (check all existing conditions)
Indicators of Channel Equilibrium	☐ The channel (or multiple channels in braided systems) has a well-defined bankfull contour that clearly demarcates an obvious active floodplain in the cross-sectional profile of the channel throughout most of the AA. ☐ Perennial riparian vegetation is abundant and well established along the bankfull contour, but not below it. ☐ There is leaf litter, thatch, or wrack in most pools (if pools are present). ☐ The channel contains embedded woody debris of the size and amount consistent with what is naturally available in the riparian area. ☐ There is little or no active undercutting or burial of riparian vegetation. ☐ If mid-channel bars and/or point bars are present, they are not densely vegetated with perennial vegetation. ☐ Channel bars consist of well-sorted bed material (smaller grain size on the top and downstream end of the bar, larger grain size along the margins and upstream end of the bar). ☐ There are channel pools, the spacing between pools tends to be regular and the bed is not planar throughout the AA ☐ The larger bed material supports abundant mosses or periphyton.
Indicators of Active Degradation	☐ The channel is characterized by deeply undercut banks with exposed living roots of trees or shrubs. ☐ There are abundant bank slides or slumps. ☐ The lower banks are uniformly scoured and not vegetated. ☐ Riparian vegetation is declining in stature or vigor, or many riparian trees and shrubs along the banks are leaning or falling into the channel. ☐ An obvious historical floodplain has recently been abandoned, as indicated by the age structure of its riparian vegetation. ☐ The channel bed appears scoured to bedrock or dense clay. ☐ Recently active flow pathways appear to have coalesced into one channel (i.e. a previously braided system is no longer braided). ☐ The channel has one or more knickpoints indicating headward erosion of the bed.
Indicators of Active Aggradation	☐ There is an active floodplain with fresh splays of coarse sediment (sand and larger that is not vegetated) deposited in the current or previous year. ☐ There are partially buried living tree trunks or shrubs along the banks. ☒ The bed is planar (flat or uniform gradient) overall; it lacks well-defined channel pools, or they are uncommon and irregularly spaced. ☐ There are partially buried, or sediment-choked, culverts. ☒ Perennial terrestrial or riparian vegetation is encroaching into the channel or onto channel bars below the bankfull contour. ☐ There are avulsion channels on the floodplain or adjacent valley floor.
Overall	☐ **Equilibrium** ☐ **Degradation** ☐ **Aggradation**

Riverine Wetland Entrenchment Ratio Calculation Worksheet

The following 5 steps should be conducted for each of 3 cross-sections located in the AA at the approximate midpoints along straight riffles or glides, away from deep pools or meander bends. An attempt should be made to place them at the top, middle, and bottom of the AA.

Steps	Replicate Cross-sections ⟶	TOP	MID	BOT
1 Estimate bankfull width.	This is a critical step requiring familiarity with field indicators of the bankfull contour. Estimate or measure the distance between the right and left bankfull contours.	2.5m		
2: Estimate max. bankfull depth.	Imagine a level line between the right and left bankfull contours; estimate or measure the height of the line above the thalweg (the deepest part of the channel).	1m		
3: Estimate flood prone depth.	Double the estimate of maximum bankfull depth from Step 2.	2m		
Ag field ← 4: Estimate flood prone width.	Imagine a level line having a height equal to the flood prone depth from Step 3; note where the line intercepts the right and left banks; estimate or measure the length of this line.	200m		
5: Calculate entrenchment ratio.	Divide the flood prone width (Step 4) by the bankfull width (Step 1).	80m	Same	Same
6: Calculate average entrenchment ratio.	Calculate the average results for Step 5 for all 3 replicate cross-sections. Enter the average result here and use it in Table 13a or 13b.			>> 2.2

Structural Patch Type Worksheet for Riverine wetlands

Circle each type of patch that is observed in the AA and enter the total number of observed patches in Table below. In the case of riverine wetlands, their status as confined or non-confined must first be determined (see page 6) to determine with patches are expected in the system (indicated by a "1" in the table below). Any feature onsite should only be counted once as a patch type. If a feature appears to meet the definition of more than one patch type (i.e. swale and secondary channel) the practitioner should choose which patch type best illustrates the feature. Not all features at a site will be patch types.

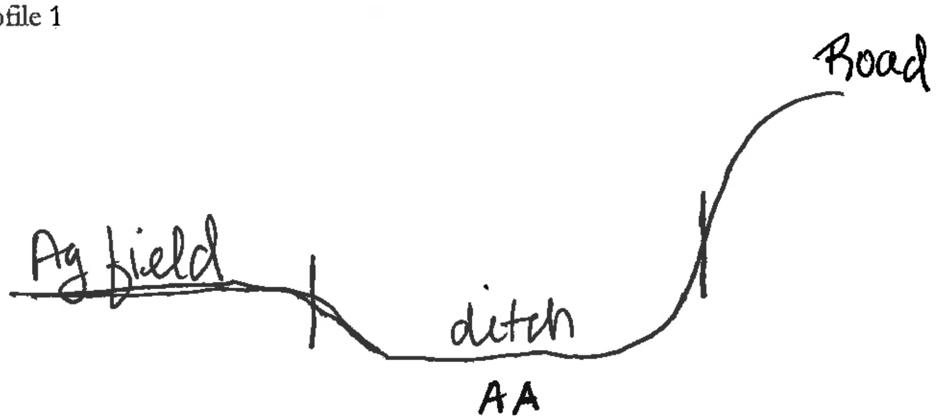
Please refer to the CRAM Photo Dictionary at** *www.cramwetlands.org* **for photos of each of the following patch types.

STRUCTURAL PATCH TYPE (circle for presence)	**Riverine (Non-confined)**	**Riverine (Confined)**
Minimum Patch Size	**3 m²**	**3 m²**
Abundant wrackline or organic debris in channel, on floodplain	**1**	**1**
Bank slumps or undercut banks in channels or along shoreline	**1**	**1**
Cobbles and/or Boulders	**1**	**1**
Debris jams	**1**	**1**
Filamentous macroalgae or algal mats	**1**	**1**
Large woody debris	**1**	**1**
Pannes or pools on floodplain	**1**	**N/A**
Plant hummocks and/or sediment mounds	**1**	**1**
Point bars and in-channel bars	**1**	**1**
Pools or depressions in channels (wet or dry channels)	**1**	**1**
Riffles or rapids (wet or dry channels)	**1**	**1**
Secondary channels on floodplains or along shorelines	**1**	**N/A**
Standing snags (at least 3 m tall)	**1**	**1**
Submerged vegetation	**1**	**N/A**
Swales on floodplain or along shoreline	**1**	**N/A**
Variegated, convoluted, or crenulated foreshore (instead of broadly arcuate or mostly straight)	**1**	**1**
Vegetated islands (mostly above high-water)	**1**	**N/A**
Total Possible	**17**	**12**
No. Observed Patch Types (enter here and use in Table 14 below)	~~[illegible]~~ 1	~~0~~

Worksheet for AA Topographic Complexity

At three locations along the AA, make a sketch of the profile of the stream from the AA boundary down to its deepest area then back out to the other AA boundary. Try to capture the benches and the intervening micro-topographic relief. To maintain consistency, make drawings at each of the stream hydrologic connectivity measurements, always facing downstream. Include the water level, an arrow at the bankfull contour, and label the benches. Based on these sketches and the profiles in Figure 10, choose a description in Table 16 that best describes the overall topographic complexity of the AA.

Profile 1



Profile 2

SAME

Profile 3

SAME

Plant Community Metric Worksheet: Co-dominant species richness for Riverine wetlands

(A dominant species represents ≥10% *relative* cover)

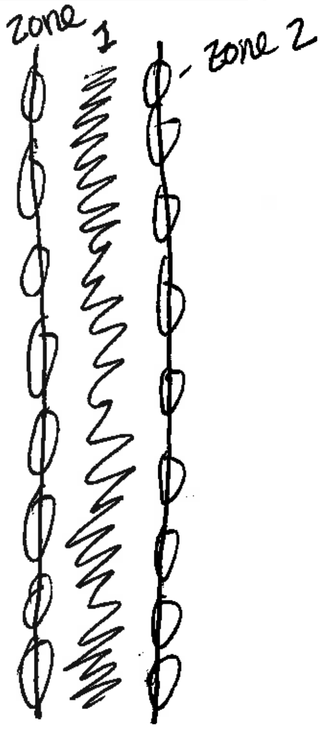
Special Note:

** Combine the counts of co-dominant species from all layers to identify the total species count. Each plant species is only counted once when calculating the Number of Co-dominant Species and Percent Invasion submetric scores, regardless of the numbers of layers in which it occurs.*

Floating or Canopy-forming (non-confined only)	Invasive?	Short (<0.5 m)	Invasive?
		Unknown 1	N
Medium (0.5-1.5 m)	**Invasive?**	**Tall (1.5-3.0 m)**	**Invasive?**
Fiddleneck	N	~~Mustard~~	~~Y~~
~~Bromus spp.~~ Hordeum marinum	Y		
~~Unknown 2~~			
Common wheat Tritiaum aestivum	~~Y~~ N		
Very Tall (>3.0 m)	**Invasive?**	**Total number of co-dominant species for all layers combined (enter here and use in Table 18)**	4
		Percent Invasion *Round to the nearest integer* (enter here and use in Table 18)	25

Horizontal Interspersion Worksheet.

Use the spaces below to make a quick sketch of the AA in plan view, outlining the major plant zones (this should take no longer than 10 minutes). Assign the zones names and record them on the right. Based on the sketch, choose a single profile from Figure 12 that best represents the AA overall.



Assigned zones:

1) channel bottom
2) sides of banks
3)
4)
5)
6)

Worksheet for Wetland disturbances and conversions

Has a major disturbance occurred at this wetland?	Yes	No		
If yes, was it a flood, fire, landslide, or other?	flood	fire	landslide	other
If yes, then how severe is the disturbance?	likely to affect site next 5 or more years	likely to affect site next 3-5 years	likely to affect site next 1-2 years	
Has this wetland been converted from another type? If yes, then what was the previous type?	depressional	vernal pool	vernal pool system	
	non-confined riverine	confined riverine	seasonal estuarine	
	perennial saline estuarine	perennial non-saline estuarine	wet meadow	
	lacustrine	seep or spring	playa	

Stressor Checklist Worksheet

HYDROLOGY ATTRIBUTE (WITHIN 50 M OF AA)	Present	Significant negative effect on AA
Point Source (PS) discharges (POTW, other non-stormwater discharge)		
Non-point Source (Non-PS) discharges (urban runoff, farm drainage)	X	
Flow diversions or unnatural inflows	X	
Dams (reservoirs, detention basins, recharge basins)		
Flow obstructions (culverts, paved stream crossings)	X	
Weir/drop structure, tide gates	X	
Dredged inlet/channel	X	
Engineered channel (riprap, armored channel bank, bed)		
Dike/levees		
Groundwater extraction		
Ditches (borrow, agricultural drainage, mosquito control, etc.)	X	
Actively managed hydrology	X	
Comments		

PHYSICAL STRUCTURE ATTRIBUTE (WITHIN 50 M OF AA)	Present	Significant negative effect on AA
Filling or dumping of sediment or soils **(N/A for restoration areas)**		
Grading/ compaction **(N/A for restoration areas)**	X	
Plowing/Discing **(N/A for restoration areas)**	X	
Resource extraction (sediment, gravel, oil and/or gas)		
Vegetation management		
Excessive sediment or organic debris from watershed		
Excessive runoff from watershed		
Nutrient impaired (PS or Non-PS pollution)	X	
Heavy metal impaired (PS or Non-PS pollution)		
Pesticides or trace organics impaired (PS or Non-PS pollution)	X	
Bacteria and pathogens impaired (PS or Non-PS pollution)	X	
Trash or refuse	X	
Comments		

BIOTIC STRUCTURE ATTRIBUTE (WITHIN 50 M OF AA)	Present	Significant negative effect on AA
Mowing, grazing, excessive herbivory (within AA)		
Excessive human visitation	X	
Predation and habitat destruction by non-native vertebrates (e.g., *Virginia opossum* and domestic predators, such as feral pets)		
Tree cutting/sapling removal		
Removal of woody debris		
Treatment of non-native and nuisance plant species		
Pesticide application or vector control	X	
Biological resource extraction or stocking (fisheries, aquaculture)		
Excessive organic debris in matrix (for vernal pools)		
Lack of vegetation management to conserve natural resources		
Lack of treatment of invasive plants adjacent to AA or buffer	X	
Comments		

BUFFER AND LANDSCAPE CONTEXT ATTRIBUTE (WITHIN 500 M OF AA)	Present	Significant negative effect on AA
Urban residential	X	
Industrial/commercial		
Military training/Air traffic		
Dams (or other major flow regulation or disruption)		
Dryland farming		
Intensive row-crop agriculture	X	
Orchards/nurseries		
Commercial feedlots		
Dairies		
Ranching (enclosed livestock grazing or horse paddock or feedlot)	X	
Transportation corridor	X	
Rangeland (livestock rangeland also managed for native vegetation)		
Sports fields and urban parklands (golf courses, soccer fields, etc.)		
Passive recreation (bird-watching, hiking, etc.)		
Active recreation (off-road vehicles, mountain biking, hunting, fishing)		
Physical resource extraction (rock, sediment, oil/gas)		
Biological resource extraction (aquaculture, commercial fisheries)		
Comments		

Basic Information Sheet: Slope Wetlands

Assessment Area Name: AA40 -ALM - 00305	
Project Name: HSR JM	
Assessment Area ID#:	
Project ID#:	**Date** 4/25/19
Assessment Team Members for This AA: LSL, DM	
Assessment Area Size:	
Surface water present during the assessment? ☐ Yes ☒ No **Flowing?** ☐ Yes ☒ No	
Briefly describe the hydrology of the AA (e.g., water sources, channels, swales, etc.)	

