

Understanding Wetland CEFs & Their Significance

Environmental Commission Retreat
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WATERSHED
PROTECTION



What is a Wetland CEF?

- **Definition:**

- “Wetlands are transitional lands between terrestrial and aquatic systems where the water table is usually at or near the surface and may have shallow water present”
 - Environmental Criteria Manual (ECM) 1.10.3 (E)

- ECM defers to the United States Army Corps of Engineers (USACE) 1987 Wetlands Delineation Manual

- **3 Parameters/Criteria**

- **Hydrophytic Vegetation**
- **Hydric Soils**
- **Hydrology**



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Hydrophytic Vegetation

- Based on the wetland indicator status of the 2018 National Wetland Plant List (USACE)
 - Obligate Wetland Plants (OBL) estimated probability >99%
 - Facultative Wetland Plants (FACW) estimated probability 67-99%
 - Facultative Plants (FAC) estimated probability 34-66%
 - Facultative Upland Plants (FACU) estimated probability 1-33%
 - Obligate Upland Plants (UPL) estimated probability <1%
- Abrupt boundary between FACW/OBL community and upland community



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NWPL - National Wetland Plant List

US Army Corps of Engineers

NWPL Custom Report - Species Listed = 2427

Report Options (derived from search options)

Scientific Name, in Alphabetic Order.

Selected Geography

Selected State = TX (Texas)

Wetland Rating Summary (regional counts)

Wetland	AGCP	AW	GP	Total
UPL	161	105	166	432
FACU	568	382	521	1471
FAC	486	285	539	1310
FACW	529	238	529	1296
OBL	554	349	368	1271
Rating	2258	1259	2263	5780

BUILDING STRONG

Scientific Name	Authorship	AGCP	AW	GP	Common Name
<i>Abutilon theophrasti</i>	Moench	FACU	UPL	UPL	Velvetleaf
<i>Acalypha gracilens</i>	Gray	FAC			Sandbar Three-Seed-Mercury
<i>Acalypha parvifolia</i>	Spring	FACU		FACU	Palestine Copperhead
<i>Acalypha rhomboides</i>	Raf.	FAC		FACU	Common Three-Seed-Mercury
<i>Achyrocline satureioides</i>	L.	FACU		FACU	Virginia Three-Seed-Mercury
<i>Acrostichum tetragynum</i>	(L.) Hurns	FACU		FACU	Tongue Cactus
<i>Acer grandidentatum</i>	Nutt.		S&CU	FAC	Canyon Maple
<i>Acer negundo</i>	L.	FAC	FACW	FAC	Ash-Leaf Maple
<i>Acer rubrum</i>	L.	FAC		FAC	Red Maple
<i>Acer saccharinum</i>	L.	FACU	FAC	FAC	Silver Maple
<i>Achillea millefolium</i>	L.	FACU	FACU	FACU	Common Yarrow
<i>Acrostichum hypoleucum</i>	(Rosenr. & J.A. Schumacher) Barlowitt		UPL	FACU	Indian Rice Grass
<i>Acrostichum spicatum</i>	(Scribn.) Marlowitt		FACU	UPL	Reindeer's Rice Grass
<i>Actinanthus aspera</i>	L.		UPL	UPL	Dart's Horsetail
<i>Acroclima repens</i>	(Walt.) L.C. Rich		FACW	FACW	Cypress-Leaf Spottedflower
<i>Actinoporus americanus</i>	(Raf.) Syst.	FACU	UPL	FACU	American Ragwort
<i>Acorus calamus</i>	L.	UPL	OBL	OBL	Sage-Vine Arrowroot
<i>Adiantum capillus-veneris</i>	L.	FACU	FACW	FACW	Southern Maidenhair
<i>Adiantum tricholepis</i>	Frag.		FAC		Fern Maidenhair
<i>Aeschynomene indica</i>	L.	FACW		FACW	Indian Joint-Vetch
<i>Aeschulus glabra</i>	Walt.	FACU		FAC	Ohio Blackeye
<i>Aeschulus parva</i>	L.	FACU		FAC	Red Blackeye
<i>Agalinia calycina</i>	Pennell	FACU	OBL	OBL	Lanceleaf Fiddleneck
<i>Agalinia fasciculata</i>	(Raf.) Raf.	FACU		FAC	Black-Face Foxglove
<i>Agalinia hageri</i>	Pennell	FACU		FAC	Coastal Plain Fiddleneck
<i>Agalinia heterophylla</i>	(Pursh.) Small & Ben.	FACU		FAC	Orange-Face Foxglove
<i>Agalinia maritima</i>	(Raf.) Raf.	OBL		OBL	Saltmarsh Black-Face Foxglove
<i>Agalinia oligophylla</i>	Pennell	FACU		FAC	Sage-Short-Face Foxglove
<i>Agalinia pulchella</i>	Pennell	FACU		FAC	St. Mark's Fiddleneck
<i>Agalinia purpurea</i>	(L.) Poir.	FACW		FACW	Purple-Face Foxglove
<i>Agalinia tenuifolia</i>	(Vahl) Raf.	FACU	FACW	FAC	Sandbar-Leaf Fiddleneck
<i>Agave americana</i>	L.	UPL	UPL	UPL	American Century-Plant
<i>Agrostis alba</i>	(L.) Kunt. & H.S. Rehm	FACU		UPL	White-Seedgrass
<i>Ageratum houstonianum</i>	P. Mill.	FACU	FACU	FACU	Bluebonnet

