



United States Department of Agriculture



Soil Science Division

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Ecological Site Concepts for Wet Areas

August 30, 2018 | Sarah Quistberg, NRCS Ecological Site Specialist | Ogden, Utah

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- Why wet ecological sites?
- What is “wetness”
- What are wet areas?
- Wet ecological site characteristics
- Ecological site concepts



Defining and Delineating Wet Ecological Sites

- **Aids in management**

- Understanding ecological drivers and restoration potential helps managers set realistic project goals and objectives

- **Ecosystem services**

- Water quality
- Restoration goals and potential
 - Aesthetics and recreation
- Wildlife habitat



Defining wetness

- **Area is covered or saturated by water**
- **Several factors influence wetness**
 - Climate
 - Landscape
 - Geomorphology and geology
 - Soil texture and drainage
 - Plant cover
 - Groundwater connectivity
- **Wetness can be defined by oscillations in the hydroperiod**
 - Timing
 - Frequency
 - Duration



Wet Areas

- Wetlands
- Fens
- Bogs
- Vernal pools
- Springs
- Streams
- Rivers
- Lakeshores
- Coastal areas



Characteristics



- **Water is present on the soil surface or within the root zone.**
- **Soil properties and vegetation typically vary over fairly short distances.**
- **The effects of water on ecological processes, geomorphic processes, and related processes are reflected in the soil properties and unique biota that are either adapted to or tolerant of wet conditions.**

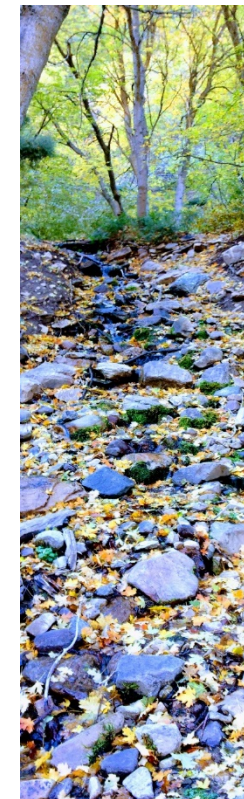


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Ecological Site Concepts

- **Spatial-temporal variability**
- **ES Patches**
- **ES Complexes**
- **History matters**
- **ES Management**



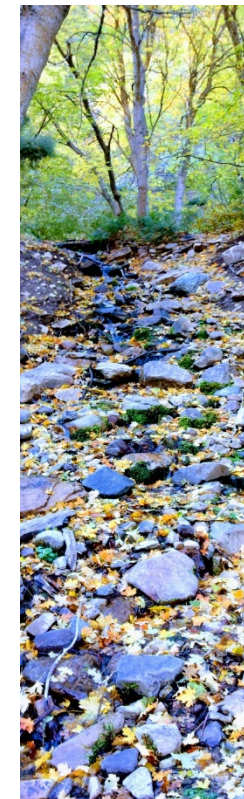
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Spatial and Temporal Variability



spatial distribution of components may change over short time periods due to hydrologic processes