AA Category:

☐ Pre-Restoration ☐ Post-Restoration ☐ Pre-Mitigation ☐ Post-Mitigation

☒ Pre-Impact ☐ Post-Impact ☐ Ambient ☐ Reference

☐ Training ☐ Other:

Which best describes the type of wetland?

☐ Channeled Wet Meadow (assoc. with a fluvial channel) ☒ Non-Channeled Wet Meadow

☒ Channeled Forested Slope ☒ Non-Channeled Forested Slope ☐ Seep or Spring

Are peat soils present in the AA? ☐ Yes ☒ No

AA Encompasses:

☐ entire wetland ☒ portion of the wetland

Which best describes the dominant hydrologic state of the AA at the time of assessment?

☐ ponded/inundated ☐ saturated soil, but no surface water ☒ moist ☒ dry

What is the apparent hydrologic regime of the wetland?

Perennial slope wetlands contain surface water year-round, *seasonal* slope wetlands support surface water for 4-11 months of the year (in > 5 out of 10 years.) *Temporarily flooded* slope wetlands possess surface water between 2 weeks and 4 months of the year.

☐ perennial ☒ seasonal ☒ temporarily flooded

Photo Identification Numbers and Description:

	Photo ID No.	Description
1		Looking North into the AA
2		Looking South into the AA
3		Looking East into the AA
4		Looking West into the AA
5		
6		
7		
8		
9		
10		

Site Location Description (including County and USGS Topographic Quadrangle if known):

Comments:

Scoring Sheet: Slope Wetlands

AA Name: AA40			Date	4/25/19
Attribute 1: Buffer and Landscape Context			**Comments**	
	Alpha	Numeric		
Aquatic Area Abundance (D)	A		97%	
Buffer				
Buffer submetric A: Percent of AA with Buffer	A		100%	
Buffer submetric B: Average Buffer Width	B		178	
Buffer submetric C: Buffer Condition	A			
Raw Attribute Score = D+[C x (A x B)½]½ (do not round)			**Final Attribute Score = (Raw Score/24) x 100**	
Attribute 2: Hydrology				
	Alpha	Numeric		
Water Source	C		> 20% ag	
Hydroperiod	B		floodwaters pumped in but natural dr	
Hydrologic Connectivity (all but Channeled)	~~B~~A		~~[illegible]~~ not altered hyd	
Hydro Connectivity submetric A: Bank Height Ratio				
Hydro Connectivity submetric B: Percent Dewatered				
Hydrologic Connectivity for Channeled (*avg. of submetrics A-B*)				
Raw Attribute Score = sum of numeric scores			**Final Attribute Score = (Raw Score/36) x 100**	
Attribute 3: Physical Structure				
	Alpha	Numeric		
Structural Patch Richness	C		7 patches	
Topographic Complexity	A		B topo A veg roughness	
Raw Attribute Score = sum of numeric scores			**Final Attribute Score = (Raw Score/24) x 100**	
Attribute 4: Biotic Structure				
Plant Community Composition (submetric A is not applicable for Non-Channeled meadows)				
	Alpha	Numeric		
Plant Community submetric A: Number of plant layers	B		3 layers	
Plant Community submetric B: Number of Co-dominant species	C		5 codoms	
Plant Community submetric C: Percent Invasive species	A		0% invasion	
Plant Comm. Composition (*avg. of submetrics A-C or B-C*)				
	Alpha	Numeric		
Horizontal Interspersion	B			
Plant Life Forms	C		3 life forms	
Raw Attribute Score = sum of numeric scores			**Final Attribute Score = (Raw Score/36) x 100**	
Overall AA Score (average of four final Attribute Scores)				

Worksheet for Aquatic Area Abundance Metric

Percentage of Transect Lines that Contains Wetland or Aquatic Habitat of Any Kind	
Segment Direction	Percentage of Transect Length That is an Aquatic Feature
North	92
South	100
East	98
West	98
Average Percentage of Transect Length That Is an Aquatic Feature	97

Percent of AA with Buffer Worksheet.

In the space provided on the datasheet, make a quick sketch of the AA, or perform the assessment directly on the aerial imagery; indicate where buffer is present, estimate the percentage of the AA perimeter providing buffer functions, and record the estimate amount in the space provided.

Worksheet for calculating Average Buffer Width of AA

Line	Buffer Width (m)
A	~~[illegible]~~ 20
B	100
C	250
D	250
E	250
F	250
G	250
H	50
Average Buffer Width	178

Channeled Wet Meadow and Channeled Forested Slope Wetland Bank Height Calculation Worksheet

The following 4 steps should be conducted for each of 3 cross-sections located in the AA at the approximate midpoints along straight riffles or glides, away from deep pools or meander bends. An attempt should be made to place them at the top, middle, and bottom of the AA.				
Steps	**Replicate Cross-sections** ⟶	**TOP**	**MID**	**BOT**
1 Estimate bankfull width.	This is a critical step requiring familiarity with field indicators of the bankfull contour. Measure the distance between the right and left bankfull contours.			
2: Estimate max. bankfull depth.	Imagine a level line between the right and left bankfull contours; measure the height of the line above the thalweg (the deepest part of the channel).			
3: Estimate max. bank height	Identify the location of the top of bank. Measure the height between the thalweg and the top of bank location.			
4: Calculate bank height ratio.	Divide the bank height (Step 3) by the bankfull depth (Step 2). Keep two significant figures.			
5: Calculate average bank height ratio.	Calculate the average results for Step 4 for all 3 replicate cross-sections. Enter the average result here and use it in Table 14. Keep two significant figures (hundredths).			

Worksheet for Assessing Hydrologic Connectivity: Percent Dewatered for Slope Wetlands.

Condition	Field Indicators (check all existing conditions)
Indicators of Intact Hydrologic Connectivity	☒ No channel incision ☒ Vigor of plant species, especially hydrophytes ☒ Low or no cover of upland plant species ☒ No rill or gully development ☐ No areas of bare soil ☐ No soil cracking ☐ No changes in soil structure or moisture content ☐ Surface water present on the wetland plain late into the summer season ☐ Groundwater emerging ☐ Moist peat soil ☐ Floating fens ☒ Evidence of regular inundation on floodplain slope wetlands (wrack etc.)
Indicators of Degraded Hydrologic Connectivity (dewatering)	☐ Evidence of channel incision, including low entrenchment ratios, undercut banks, block bank failures, sloughing banks, hanging or exposed roots, channel scoured to bedrock or dense clay, active knickpoints, active gully erosion, active headcutting ☐ Stress or mortality of plants ☐ Presence of xeric plant species ☐ Development of rills or gullies on the wetland surface ☒ Areas of bare soil ☒ Areas of soil cracking ☐ Drying of peat ☐ Decrease in vigor of hydrophytes ☒ Changes in plant or animal species or communities ☒ Changes in soil structure or moisture content ☐ More than 5% cover in the AA of upland conifer species (e.g. Douglas fir (*Pseudotsuga menziesii*), Lodgepole Pine (*Pinus contorta)*, see special note) ☐ More than 5% cover in the AA of upland broadleaf tree species (e.g. tanoak (*Notholithocarpus densiflorus*), coast live oak (*Quercus agrifolia*) ☐ More than 5% cover in the AA of upland shrub species (e.g. sagebrush (*Artemisia tridentate)*, rabbitbrush (*Ericameria nauseosa)*, French broom (*Genista monspessulana*) ☐ More than 5% cover in the AA of upland vines (e.g. English ivy (*Hedera helix)*, Himalayan blackberry (*Rubus armeniacus)*, field bindweed (*Convolvulus arvensis*) ☐ More than 5% cover in the AA of upland grasses (e.g. ripgut brome (*Bromus diandrus)*, cheatgrass (*Bromus tectorum)*, needlegrass (*Stipa pulchra*) ☐ More than 5% cover in the AA of upland herbs and forbs (e.g. ragweed (*Ambrosia artemisiifolia)*, mustard (*Brassica rapa)*, yellow star thistle (*Centaurea solstitialis*)
Overall area of the wetland showing evidence of dewatering	☒ **No dewatering** ☐ **<25% dewatered** ☐ **25-50% dewatered** ☒ **>50% dewatered** natural drawdown

Structural Patch Type Worksheet for Slope Wetlands

STRUCTURAL PATCH TYPE **(circle for presence)**	**Slope Wetland**
Minimum Patch Size	**3 m^2**
Abundant wrack or organic debris in channel, or across wetland plain	X
Active fluvial channel(s)	
Animal mounds and burrows, sediment disturbance, or vole trails	
Bank slumps or undercut banks in channels	
Beaver dams or lodges	
Boulders or bedrock outcrop	
Cutoff channels or oxbows	
Filamentous macroalgae or algal mats	X
Gravel, cobble, or sand	
Large woody debris	X
Moss	
Non-vegetated flats or bare ground	X
Pannes or pools on wetland surface	X
Plant hummocks and/or tussocks	
Sediment mounds around the bases of shrubs or trees	
Sediment splays	
Soil cracks	X
Springs or upwelling groundwater	
Standing snags (at least 3 m tall)	
Submerged vegetation (in channels or open water)	
Swales	
Thatch	X
Variegated, convoluted, or crenulated upland edge (not broadly arcuate or mostly straight)	
Total Possible	**23**
No. Observed Patch Types **(enter here and use in Table 17 below)**	7

Worksheet for AA Topographic Complexity

Complete a sketch of the topographic profile of the AA along a cross section perpendicular to the overall slope of wetland within the AA. Draw the section to include both AA boundaries. Include both the ground surface and the vegetation roughness. Indicate the letter grade for each component in the space below the sketch. Note the AA boundaries and important topographic features.

Physical topographic complexity score B Vegetation roughness score A

Plant Community Metric Worksheet: Co-dominant species richness for Channeled Wet Meadow, Channeled Forested Slope Wetlands, Non-channeled Forested Slope Wetlands, and Seeps and Springs

Floating or Canopy-forming	Invasive?	Short (<0.3 m)	Invasive?
		Xanthium strumarium	
Medium (0.3-1.0 m)	**Invasive?**	**Tall (1.0-3.0 m)**	**Invasive?**
		Schoenoplectus californica	
		Typha latifolia	
		Juncus effusus	
Very Tall (>3.0 m)	**Invasive?**	**Total number of co-dominant species for all layers combined (enter here and see Table 21)**	5
Salix goodingii			
		Percent Invasion (enter here and see Table 21)	0%

Table 22: Worksheet for Co-dominant Plant Species.

Co-dominant Species	Check if Invasive
Total Number of Co-dominants	
Total Number of Invasive Co-dominant species	
Percent Invasive Species (round to nearest integer)	

Horizontal Interspersion Worksheet

Use the spaces below to make a quick sketch of the AA in plan view, outlining the major plant zones (this should take no longer than 10 minutes). Assign the zones names and record them on the right. Based on the sketch, choose a single profile from Figure 17 that best represents the AA overall.

Assigned zones:

1) Willows

2) Schoenoplectus

3) Juncus

4) Open

5)

6)

Table 24. Plant Life Forms Metric.