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Obligate Wetland Plant (OBL) Example

- Mexican primrose willow (*Ludwigia octovalvis*)



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Facultative Wet Plant (FACW) Example

- Sand spikerush (*Eleocharis montevidensis*)



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Facultative Wet Plant (FACW) Example

- Black willow (*Salix nigra*)



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Facultative Wetland Plant (FAC) Example

- Annual marshelder (*Iva annua*)



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Hydric Soils

• Definition

- “A hydric soil is a soil that is saturated, flooded, or ponded long enough during the **growing season** to develop anaerobic conditions that favor the growth and regeneration of hydrophytic vegetation...”
–USACE 1987 Wetlands Delineation Manual Part 36

• Two of the four supporting criteria (Part 37):

- “C. Soils that are ponded for **long or very long duration** during the **growing season**; or”
- “D. Soils that are frequently flooded for **long duration or very long duration** during the **growing season**.”

- **growing season** = year-round in Austin

- **long duration** = 7-30 days

- **very long duration** >30 days



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Hydric Soils

- Soil, surface water, and groundwater become anaerobic
- Hydric soil indicators
 - Redoxomorphic or redox features
 - Concentrations: Iron (Fe) or Manganese (Mn)
 - Depletions
 - Value and chroma using Munsell Soil Book
 - Example: Depleted Matrix
- Problematic hydric soils
 - No typical indicators
 - Meets definition of hydric soil

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Gleyed Matrix (S4)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Sandy Redox (S5)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Stripped Matrix (S6)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Mucky Mineral (F1)
<input type="checkbox"/> Stratified Layers (A5) (LRR F)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)
<input type="checkbox"/> 1 cm Muck (A9) (LRR F, G, H)	<input type="checkbox"/> Depleted Matrix (F3)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Redox Dark Surface (F6)
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Depleted Dark Surface (F7)
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Redox Depressions (F8)
<input type="checkbox"/> 2.5 cm Mucky Peat or Peat (S2) (LRR G, H)	<input type="checkbox"/> High Plains Depressions (F16)
<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3) (LRR F)	<input type="checkbox"/> (MLRA 72 & 73 of LRR H)

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Indicators for Problematic Hydric Soils³:

