

## Site Assessment

ESRM 302/CFR 590  
Restoration Design

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## Elements

- Determination of ecosystem types
- Hydrology and water quality
- Topography and drainage
- Soils
- Boundaries
- Ecological communities
- External conditions
- Functions performed
- Local climate
- History
- Any site constraints

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## Resources

- USGS topo maps
- Digital images
- Aerial photographs
- GIS databases
- State stream catalog
- Vegetation manuals
- Plant manuals
- Subdivision plats
- Survey maps
- Personal interviews
- USGS Wetland Inventory
- Local Wetland Inventories
- Soil maps

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## Determination of Ecosystem Types

- Terrestrial or riparian/wetland
- Forested vs. open
- Shallow soil vs. deep
- Stressful environment vs. mesic
- Restoration Sites may contain a mixture of ecosystem types, plus gradients of resources (like water) between them.

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- Different ecosystem types on a site may mean that entirely different restoration strategies are appropriate for each.

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- Vegetation manuals or monographs are good resources for finding typical makeup of an ecosystem type, e.g., riparian forest in western Washington.
  - Natural Vegetation of Oregon and Washington by Franklin and Dyrness.
  - Silvics of North America, USDA Forest Service

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## Hydrology and Water Quality

- An assessment of hydrology at a site must be done with the understanding that there is a characteristic annual pattern.
  - You need observations throughout the year
  - Or, records that reflect past patterns.
  - There are also longer-term fluctuations

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- Hydrology can be determined indirectly in a number of ways:
  - Evidence of hydrology
    - Drift lines on vegetation or waterlines on tree trunks
    - Blackened leaves on soil (evidence they sat under water)
  - Soils
    - Gleying, low chroma, concretions, mottles
  - Hydrophytic vegetation
    - List of facultative or obligate wetland species.

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## Topography and Drainage

- Topography is critical for wetland restoration.
- Slope and aspect impact local climate
- Landform influences resource allocation and retention
- Topography off-site influences site

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## Soils

- Soils are good indicators of past vegetation at a site (wetland indicators)
- Soil condition is often degraded
  - Removal
  - Compaction
  - Erosion

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## Boundaries

- Project boundaries are often set by property lines.
- Wetlands are delineated; there are specific regulations within wetlands, shoreline zones, buffers.

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## Ecological Communities

- Inventory native vegetation
  - May be candidate for preservation
  - Potential donor areas may be off site
- Inventory invasive vegetation
  - Will be removed or suppressed on site
  - May need to be controlled off site
- Inventory wildlife
  - Wildlife features
  - Herbivory
  - Non-natives (bullfrogs, wild pigs)

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## External Conditions

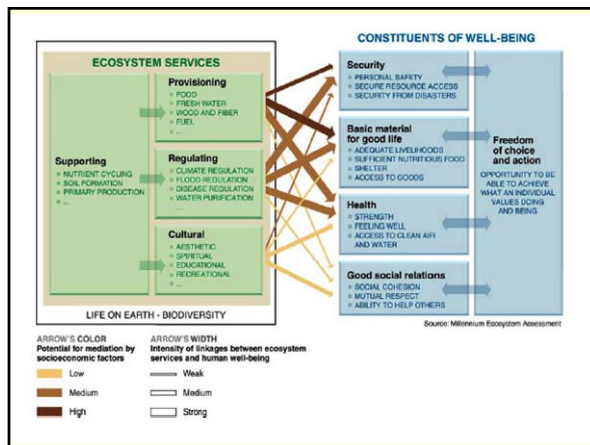
- Context, matrix
- Seed sources
- Weed sources
- Fire sources
- Climate modifiers
- Watershed changes
- Disturbance source
- Feral animals
- Complaining neighbors

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## Functions Performed

- Hydrology
- Water and air quality
- Habitat
- Supporting processes
- Regulating processes

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- Examples of quality habitat
  - High structural diversity
  - Adequate buffers from other uses
  - Functioning corridors to other habitat
  - Diversity and abundance of native plants and animals
  - Seasonal or intermittent water
  - Absence of predators, herbivores

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## Local Climate

- Moderation of climatic extremes
  - Canopy creates convective heat loss at canopy in summer.
  - Blocks winter re-radiation and clear night freezing.
- Evapotranspiration
- Microsites

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## History

- Historical condition
- Record of disturbances
- Record of uses
- Major modifications, on or off site.

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- Topo maps often indicate past agricultural uses, buildings, roads, impoundments.
- Soil maps show locations of past wetlands.

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## Site Constraints

- Limited access for equipment
- Steep slopes
- Utility lines, manholes
- Overhead wires
- Adjacent property (cannot flood)
- Neighbor's view

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## Look at site with restoration in mind

- Why is it degraded?
- What is the prognosis for repair?
- What is the most appropriate community?
- What is most likely community to flourish?
- What modifications need to be made?
- What can we afford?
- How can we minimize subsidy and get site to help with restoration?

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## Look at site with restoration in mind (2)

- What kind of plant material will we need?
- How can we get it?
- Is there water?
- If not, how can we maximize the efficiency of water use?
- Are there herbivores?
- What is the likely frequency of required return for maintenance?

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## Look at site with restoration in mind (3)

- What kinds of passive restoration are available?
- What phases should restoration installation be divided into?
- What animal features are appropriate?
- How quickly do we need to get onto the site?
- When do we start?
- How long will it take to install?

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## Look at site with restoration in mind (4)

- Are there any access problems?
- Is there a storage location on site?
- How likely is volunteer help at this site?
- Are there potential conflicts with neighboring uses?
- Is the project eligible for grants, free labor, free plants?

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