Life Form	Present in > 5% of AA?
Bryophytes (mosses, liverworts, hornworts)	
Coniferous Trees	
Deciduous Broadleaf Trees	X
Evergreen Broadleaf Trees	
Ferns	
Grasses	
Herbs/Forbs	X
Lichens or Fungi	
Sedges/Rushes	X
Shrubs	
Vines	
Total Number of life forms	3

Worksheet: Stressor Checklist

HYDROLOGY ATTRIBUTE (WITHIN 50 M OF AA)	Present	Present and likely to have significant negative effect on AA
Point Source (PS) discharges (POTW, other non-stormwater discharge)		
Non-point Source (Non-PS) discharges (urban runoff, farm drainage)	X	
Flow diversions or unnatural inflows		
Dams (reservoirs, detention basins, recharge basins)		
Flow obstructions (culverts, paved stream crossings)		
Weir/drop structure, tide gates		
Dredged inlet/channel		
Engineered channel (riprap, armored channel bank, bed)		
Dike/levees	X	
Groundwater extraction		
Ditches (borrow, agricultural drainage, mosquito control, etc.)	X	
Actively managed hydrology	X	
Comments		

PHYSICAL STRUCTURE ATTRIBUTE (WITHIN 50 M OF AA)	Present	Present and likely to have significant negative effect on AA
Filling or dumping of sediment or soils **(N/A for restoration areas)**		
Grading/ compaction **(N/A for restoration areas)**		
Plowing/Discing **(N/A for restoration areas)**		
Resource extraction (sediment, gravel, oil and/or gas)		
Vegetation management		
Excessive sediment or organic debris from watershed		
Excessive runoff from watershed		
Nutrient impaired (PS or Non-PS pollution)		
Heavy metal impaired (PS or Non-PS pollution)		
Pesticides or trace organics impaired (PS or Non-PS pollution)		
Bacteria and pathogens impaired (PS or Non-PS pollution)		
Trash or refuse		
Comments		

BIOTIC STRUCTURE ATTRIBUTE (WITHIN 50 M OF AA)	Present	Present and Likely to Have Significant negative effect on AA
Mowing, grazing, excessive herbivory (within AA)		
Excessive human visitation		
Predation and habitat destruction by non-native vertebrates (e.g., *Virginia opossum* and domestic predators, such as feral pets)		
Tree cutting/sapling removal		
Removal of woody debris		
Treatment of non-native and nuisance plant species		
Pesticide application or vector control		
Biological resource extraction or stocking (fisheries, aquaculture)		
Excessive organic debris in matrix (for vernal pools)		
Lack of vegetation management to conserve natural resources		
Lack of treatment of invasive plants adjacent to AA or buffer		
Comments		

BUFFER AND LANDSCAPE CONTEXT ATTRIBUTE (WITHIN 500 M OF AA)	Present	Present and likely to have significant negative effect on AA
Urban residential		
Industrial/commercial		
Military training/Air traffic		
Dams (or other major flow regulation or disruption)		
Dryland farming		
Intensive row-crop agriculture		
Orchards/nurseries		
Commercial feedlots		
Dairies		
Ranching (enclosed livestock grazing or horse paddock or feedlot)		
Transportation corridor	X	
Rangeland (livestock rangeland also managed for native vegetation)		
Sports fields and urban parklands (golf courses, soccer fields, etc.)		
Passive recreation (bird-watching, hiking, etc.)		
Active recreation (off-road vehicles, mountain biking, hunting, fishing)	X	
Physical resource extraction (rock, sediment, oil/gas)		
Biological resource extraction (aquaculture, commercial fisheries)	X	
Comments		
duck hunting		

Basic Information Sheet: Slope Wetlands

Assessment Area Name: AA41-ALN-00292

Project Name: HSR JM

Assessment Area ID#:

Project ID#: | **Date** 4/25/19

Assessment Team Members for This AA:

LSL, DM

Assessment Area Size:

Surface water present during the assessment? ☐ Yes ☒ No **Flowing?** ☐ Yes ☒ No

Briefly describe the hydrology of the AA (e.g., water sources, channels, swales, etc.)

AA Category:

☐ Pre-Restoration ☐ Post-Restoration ☐ Pre-Mitigation ☐ Post-Mitigation

☒ Pre-Impact ☐ Post-Impact ☐ Ambient ☐ Reference

☐ Training ☐ Other:

Which best describes the type of wetland?

☐ Channeled Wet Meadow (assoc. with a fluvial channel) ☒ Non-Channeled Wet Meadow

☐ Channeled Forested Slope ☒ Non-Channeled Forested Slope ☐ Seep or Spring

Are peat soils present in the AA? ☐ Yes ☒ No

AA Encompasses:

☐ entire wetland ☒ portion of the wetland

Which best describes the dominant hydrologic state of the AA at the time of assessment?

☐ ponded/inundated ☐ saturated soil, but no surface water ☒ moist ☒ dry

What is the apparent hydrologic regime of the wetland?

Perennial slope wetlands contain surface water year-round, *seasonal* slope wetlands support surface water for 4-11 months of the year (in > 5 out of 10 years.) *Temporarily flooded* slope wetlands possess surface water between 2 weeks and 4 months of the year.

☐ perennial ☒ seasonal ☒ temporarily flooded

Photo Identification Numbers and Description:

	Photo ID No.	Description
1		Looking North into the AA
2		Looking South into the AA
3		Looking East into the AA
4		Looking West into the AA
5		
6		
7		
8		
9		
10		

Site Location Description (including County and USGS Topographic Quadrangle if known):

Comments:

Scoring Sheet: Slope Wetlands

AA Name: AA41			Date: 4/25/19
Attribute 1: Buffer and Landscape Context			**Comments**
	Alpha	Numeric	
Aquatic Area Abundance (D)	A		74 %
Buffer			
Buffer submetric A: Percent of AA with Buffer	A		100%
Buffer submetric B: Average Buffer Width	B		146m
Buffer submetric C: Buffer Condition	A		
Raw Attribute Score = D+[C x (A x B)½]½ (do not round)			**Final Attribute Score = (Raw Score/24) x 100**
Attribute 2: Hydrology			
	Alpha	Numeric	
Water Source	C		
Hydroperiod	B		flood waters pumped in, natural draw
Hydrologic Connectivity (all but Channeled)	~~B~~A		~~>50% dewatered~~ not altered hyd
Hydro Connectivity submetric A: Bank Height Ratio			
Hydro Connectivity submetric B: Percent Dewatered			
Hydrologic Connectivity for Channeled (*avg. of submetrics A-B*)			
Raw Attribute Score = sum of numeric scores			**Final Attribute Score = (Raw Score/36) x 100**
Attribute 3: Physical Structure			
	Alpha	Numeric	
Structural Patch Richness	C		8 patches
Topographic Complexity	A		B for topo, A for veg roughness
Raw Attribute Score = sum of numeric scores			**Final Attribute Score = (Raw Score/24) x 100**
Attribute 4: Biotic Structure			
Plant Community Composition (submetric A is not applicable for Non-Channeled meadows)			
	Alpha	Numeric	
Plant Community submetric A: Number of plant layers	B		3 layers
Plant Community submetric B: Number of Co-dominant species	C		5 codoms
Plant Community submetric C: Percent Invasive species	A		0 % invasion
Plant Comm. Composition (*avg. of submetrics A-C or B-C*)			
	Alpha	Numeric	
Horizontal Interspersion	B		
Plant Life Forms	B		4 life forms
Raw Attribute Score = sum of numeric scores			**Final Attribute Score = (Raw Score/36) x 100**
Overall AA Score (average of four final Attribute Scores)			

Worksheet for Aquatic Area Abundance Metric

Percentage of Transect Lines that Contains Wetland or Aquatic Habitat of Any Kind	
Segment Direction	Percentage of Transect Length That is an Aquatic Feature
North	75
South	24
East	100
West	98
Average Percentage of Transect Length That Is an Aquatic Feature	74

Percent of AA with Buffer Worksheet.

In the space provided on the datasheet, make a quick sketch of the AA, or perform the assessment directly on the aerial imagery; indicate where buffer is present, estimate the percentage of the AA perimeter providing buffer functions, and record the estimate amount in the space provided.

Worksheet for calculating Average Buffer Width of AA

Line	Buffer Width (m)
A	25
B	50
C	115
D	175
E	250
F	250
G	250
H	50
Average Buffer Width	146 m

Channeled Wet Meadow and Channeled Forested Slope Wetland Bank Height Calculation Worksheet

The following 4 steps should be conducted for each of 3 cross-sections located in the AA at the approximate midpoints along straight riffles or glides, away from deep pools or meander bends. An attempt should be made to place them at the top, middle, and bottom of the AA.				
Steps	**Replicate Cross-sections** ⟶	**TOP**	**MID**	**BOT**
1 Estimate bankfull width.	This is a critical step requiring familiarity with field indicators of the bankfull contour. Measure the distance between the right and left bankfull contours.			
2: Estimate max. bankfull depth.	Imagine a level line between the right and left bankfull contours; measure the height of the line above the thalweg (the deepest part of the channel).			
3: Estimate max. bank height	Identify the location of the top of bank. Measure the height between the thalweg and the top of bank location.			
4: Calculate bank height ratio.	Divide the bank height (Step 3) by the bankfull depth (Step 2). Keep two significant figures.			
5: Calculate average bank height ratio.	Calculate the average results for Step 4 for all 3 replicate cross-sections. Enter the average result here and use it in Table 14. Keep two significant figures (hundredths).			

Worksheet for Assessing Hydrologic Connectivity: Percent Dewatered for Slope Wetlands.

Condition	Field Indicators (check all existing conditions)
Indicators of Intact Hydrologic Connectivity	☒ No channel incision ☒ Vigor of plant species, especially hydrophytes ☒ Low or no cover of upland plant species ☒ No rill or gully development ☐ No areas of bare soil ☐ No soil cracking ☐ No changes in soil structure or moisture content ☐ Surface water present on the wetland plain late into the summer season ☐ Groundwater emerging ☐ Moist peat soil ☐ Floating fens ☒ Evidence of regular inundation on floodplain slope wetlands (wrack etc.)
Indicators of Degraded Hydrologic Connectivity (dewatering)	☐ Evidence of channel incision, including low entrenchment ratios, undercut banks, block bank failures, sloughing banks, hanging or exposed roots, channel scoured to bedrock or dense clay, active knickpoints, active gully erosion, active headcutting ☐ Stress or mortality of plants ☐ Presence of xeric plant species ☐ Development of rills or gullies on the wetland surface ☒ Areas of bare soil ☒ Areas of soil cracking ☐ Drying of peat ☐ Decrease in vigor of hydrophytes ☒ Changes in plant or animal species or communities ☒ Changes in soil structure or moisture content ☐ More than 5% cover in the AA of upland conifer species (e.g. Douglas fir (*Pseudotsuga menziesii*), Lodgepole Pine (*Pinus contorta*), see special note) ☐ More than 5% cover in the AA of upland broadleaf tree species (e.g. tanoak (*Notholithocarpus densiflorus*), coast live oak (*Quercus agrifolia*) ☐ More than 5% cover in the AA of upland shrub species (e.g. sagebrush (*Artemisia tridentate*), rabbitbrush (*Ericameria nauseosa*), French broom (*Genista monspessulana*) ☐ More than 5% cover in the AA of upland vines (e.g. English ivy (*Hedera helix*), Himalayan blackberry (*Rubus armeniacus*), field bindweed (*Convolvulus arvensis*) ☐ More than 5% cover in the AA of upland grasses (e.g. ripgut brome (*Bromus diandrus*), cheatgrass (*Bromus tectorum*), needlegrass (*Stipa pulchra*) ☐ More than 5% cover in the AA of upland herbs and forbs (e.g. ragweed (*Ambrosia artemisiifolia*), mustard (*Brassica rapa*), yellow star thistle (*Centaurea solstitialis*)
Overall area of the wetland showing evidence of dewatering	☒ **No dewatering** ☐ **<25% dewatered** ☐ **25-50% dewatered** ☒ **>50% dewatered** Natural drawdown

Structural Patch Type Worksheet for Slope Wetlands

STRUCTURAL PATCH TYPE (circle for presence)	Slope Wetland
Minimum Patch Size	**3 m^2**
Abundant wrack or organic debris in channel, or across wetland plain	X
Active fluvial channel(s)	
Animal mounds and burrows, sediment disturbance, or vole trails	
Bank slumps or undercut banks in channels	
Beaver dams or lodges	
Boulders or bedrock outcrop	
Cutoff channels or oxbows	
Filamentous macroalgae or algal mats	X
Gravel, cobble, or sand	
Large woody debris	X
Moss	
Non-vegetated flats or bare ground	X
Pannes or pools on wetland surface	X
Plant hummocks and/or tussocks	
Sediment mounds around the bases of shrubs or trees	
Sediment splays	
Soil cracks	X
Springs or upwelling groundwater	
Standing snags (at least 3 m tall)	X
Submerged vegetation (in channels or open water)	
Swales	
Thatch	X
Variegated, convoluted, or crenulated upland edge (not broadly arcuate or mostly straight)	
Total Possible	**23**
No. Observed Patch Types (enter here and use in Table 17 below)	8

Worksheet for AA Topographic Complexity

Complete a sketch of the topographic profile of the AA along a cross section perpendicular to the overall slope of wetland within the AA. Draw the section to include both AA boundaries. Include both the ground surface and the vegetation roughness. Indicate the letter grade for each component in the space below the sketch. Note the AA boundaries and important topographic features.

