USDA

United States Department of Agriculture

Natural Resources Conservation Service

Wetlands in a Watershed/Landscape Context – Vegetation & Wildlife

August 15, 2018 - Kendra Moseley,
Regional ESS, Soil Science Division

Natural Resources Conservation Service

nrcs.usda.gov/

USDA

United States Department of Agriculture

Vegetation in Wetlands

- Vegetation as an Indicator of Hydrology
- Vegetation Adaptations
- Vegetation Abundance
- Vegetation Functional Groups
- Vegetation Distribution
- Other Species that Influence Wetlands

Natural Resources Conservation Service

nrcs.usda.gov/

Vegetation in Wetlands

What is the Vegetation Illustrating About the Water Flow from the Landscape/Watershed Scale?

Vegetation in wetlands are a primary indicator of the hydrology

Some of the key ways vegetation can help understand the water across the landscape:

- Vegetation Adaptations
- Vegetation Functional Groups
- Vegetation Abundance
- Vegetation Distribution

Vegetation Adaptations

There are many ways that some plants have adapted to water conditions, some of these adaptations include:**

- Ability to float on top of the water
- Large leaves to capture more sunlight
- Waxy leaves that protect them from the water
- Air spaces in stems to help hold the plant up in water
- Ability to reproduce asexually or through spreading rhizomes or stolons
- Tolerates little to no oxygen in the water/soil
- Tolerates water fluctuations/tidal/etc.
- Flexible stems that allow the plant to bend during high velocity water or wind events
- Efficient roots that are densely packed with seeds
- Seeds that are easily dispersed by the wind or water
- Aerial roots
- Vegetative parts are able to absorb nutrients and water, making roots less essential

**this list is NOT exhaustive, there are many plant adaptations to water

Vegetation Adaptations

Vegetation Adaptations

Some wetland adaptations also include:

- **pH (acidic/alkaline)**
- **Chemical composition (salts, heavy metals, etc.)**

