

## 2015 COLORADO WETLAND ECOLOGICAL INTEGRITY ASSESSMENT (EIA) – SITE INFORMATION

LOCATION AND GENERAL INFORMATION	
Site ID: _____ Site Name _____	LEVEL 2.5 ASSESSMENT
Date: _____ Surveyors: _____	
General Location: _____ County: _____	
General Ownership: _____ Specific Ownership: _____	
Directions to Point:	
Access Comments (note permit requirements or difficulties accessing the site):	
GPS COORDINATES OF TARGET POINT AND ASSESSMENT AREA	
<u>Dimensions of AA:</u> ___ 40-m radius circle ___ Freeform polygon, limited to 0.5 ha ___ Wetland boundary, other (note in comments)	Elevation (m): _____ Slope (deg): _____ Aspect (deg): _____
AA-Center WP #: _____ UTM E: _____ UTM N: _____ Error (+/-): _____ (Circle AAs Only)	
AA-1 WP #: _____ UTM E: _____ UTM N: _____ Error (+/-): _____	
AA-2 WP #: _____ UTM E: _____ UTM N: _____ Error (+/-): _____	
AA-3 WP #: _____ UTM E: _____ UTM N: _____ Error (+/-): _____	
AA-4 WP #: _____ UTM E: _____ UTM N: _____ Error (+/-): _____	
AA-Track Track Name: _____ Area: _____	
AA Placement and Dimensions Comments:	
PHOTOS OF ASSESSMENT AREA (Taken at four points on edge of AA looking in. Record WPs of each photo in table above.)	
AA-1 Photo #: _____ Aspect: _____ AA-2 Photo #: _____ Aspect: _____ AA-3 Photo #: _____ Aspect: _____ AA-4 Photo #: _____ Aspect: _____	Photo Range: _____  Comments: _____

**ENVIRONMENTAL DESCRIPTION AND CLASSIFICATION OF ASSESSMENT AREA**

<p><u>Wetland / riparian / upland inclusions:</u> (should = 100%)</p> <p>_____ % AA with true wetland and/or water</p> <p>_____ % AA with non-wetland riparian area</p> <p>_____ % AA with upland inclusions</p>	<p><u>Wetland origin:</u> (if known)</p> <p>_____ Natural feature with minimal alteration</p> <p>_____ Natural feature, but altered or augmented by modification</p> <p>_____ Non-natural feature created by passive or active management</p> <p>_____ Unknown</p>
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Ecological System: (see manual for key and pick the *best match*) Fidelity: High Med Low

<p><u>Cowardin Classification</u> Fidelity: High Med Low (see manual and pick <i>one each</i> of System, Class, Water Regime, and optional Modifier for dominant type)</p>	<p><u>HGM Class:</u> (pick <i>only one</i>) Fidelity: High Med Low</p> <p>_____ Riverine*      _____ Lacustrine Fringe</p> <p>_____ Depressional      _____ Slope</p> <p>_____ Flats      _____ Novel (Irrigation-Fed) Riverine / Slope</p> <p><i>*Specific classification and metrics apply to the Riverine HGM Class</i></p>
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**RIVERINE SPECIFIC CLASSIFICATION OF THE ASSESSMENT AREA**

<p><u>Confined vs. Unconfined Valley Setting</u></p> <p>_____ Confined Valley Setting (valley width &lt; 2x bankfull width)</p> <p>_____ Unconfined Valley Setting (valley width ≥ 2x bankfull width)</p> <p><u>Stream Flow Duration</u></p> <p>_____ Perennial</p> <p>_____ Intermittent</p> <p>_____ Ephemeral</p>	<p><u>Proximity to Channel</u></p> <p>_____ AA includes the channel and both banks</p> <p>_____ AA is adjacent to or near the channel (&lt; 50 m) and evaluation includes one or both banks</p> <p>_____ AA is &gt; 50 m from the channel and banks were not evaluated</p> <p><u>Stream Depth at Time of Survey (if evaluated)</u></p> <p>_____ Wadeable</p> <p>_____ Non-wadeable</p>
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**MAJOR ZONES WITHIN THE ASSESSMENT AREA** (See manual for rules and definitions. Mark each zone on the site sketch.)

Zone 1	Description _____	Dom spp: _____	% of AA: _____
Zone 2	Description _____	Dom spp: _____	% of AA: _____
Zone 3	Description _____	Dom spp: _____	% of AA: _____
Zone 4	Description _____	Dom spp: _____	% of AA: _____
Zone 5	Description _____	Dom spp: _____	% of AA: _____

**ENVIRONMENTAL AND CLASSIFICATION COMMENTS**

Classification Issues (important for sites with medium or low fidelity to one or more classification systems):

  
  
  

**AA REPRESENTATIVENESS**

Is AA the entire wetland/riparian area?  Yes  No

**If no**, is AA representative of larger wetland/riparian area?  Yes  No  NA (if AA is the entire wetland)

Comments:

**ASSESSMENT AREA DRAWING**

Add north arrow and approx. scale bar. Document **habitat features** and **biotic and abiotic zones** (particularly open water), inflows and outflows, and indicate direction of drainage. Include location of **AA points**, **soil pits**, and **water chemistry** samples. If appropriate, add a **cross-sectional diagram** and indicate slope of side.