Physical topographic complexity score B   Vegetation roughness score A

Plant Community Metric Worksheet: Co-dominant species richness for Channeled Wet Meadow, Channeled Forested Slope Wetlands, Non-channeled Forested Slope Wetlands, and Seeps and Springs

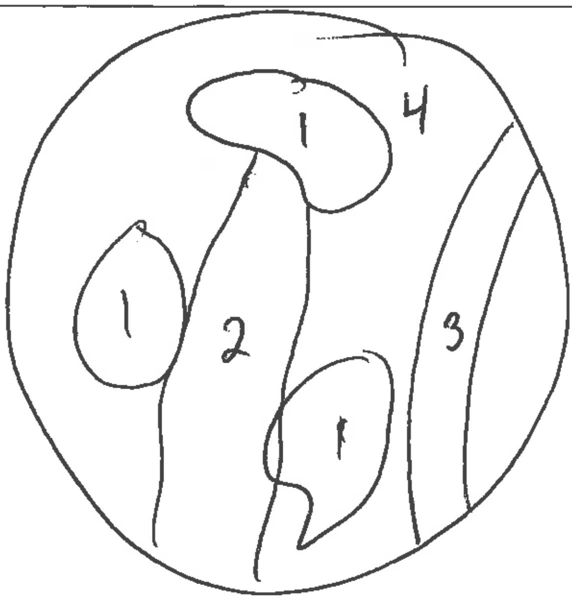
Floating or Canopy-forming	Invasive?	Short (<0.3 m)	Invasive?
		Xanthium strumarium	
Medium (0.3-1.0 m)	**Invasive?**	**Tall (1.0-3.0 m)**	**Invasive?**
		Juncus effusus	
		Typha latifolia	
		Bolboschoenus maritimus	
Very Tall (>3.0 m)	**Invasive?**	**Total number of co-dominant species for all layers combined (enter here and see Table 21)**	5
Salix gooddingii			
		Percent Invasion (enter here and see Table 21)	0

Table 22: Worksheet for Co-dominant Plant Species.

Co-dominant Species	Check if Invasive
Total Number of Co-dominants	
Total Number of Invasive Co-dominant species	
Percent Invasive Species (round to nearest integer)	

Horizontal Interspersion Worksheet

Use the spaces below to make a quick sketch of the AA in plan view, outlining the major plant zones (this should take no longer than 10 minutes). Assign the zones names and record them on the right. Based on the sketch, choose a single profile from Figure 17 that best represents the AA overall.



Assigned zones:

1) Willow

2) Typha

3) bare

4) Juncus / sedge

5)

6)

Table 24. Plant Life Forms Metric.

Life Form	Present in > 5% of AA?
Bryophytes (mosses, liverworts, hornworts)	
Coniferous Trees	
Deciduous Broadleaf Trees	X
Evergreen Broadleaf Trees	
Ferns	
Grasses	X
Herbs/Forbs	X
Lichens or Fungi	
Sedges/Rushes	X
Shrubs	
Vines	
Total Number of life forms	4

Worksheet: Stressor Checklist

HYDROLOGY ATTRIBUTE (WITHIN 50 M OF AA)	Present	Present and likely to have significant negative effect on AA
Point Source (PS) discharges (POTW, other non-stormwater discharge)		
Non-point Source (Non-PS) discharges (urban runoff, farm drainage)	X	
Flow diversions or unnatural inflows		
Dams (reservoirs, detention basins, recharge basins)		
Flow obstructions (culverts, paved stream crossings)		
Weir/drop structure, tide gates		
Dredged inlet/channel		
Engineered channel (riprap, armored channel bank, bed)		
Dike/levees	X	
Groundwater extraction		
Ditches (borrow, agricultural drainage, mosquito control, etc.)	X	
Actively managed hydrology	X	
Comments		

PHYSICAL STRUCTURE ATTRIBUTE (WITHIN 50 M OF AA)	Present	Present and likely to have significant negative effect on AA
Filling or dumping of sediment or soils **(N/A for restoration areas)**		
Grading/ compaction **(N/A for restoration areas)**		
Plowing/Discing **(N/A for restoration areas)**		
Resource extraction (sediment, gravel, oil and/or gas)		
Vegetation management		
Excessive sediment or organic debris from watershed		
Excessive runoff from watershed		
Nutrient impaired (PS or Non-PS pollution)		
Heavy metal impaired (PS or Non-PS pollution)		
Pesticides or trace organics impaired (PS or Non-PS pollution)		
Bacteria and pathogens impaired (PS or Non-PS pollution)		
Trash or refuse		
Comments		

BIOTIC STRUCTURE ATTRIBUTE (WITHIN 50 M OF AA)	Present	Present and Likely to Have Significant negative effect on AA
Mowing, grazing, excessive herbivory (within AA)		
Excessive human visitation		
Predation and habitat destruction by non-native vertebrates (e.g., *Virginia opossum* and domestic predators, such as feral pets)		
Tree cutting/sapling removal		
Removal of woody debris		
Treatment of non-native and nuisance plant species		
Pesticide application or vector control		
Biological resource extraction or stocking (fisheries, aquaculture)		
Excessive organic debris in matrix (for vernal pools)		
Lack of vegetation management to conserve natural resources		
Lack of treatment of invasive plants adjacent to AA or buffer		
Comments		

BUFFER AND LANDSCAPE CONTEXT ATTRIBUTE (WITHIN 500 M OF AA)	Present	Present and likely to have significant negative effect on AA
Urban residential		
Industrial/commercial		
Military training/Air traffic		
Dams (or other major flow regulation or disruption)		
Dryland farming		
Intensive row-crop agriculture		
Orchards/nurseries		
Commercial feedlots		
Dairies		
Ranching (enclosed livestock grazing or horse paddock or feedlot)		
Transportation corridor	X	
Rangeland (livestock rangeland also managed for native vegetation)		
Sports fields and urban parklands (golf courses, soccer fields, etc.)		
Passive recreation (bird-watching, hiking, etc.)		
Active recreation (off-road vehicles, mountain biking, hunting, fishing)	X	
Physical resource extraction (rock, sediment, oil/gas)		
Biological resource extraction (aquaculture, commercial fisheries)	X	
Comments		
duck hunting		

Basic Information Sheet: Riverine Wetlands

Assessment Area Name: AA42-COW-02335	
Project Name: HBR	
Assessment Area ID #: 42	
Project ID #:	**Date:** 4/24/19
Assessment Team Members for This AA:	
Lanika Cervantes, Donna Maniscalco	
Average Bankfull Width: 7m	
Approximate Length of AA (10 times bankfull width, min 100 m, max 200 m): 100m	
Upstream Point Latitude: 36.9891	**Longitude:** -121.4949
Downstream Point Latitude: 36.97235	**Longitude:** -121.52441

Wetland Sub-type:

☐ Confined ☒ Non-confined

AA Category:

☐ Restoration ☐ Mitigation ☐ Impacted ☐ Ambient ☐ Reference ☐ Training

☒ Other: Pre-project

Did the river/stream have flowing water at the time of the assessment? ☒ yes ☐ no

What is the apparent hydrologic flow regime of the reach you are assessing?

The hydrologic flow regime of a stream describes the frequency with which the channel conducts water. *Perennial* streams conduct water all year long, whereas *ephemeral* streams conduct water only during and immediately following precipitation events. *Intermittent* streams are dry for part of the year, but conduct water for periods longer than ephemeral streams, as a function of watershed size and water source.

☐ perennial ☒ intermittent ☐ ephemeral

Photo Identification Numbers and Description:

	Photo ID No.	Description	Latitude	Longitude	Datum
1		Upstream			
2		Middle Left			
3		Middle Right			
4		Downstream			
5					
6					
7					
8					
9					
10					

Site Location Description:

Comments:

Scoring Sheet: Riverine Wetlands

AA Name: AA42			Date: 4/24/19
Attribute 1: Buffer and Landscape Context (pp. 11-19)			**Comments**
	Alpha.	Numeric	
Stream Corridor Continuity (D)	A		25m nonbuffer
Buffer:			
	Alpha.	Numeric	
Buffer submetric A: Percent of AA with Buffer	B		50% buffer on No. side
Buffer submetric B: Average Buffer Width	~~A~~ B		~~250~~ 150m - ~~Ag field~~ Field - fall
Buffer submetric C: Buffer Condition	C		Non-native ag plants. Disturbed 50
Raw Attribute Score = D+[C x (A x B)½]½			**Final Attribute Score = (Raw Score/24) x 100**
Attribute 2: Hydrology (pp. 20-26)			
	Alpha.	Numeric	
Water Source	C		Ag runoff
Channel Stability	B		
Hydrologic Connectivity	A		19-entrenchment
Raw Attribute Score = sum of numeric scores			**Final Attribute Score = (Raw Score/36) x 100**
Attribute 3: Physical Structure (pp. 27-33)			
	Alpha.	Numeric	
Structural Patch Richness	D		
Topographic Complexity	C		
Raw Attribute Score = sum of numeric scores			**Final Attribute Score = (Raw Score/24) x 100**
Attribute 4: Biotic Structure (pp. 34-41)			
Plant Community Composition (based on sub-metrics A-C)			
	Alpha.	Numeric	
Plant Community submetric A: Number of plant layers	B		3 layers Very tall, tall, med.
Plant Community submetric B: Number of Co-dominant species	D		5 Codoms
Plant Community submetric C: Percent Invasion	D		60% invasive
Plant Community Composition Metric *(numeric average of submetrics A-C)*			
Horizontal Interspersion	D		
Vertical Biotic Structure	C		
Raw Attribute Score = sum of numeric scores			**Final Attribute Score = (Raw Score/36) x 100**
Overall AA Score (average of four final Attribute Scores)			

Worksheet for Stream Corridor Continuity Metric for Riverine Wetlands

Lengths of Non-buffer Segments For Distance of 500 m Upstream of AA		Lengths of Non-buffer Segments For Distance of 500 m Downstream of AA	
Segment No.	Length (m)	Segment No.	Length (m)
1	25	1	0
2	0	2	0
3	0	3	0
4	0	4	0
5	0	5	0
Upstream Total Length	25	Downstream Total Length	0

Percent of AA with Buffer Worksheet

In the space provided below make a quick sketch of the AA, or perform the assessment directly on the aerial imagery; indicate where buffer is present, estimate the percentage of the AA perimeter providing buffer functions, and record the estimate amount in the space provided.

Percent of AA with Buffer: 50 %

Worksheet for calculating average buffer width of AA - Drawing on aerial

Line	Buffer Width (m)
A	15
B	200
C	190
D	180
E	160
F	160
G	160
H	160
Average Buffer Width *Round to the nearest integer*	153

Worksheet for Assessing Channel Stability for Riverine Wetlands

Condition	Field Indicators (check all existing conditions)
Indicators of Channel Equilibrium	☐ The channel (or multiple channels in braided systems) has a well-defined bankfull contour that clearly demarcates an obvious active floodplain in the cross-sectional profile of the channel throughout most of the AA. ☐ Perennial riparian vegetation is abundant and well established along the bankfull contour, but not below it. ☒ There is leaf litter, thatch, or wrack in most pools (if pools are present). ☐ The channel contains embedded woody debris of the size and amount consistent with what is naturally available in the riparian area. ☐ There is little or no active undercutting or burial of riparian vegetation. ☐ If mid-channel bars and/or point bars are present, they are not densely vegetated with perennial vegetation. ☐ Channel bars consist of well-sorted bed material (smaller grain size on the top and downstream end of the bar, larger grain size along the margins and upstream end of the bar). ☐ There are channel pools, the spacing between pools tends to be regular and the bed is not planar throughout the AA ☐ The larger bed material supports abundant mosses or periphyton.
Indicators of Active Degradation	☐ The channel is characterized by deeply undercut banks with exposed living roots of trees or shrubs. ☐ There are abundant bank slides or slumps. ☐ The lower banks are uniformly scoured and not vegetated. ☐ Riparian vegetation is declining in stature or vigor, or many riparian trees and shrubs along the banks are leaning or falling into the channel. ☐ An obvious historical floodplain has recently been abandoned, as indicated by the age structure of its riparian vegetation. ☐ The channel bed appears scoured to bedrock or dense clay. ☐ Recently active flow pathways appear to have coalesced into one channel (i.e. a previously braided system is no longer braided). ☐ The channel has one or more knickpoints indicating headward erosion of the bed.
Indicators of Active Aggradation	☐ There is an active floodplain with fresh splays of coarse sediment (sand and larger that is not vegetated) deposited in the current or previous year. ☒ There are partially buried living tree trunks or shrubs along the banks. ☐ The bed is planar (flat or uniform gradient) overall; it lacks well-defined channel pools, or they are uncommon and irregularly spaced. ☐ There are partially buried, or sediment-choked, culverts. ☒ Perennial terrestrial or riparian vegetation is encroaching into the channel or onto channel bars below the bankfull contour. ☐ There are avulsion channels on the floodplain or adjacent valley floor.
Overall	☐ **Equilibrium** ☐ **Degradation** ☒ **Aggradation**

Riverine Wetland Entrenchment Ratio Calculation Worksheet

The following 5 steps should be conducted for each of 3 cross-sections located in the AA at the approximate midpoints along straight riffles or glides, away from deep pools or meander bends. An attempt should be made to place them at the top, middle, and bottom of the AA.				
Steps	**Replicate Cross-sections** ⟶	**TOP**	**MID**	**BOT**
1 Estimate bankfull width.	This is a critical step requiring familiarity with field indicators of the bankfull contour. Estimate or measure the distance between the right and left bankfull contours.	7m	7m	7m
2: Estimate max. bankfull depth.	Imagine a level line between the right and left bankfull contours; estimate or measure the height of the line above the thalweg (the deepest part of the channel).	3m	3m	2m
3: Estimate flood prone depth.	Double the estimate of maximum bankfull depth from Step 2.	6m	6m	4m
4: Estimate flood prone width.	Imagine a level line having a height equal to the flood prone depth from Step 3; note where the line intercepts the right and left banks; estimate or measure the length of this line.	200m+	200+m	10m
5: Calculate entrenchment ratio.	Divide the flood prone width (Step 4) by the bankfull width (Step 1).	28.5m	28.5m	1.4m
6: Calculate average entrenchment ratio.	Calculate the average results for Step 5 for all 3 replicate cross-sections. Enter the average result here and use it in Table 13a or 13b.			19

Structural Patch Type Worksheet for Riverine wetlands

Circle each type of patch that is observed in the AA and enter the total number of observed patches in Table below. In the case of riverine wetlands, their status as confined or non-confined must first be determined (see page 6) to determine with patches are expected in the system (indicated by a "1" in the table below). Any feature onsite should only be counted once as a patch type. If a feature appears to meet the definition of more than one patch type (i.e. swale and secondary channel) the practitioner should choose which patch type best illustrates the feature. Not all features at a site will be patch types.