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Gradients

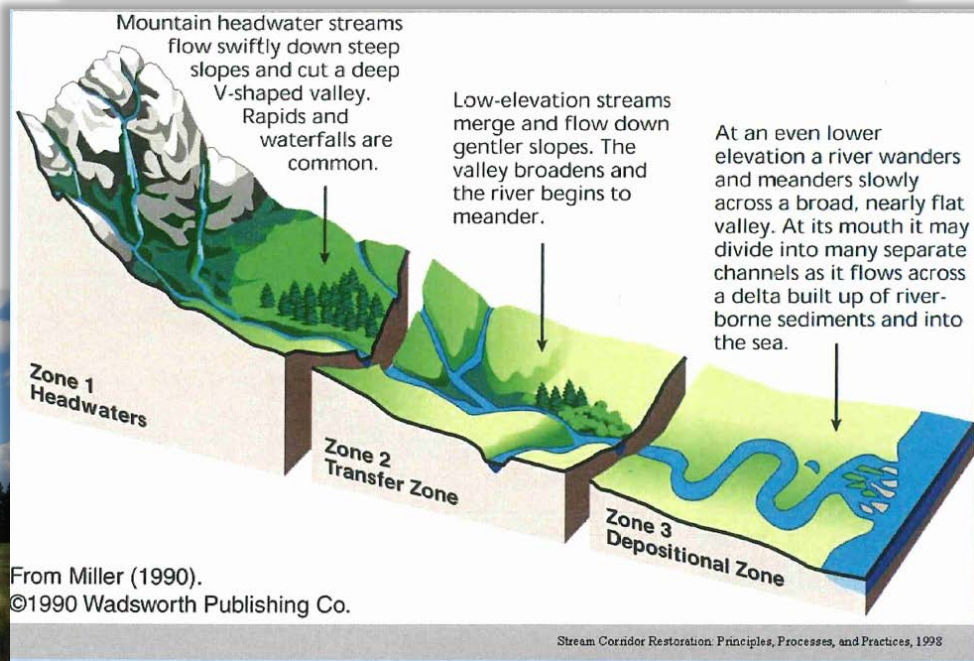
Longitudinal

- Watershed Position
- Elevation
- Valley Shape

Lateral

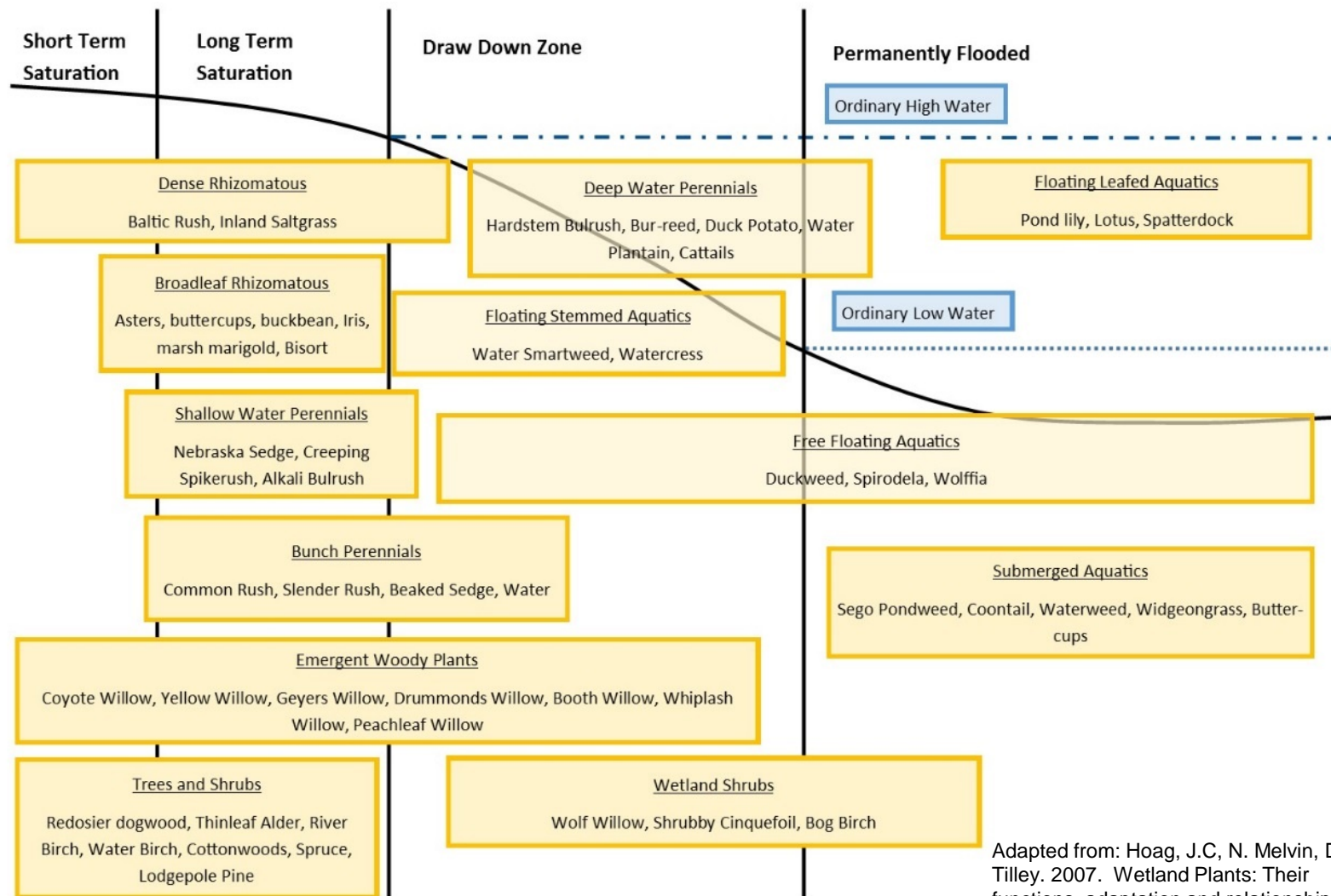
- Ground water
- Surface water
- Deposition and Scour
- Fluvial Landforms





