MRGESCP Jurisdictional Wetlands and Delineation Process

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US Army Corps of Engineers .



Introduction

- On average, only 5% of the lower 48 states is wetlands and other shallow aquatic habitats.
- Wetland abundance varies by region:
 - <1% of CA, NV, AZ, NM, UT, KS, MT, and WV
 - Approx. 30% of FL and LA
 45% of AK



Wetland Losses in the U.S.





Since the late 1700s, >50% of U.S. wetlands have been converted to other uses.



Wetland Values

Wetlands provide benefits to society out of proportion to their extent on the landscape.



... water quality

... flood control

... habitat

Why Delineate Wetlands?

- Help to define the limits of Federal jurisdiction, in accordance with current laws, regulations, and policy
- Determine the wetland area affected by a project, as a first step in impact assessment, alternatives analysis, and mitigation

Wetland Definitions

Corps/EPA definition - for Clean Water Act Section 404 purposes:

 Areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.

Adjacent Wetlands

- Regulatory definition (§328.3(c))
 - bordering, contiguous, or neighboring.
 Wetlands separated from other waters of the United States by man-made dikes or barriers, natural river berms, beach dunes and the like are "adjacent wetlands."

Adjacent Wetlands

- Three criteria clarifying "adjacent wetlands"
 - Wetlands with unbroken hydrologic connection;
 - Connection may be surface or shallow subsurface
 - Connection may be intermittent
 - Wetlands separated by berm or similar feature(s) from a jurisdictional water;
 - Man-made dikes or barriers, natural river berms, beach dune etc.
 - Wetlands in reasonably close physical proximity to a jurisdictional water
 - Science-based inference that wetlands have ecological interconnection with jurisdictional waters

Wetland Delineation Manuals

 Corps of Engineers Wetland Delineation Manual (1987)

Designed for Clean Water Act applications
 Regional Supplements introduced in 2006

Regional Supplements

Diagnostic Characteristics

Hydrophytic Vegetation

Dominated by species that are tolerant of prolonged inundation or soil saturation

Hydric Soils

- Exhibit characteristics that develop under permanent or periodic soil saturation
- Wetland Hydrology
 - Evidence of ongoing and continuing wetland conditions

Hydrology Objectives

- Understand major factors that affect site wetness
- Review terminology used to describe hydrologic characteristics of a site

Some Factors that Influence the Wetness of a Site

Climate

- Landscape / geomorphic setting
- Stratigraphy
- Soil texture and drainage
- Plant cover

Inundation

Condition in which water from any source temporarily or permanently covers a land surface. Two types:

- Ponding
- Flooding

Ponding

Condition in which water stands in a closed depression. The water is removed only by percolation, evaporation, or transpiration.

Flooding

Condition in which the soil surface is temporarily covered with flowing water from any source, such as overflowing streams or rivers, runoff from adjacent slopes, and inflow from high tides.

Ponded

Flooded

Saturation

Condition in which all pores between soil particles are temporarily or permanently filled with water.

Water Table

The upper surface of groundwater, or the level at which water stands in an unlined borehole.

Vegetation Objectives

- Understand the concept of a hydrophyte
- Understand "wetland indicator status"
- Understand the "50/20 rule" for selecting dominant plant species

Hydrophyte

Plants that grow in water or on a substrate inundated or saturated during the growing period at a frequency and duration sufficient to influence plant occurrence.

Developed by interagency panels

- Vascular plants
 - Bryophytes for some regions
- Compiled by region

USACE National Wetland Plant List

Assign each species a "wetland indicator status"

http://rsgisias.crrel.usace.army.mil/NWPL/ http://wetland_plants.usace.army.mil

Wetland Indicator Status Rating

			Estimated occurrence
	Indicator category	<u>Symbol</u>	in wetlands
WET			
1	Obligate wetland plants	OBL	> 99%
	Facultative wetland plants	FACW	67 - 99%
	Facultative plants	FAC	34 - 66%
	Facultative upland plants	FACU	1 - 33%
₩	Obligate upland plants	UPL	< 1%
DRY			

Definitions of Vegetation Strata

1987 Manual (Regional Supplements may differ)

Tree	Woody plants \geq 3.0 inches DBH, regardless of height
Sapling/Shrub	Woody plants ≥3.2 ft tall but <3.0 inches DBH
Herb	All nonwoody plants, and woody plants <3.2 ft tall
Woody Vine	Woody climbing plants ≥3.2 ft tall

Basic sampling protocol

Estimating the abundance of plant species

- Use <u>absolute percent cover</u> for all species and strata
 - Allows the use of the Dominance Test and Prevalence Index on the same data
- Estimate visually within a plot or across the entire community (a plot is recommended)

Selection of Dominant Species

The "50/20 rule":

Dominant species are the most abundant plant species that individually or together account for <u>more than</u> 50 percent of the total coverage of vegetation in the stratum, plus any additional species that, by itself, comprises <u>at least</u> 20 percent of the total.