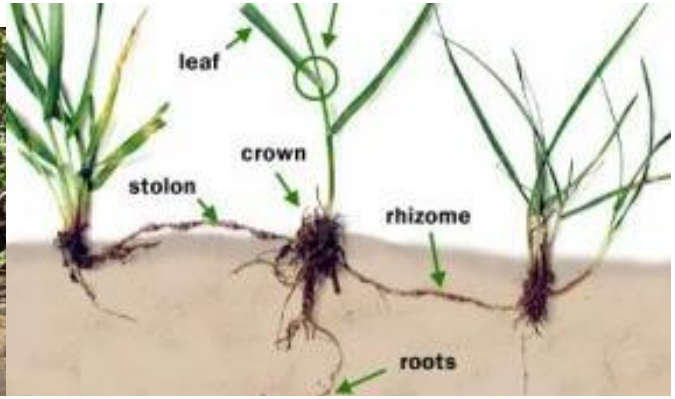
Cattails

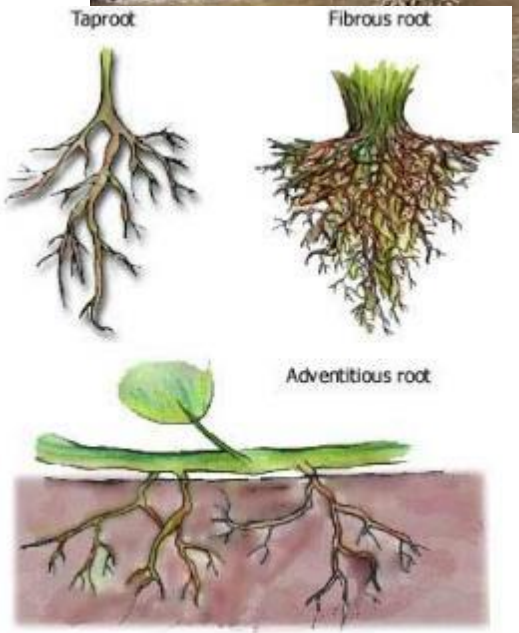
Saltgrass

Pitcher plant

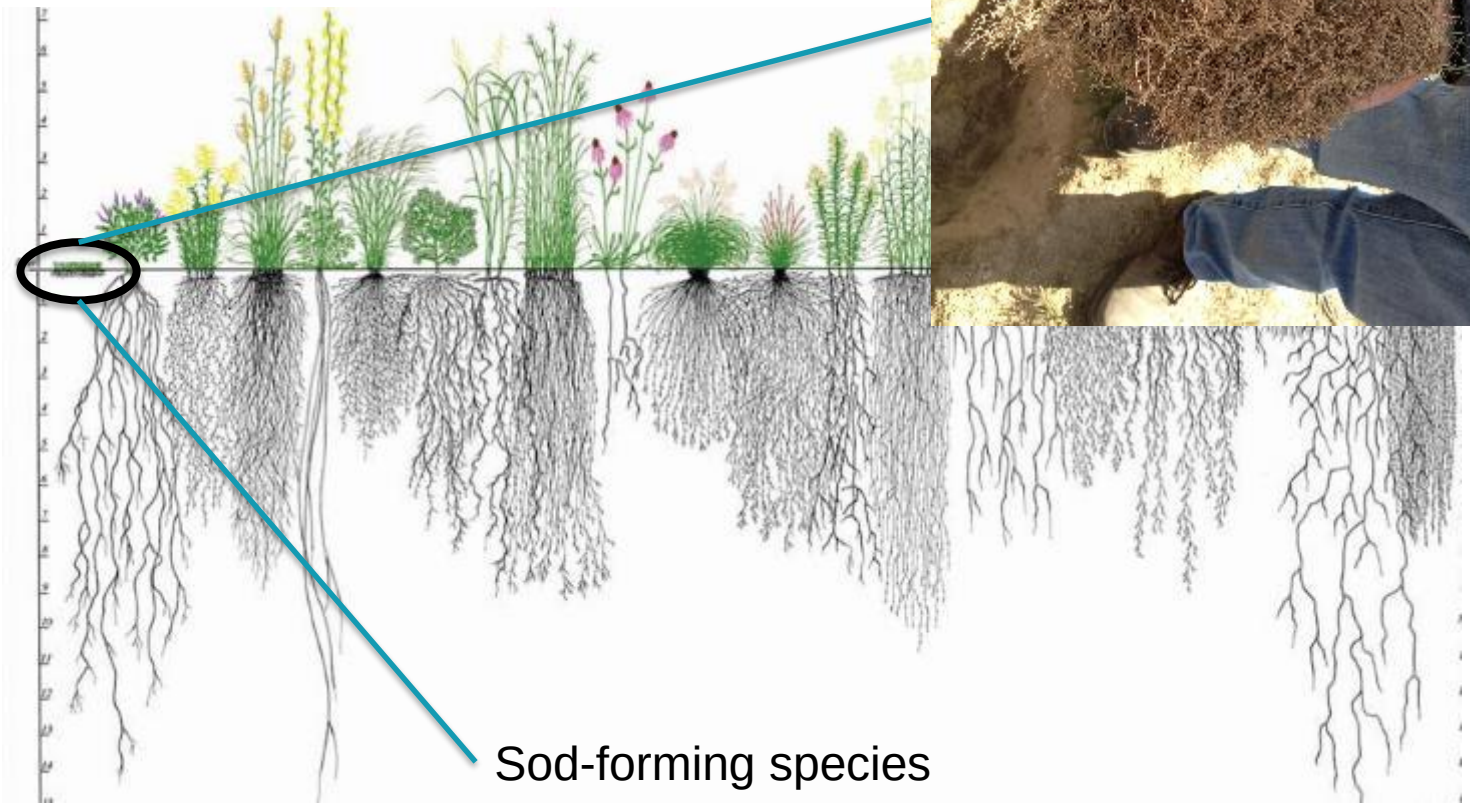
Cordgrass

Vegetation Adaptations - Roots





Roots



**Conservation Research Institute image

Vegetation Functional Groups

Water Indicator Functional Groups (abbreviation)	Ecological description (Lichvar and Minkin 2008)
Obligate (OBL)	Almost always is a hydrophyte, rarely in uplands
Facultative Wetland (FACW)	Usually is a hydrophyte but occasionally found in uplands
Facultative (FAC)	Commonly occurs as either a hydrophyte or non-hydrophyte
Facultative Upland (FACU)	Occasionally is a hydrophyte, but usually occurs in uplands
Upland (UPL)	Rarely is a hydrophyte, almost always in uplands.

Nymphoides pelata

Carex scoparia

Balsamorrhiza sagittata

Deschampsia caespitosa

Cornus drummondii

Vegetation Abundance

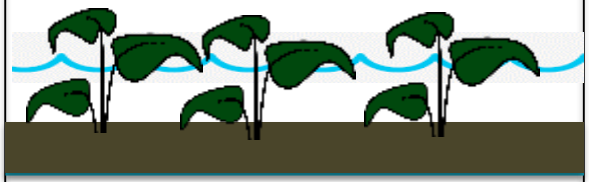
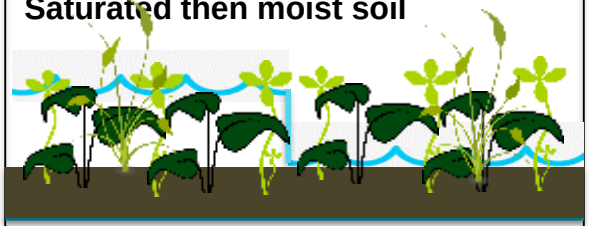