**ASSESSMENT AREA DESCRIPTION AND COMMENTS**

Overall site description and details on site hydrology, soil, and vegetation.





GROUND COVER BY HABITAT TYPE				
<i>Estimate cover of each ground cover by habitat type. Estimate cover based on 1% or 5% increments (not cover classes).</i>				
Cover (unless otherwise noted) →	C	Comments		
<b>Actual</b> cover of water (any depth, vegetated or not, standing or flowing) (A+B+C below)				
<b>Actual</b> cover of open water zone and no vegetation (or only algae) (A)				
<b>Actual</b> cover of water zone with emergent vegetation (B)				
<b>Actual</b> cover of water zone with submergent / floating vegetation (C)				
<b>Actual</b> predominant <u>depth</u> of water (cm)				
<b>Actual</b> max <u>depth</u> of water (cm)				
<b>Potential</b> cover of water at ordinary high water				
<b>Potential</b> predominant <u>depth</u> at ordinary high water (cm)				
Stability of water level ( <i>Pick one</i> : A: permanent and stable / B: permanent but fluctuates / C: intermittent or ephemeral)				
Cover of exposed bare ground (any substrate, can have algae cover)				
Cover of litter (all cover, <u>including under water or vegetation</u> )				
<u>Depth</u> of litter (cm) – average of four non-trampled locations where litter occurs				
<u>Count</u> of standing dead trees (>25 cm diameter at breast height)				
Cover of standing dead shrubs or small trees (<25 cm diameter at breast height)				
Cover of downed coarse woody debris (fallen trees, rotting logs, >25 cm diameter)				
Cover of downed fine woody debris (<25 cm diameter)				
Cover bryophytes (all cover, <u>including under water, vegetation or litter cover</u> )				
Cover lichens (all cover, <u>including under water, vegetation or litter cover</u> )				
Cover algae (all cover, <u>including under water, vegetation or litter cover</u> )				
VERTICAL STRATA BY HABITAT TYPE				
<i>Estimate cover of each vertical strata by habitat type. Estimate height using classes. Estimate cover base on 1% or 5% increments (not classes).</i>				
Height Classes 0: <0.2 m 1: 0.2–0.5 m 2: 0.5–1m 3: 1–2 m 4: 2–5 m 5: 5–10 m 6: 10–15 m 7: 15–20 m 8: 20–35 m 9: 35–50 m 10: >50 m				
Vertical Vegetation Strata (live or very recently dead)	Height / Cover →	H	C	Comments
(T1) Dominant canopy trees (>5 m and >~ 30% cover)				
(T2) Sub-canopy trees (> 5m but < dominant canopy height) or trees with sparse cover				
(S1) Tall shrubs, tree saplings or seedling (>2 m)				
(S2) Short shrubs (<2 m)				
(HT) Herbaceous total				
(H1) Graminoids (grass and grass-like plants)				
(H2) Forbs (all non-graminoids)				
(AQ) Submergent or floating aquatics				





**2015 COLORADO WETLAND ECOLOGICAL INTEGRITY ASSESSMENT (EIA) – METRICS**

LANDSCAPE METRICS			
L1. CONTIGUOUS NATURAL LAND COVER		L2. LAND USE INDEX	
Select the statement that best describes the <b>contiguous natural land cover</b> within the 500 m envelope surrounding the AA. See list of natural land covers in the field manual.		Select the statement that best describes the intensity of surrounding land use. Use the <b>Land Use Index</b> Worksheet (last page) to calculate the Land Use Index score.	
Intact: AA embedded in 90–100% contiguous natural land cover.	<b>A</b>	Land Use Index = 9.5–10.0	<b>A</b>
Variegated: AA embedded in 60–90% contiguous natural land cover.	<b>B</b>	Land Use Index = 8.0–9.4	<b>B</b>
Fragmented: AA embedded in 20–60% contiguous natural land cover.	<b>C</b>	Land Use Index = 4.0–7.9	<b>C</b>
Relictual: AA embedded within <20% contiguous natural land cover.	<b>D</b>	Land Use Index = <4.0	<b>D</b>
Landscape comments:			
BUFFER METRICS			
B1. PERIMETER WITH NATURAL BUFFER		B2. WIDTH OF NATURAL BUFFER	
Select the statement that best describes the <b>perimeter of the AA with natural buffer</b> . Buffer land covers must be ≥ 5 m wide and extend along ≥ 10 m of the AA perimeter. See list of buffer land covers in the field manual.		Select the statement that best describes the <b>width of the natural buffer</b> . Estimate the width of buffer land covers along eight lines radiating out from the AA at the cardinal and ordinal directions (N, NE, E, SE, S, SW, W, NW) and average their width. Estimate up to 100 m.	
Natural buffer surrounds 100% of the AA perimeter.	<b>A</b>	Average buffer width is 100 m	<b>A</b>
Natural buffer surrounds 75–99% of the AA perimeter.	<b>B</b>	Average buffer width is 75–99 m	<b>B</b>
Natural buffer surrounds 25–74% of the AA perimeter.	<b>C</b>	Average buffer width is 25–74 m	<b>C</b>
Natural buffer surrounds <25% of the AA perimeter.	<b>D</b>	Average buffer width is <25 m	<b>D</b>
B3. CONDITION OF NATURAL BUFFER			
Select the statement that best describes the <b>natural buffer condition</b> . Select one statement per column. Only consider <u>the actual natural buffer</u> measured in metrics above. <i>Remember to look for <b>non-native hay grasses</b> when evaluating native / non-native vegetation in the buffer.</i>			
Abundant (≥95%) relative cover native vegetation and little or no (<5%) cover of non-native plants.	<b>A</b>	Intact soils, no water quality concerns, little or no trash, AND little or no evidence of human visitation.	<b>A</b>
Substantial (75–95%) relative cover of native vegetation and low (5–25%) cover of non-native plants.	<b>B</b>	Intact or minor soil disruption, minor water quality concerns, moderate or lesser amounts of trash, AND/OR minor intensity of human visitation or recreation.	<b>B</b>
Low (25–75%) relative cover of native vegetation and moderate to substantial (25–75%) cover of non-native plants.	<b>C</b>	Moderate or extensive soil disruption, moderate to strong water quality concerns, moderate or greater amounts of trash, AND/OR moderate intensity of human use.	<b>C</b>
Very low (<25%) relative cover of native vegetation and dominant (>75% cover) of non-native plants OR no buffer exists.	<b>D</b>	Barren ground and highly compacted or otherwise disrupted soils, significant water quality concerns, substantial amounts of trash, extensive human use, OR no buffer exists.	<b>D</b>
Buffer comments:			