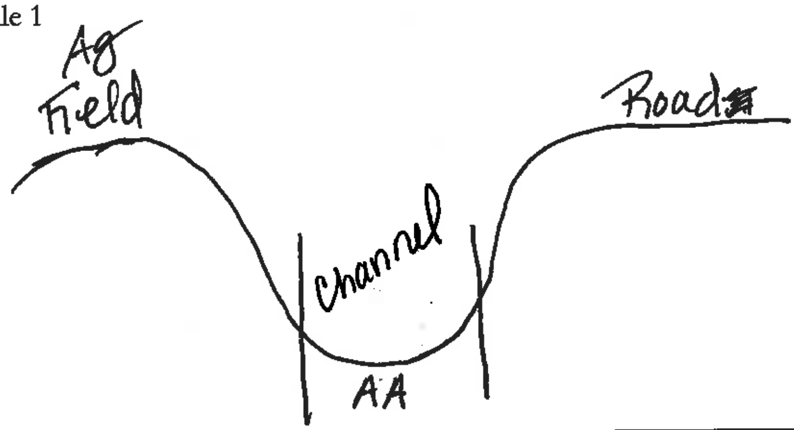
Please refer to the CRAM Photo Dictionary at** www.cramwetlands.org **for photos of each of the following patch types.

STRUCTURAL PATCH TYPE (circle for presence)	**Riverine (Non-confined)**	**Riverine (Confined)**
Minimum Patch Size	**3 m^2**	**3 m^2**
Abundant wrackline or organic debris in channel, on floodplain	1	1
Bank slumps or undercut banks in channels or along shoreline	1	1
Cobbles and/or Boulders	1	1
Debris jams	1	1
Filamentous macroalgae or algal mats	1	1
Large woody debris	1	1
Pannes or pools on floodplain	1	N/A
Plant hummocks and/or sediment mounds	1	1
Point bars and in-channel bars	1	1
Pools or depressions in channels (wet or dry channels)	1	1
Riffles or rapids (wet or dry channels)	1	1
Secondary channels on floodplains or along shorelines	1	N/A
Standing snags (at least 3 m tall)	1	1
Submerged vegetation	1	N/A
Swales on floodplain or along shoreline	1	N/A
Variegated, convoluted, or crenulated foreshore (instead of broadly arcuate or mostly straight)	1	1
Vegetated islands (mostly above high-water)	1	N/A
Total Possible	**17**	**12**
No. Observed Patch Types (enter here and use in Table 14 below)	4	

Worksheet for AA Topographic Complexity

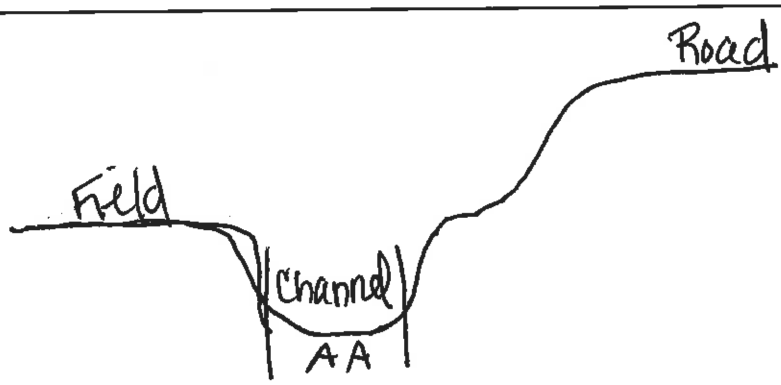
At three locations along the AA, make a sketch of the profile of the stream from the AA boundary down to its deepest area then back out to the other AA boundary. Try to capture the benches and the intervening micro-topographic relief. To maintain consistency, make drawings at each of the stream hydrologic connectivity measurements, always facing downstream. Include the water level, an arrow at the bankfull contour, and label the benches. Based on these sketches and the profiles in Figure 10, choose a description in Table 16 that best describes the overall topographic complexity of the AA.

Profile 1



Profile 2

Profile 3



Plant Community Metric Worksheet: Co-dominant species richness for Riverine wetlands
(A dominant species represents ≥10% *relative* cover)

Special Note:

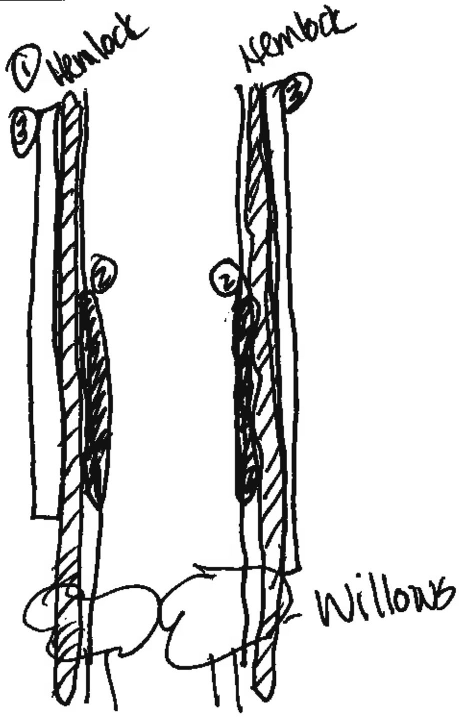
** Combine the counts of co-dominant species from all layers to identify the total species count. Each plant species is only counted once when calculating the Number of Co-dominant Species and Percent Invasion submetric scores, regardless of the numbers of layers in which it occurs.*

Floating or Canopy-forming (non-confined only)	Invasive?	Short (<0.5 m)	Invasive?
Medium (0.5-1.5 m)	**Invasive?**	**Tall (1.5-3.0 m)**	**Invasive?**
Himalayin blackberry	Y	Bulrush	N
Poison hemlock	Y	Mustard	Y

Very Tall (>3.0 m)	Invasive?		
Salix spp. Arroyo	N	Total number of co-dominant species for all layers combined (enter here and use in Table 18)	5
		Percent Invasion *Round to the nearest integer* (enter here and use in Table 18)	60%

Horizontal Interspersion Worksheet.

Use the spaces below to make a quick sketch of the AA in plan view, outlining the major plant zones (this should take no longer than 10 minutes). Assign the zones names and record them on the right. Based on the sketch, choose a single profile from Figure 12 that best represents the AA overall.



Assigned zones:

1) Hemlock

2) Bulrush

3) Mustard

4)

5)

6)

Worksheet for Wetland disturbances and conversions

Has a major disturbance occurred at this wetland?	Yes	No		
If yes, was it a flood, fire, landslide, or other?	flood	fire	landslide	other
If yes, then how severe is the disturbance?	likely to affect site next 5 or more years	likely to affect site next 3-5 years	likely to affect site next 1-2 years	
Has this wetland been converted from another type? If yes, then what was the previous type?	depressional	vernal pool	vernal pool system	
	non-confined riverine	confined riverine	seasonal estuarine	
	perennial saline estuarine	perennial non-saline estuarine	wet meadow	
	lacustrine	seep or spring	playa	

Stressor Checklist Worksheet

HYDROLOGY ATTRIBUTE (WITHIN 50 M OF AA)	Present	Significant negative effect on AA
Point Source (PS) discharges (POTW, other non-stormwater discharge)		
Non-point Source (Non-PS) discharges (urban runoff, farm drainage)	X	
Flow diversions or unnatural inflows		
Dams (reservoirs, detention basins, recharge basins)		
Flow obstructions (culverts, paved stream crossings)		
Weir/drop structure, tide gates		
Dredged inlet/channel		
Engineered channel (riprap, armored channel bank, bed)		
Dike/levees		
Groundwater extraction		
Ditches (borrow, agricultural drainage, mosquito control, etc.)	X	
Actively managed hydrology		
Comments		

PHYSICAL STRUCTURE ATTRIBUTE (WITHIN 50 M OF AA)	Present	Significant negative effect on AA
Filling or dumping of sediment or soils **(N/A for restoration areas)**		
Grading/ compaction **(N/A for restoration areas)**	X	
Plowing/Discing **(N/A for restoration areas)**	X	
Resource extraction (sediment, gravel, oil and/or gas)		
Vegetation management		
Excessive sediment or organic debris from watershed		
Excessive runoff from watershed		
Nutrient impaired (PS or Non-PS pollution)	X	
Heavy metal impaired (PS or Non-PS pollution)		
Pesticides or trace organics impaired (PS or Non-PS pollution)	X	
Bacteria and pathogens impaired (PS or Non-PS pollution)		
Trash or refuse		
Comments		

BIOTIC STRUCTURE ATTRIBUTE (WITHIN 50 M OF AA)	Present	Significant negative effect on AA
Mowing, grazing, excessive herbivory (within AA)		
Excessive human visitation		
Predation and habitat destruction by non-native vertebrates (e.g., *Virginia opossum* and domestic predators, such as feral pets)		
Tree cutting/sapling removal		
Removal of woody debris		
Treatment of non-native and nuisance plant species		
Pesticide application or vector control	X	
Biological resource extraction or stocking (fisheries, aquaculture)		
Excessive organic debris in matrix (for vernal pools)		
Lack of vegetation management to conserve natural resources		
Lack of treatment of invasive plants adjacent to AA or buffer	X	
Comments		

BUFFER AND LANDSCAPE CONTEXT ATTRIBUTE (WITHIN 500 M OF AA)	Present	Significant negative effect on AA
Urban residential		
Industrial/commercial	X	
Military training/Air traffic		
Dams (or other major flow regulation or disruption)		
Dryland farming		
Intensive row-crop agriculture	X	
Orchards/nurseries		
Commercial feedlots		
Dairies		
Ranching (enclosed livestock grazing or horse paddock or feedlot)		
Transportation corridor	X	
Rangeland (livestock rangeland also managed for native vegetation)		
Sports fields and urban parklands (golf courses, soccer fields, etc.)		
Passive recreation (bird-watching, hiking, etc.)		
Active recreation (off-road vehicles, mountain biking, hunting, fishing)		
Physical resource extraction (rock, sediment, oil/gas)		
Biological resource extraction (aquaculture, commercial fisheries)		
Comments		

Basic Information Sheet: Slope Wetlands

Assessment Area Name: AA43 - MIR - 03486	
Project Name: HSR JM	
Assessment Area ID#:	
Project ID#:	**Date** 4/24/19
Assessment Team Members for This AA: LSL, ML	
Assessment Area Size:	
Surface water present during the assessment? ☐ Yes ☒ No **Flowing?** ☐ Yes ☒ No	
Briefly describe the hydrology of the AA (e.g., water sources, channels, swales, etc.)	

AA Category:

☐ Pre-Restoration ☐ Post-Restoration ☐ Pre-Mitigation ☐ Post-Mitigation

☒ Pre-Impact ☐ Post-Impact ☐ Ambient ☐ Reference

☐ Training ☐ Other:

Which best describes the type of wetland?

☐ Channeled Wet Meadow (assoc. with a fluvial channel) ☒ Non-Channeled Wet Meadow

☐ Channeled Forested Slope ☐ Non-Channeled Forested Slope ☐ Seep or Spring

Are peat soils present in the AA? ☐ Yes ☒ No

AA Encompasses:

☐ entire wetland ☒ portion of the wetland

Which best describes the dominant hydrologic state of the AA at the time of assessment?

☐ ponded/inundated ☐ saturated soil, but no surface water ☐ moist ☒ dry

What is the apparent hydrologic regime of the wetland?

Perennial slope wetlands contain surface water year-round, *seasonal* slope wetlands support surface water for 4-11 months of the year (in > 5 out of 10 years.) *Temporarily flooded* slope wetlands possess surface water between 2 weeks and 4 months of the year.

