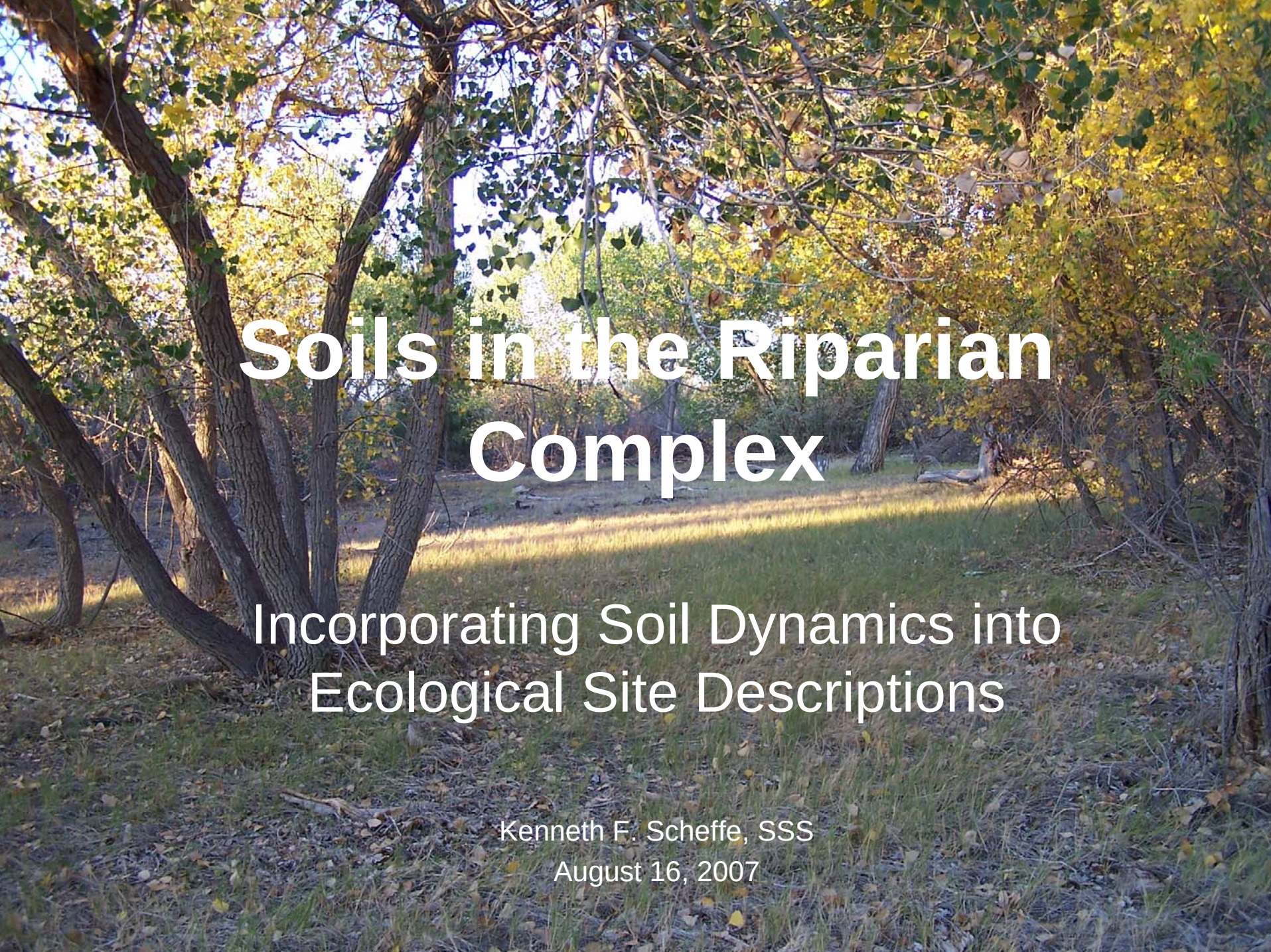

Soils in the Riparian Complex

Incorporating Soil Dynamics into Ecological Site Descriptions

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August 16, 2007

Water Changes Everything

- Water is the trump card over soils in riparian zones in arid climates
- Plant community may reflect dynamics of moisture conditions rather than soil characteristics
- Plant community may reflect recent conditions that may not be evident in the soil

Fourth Dimension of Variability

- **Temporal (Seasonal) Variability**
  - Depth to water table
  - Salt distribution (salt moves with water)
  - Anaerobic conditions
  - Ponding and flooding

Dynamics of Soil Wetness

- Episaturation
- Endosaturation
- Ponding
- Flooding
- Capillary fringe

- Depth
- Duration
- Frequency

Dramatic Changes over Short Distance

- Vertical stratification
- Channel cut and fill
- Recent deposition
- Nature (particle size) of sediments

Soil Impacts

- Fresh sediment addition and fine stratification common
- Clay and gravel lenses affect vertical and lateral flow
- Sediment may be from stream flow deposits or upland slope wash
- Soil particle size reflect the energy (velocity) of depositional environment
- Salinity is transient, but moves slowest through clayey sediments (as does the water)
- System may be accumulating or eroding soil sediments, often both occurring at same time
- Water table may act as restrictive feature to rooting on some plants

Soil Indicators of Wetness

- Redoximorphic soil indicators when observable usually indicate long term stable conditions, or long term fluctuations
- Wetness indicators (redoximorphic) may not be reflective of current moisture
- Relict redoximorphic features may persist after a site is drained
- Hydric Soil definition or criteria may or may not always be met in riparian areas

Soil Map Reliability

- Soils in riparian settings (level, near water) often dramatically manipulated by man for agricultural production over centuries of time
- Do not expect soil maps to reflect the full variability of conditions, nor be site specific
- Look for special features/spot symbols to reflect areas of observed deviation from named soil
- Read between the lines on soil reports and descriptions
- Look for small topographic changes
  - terrace vs. flood plain vs. active channel
- Soils in riparian zones reflect changes in upland
- conditions (sediment deposition, scouring, and changes in particle sizes)
- Get support from soil scientist