**VEGETATION COMPOSITION METRICS**

V1. NATIVE PLANT SPECIES COVER (RELATIVE)		V2. INVASIVE NONNATIVE PLANT SPECIES COVER (ABSOLUTE)	
Select the statement that best describes the <u>relative cover</u> of <b>native plant species</b> within the AA.		Select the statement that best describes the <u>absolute cover</u> of <b>invasive nonnative plant species</b> within the AA. Use list provided in the manual.	
AA contains >99% relative cover of native plant species.	<b>A</b>	Invasive nonnative species are absent from all strata.	<b>A</b>
AA contains 95–99% relative cover of native plant species.	<b>B</b>	Invasive species present, but sporadic (<4% absolute cover).	<b>B</b>
AA contains 85–95% relative cover of native plant species.	<b>C</b>	Noxious weeds somewhat abundant (4–10% cover).	<b>C</b>
AA contains 60–85% relative cover of native plant species.	<b>C-</b>	Noxious weeds abundant (10–30% cover).	<b>C-</b>
AA contains <60% relative cover of native plant species.	<b>D</b>	Noxious weed very abundant (>30% cover).	<b>D</b>

**V3. NATIVE PLANT SPECIES COMPOSITION**

Select the statement that best describes the <b>native plant species composition</b> (species abundance and diversity) within the AA. Look for native species diagnostic of the system vs. native increasers that may thrive in human disturbance.	
Native plant species composition with expected natural conditions: i) Typical range of native diagnostic species present, AND ii) Native species sensitive to anthropogenic degradation are present, AND iii) Native species indicative of anthropogenic disturbance (i.e., increasers, weedy or ruderal species) absent to minor.	<b>A</b>
Native plant species composition with minor disturbed conditions: i) Some native diagnostic species absent or substantially reduced in abundance, OR ii) Native species indicative of anthropogenic disturbance are present with low cover.	<b>B</b>
Native plant species composition with moderately disturbed conditions: i) Many native diagnostic species absent or substantially reduced in abundance, OR ii) Native species indicative of anthropogenic disturbance are present with moderate cover.	<b>C</b>
Native plant species composition with severely disturbed conditions: i) Most or all native diagnostic species absent, a few remain in low cover, OR ii) Native species indicative of anthropogenic disturbance are present with high cover.	<b>D</b>
Vegetation composition comments:	

**VEGETATION STRUCTURE METRICS**

V4. VEGETATION STRUCTURE (VERTICAL AND HORIZONTAL)	
Select the statement below that best describes the <b>overall vertical and horizontal structure</b> within the AA. Vertical structure relates to the number of vertical vegetation strata. Horizontal structure relates to the number and complexity of biotic and abiotic patches within the wetland/riparian area. See reference card for potential structural patches. Assess each site based on the expected conditions within its Ecological System type. For woody systems, rate regeneration and woody debris individually on next page, then consider those ratings in the overall assessment of structure.	
<b>Herbaceous systems: Marsh, Meadow, Playa</b>	<b>Woody systems: Riparian and Floodplain</b>
<i>General: Vegetation structure is at or near minimally disturbed natural conditions. Little to no structural indicators of degradation evident.</i>	
Structural patches/zones are appropriate in number and type for the system (can be few in playas, fens, meadows). There is diversity in vertical strata within the herbaceous vegetation (some tall and some short layers and/or low cover of shrubs or trees, where appropriate). Litter and other organic inputs are typical of the system (i.e., playas should have low litter while meadows and marshes should have moderate amounts of litter).	AA is characterized by a complex array of nested or interspersed patches. Canopy (if present) contains a mosaic of different ages or sizes, including large old trees and obvious regeneration. Number of live stems is well within expected range. Shrub and herbaceous layers are complex, providing a diversity of vertical strata. Woody species are of sufficient size and density to provide future woody debris to stream or floodplain. Litter layer is neither lacking nor extensive.
<b>A</b>	