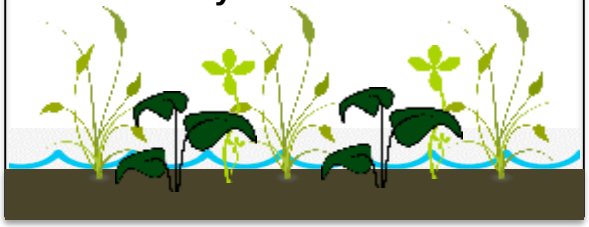
The abundance of vegetation can be a useful indicator of the hydrology and characteristics of a wetland.

Abundance can be evaluated as:

- **Density**
- **Cover**
- **Biomass**
- **Relative amounts of different functional groups**

These types of abundance measurements can be valuable indicators of the over-riding hydrology and foundational characteristics of the wetland.

Vegetation Abundance

Hydroperiod	Vegetation Response
Continuously saturated 	• Lowest species diversity • High density of obligate species • Usually perennials with no annuals
Saturated then moist soil 	• Mid-range species diversity • High density of obligate species • Perennials dominate; with little to no annuals
Moist soil then saturated 	• Mid-range species diversity • Low density of obligate species • Mid-range density of annuals
Continuously moist soil 	• Highest species diversity • Low density of obligate species • Annuals with fewer perennials