☐ perennial ☒ seasonal ☒ temporarily flooded

Photo Identification Numbers and Description:		
	Photo ID No.	**Description**
1		Looking North into the AA
2		Looking South into the AA
3		Looking East into the AA
4		Looking West into the AA
5		
6		
7		
8		
9		
10		

Site Location Description (including County and USGS Topographic Quadrangle if known):

Comments:

2 pics on LSL phone

1 facing SW

2 facing NE

Scoring Sheet: Slope Wetlands

AA Name: AA43			Date: 4/24/19
Attribute 1: Buffer and Landscape Context			**Comments**
	Alpha	Numeric	
Aquatic Area Abundance (D)	A		63%
Buffer			
Buffer submetric A: Percent of AA with Buffer	A		100%
Buffer submetric B: Average Buffer Width	B		186
Buffer submetric C: Buffer Condition	B		
Raw Attribute Score = $D+[C \times (A \times B)^{1/2}]^{1/2}$ (do not round)			**Final Attribute Score = (Raw Score/24) x 100**
Attribute 2: Hydrology			
	Alpha	Numeric	
Water Source	C		
Hydroperiod	A		
Hydrologic Connectivity (all but Channeled)	B		<25%
Hydro Connectivity submetric A: Bank Height Ratio			
Hydro Connectivity submetric B: Percent Dewatered			
Hydrologic Connectivity for Channeled (*avg. of submetrics A-B*)			
Raw Attribute Score = sum of numeric scores			**Final Attribute Score = (Raw Score/36) x 100**
Attribute 3: Physical Structure			
	Alpha	Numeric	
Structural Patch Richness	B		9 patches
Topographic Complexity	B		C topo A for veg roughness
Raw Attribute Score = sum of numeric scores			**Final Attribute Score = (Raw Score/24) x 100**
Attribute 4: Biotic Structure			
Plant Community Composition (submetric A is not applicable for Non-Channeled meadows)			
	Alpha	Numeric	
Plant Community submetric A: Number of plant layers			2 layers
Plant Community submetric B: Number of Co-dominant species	C		4 codoms
Plant Community submetric C: Percent Invasive species	D		75%
Plant Comm. Composition (*avg. of submetrics A-C or B-C*)			
	Alpha	Numeric	
Horizontal Interspersion	D		
Plant Life Forms	C		
Raw Attribute Score = sum of numeric scores			**Final Attribute Score = (Raw Score/36) x 100**
Overall AA Score (average of four final Attribute Scores)			

Worksheet for Aquatic Area Abundance Metric

Percentage of Transect Lines that Contains Wetland or Aquatic Habitat of Any Kind	
Segment Direction	Percentage of Transect Length That is an Aquatic Feature
North	100
South	30
East	100
West	20
Average Percentage of Transect Length That Is an Aquatic Feature	63

Percent of AA with Buffer Worksheet.

In the space provided on the datasheet, make a quick sketch of the AA, or perform the assessment directly on the aerial imagery; indicate where buffer is present, estimate the percentage of the AA perimeter providing buffer functions, and record the estimate amount in the space provided.

Worksheet for calculating Average Buffer Width of AA

Line	Buffer Width (m)
A	250
B	250
C	250
D	250
E	175
F	250
G	25
H	35
Average Buffer Width	186

Channeled Wet Meadow and Channeled Forested Slope Wetland Bank Height Calculation Worksheet

The following 4 steps should be conducted for each of 3 cross-sections located in the AA at the approximate midpoints along straight riffles or glides, away from deep pools or meander bends. An attempt should be made to place them at the top, middle, and bottom of the AA.				
Steps	**Replicate Cross-sections** ⟶	**TOP**	**MID**	**BOT**
1 Estimate bankfull width.	This is a critical step requiring familiarity with field indicators of the bankfull contour. Measure the distance between the right and left bankfull contours.			
2: Estimate max. bankfull depth.	Imagine a level line between the right and left bankfull contours; measure the height of the line above the thalweg (the deepest part of the channel).			
3: Estimate max. bank height	Identify the location of the top of bank. Measure the height between the thalweg and the top of bank location.			
4: Calculate bank height ratio.	Divide the bank height (Step 3) by the bankfull depth (Step 2). Keep two significant figures.			
5: Calculate average bank height ratio.	Calculate the average results for Step 4 for all 3 replicate cross-sections. Enter the average result here and use it in Table 14. Keep two significant figures (hundredths).			

Worksheet for Assessing Hydrologic Connectivity: Percent Dewatered for Slope Wetlands.

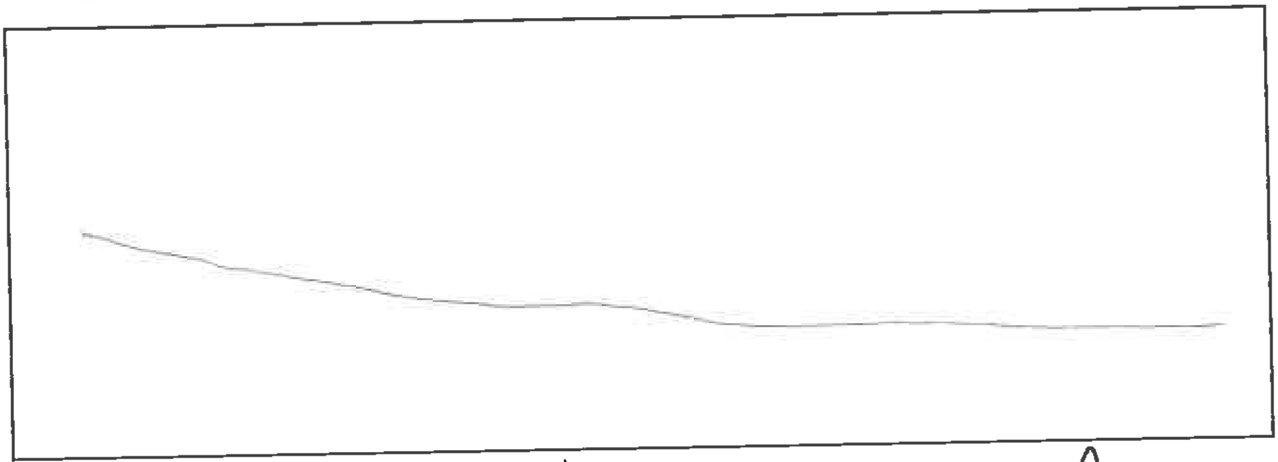
Condition	Field Indicators (check all existing conditions)
Indicators of Intact Hydrologic Connectivity	☒ No channel incision ☐ Vigor of plant species, especially hydrophytes ☐ Low or no cover of upland plant species ☒ No rill or gully development ☒ No areas of bare soil ☒ No soil cracking ☐ No changes in soil structure or moisture content ☐ Surface water present on the wetland plain late into the summer season ☐ Groundwater emerging ☐ Moist peat soil ☐ Floating fens ☐ Evidence of regular inundation on floodplain slope wetlands (wrack etc.)
Indicators of Degraded Hydrologic Connectivity (dewatering)	☐ Evidence of channel incision, including low entrenchment ratios, undercut banks, block bank failures, sloughing banks, hanging or exposed roots, channel scoured to bedrock or dense clay, active knickpoints, active gully erosion, active headcutting ☐ Stress or mortality of plants ☒ Presence of xeric plant species ☐ Development of rills or gullies on the wetland surface ☐ Areas of bare soil ☒ Areas of soil cracking ☐ Drying of peat ☐ Decrease in vigor of hydrophytes ☐ Changes in plant or animal species or communities ☐ Changes in soil structure or moisture content ☐ More than 5% cover in the AA of upland conifer species (e.g. Douglas fir (*Pseudotsuga menziesii*), Lodgepole Pine (*Pinus contorta*), see special note) ☐ More than 5% cover in the AA of upland broadleaf tree species (e.g. tanoak (*Notholithocarpus densiflorus*), coast live oak (*Quercus agrifolia*) ☐ More than 5% cover in the AA of upland shrub species (e.g. sagebrush (*Artemisia tridentate*), rabbitbrush (*Ericameria nauseosa*), French broom (*Genista monspessulana*) ☐ More than 5% cover in the AA of upland vines (e.g. English ivy (*Hedera helix*), Himalayan blackberry (*Rubus armeniacus*), field bindweed (*Convolvulus arvensis*) ☒ More than 5% cover in the AA of upland grasses (e.g. ripgut brome (*Bromus diandrus*), cheatgrass (*Bromus tectorum*), needlegrass (*Stipa pulchra*) ☒ More than 5% cover in the AA of upland herbs and forbs (e.g. ragweed (*Ambrosia artemisiifolia*), mustard (*Brassica rapa*), yellow star thistle (*Centaurea solstitialis*)
Overall area of the wetland showing evidence of dewatering	☐ **No dewatering** ☒ **<25% dewatered** ☒ **25-50% dewatered** ☐ **>50% dewatered**

Structural Patch Type Worksheet for Slope Wetlands

STRUCTURAL PATCH TYPE (circle for presence)	Slope Wetland
Minimum Patch Size	**3 m^2**
Abundant wrack or organic debris in channel, or across wetland plain	X
Active fluvial channel(s)	/
Animal mounds and burrows, sediment disturbance, or vole trails	
Bank slumps or undercut banks in channels	/
Beaver dams or lodges	/
Boulders or bedrock outcrop	/
Cutoff channels or oxbows	/
Filamentous macroalgae or algal mats	X
Gravel, cobble, or sand	/
Large woody debris	X
Moss	/
Non-vegetated flats or bare ground	X
Pannes or pools on wetland surface	X
Plant hummocks and/or tussocks	/
Sediment mounds around the bases of shrubs or trees	/
Sediment splays	/
Soil cracks	/
Springs or upwelling groundwater	/
Standing snags (at least 3 m tall)	X
Submerged vegetation (in channels or open water)	/
Swales	/
Thatch	X
Variegated, convoluted, or crenulated upland edge (not broadly arcuate or mostly straight)	X
Total Possible	**23**
No. Observed Patch Types (enter here and use in Table 17 below)	8

Worksheet for AA Topographic Complexity

Complete a sketch of the topographic profile of the AA along a cross section perpendicular to the overall slope of wetland within the AA. Draw the section to include both AA boundaries. Include both the ground surface and the vegetation roughness. Indicate the letter grade for each component in the space below the sketch. Note the AA boundaries and important topographic features.



Physical topographic complexity score C Vegetation roughness score A

Plant Community Metric Worksheet: Co-dominant species richness for Channeled Wet Meadow, Channeled Forested Slope Wetlands, Non-channeled Forested Slope Wetlands, and Seeps and Springs

Floating or Canopy-forming	Invasive?	Short (<0.3 m)	Invasive?
		Lepidium ~~sp~~ draba	X
		Lotus sp.	
		Polypogon	X
Medium (0.3-1.0 m)	**Invasive?**	**Tall (1.0-3.0 m)**	**Invasive?**
Lepidium ~~sp.~~ draba	X		
~~Unknown 2 (collected)~~			
Lepidium latifolium	X		
Very Tall (>3.0 m)	**Invasive?**	**Total number of co-dominant species for all layers combined (enter here and see Table 21)**	4
		Percent Invasion (enter here and see Table 21)	75% ←

Table 22: Worksheet for Co-dominant Plant Species.

Co-dominant Species	Check if Invasive
Total Number of Co-dominants	
Total Number of Invasive Co-dominant species	
Percent Invasive Species (round to nearest integer)	

Horizontal Interspersion Worksheet

Use the spaces below to make a quick sketch of the AA in plan view, outlining the major plant zones (this should take no longer than 10 minutes). Assign the zones names and record them on the right. Based on the sketch, choose a single profile from Figure 17 that best represents the AA overall.

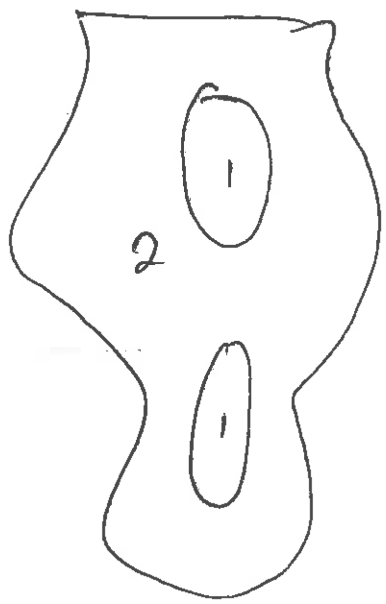
<table>
<tr>
<td rowspan="7">
</td>
<td>Assigned zones:</td>
</tr>
<tr><td>1)</td></tr>
<tr><td>2)</td></tr>
<tr><td>3)</td></tr>
<tr><td>4)</td></tr>
<tr><td>5)</td></tr>
<tr><td>6)</td></tr>
</table>

Table 24. Plant Life Forms Metric.