<i>General: Vegetation structure shows minor alterations from natural conditions.</i>			
<p><b>Marshes:</b> cattail and bulrush density may prevent animal movement in some areas of the wetland, but not throughout.</p> <p><b>Meadows:</b> grazing and mowing have minor effects.</p> <p><b>Playas:</b> natural areas of bare ground are still prevalent, though non-native or weedy species may be encroaching.</p>		AA is characterized by a moderate array of nested or interspersed zones with no single dominant zone, though some structural patches (especially open zones) may be missing. Canopy still heterogeneous in age or size, but may be missing some age classes. Vertical strata may be somewhat less complex than natural conditions. Woody debris or litter may be somewhat lacking.	<b>B</b>
<i>General: Vegetation structure is moderately altered from natural conditions.</i>			
<p><b>Marshes:</b> cattail and bulrush density may prevent animal movement in half or more of the wetland.</p> <p><b>Meadows:</b> grazing and mowing have moderate effects.</p> <p><b>Playas:</b> natural areas of bare ground are present, but non-native or weedy species have filled in many area.</p>		AA is characterized by a simple array of nested or interspersed zones. One zone may dominate others. Vertical strata may be moderately less complex than natural conditions. Site may be denser than natural conditions (due to non-native woody species) or may be more open and decadent. Woody debris or litter may be moderately lacking.	<b>C</b>
<i>General: Vegetation structure is greatly altered from natural conditions.</i>			
<p><b>Marshes:</b> cattail and bulrush density prevent animal movement throughout the wetland.</p> <p><b>Meadows:</b> grazing and mowing greatly affect the structure of the vegetation and prevalence of litter.</p> <p><b>Playas:</b> natural areas of bare ground are absent due to an abundance of non-native or weedy species.</p>		AA is characterized by one dominant zone and several expected structural patches or vertical strata are missing. Site is either extremely dense with non-native woody species or open with predominantly decadent or dead trees. Woody debris and/or litter may be absent entirely or may be excessive due to decadent trees.	<b>D</b>
<b>V5. REGENERATION OF NATIVE WOODY SPECIES</b>		<b>V6. COARSE AND FINE WOODY DEBRIS</b>	
Select the statement that best describes the <b>regeneration of native woody species</b> within the AA.		Select the statement that best describes <b>coarse and fine woody debris</b> within the AA.	
Woody species are naturally uncommon or absent.	<b>NA</b>	There are no obvious inputs of woody debris or woody species are naturally uncommon.	<b>NA</b>
All age classes of <i>native</i> woody species present. Native tree saplings /seedlings and shrubs common to the type present in expected amounts and diversity. Regeneration is obvious.	<b>A</b>	AA characterized by moderate amount of coarse and fine woody debris, relative to expected conditions. There is wide size-class diversity of standing snags and downed logs in various stages of decay. For riverine wetlands, debris is sufficient to trap sediment, but does not inhibit stream flow. For non-riverine wetlands, woody debris provides structural complexity, but does not overwhelm the site.	<b>A/B</b>
Age classes of <i>native</i> woody species restricted to mature individuals and young sprouts. Middle age groups appear to be absent or there is some other indication that regeneration is moderately impacted.	<b>B</b>		
<i>Native</i> woody species comprised of mainly mature individuals OR mainly evenly aged young sprouts that choke out other vegetation. Regeneration is obviously impacted. Site may contain Russian Olive and/or Salt Cedar.	<b>C</b>	AA characterized by small amounts of woody debris OR debris is somewhat excessive. For riverine wetlands, lack of debris may affect stream temperatures and reduce available habitat.	<b>C</b>
<i>Native</i> woody species predominantly consist of decadent or dying individuals OR are absent from an area that should be wooded. Site may be dominated by Russian Olive / Salt Cedar.	<b>D</b>	AA lacks woody debris, even though inputs are available.	<b>D</b>
Vegetation structure comments (including regeneration and woody debris):			

**HYDROLOGY METRICS**

**H1. WATER SOURCE**

Check off all *major* water sources in the table to the right. Select the statement below that best describes the **water sources** feeding the AA during the growing season.

- |  |  |
|--|--|
| <input type="checkbox"/> Overbank flooding     | <input type="checkbox"/> Irrigation via direct application |
| <input type="checkbox"/> Alluvial aquifer      | <input type="checkbox"/> Irrigation via seepage            |
| <input type="checkbox"/> Groundwater discharge | <input type="checkbox"/> Irrigation via tail water run-off |
| <input type="checkbox"/> Natural surface flow  | <input type="checkbox"/> Urban run-off / culverts          |
| <input type="checkbox"/> Precipitation         | <input type="checkbox"/> Pipes (directly feeding wetland)  |
| <input type="checkbox"/> Snowmelt              | <input type="checkbox"/> Other:                            |

Water sources are natural. Site hydrology is fed by precipitation, groundwater, natural runoff, or natural flow from an adjacent freshwater body. The system may naturally lack water at times, even for several years. There is no indication of direct artificial water sources, either point sources or non-point sources. Land use in the local watershed is primarily open space or low density, passive use with little irrigation.