**Adapted from Mitsch & Gosslink 2007

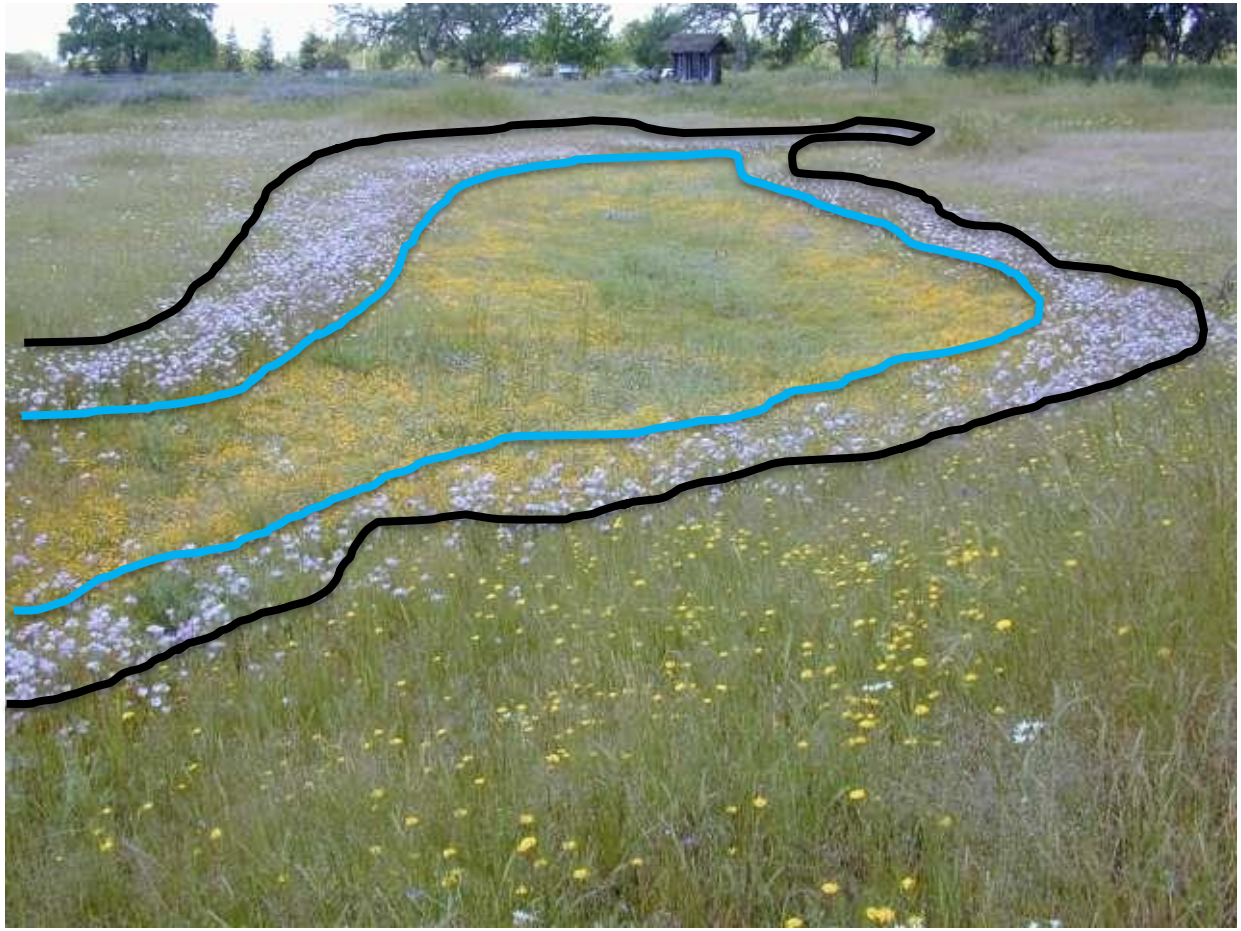
Natural Resources Conservation Service
nrcs.usda.gov/

Vegetation Distribution

Evaluating the various distributions of functional groups in wetlands can provide information on:

- **Periods of inundation**
- **Depth to water table**
- **Water source**
- **Nutrient content of the water/soils**
- **Landscape position/topology**

Vegetation Distribution



Rings of vegetation –

Middle collects most water

Next ring of vegetation gets a bit less water

Vegetation Distribution

2011 Nature Education Courtesy of Julia Cherry.

Vegetation Distribution

Willow patch

Small isolated area dominated by a facultative wet species

Sedges & rushes patch

Small, lower area of the meadow (depressional) that is dominated by a obligate species