<input type="checkbox"/> 1 cm Muck (A9) (LRR I, J)
<input type="checkbox"/> Coast Prairie Redox (A16) (LRR F, G, H)
<input type="checkbox"/> Dark Surface (S7) (LRR G)
<input type="checkbox"/> High Plains Depressions (F16)
<input type="checkbox"/> (LRR H outside of MLRA 72 & 73)
<input type="checkbox"/> Reduced Vertic (F18)
<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Very Shallow Dark Surface (TF12)
<input type="checkbox"/> Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

https://www.pantone.com/products/munsell/munsell-soil-color-identification-2-pack?utm_source=googlefeed&gclid=Cj0KCQIAy579BRCPARIsAB6QoIZNEpEzf5KhzEbECOVdINmbGJBGB3Lqhaxjkz2FurFDK-OmVNxEoT4aAsPFEALw_wcB



Hydrology

• Definition

- Wetland hydrology- “all hydrologic characteristics of areas that are periodically inundated or have soils saturated to the surface at some time during the growing season.” –USACE 1987 Wetlands Delineation Manual Part 46

HYDROLOGY

Wetland Hydrology Indicators:		
Primary Indicators (minimum of one required; check all that apply)		Secondary Indicators (minimum of two required)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Salt Crust (B11)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Invertebrates (B13)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Dry-Season Water Table (C2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	(where tilled)
<input type="checkbox"/> Drift Deposits (B3)	(where not tilled)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Water-Stained Leaves (B9)		<input type="checkbox"/> Frost-Heave Hummocks (D7) (LRR F)
Field Observations: Surface Water Present? Yes <input type="checkbox"/> No <input type="checkbox"/> Depth (inches): _____ Water Table Present? Yes <input type="checkbox"/> No <input type="checkbox"/> Depth (inches): _____ Saturation Present? Yes <input type="checkbox"/> No <input type="checkbox"/> Depth (inches): _____ (includes capillary fringe)		Wetland Hydrology Present? Yes <input type="checkbox"/> No <input type="checkbox"/>
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:		
Remarks:		

US Army Corps of Engineers

Great Plains – Version 2.0

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Hydrology Indicators

- Surface Water
- Saturation



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Hydrology Indicators

- Surface Soil Cracks



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Hydrology Indicators

- Crawfish Burrows



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Hydrology Indicators

- Drift Deposits



https://www.sas.usace.army.mil/Portals/61/docs/regulatory/Workshop_Hydrology_Fall2011.pdf



Hydrology Indicators

- Algal Mat or Crust



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Hydrology Indicators

- Seasonally influenced or ephemeral can be misleading
need all three criteria



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What isn't a Wetland CEF?

- “Permitted water quality wet ponds, roadside ditches, and ponds fed by wells or other artificial sources of hydrology”
-ECM 1.10.3 (E)
- Hydrology source
 - Natural
 - Sheet flow or groundwater
 - Artificial
 - Well or windmill



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Why are Wetland CEFs important?

- **Hydrologic Function**

- Flood protection/storm runoff for sheet flow
- Replenish groundwater (percolation/recharge aquifer)
- Erosion control

- **Water Quality Improvement**

- Retain pollutants
- Reduce sediment
- Sequester carbon

- **Ecosystem**

- Habitat/critical resources for variety of aquatic and terrestrial flora and fauna
- Fringe along creek or shoreline vs. isolated emergent wetland

- **Aesthetically appealing**



Why I love Wetland CEFs?

- Wetlands are...
 - Beautiful
 - Vibrant
 - Diverse
 - Complex
- Wetlands provide numerous benefits to the natural landscape
- Wetlands make fieldwork interesting 😊



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How to protect Wetland CEFs?

- **Protective buffers/no development surrounding wetland CEFs**
 - Immediately surrounding wetland CEFs
 - Topographically upgradient/upstream
 - Source of water (i.e. stream or lake)
 - Topographically downgradient/downstream
 - Adjacent surface water resources associated with wetland
- **Protect surrounding physical, chemical, or biological characteristics that support the wetland**
 - Retain canopy coverage
- **Maintain/improve quality of features**
 - Restoration or enhancement (native plantings)
 - Remove invasive species
 - Biofiltration ponds and stormwater quality features that enhance standard sedimentation/filtration water quality





Thank You!

Questions?

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