**A**

Water sources are mostly natural, but also include occasional or small amounts of inflow from anthropogenic sources. Indications of anthropogenic sources include developed land or irrigated agriculture that comprises < 20% of the immediate drainage area, some road runoff, small storm drains or other minor point source discharges. No large point sources control the overall hydrology.

**B**

Water sources are moderately impacted by anthropogenic sources, but are still a mix of natural and non-natural sources. Indications of moderate contribution from anthropogenic sources include developed land or irrigated agriculture that comprises 20–60% of the immediate drainage area or moderate point source discharges into the wetland, such as many small storm drains or a few large ones or many sources of irrigation runoff. The key factors to consider are whether the wetland is located in a landscape position that supported wetlands before irrigation / development *AND* whether the wetland is still connected to its natural water source (e.g., modified ponds on a floodplain that are still connected to alluvial aquifers or natural stream channels that now receive substantial irrigation return flows).

**C**

Water sources are primarily from anthropogenic sources (e.g., urban runoff, direct irrigation, pumped water, artificially impounded water, or another artificial hydrology). Indications of substantial artificial hydrology include developed or irrigated agricultural land that comprises > 60% of the immediate drainage basin of the AA, or the presence of major drainage point source discharges that obviously control the hydrology of the AA. The key factors to consider are whether the wetland is located in a landscape position that likely never supported a wetland prior to human development *OR* did support a wetland, but is now disconnected from its natural water source. The reason the wetland exists is because of direct irrigation, irrigation seepage, irrigation return flows, urban storm water runoff, or direct pumping.

**D**

Water source comments:

**H2. HYDROPERIOD**

Select the statement below that best describes the **hydroperiod** within the AA (extent and duration of inundation and/or saturation). Search the AA and 500 m envelope for hydrologic stressors (see list on following pages). Use best professional judgment to determine the overall condition of the hydroperiod. For some wetlands, this may mean that water is being channelized or diverted away from the wetland. For others, water may be concentrated or increased. *Please add comments on next page.*

Hydroperiod is characterized by natural patterns of inundation/saturation and drawdown and/or flood frequency, duration, level and timing. There are no major hydrologic stressors that impact the natural hydroperiod. Riparian channels are characterized by equilibrium conditions with no evidence of severe aggradation or degradation indicative of altered hydrology.

**A**

Hydroperiod inundation and drying patterns deviate slightly from natural conditions due to presence of stressors such as: flood control/water storage dams upstream; berms or roads at/near grade; minor pugging by livestock; small ditches or diversions removing water; or minor flow additions from irrigation return flow or storm water runoff. Outlets may be slightly constricted, but not to significantly slow outflow. Riparian channels may have some sign of aggradation or degradation, but approach equilibrium conditions. Playas are not significantly impacted pitted or dissected. *If wetland is artificially controlled*, the management regime closely mimics a natural analogue (it is very unusual for a purely artificial wetland to be rated in this category).

**B**

Hydroperiod inundation and drying patterns deviate moderately from natural conditions due to presence of stressors such as: flood control/water storage dams upstream or downstream that moderately effect hydroperiod; two lane roads; culverts adequate for base stream flow but not flood flow; moderate pugging by livestock that could channelize or divert water; shallow pits within playas; ditches or diversions 1–3 ft. deep; or moderate flow additions. Outlets may be moderately constricted, but flow is still possible. Riparian channels may show distinct signs of aggradation or degradation. *If wetland is artificially controlled*, the management regime approaches a natural analogue. Site may be passively managed, meaning that the hydroperiod is still connected to and influenced by natural high flows timed with seasonal water levels.

**C**

Hydroperiod inundation and drawdown patterns deviate substantially from natural conditions from high intensity alterations such as: significant flood control / water storage das upstream or downstream; a 4-lane highway; large dikes impounding water; diversions > 3ft. deep that withdraw a significant portion of flow, deep pits in playas; large amounts of fill; significant artificial groundwater pumping; or heavy flow additions. Outlets may be significantly constricted, blocking most flow. Riparian channels may be concrete or artificially hardened. *If wetland is artificially controlled*, the site is actively managed and not connected to any natural season fluctuations.

**D**

Hydroperiod comments:

**H3. HYDROLOGIC CONNECTIVITY**

Select the statement below that best describes the degree to which **hydrology within the AA is connected to the larger landscape** throughout the year, but particularly at times of high water. Consider the effect of impoundments, entrenchment, or other obstructions to connectivity that occur within the surrounding landscape, if those impoundments clearly impact the AA.