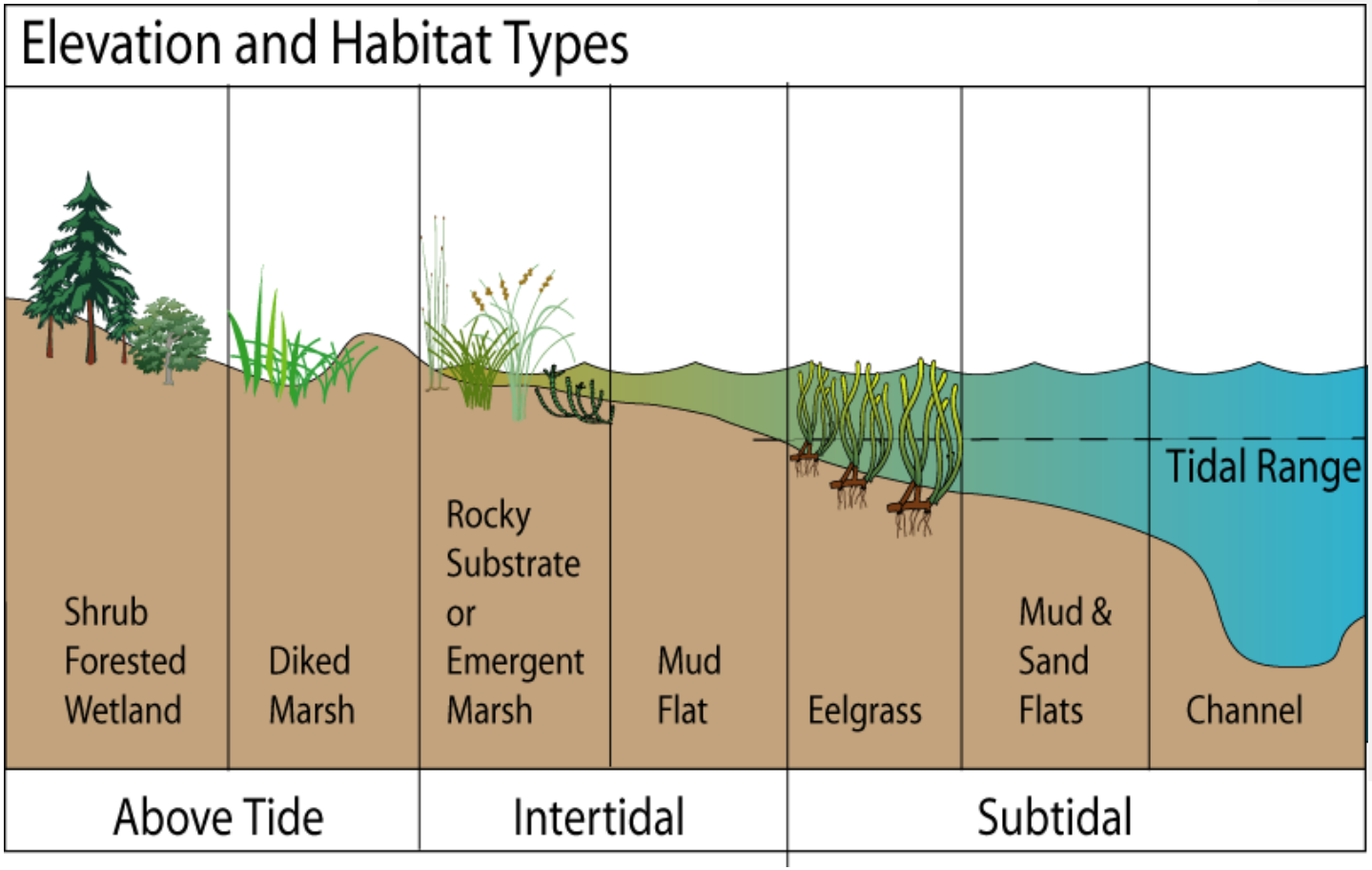
False hellebore & sedges & grasses

Large area dominated by facultative wet & facultative species

Natural Resources Conservation Service

nrcs.usda.gov/

Vegetation Distribution



Influences from Other Living Organisms

Influences from Other Living Organisms