Life Form	Present in > 5% of AA?
Bryophytes (mosses, liverworts, hornworts)	
Coniferous Trees	
Deciduous Broadleaf Trees	
Evergreen Broadleaf Trees	
Ferns	
Grasses	✓
Herbs/Forbs	✓
Lichens or Fungi	
Sedges/Rushes	✓
Shrubs	
Vines	
Total Number of life forms	3

Worksheet: Stressor Checklist

HYDROLOGY ATTRIBUTE (WITHIN 50 M OF AA)	Present	Present and likely to have significant negative effect on AA
Point Source (PS) discharges (POTW, other non-stormwater discharge)		
Non-point Source (Non-PS) discharges (urban runoff, farm drainage)	X	
Flow diversions or unnatural inflows		
Dams (reservoirs, detention basins, recharge basins)		
Flow obstructions (culverts, paved stream crossings)		
Weir/drop structure, tide gates		
Dredged inlet/channel		
Engineered channel (riprap, armored channel bank, bed)		
Dike/levees		
Groundwater extraction		
Ditches (borrow, agricultural drainage, mosquito control, etc.)	X	
Actively managed hydrology		
Comments		

PHYSICAL STRUCTURE ATTRIBUTE (WITHIN 50 M OF AA)	Present	Present and likely to have significant negative effect on AA
Filling or dumping of sediment or soils **(N/A for restoration areas)**		
Grading/ compaction **(N/A for restoration areas)**	X	
Plowing/Discing **(N/A for restoration areas)**	X	
Resource extraction (sediment, gravel, oil and/or gas)		
Vegetation management		
Excessive sediment or organic debris from watershed		
Excessive runoff from watershed		
Nutrient impaired (PS or Non-PS pollution)	X	
Heavy metal impaired (PS or Non-PS pollution)		
Pesticides or trace organics impaired (PS or Non-PS pollution)	X	
Bacteria and pathogens impaired (PS or Non-PS pollution)	X	
Trash or refuse		
Comments		

BIOTIC STRUCTURE ATTRIBUTE (WITHIN 50 M OF AA)	Present	Present and Likely to Have Significant negative effect on AA
Mowing, grazing, excessive herbivory (within AA)	X	
Excessive human visitation		
Predation and habitat destruction by non-native vertebrates (e.g., *Virginia opossum* and domestic predators, such as feral pets)		
Tree cutting/sapling removal	X	X
Removal of woody debris	X	
Treatment of non-native and nuisance plant species		
Pesticide application or vector control	X	
Biological resource extraction or stocking (fisheries, aquaculture)		
Excessive organic debris in matrix (for vernal pools)		
Lack of vegetation management to conserve natural resources	X	
Lack of treatment of invasive plants adjacent to AA or buffer	X	
Comments		

BUFFER AND LANDSCAPE CONTEXT ATTRIBUTE (WITHIN 500 M OF AA)	Present	Present and likely to have significant negative effect on AA
Urban residential	X	
Industrial/commercial		
Military training/Air traffic		
Dams (or other major flow regulation or disruption)		
Dryland farming		
Intensive row-crop agriculture	X	
Orchards/nurseries	X	
Commercial feedlots		
Dairies		
Ranching (enclosed livestock grazing or horse paddock or feedlot)		
Transportation corridor	X	
Rangeland (livestock rangeland also managed for native vegetation)		
Sports fields and urban parklands (golf courses, soccer fields, etc.)		
Passive recreation (bird-watching, hiking, etc.)		
Active recreation (off-road vehicles, mountain biking, hunting, fishing)		
Physical resource extraction (rock, sediment, oil/gas)		
Biological resource extraction (aquaculture, commercial fisheries)		
Comments		

Basic Information Sheet: Riverine Wetlands

Assessment Area Name: AA 44 NAW-03114	
Project Name: HSR	
Assessment Area ID #: 44	
Project ID #:	Date: 4/23/19
Assessment Team Members for This AA:	
RJ, D Maniscalco	
Average Bankfull Width:	
Approximate Length of AA (10 times bankfull width, min 100 m, max 200 m):	
Upstream Point Latitude: 37.0719	Longitude: -121.2152
Downstream Point Latitude: 37.0719	Longitude: -121.2152

Wetland Sub-type:

☒ Confined ☐ Non-confined

AA Category:

☐ Restoration ☐ Mitigation ☐ Impacted ☐ Ambient ☐ Reference ☐ Training

☒ Other: Pre-project

Did the river/stream have flowing water at the time of the assessment? ☐ yes ☒ no

What is the apparent hydrologic flow regime of the reach you are assessing?

The hydrologic flow regime of a stream describes the frequency with which the channel conducts water. *Perennial* streams conduct water all year long, whereas *ephemeral* streams conduct water only during and immediately following precipitation events. *Intermittent* streams are dry for part of the year, but conduct water for periods longer than ephemeral streams, as a function of watershed size and water source.

☐ perennial ☒ intermittent ☐ ephemeral

Photo Identification Numbers and Description:

	Photo ID No.	Description	Latitude	Longitude	Datum
1		Upstream			
2		Middle Left			
3		Middle Right			
4		Downstream			
5					
6					
7					
8					
9					
10					

Site Location Description:

Comments:

Scoring Sheet: Riverine Wetlands

AA Name: AA44			Date: 4/23/19
Attribute 1: Buffer and Landscape Context (pp. 11-19)			**Comments**
	Alpha.	Numeric	
Stream Corridor Continuity (D)	A		
Buffer:			
	Alpha.	Numeric	
Buffer submetric A: Percent of AA with Buffer	A		open land - hillside
Buffer submetric B: Average Buffer Width	A		All 250 m
Buffer submetric C: Buffer Condition	B		Non native grasses = ~25%
Raw Attribute Score = D+[C x (A x B)^{½}]^{½}			**Final Attribute Score = (Raw Score/24) x 100**
Attribute 2: Hydrology (pp. 20-26)			
	Alpha.	Numeric	
Water Source	A		
Channel Stability	A		
Hydrologic Connectivity	A		
Raw Attribute Score = sum of numeric scores			**Final Attribute Score = (Raw Score/36) x 100**
Attribute 3: Physical Structure (pp. 27-33)			
	Alpha.	Numeric	
Structural Patch Richness	B		
Topographic Complexity	C		
Raw Attribute Score = sum of numeric scores			**Final Attribute Score = (Raw Score/24) x 100**
Attribute 4: Biotic Structure (pp. 34-41)			
Plant Community Composition (based on sub-metrics A-C)			
	Alpha.	Numeric	
Plant Community submetric A: Number of plant layers	C		
8P [illegible] *Plant Community submetric B: Number of Co-dominant species*	B		
* *Plant Community submetric C: Percent Invasion*	D		
Plant Community Composition Metric *(numeric average of submetrics A-C)*			
Horizontal Interspersion	D		
Vertical Biotic Structure	C		
Raw Attribute Score = sum of numeric scores			**Final Attribute Score = (Raw Score/36) x 100**
Overall AA Score (average of four final Attribute Scores)			

Worksheet for Stream Corridor Continuity Metric for Riverine Wetlands

Lengths of Non-buffer Segments For Distance of 500 m Upstream of AA		Lengths of Non-buffer Segments For Distance of 500 m Downstream of AA	
Segment No.	Length (m)	Segment No.	Length (m)
1	Ø	1	0
2		2	
3		3	
4		4	
5		5	
Upstream Total Length		Downstream Total Length	

Percent of AA with Buffer Worksheet

In the space provided below make a quick sketch of the AA, or perform the assessment directly on the aerial imagery; indicate where buffer is present, estimate the percentage of the AA perimeter providing buffer functions, and record the estimate amount in the space provided.

Percent of AA with Buffer: 100 %

Worksheet for calculating average buffer width of AA

Line	Buffer Width (m)
A	250
B	
C	
D	
E	
F	
G	
H	
Average Buffer Width *Round to the nearest integer*	250

Worksheet for Assessing Channel Stability for Riverine Wetlands

Condition	Field Indicators (check all existing conditions)
Indicators of Channel Equilibrium	☐ The channel (or multiple channels in braided systems) has a well-defined bankfull contour that clearly demarcates an obvious active floodplain in the cross-sectional profile of the channel throughout most of the AA.
	☐ Perennial riparian vegetation is abundant and well established along the bankfull contour, but not below it.
	☒ There is leaf litter, thatch, or wrack in most pools (if pools are present).
	☒ The channel contains embedded woody debris of the size and amount consistent with what is naturally available in the riparian area.
	☒ There is little or no active undercutting or burial of riparian vegetation.
	☐ If mid-channel bars and/or point bars are present, they are not densely vegetated with perennial vegetation.
	☐ Channel bars consist of well-sorted bed material (smaller grain size on the top and downstream end of the bar, larger grain size along the margins and upstream end of the bar).
	☒ There are channel pools, the spacing between pools tends to be regular and the bed is not planar throughout the AA
	☒ The larger bed material supports abundant mosses or periphyton.
Indicators of Active Degradation	☐ The channel is characterized by deeply undercut banks with exposed living roots of trees or shrubs.
	☐ There are abundant bank slides or slumps.
	☐ The lower banks are uniformly scoured and not vegetated.
	☐ Riparian vegetation is declining in stature or vigor, or many riparian trees and shrubs along the banks are leaning or falling into the channel.
	☐ An obvious historical floodplain has recently been abandoned, as indicated by the age structure of its riparian vegetation.
	☐ The channel bed appears scoured to bedrock or dense clay.
	☐ Recently active flow pathways appear to have coalesced into one channel (i.e. a previously braided system is no longer braided).
	☐ The channel has one or more knickpoints indicating headward erosion of the bed.
Indicators of Active Aggradation	☐ There is an active floodplain with fresh splays of coarse sediment (sand and larger that is not vegetated) deposited in the current or previous year.
	☐ There are partially buried living tree trunks or shrubs along the banks.
	☐ The bed is planar (flat or uniform gradient) overall; it lacks well-defined channel pools, or they are uncommon and irregularly spaced.
	☐ There are partially buried, or sediment-choked, culverts.
	☐ Perennial terrestrial or riparian vegetation is encroaching into the channel or onto channel bars below the bankfull contour.
	☐ There are avulsion channels on the floodplain or adjacent valley floor.
Overall	☒ **Equilibrium** ☐ **Degradation** ☐ **Aggradation**

Riverine Wetland Entrenchment Ratio Calculation Worksheet

The following 5 steps should be conducted for each of 3 cross-sections located in the AA at the approximate midpoints along straight riffles or glides, away from deep pools or meander bends. An attempt should be made to place them at the top, middle, and bottom of the AA.

Steps	Replicate Cross-sections →	TOP	MID	BOT
1 Estimate bankfull width.	This is a critical step requiring familiarity with field indicators of the bankfull contour. Estimate or measure the distance between the right and left bankfull contours.	1.5m	1m	1.75m
2: Estimate max. bankfull depth.	Imagine a level line between the right and left bankfull contours; estimate or measure the height of the line above the thalweg (the deepest part of the channel).	.3m	.3m	.75m
3: Estimate flood prone depth.	Double the estimate of maximum bankfull depth from Step 2.	.6m	.6m	1.5m
4: Estimate flood prone width.	Imagine a level line having a height equal to the flood prone depth from Step 3; note where the line intercepts the right and left banks; estimate or measure the length of this line.	2.5m	4m	2.5m
5: Calculate entrenchment ratio.	Divide the flood prone width (Step 4) by the bankfull width (Step 1).	1.6m	4m	1.4m
6: Calculate average entrenchment ratio.	Calculate the average results for Step 5 for all 3 replicate cross-sections. Enter the average result here and use it in Table 13a or 13b.			2.33m

Structural Patch Type Worksheet for Riverine wetlands

Circle each type of patch that is observed in the AA and enter the total number of observed patches in Table below. In the case of riverine wetlands, their status as confined or non-confined must first be determined (see page 6) to determine with patches are expected in the system (indicated by a "1" in the table below). Any feature onsite should only be counted once as a patch type. If a feature appears to meet the definition of more than one patch type (i.e. swale and secondary channel) the practitioner should choose which patch type best illustrates the feature. Not all features at a site will be patch types.

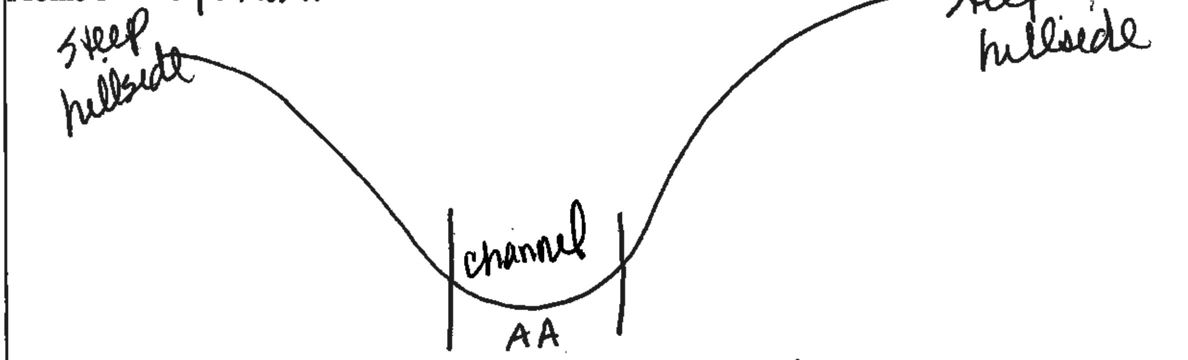
Please refer to the CRAM Photo Dictionary at www.cramwetlands.org for photos of each of the following patch types.