<i>Marsh / Meadow variant</i>	<i>Playa variant</i>	<i>Riverine / Riparian variant</i>	
No unnatural obstructions to lateral or vertical movement of surface or ground water. Rising water in the site has unrestricted access to adjacent upland, without levees, excessively high banks, artificial barriers, or other obstructions to the lateral movement of flood flows.	Surrounding land cover / vegetation does not interrupt surface flow. No artificial channels feed water to playa.	Completely connected to floodplain (backwater sloughs and channels). No geomorphic modifications made to contemporary floodplain. Channel is not entrenched.	<b>A</b>
Minor restrictions to the lateral or vertical movement of surface and ground water by unnatural features such as levees, road grades or excessively high banks. Up to 25% of the site may be restricted by barriers to drainage. Restrictions may be intermittent along the margins of the AA, or they may occur only along one bank or shore. Flood flows may exceed the impoundments, but drainage back into the wetland may be incomplete due to the impoundments.	Surrounding land cover / vegetation may interrupt a minor amount of surface flow. Artificial channels may feed minor amounts of excess water to playa.	Minimally disconnected from floodplain. Up to 25% of stream banks may be affected by dikes, rip rap, and/or elevated culverts. Channel may be somewhat entrenched, but overbank flow occurs during most floods.	<b>B</b>
Moderate restrictions to the lateral or vertical movement of surface and ground water by unnatural features such as levees, road grades or excessively high banks. Between 25–75% of the site may be restricted by barriers to drainage. Flood flows may exceed the impoundments, but drainage back into the wetland may be incomplete due to the impoundments.	Surrounding land cover / vegetation may interrupt a moderate amount of surface flow. Artificial channels may feed moderate amounts of excess water to playa.	Moderately disconnected from floodplain due to multiple geomorphic modifications. Between 25-75% of stream banks may be affected by dikes, rip rap, concrete, and/or elevated culverts. Channel may be moderately entrenched and disconnected from the floodplain except in large floods.	<b>C</b>
Essentially no hydrologic connection to adjacent landscape. Most or all stages may be contained within artificial banks, levees, or comparable features. Greater than 75% of the site is restricted by barriers to drainage.	Surrounding land cover / vegetation may dramatically restrict surface flow. Artificial channels may feed significant amounts of excess water to playa.	Channel is severely entrenched and entirely disconnected from the floodplain. More than 75% of stream banks may be affected by dikes, rip rap, concrete and/or elevated culverts. Overbank flow never occurs or only in severs floods.	<b>D</b>

Hydrologic connectivity comments:

**PHYSIOCHEMICAL METRICS**

**S1. SUBSTRATE / SOIL DISTURBANCE**

Select the statement below that best describes disturbance to the substrate or soil within the AA. For playas, the most significant substrate disturbance is sedimentation or unnaturally filling, which prevents the system's ability to pond after heavy rains. For other wetland types, disturbances may lead to bare or exposed soil and may increase ponding or channelization where it is not normally. For any wetland type, consider the disturbance relative to what is expected for the system.

No soil disturbance within AA. Little bare soil OR bare soil areas are limited to naturally caused disturbances such as flood deposition or game trails OR soil is naturally bare (e.g., playas). No pugging, soil compaction, or sedimentation.	<b>A</b>
Minimal soil disturbance within AA. Some amount of bare soil, pugging, compaction, or sedimentation present due to human causes, but the extent and impact are minimal. The depth of disturbance is limited to only a few inches and does not show evidence of altering hydrology. Any disturbance is likely to recover within a few years after the disturbance is removed.	<b>B</b>
Moderate soil disturbance within AA. Bare soil areas due to human causes are common and will be slow to recover. There may be pugging due to livestock resulting in several inches of soil disturbance. ORVs or other machinery may have left some shallow ruts. Sedimentation may be filling the wetland. Damage is obvious, but not excessive. The site could recover to potential with the removal of degrading human influences and moderate recovery times.	<b>C</b>
Substantial soil disturbance within AA. Bare soil areas substantially degrade the site and have led to altered hydrology or other long-lasting impacts. Deep ruts from ORVs or machinery may be present, or livestock pugging and/or trails are widespread. Sedimentation may have severely impacted the hydrology. The site will not recover without active restoration and/or long recovery times.	<b>D</b>

Substrate / soil comments and photo #'s:

<b>S2. SURFACE WATER TURBIDITY / POLLUTANTS</b>	<b>S3. ALGAL GROWTH</b>
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Select the statement that best describes the <b>turbidity or evidence or pollutants</b> in surface water within the AA.		Select the statement that best describes <b>algal growth</b> within surface water in the AA. Exclude <i>Chara</i> (multicellular algae) in cover estimate.	
No open water in AA	<b>NA</b>	No open water in AA or evidence of open water.	<b>NA</b>
No visual evidence of turbidity or other pollutants.	<b>A</b>	Water is clear with minimal algal growth.	<b>A</b>
Some turbidity in water (such as turbidity caused by high flows or naturally occurring in playas) OR presence of other pollutants, but limited to small and localized areas within the wetland. Water may be slightly cloudy.	<b>B</b>	Algal growth is limited to small and localized areas of the wetland. Water may have a greenish tint or cloudiness.	<b>B</b>
Water is cloudy or has unnatural oil sheen, but the bottom is still visible. <i>Note: If the sheen breaks apart when you run your finger through it, it is a natural bacterial process and not water pollution.</i>	<b>C</b>	Algal growth occurs in moderate to large patches throughout the AA. Water may have a moderate greenish tint or sheen.	<b>C</b>
Water is milky and/or muddy or has unnatural oil sheen. The bottom is difficult to see. <i>Note: If the sheen breaks apart when you run your finger through it, it is a natural bacterial process and not water pollution.</i>	<b>D</b>	Algal mats are extensive, blocking light to the bottom. Water may have a strong greenish tint and the bottom is difficult to see.	<b>D</b>

Water quality comments and photo #'s:

*Turbidity and algal growth may be natural depending on recent weather patterns and flow timing (i.e., higher flows are often more turbid). Please rank the system as you see it, regardless of whether the conditions are natural. Include good notes and take photos.*

**SIZE METRICS**

**Z1. COMPARATIVE SIZE**

Select the statement below that best describes the **absolute size** of the wetland, as compared with others of its type.