Ecological Site Patches

small-scale, within-ecological site spatial patterns of vegetation and soils



Adapted from: Hoag, J.C, N. Melvin, D. Tilley. 2007. Wetland Plants: Their functions, adaptation and relationship to water levels. Riparian/Wetland Project Information Series No. 21. USDA-NRCS.





Vegetation

- **Vegetative communities are influenced by:**

- Climate
- Water Availability
 - Season, duration, magnitude, frequency
 - Hydrology
- Topography
 - Proximity to surface and ground water
 - Watershed position
- Soil
 - Texture, organic matter



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Ecological Site Complexes



large-scale associations of environmentally-related ecological sites



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Photo: US COE – Regional Guidebook

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Site History

interpreting indicators of
land history, use, and site
potential



Figure 25. 1935. "River Control"

Zion National Park Archives. #857-Zio.

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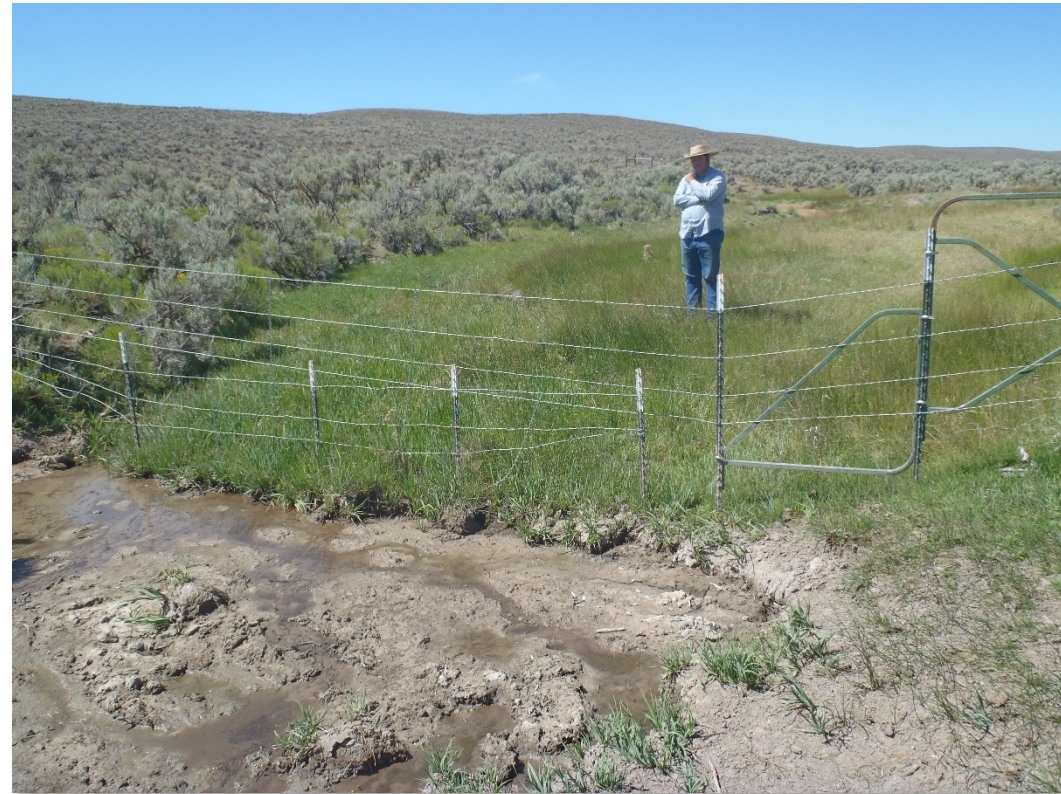
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Management



Typically managed as one unit, despite clear soil and vegetation distinctions



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Potential

Degraded

Restored



Questions?

sarah.quistberg@ut.usda.gov



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