STRUCTURAL PATCH TYPE (circle for presence)	Riverine (Non-confined)	Riverine (Confined)
Minimum Patch Size	**3 m^2**	**3 m^2**
Abundant wrackline or organic debris in channel, on floodplain	1	1
Bank slumps or undercut banks in channels or along shoreline	1	1
Cobbles and/or Boulders	~~1~~	1
Debris jams	1	1
Filamentous macroalgae or algal mats	~~1~~	1
Large woody debris	1	1
Pannes or pools on floodplain	1	N/A
Plant hummocks and/or sediment mounds	1	1
Point bars and in-channel bars	1	1
Pools or depressions in channels (wet or dry channels)	~~1~~	1
Riffles or rapids (wet or dry channels)	~~1~~	1
Secondary channels on floodplains or along shorelines	1	N/A
Standing snags (at least 3 m tall)	1	1
Submerged vegetation	1	N/A
Swales on floodplain or along shoreline	1	N/A
Variegated, convoluted, or crenulated foreshore (instead of broadly arcuate or mostly straight)	1	1
Vegetated islands (mostly above high-water)	1	N/A
Total Possible	**17**	**12**
No. Observed Patch Types (enter here and use in Table 14 below)		7

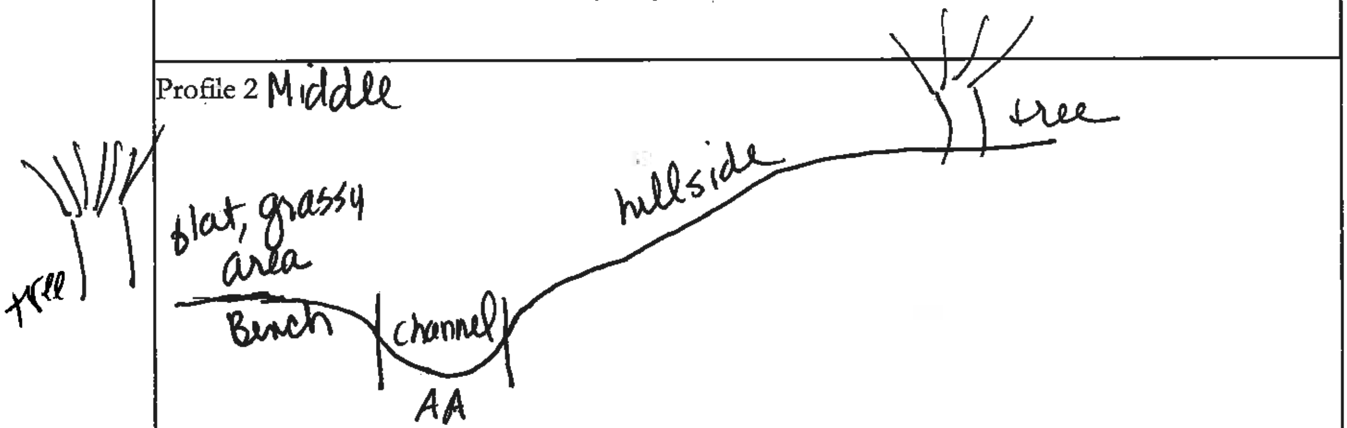
Worksheet for AA Topographic Complexity

At three locations along the AA, make a sketch of the profile of the stream from the AA boundary down to its deepest area then back out to the other AA boundary. Try to capture the benches and the intervening micro-topographic relief. To maintain consistency, make drawings at each of the stream hydrologic connectivity measurements, always facing downstream. Include the water level, an arrow at the bankfull contour, and label the benches. Based on these sketches and the profiles in Figure 10, choose a description in Table 16 that best describes the overall topographic complexity of the AA.

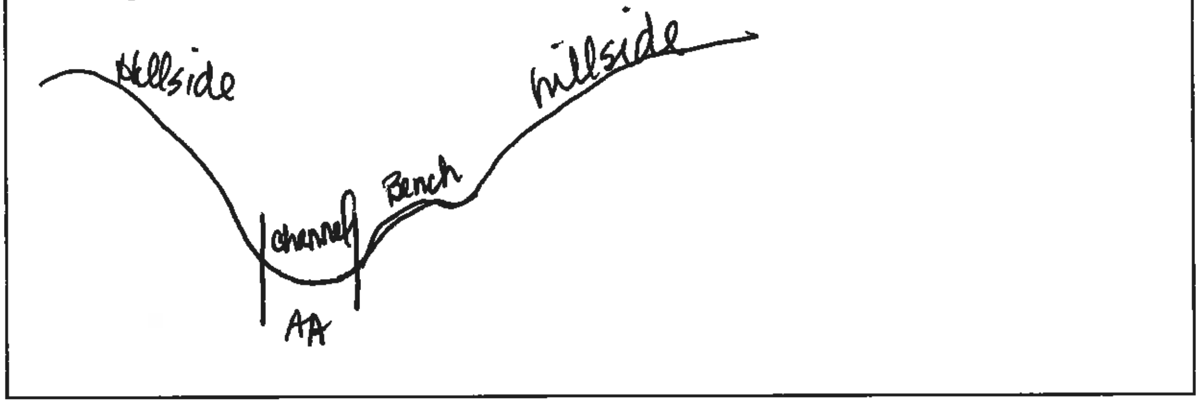
Profile 1 Upstream



Profile 2 Middle



Profile 3 Downstream



Plant Community Metric Worksheet: Co-dominant species richness for Riverine wetlands
(A dominant species represents ≥10% *relative* cover)

Special Note:

* *Combine the counts of co-dominant species from all layers to identify the total species count. Each plant species is only counted once when calculating the Number of Co-dominant Species and Percent Invasion submetric scores, regardless of the numbers of layers in which it occurs.*

Floating or Canopy-forming (non-confined only)	Invasive?	Short (<0.5 m)	Invasive?

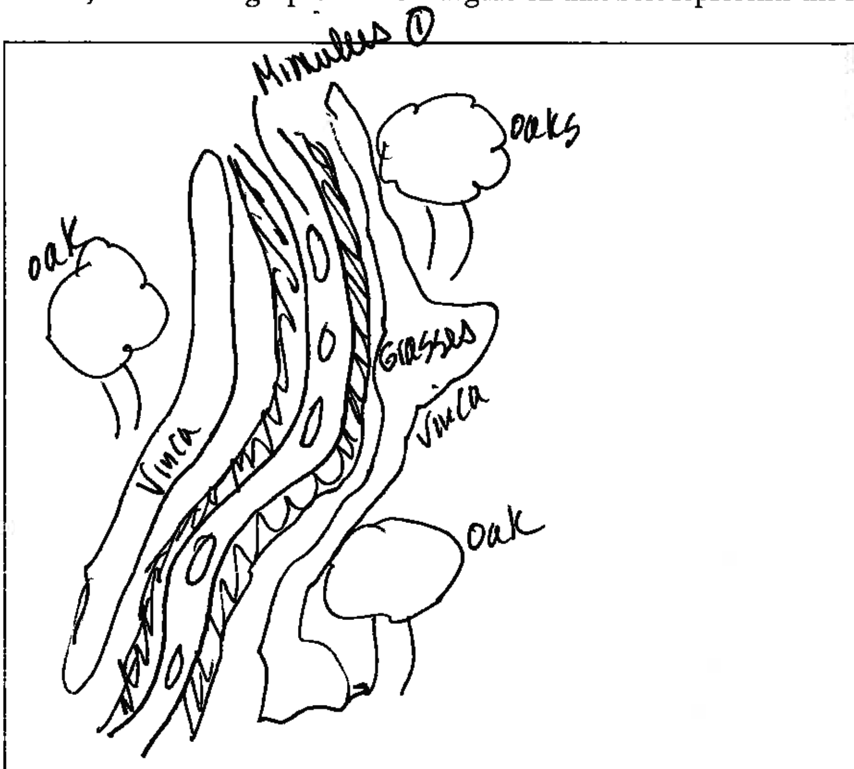
Medium (0.5-1.5 m)	Invasive?	Tall (1.5-3.0 m)	Invasive?
lupines ~~Vicia~~ tetrasperma	N		
Mimulus spp.	N		
Miners lettuce	N		
Hordeum spp (murinum)	Y		
(~~3~~) Festuca perenis	Y		
Avena spp.	Y		

Very Tall (>3.0 m)	Invasive?		
oaks Quercus spp.	N	Total number of co-dominant species for all layers combined (enter here and use in Table 18)	8
		Percent Invasion *Round to the nearest integer* (enter here and use in Table 18)	~~[illegible]~~ 50%

Bromus diandrus Y

Horizontal Interspersion Worksheet.

Use the spaces below to make a quick sketch of the AA in plan view, outlining the major plant zones (this should take no longer than 10 minutes). Assign the zones names and record them on the right. Based on the sketch, choose a single profile from Figure 12 that best represents the AA overall.



Assigned zones:

1) Channel

2)

3)

4)

5)

6)

Worksheet for Wetland disturbances and conversions

Has a major disturbance occurred at this wetland?	Yes	No		
If yes, was it a flood, fire, landslide, or other?	flood	fire	landslide	other
If yes, then how severe is the disturbance?	likely to affect site next 5 or more years	likely to affect site next 3-5 years	likely to affect site next 1-2 years	
Has this wetland been converted from another type? If yes, then what was the previous type?	depressional	vernal pool	vernal pool system	
	non-confined riverine	confined riverine	seasonal estuarine	
	perennial saline estuarine	perennial non-saline estuarine	wet meadow	
	lacustrine	seep or spring	playa	

Stressor Checklist Worksheet

Nothing present

HYDROLOGY ATTRIBUTE (WITHIN 50 M OF AA)	Present	Significant negative effect on AA
Point Source (PS) discharges (POTW, other non-stormwater discharge)		
Non-point Source (Non-PS) discharges (urban runoff, farm drainage)		
Flow diversions or unnatural inflows		
Dams (reservoirs, detention basins, recharge basins)		
Flow obstructions (culverts, paved stream crossings)		
Weir/drop structure, tide gates		
Dredged inlet/channel		
Engineered channel (riprap, armored channel bank, bed)		
Dike/levees		
Groundwater extraction		
Ditches (borrow, agricultural drainage, mosquito control, etc.)		
Actively managed hydrology		
Comments		

Nothing present

PHYSICAL STRUCTURE ATTRIBUTE (WITHIN 50 M OF AA)	Present	Significant negative effect on AA
Filling or dumping of sediment or soils **(N/A for restoration areas)**		
Grading/ compaction **(N/A for restoration areas)**		
Plowing/Discing **(N/A for restoration areas)**		
Resource extraction (sediment, gravel, oil and/or gas)		
Vegetation management		
Excessive sediment or organic debris from watershed		
Excessive runoff from watershed		
Nutrient impaired (PS or Non-PS pollution)		
Heavy metal impaired (PS or Non-PS pollution)		
Pesticides or trace organics impaired (PS or Non-PS pollution)		
Bacteria and pathogens impaired (PS or Non-PS pollution)		
Trash or refuse		
Comments		

BIOTIC STRUCTURE ATTRIBUTE (WITHIN 50 M OF AA)	Present	Significant negative effect on AA
Mowing, grazing, excessive herbivory (within AA)		
Excessive human visitation		
Predation and habitat destruction by non-native vertebrates (e.g., *Virginia opossum* and domestic predators, such as feral pets)		
Tree cutting/sapling removal		
Removal of woody debris		
Treatment of non-native and nuisance plant species		
Pesticide application or vector control		
Biological resource extraction or stocking (fisheries, aquaculture)		
Excessive organic debris in matrix (for vernal pools)		
Lack of vegetation management to conserve natural resources		
Lack of treatment of invasive plants adjacent to AA or buffer	X	
Comments		

Nothing present

BUFFER AND LANDSCAPE CONTEXT ATTRIBUTE (WITHIN 500 M OF AA)	Present	Significant negative effect on AA
Urban residential		
Industrial/commercial		
Military training/Air traffic		
Dams (or other major flow regulation or disruption)		
Dryland farming		
Intensive row-crop agriculture		
Orchards/nurseries		
Commercial feedlots		
Dairies		
Ranching (enclosed livestock grazing or horse paddock or feedlot)		
Transportation corridor		
Rangeland (livestock rangeland also managed for native vegetation)		
Sports fields and urban parklands (golf courses, soccer fields, etc.)		
Passive recreation (bird-watching, hiking, etc.)		
Active recreation (off-road vehicles, mountain biking, hunting, fishing)		
Physical resource extraction (rock, sediment, oil/gas)		
Biological resource extraction (aquaculture, commercial fisheries)		
Comments		