<i>Meadows and Marshes</i>	<i>Playas and Fens</i>	<i>Riparian Areas</i>	
>10 hectares (>25 acres)	>2 hectares (>5 acres)	>5 km (>3 miles)	<b>A</b>
2–10 hectares (25 acres)	0.5–2 hectares (5 acres)	1–5 km (3 miles)	<b>B</b>
0.5–2hectares (5 acres)	0.1–0.5 hectares (1 acre)	0.1–1 km (0.6 mile)	<b>C</b>
<0.5 hectare (<1 acre)	<0.1 hectare (<0.25 acre)	<0.1 km (<0.06 mile)	<b>D</b>

Comparative size comments:

**Z2. CHANGE IN SIZE**

Select the statement below that best describes the **change in size** of the wetland.

Occurrence is at, or only minimally reduced (<15%) from its original, natural extent, and has not been artificially reduced in size.	<b>A</b>
Occurrence is only somewhat reduced (15-10%) from its original natural extent.	<b>B</b>
Occurrence is modestly reduced (10-30%) from its original, natural extent.	<b>C</b>
Occurrence is substantially reduced (>30%) from its original, natural extent.	<b>D</b>

Change in size comments:

**Land Use Index Worksheet**

<i>Land Use Categories</i> <sup>1</sup>	<i>Coefficient</i>	<i>500 m Envelope</i>	
		<i>% Area</i>	<i>Score</i>
Paved roads, parking lots, domestic, commercial, and industrial buildings	0		
Gravel pit operation, open pit mining, strip mining, abandoned mines	0		
Unpaved roads (e.g., driveway, tractor trail, 4-wheel drive roads)	1		
Resource extraction (oil and gas)	1		
Tilled agricultural crop production (corn, wheat, soy, etc.)	2		
Intensively managed golf courses, sports fields, lawns	2		
Vegetation conversion (chaining, cabling, rotochopping, clearcut)	3		
Heavy grazing by livestock	3		
Logging or tree removal with 50-75% of large trees removed	4		
Intense recreation (ATV use / camping / popular fishing spot, etc.)	4		
Permanent crop agriculture (hay pasture, vineyard, orchard)	4		
Dam sites and disturbed shorelines around water storage reservoirs. Include open water of reservoir if there is intensive recreation, such as boating.	5		
Old fields and other disturbed fallow lands dominated by non-native species	5		
Moderate grazing on rangeland	6		
Moderate recreation (high-use trail)	7		
Selective logging or tree removal with <50% of large trees	8		
Light grazing on rangeland	9		
Light recreation (low-use trail)	9		
Natural area / land managed for native vegetation	10		
<b>Total Land Use Score</b>			

**Buffer Width Worksheet**

1: _____	5: _____
2: _____	6: _____
3: _____	7: _____
4: _____	8: _____
Average width: _____	

## 2015 COLORADO ECOLOGICAL INTEGRITY ASSESSMENT (EIA) –STRESSOR CHECKLIST

**Stressors:** *direct threats*; “the proximate (human) activities or processes that have caused, are causing, or may cause the destruction, degradation, and/or impairment of biodiversity and natural processes” or altered disturbance regime (e.g. flooding, fire, or browse).

**Some Important Points about Stressors Checklists:**

1. The Stressors Checklist must be completed for the 500 m envelop surrounding the AA (Landscape) and for the 0.5 ha AA (Veg, Hydro, Soils). Rely on imagery in combination with what you can field check.
2. Assess stressors in the 500 m envelope for their effects on land surrounding the AA (*NOT how they may impact the AA*)
3. Stressors for Vegetation, Soils, and Hydrology are assessed across the full 0.5 ha assessment area (AA)
4. Severity has been pre-assigned for many stressors. If the severity differs from the pre-assigned rating, cross it out and note the true severity. If there is more than one pre-assigned value, circle the appropriate value.
5. To comment, note the stressor number before writing comments.