Selection of Dominant Species

Example for the sapling/shrub stratum:

A I

	Absolute
Species Present	<u>% Cover</u>
Cornus foemina	25*
Spiraea alba	20*
Cornus amomum	15*
Rhamnus frangula	10
Toxicodendron vernix	5
TOTAL COVER	75

50/20 Thresholds:

50% of total cover = 50% of 75 = **37.5%**

20% of total cover = 20% of 75 = **15%**

* Selected as dominants

Soils Objectives

- Understand key soil properties related to hydric soil development and recognition
- Understand types of redoximorphic features and how they form

What is Soil?

Natural body that occurs on the land surface, occupies space, and is characterized by one or both of the following:

- Horizons or layers
- The ability to support rooted plants in a natural environment
 - ► Upper limit is air or shallow (>2.5 m) water
 - Lower limit is either bedrock or the limit of biological activity
 - Lower limit for classification set at an arbitrary 2 m

Definition of a Hydric Soil

A hydric soil is a soil that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part.

Aspects of Soil Color

Munsell Soil Color System

Hue

- Value
- Chroma

10R 5/8

Hue

Spectral color in relation to red, yellow, blue, etc.

) 2.5YR 5YR 7.5YR 10YR

Yellow-Red \rightarrow

Yellow

Value

10/0 - Pure White

The Lightness or **Darkness of Color 5**/0 - "Gray"

0/0 - Pure Black

8/

Chroma

Increasing strength of color _

Increasing grayness

Munsell[®] or Earth Colors[®]

- The Munsell notation system is a system for recording color.
- Earth Colors and Munsell books use the same color notation.

Redox Features Within a Soil Matrix

Oxidation/Reduction and Soil Color

- In subsoil horizons, Fe and Mn oxides give soils their characteristic brown, red, and yellow colors.
- When saturated and reduced, Fe and Mn are mobile and can be stripped from soil particles.
- This leaves the characteristic mineral grain color, usually a neutral gray.

Depleted Matrix

- Dominant color of the soil is "gray" due to removal (depletion) of iron
- Commonly used to identify hydric soils
 - Discussed more in the lecture on hydric soil indicators

Describe the Soil Profile

SOIL				Sampling Point:	_
Profile Description: (Describe to the depting) Depth Matrix (inches) Color (moist) % 0-7 10 YR 3/2 100 7-20 10 YR 5/1 90	th needed to document the in <u>Redox Features</u> <u>Color (moist)</u> % 10 YR 6/8 10	dicator or confirm Type ¹ Loc ² C M	Texture L/C L/C	ef indicators.) Remarks Loamy Clay	
¹ Type: C=Concentration, D=Depletion, RM=	Reduced Matrix, MS=Masked	Sand Grains.	2Location:	PL=Pore Lining, M=Matrix.	

- Record: Layer Depth and Thickness (to at least to 20" depth)
- Record: Matrix Color and Percent
- □ Record: Redox Color and Percent
- □ Record: Redox Feature Type
- Record: Redox Feature Location
- Record: Texture
- Record: Additional Supporting Information as Applicable

Interpretation Problems

Not all wet soils develop redoximorphic features

- Low amounts of soluble organic carbon
- High pH
- Cold temperatures
- Low amounts of Fe
- Aerated groundwater

Hydric Soil Indicators

Indicators presented in Regional Supplements are subsets of the NTCHS "Field Indicators of Hydric Soils in the United States"

https://www.nrcs.usda.gov/Internet/ FSE_DOCUMENTS/nrcs142p2_0531 71.pdf

Natural Resources Conservation Service

In cooperation with the National Technical Committee for Hydric Soils

Field Indicators of Hydric Soils in the United States

A Guide for Identifying and Delineating Hydric Soils, Version 8.0, 2016

Hydric Soil Indicators Five-Part Structure

1. Alpha-numeric listing

2. Short name

3. Application to LRRs

5. User notes

S4. Sandy Gleyed Matrix. For use in all LRRs except W, X, and Y. A gleyed matrix that occupies 60 percent or more of a layer starting ≤ 6 in. (15 cm) of the soil surface.

4. Description of the Indicator

Sandy Gleyed Matrix User Notes: Gleyed colors are not synonymous with gray colors. Gley colors are those colors...