Site ID / Name: \_\_\_\_\_ Date: \_\_\_\_\_

SCOPE of Threat (% of AA or Buffer affected by direct threat)	
1 = Small	Affects a small portion (1-10%) of the AA or landscape
2 = Restricted	Affects some (11-30%) of the AA or landscape
3 = Large	Affects much (31-70%) of the AA or landscape
4 = Pervasive	Affects all or most (71-100%) of the AA or landscape
SEVERITY of Threat within the defined Scope (degree of degradation to AA or Buffer)	
1 = Slight	Likely to only slightly degrade/reduce
2 = Moderate	Likely to moderately degrade/reduce
3 = Serious	Likely to seriously degrade/reduce
4 = Extreme	Likely to extremely degrade/destroy or eliminate

	STRESSORS CHECKLIST	500 m Envelope Landscape			ASSESSMENT AREA (0.5 ha)									Comments	
		Scope	Severity	IMPACT	Vegetation			Soil / Substrate			Hydrology				
					Scope	Severity	IMPACT	Scope	Severity	IMPACT	Scope	Severity	IMPACT		
D E V E L O P	1. Residential, recreational buildings, associated pavement		3												
	2. Industrial, commercial, military buildings, associated pavement		4												
	3. Oil and gas wells and surrounding footprint		4												
	4. Roads (gravel=2, paved=3, highway=4), railroad=3		2, 3, 4												
	5. Sports field, golf course, urban parkland, expansive lawns		2												
	6. Row-crop agriculture, orchard, nursery		3												
	7. Hay field, fallow field		2, 3												
	8. Utility / power line corridor		1, 2, 3			1, 2, 3									
	9. Other [specify]:														
R E C	10. Low impact recreation (hunting, fishing, camping, hiking, bird-watching, canoe/kayak)		1				1								
	11. High impact recreation (ATV, mountain biking, motor boats)		3				3								
	12. Other [specify]:														
V E G	13. Tree resource extraction (clear cut=3 or 4, selective cut= 2 or 3)		2, 3, 4				2, 3, 4								
	14. Vegetation management (cutting, mowing)		2				2								
	15. Livestock grazing, excessive herbivory by native species (ungulates, prairie dogs) (low=1, mod=2, high=3)		1, 2, 3				1, 2, 3								
	16. Insect pest damage (low=1, mod=2, high=3)		1, 2, 3				1, 2, 3								
	17. Invasive plant species (see noxious weed list)		3				3								
	18. Direct application of agricultural chemicals, herbicide spraying		2, 3				2, 3								
19. Other [specify]:															
N A T	20a. Evidence of recent fire (low=1, mod=2, high=3)		1, 2, 3				1, 2, 3								
	20b. Recent beaver dam blowout		1, 2				1, 2								
	21. Other [specify]:														

	STRESSORS CHECKLIST	500 m Envelope Landscape			ASSESSMENT AREA (0.5 ha)									Comments	
		Scope	Severity	IMPACT	Vegetation			Soil / Substrate			Hydrology				
					Scope	Severity	IMPACT	Scope	Severity	IMPACT	Scope	Severity	IMPACT		
S O I L S	22. Excessive sediment or organic debris (inputs from recently logged sites, sedimentation in playas)														
	23. Excessive erosion or loss of organic matter (gullyng, decay of organic soils)														
	24. Trash or refuse dumping														
	25. Filling or dumping of sediment (spoils from excavation)														
	26. Substrate removal (excavation)														
	27. Indirect soil disturbance (compaction or trampling by livestock, human use, vehicles)														
	28. Direct soil disturbance (grading, compaction, plowing, discing, deeply dug fire lines)														
	29. Physical resource extraction (rock, sand, gravel, minerals, etc.)														
	30. Obvious excess salinity (dead or stressed plants, salt crusts)														
	31. Other [specify]:														
H Y D R O L O G Y	32. PS discharge (waste water treatment, factory discharge, septic)														
	33. NPS discharge (urban / storm water runoff)														
	34. NPS discharge (agricultural runoff, excess irrigation, feedlots, excess manure)														
	35. NPS discharge (mine runoff, discharge from oil and gas)														
	36. Large dams / reservoirs														
	37. Impoundments, berms, dikes, levees that hold water in or out														
	38. Canals, diversions, ditches, pumps that move water in or out														
	39. Excavation for water retention (gravel ponds, pitted playas)														
	40. Groundwater extraction (few small wells=2, extensive extraction cause a lowered water table=4)														
	41. Flow obstructions (culverts, paved stream crossings)														
42. Engineered channel (riprap, armored channel bank, bed)															
43. Control of flow and energy (weir/drop structure, dredging)															
44. Other [specify]:															
<b>Stressors Very Minimal or Not Evident (check box, if true)</b>		<input type="checkbox"/>			<input type="checkbox"/>			<input type="checkbox"/>			<input type="checkbox"/>				
<b>STRESSOR RATING BY CATEGORY (Envelope, Veg, Soils, Hydro)</b>		Score:	Rating:		Score:	Rating:		Score:	Rating:		Score:	Rating:		HIS Score:	HIS Rating:
<b>OVERALL HUMAN STRESSOR INDEX (HSI) – use category weights</b>		<b>0.3</b>			<b>0.3</b>			<b>0.1</b>			<b>0.3</b>				

Threat Impact Calculator		Scope			
		Pervasive = 4	Large = 3	Restricted = 2	Small = 1
Severity	Extreme = 4	VERY HIGH = 10	High = 7	Medium = 4	Low = 1
	Serious = 3	High = 7	High = 7	Medium = 4	Low = 1
	Moderate = 2	Medium = 4	Medium = 4	Low = 1	Low = 1
	Slight = 1	Low = 1	Low = 1	Low = 1	Low = 1

Category / HSI Roll-up Formulas	
Score	Rating
10+	Very High
7 – 9.9	High
4 – 6.9	Medium
1 – 3.9	Low
0 – 0.9	Absent