Delineation Sheets

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site:				City/County:			Sampling Date:
Applicant/Owner: _				50.00 MB0 00 00 M 00 - 2		State:	Sampling Point:
Investigator(s):				_ Section, Town	ship, Range:		
Landform (hillslope	, terrace, etc	.):		_ Local relief (c	oncave, convex	, none):	Slope (%):
Subregion (LRR):			Lat:		Long	:	Datum:
Soil Map Unit Nam	e:					NWI cla	assification:
Are climatic / hydro	ologic conditio	ons on the site typical f	or this time of	year? Yes	No	(If no, explain	n in Remarks.)
Are Vegetation	Soil	, or Hydrology	significant	ly disturbed?	Are "Norma	I Circumstan	ces" present? Yes No
Are Vegetation	, Soil	, or Hydrology	naturally p	problematic?	(If needed,	explain any a	nswers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Hydric Soil Present? Wetland Hydrology Present?	Yes Yes Yes	No No No	is the Sampled Area within a Wetland?	Yes	No
Remarks:					

VEGETATION – Use scientific names of plants.

	Absolute Dominant	Indicator Dominance Test work	ksheet:	
Tree Stratum (Plot size:) 1.	<u>% Cover</u> <u>Species?</u>	Status Number of Dominant S That Are OBL, FACW,	or FAC:	(A)
2				
1		Total Number of Domin	hant	
		Species Across Air Str	ata.	_ (B)
*	= Total Cov	Percent of Dominant S That Are OBL, FACW,	or FAC:	(A/B)
1.		Prevalence Index wo	rksheet:	
2.		Total % Cover of:	Multiply by	¢
3		OBL species	x 1 =	
1		FACW species	x 2 =	
		FAC species	x 3 =	
··	= Total Cou	FACU species	x 4 =	
Herb Stratum (Plot size:)	= 10(a) 000	UPL species	x 5 =	_
L		Column Totals:	(A)	(B)
2				(0)
3.		Prevalence Index	c = B/A =	
4.		Hydrophytic Vegetati	on Indicators:	
1		Dominance Test is	\$ >50%	
3		Prevalence Index	is ≤3.0 ¹	
7		Morphological Ada	aptations ¹ (Provide sup	porting
		data in Remark	s or on a separate she	et)
	- Tatal Car	Problematic Hydro	phytic Vegetation ¹ (Ex	plain)
Woody Vine Stratum (Plot size:)	= Total Cov	ei		
1.		¹ Indicators of hydric so	il and wetland hydrolog	gy must
2.		be present, unless dist	urbed or problematic.	
	= Total Cov	er Hydrophytic Vegetation		
% Bare Ground in Herb Stratum %	Cover of Biotic Crust	Present? Ye	ns No	_

Profile Description: (Describe to the de	pth needed to document the indicator o	r confirm the absence of indicators.)
Depth Matrix	Redox Features	
(inches) Color (moist) %	Color (moist) % Type ¹	Loc ² Texture Remarks
	·	
Trans Conference Production D	- Deduced Matrix 21 analises DI - Dese	Lister DO-Dest Changel MeMatrix
Type: C=Concentration, D=Depletion, RM	I PRe unless otherwise noted)	Indicators for Problematic Hydric Soils ³
Hydric Son marcators. (Applicable to a	in Errics, diffess otherwise floted.)	Indicators for Problematic Hydric Sons .
Histosol (A1)	Sandy Redox (SS)	1 cm Muck (A9) (LRR C)
Histic Epipedon (A2)	Supped Mathx (S6)	2 cm Muck (A10) (LRK B)
Black Histic (A3)	Loamy Mucky Mineral (F1)	Reduced Vertic (F18)
Hydrogen Sunice (A4)	Loanny Gleyed Matrix (F2)	Red Parent Material (TP2)
d and Much (AO) (LRR C)	Depleted Matrix (F3)	Other (Explain in Remarks)
Depleted Below Dark Surface (\$11)	Redox Dark Surface (F6)	
Thick Dark Surface (A12)	Depieted Dark Surface (F7)	
Sandy Musicy Minarel (S1)	Redox Depressions (Fo)	³ Indicators of hydrophytic vegetation and
Sandy Mucky Milleral (S1)	Vental Pools (P3)	wetland bydrology must be present
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Resultive Layer (in present).		
and the second se		
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US Army Corps of Engineers

Information Sources on the Web

- NRCS Hydric Soils web site
 - http://soils.usda.gov/use/hydric/
- NRCS Soil Data Mart
 - http://soildatamart.nrcs.usda.gov/
- Web Soil Survey
 - http://websoilsurvey.nrcs.usda.gov/app/
- USACE National Wetland Plant List
 - http://rsgisias.crrel.usace.army.mil/NWPL/
 - http://wetland_plants.usace.army.mil
- USDA Plants Database
 - http://plants.usda.gov/

Questions

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