What is Restoration Ecology?
SER Definition

- Ecological restoration is the process of assisting the recovery of an ecosystem that has been degraded, damaged or destroyed.
Another Definition

Introduction of native plant species into a prepared (or unprepared) site with the goal of fostering natural ecosystem processes and returning the site to a more natural condition.
Endpoints

- Pre-history
- Pre-native
- Pre-European
- All natives, maximum diversity
- All natives, attainable diversity
- Some non-natives
- All non-natives?
Similar concepts

• Ecological repair
• Reclamation/rehabilitation
• Ecological Engineering
• Conservation
• Land management
Bradshaw
Ecosystem Functions and Services

<table>
<thead>
<tr>
<th>Supporting</th>
<th>Regulating</th>
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<tbody>
<tr>
<td>Nutrient Cycling</td>
<td>Climate</td>
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<td>Soil Formation</td>
<td>Flood</td>
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<td>Primary Production</td>
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<td><strong>Provisioning</strong></td>
<td><strong>Water purification</strong></td>
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How are restoration and conservation related?

- Restoration is the creation or improvement of habitat or ecosystem types.
- Conservation focuses on securing and protecting intact systems.
- Conservation sometimes works with specific taxa (threatened and endangered species).
Restoration supports conservation

- Creates buffers
- Increases effective size of parcels
- Creates similar matrix
- Eventually becomes like conserved habitat
Why restore?

- We have degraded 90% of all terrestrial ecosystems.
- This process continues.
- There are no pristine ecosystems.
- We have created an epoch of extinctions.
- Explosive population growth continues.
- Land is being lost from productive use.
- Bio-geochemical and bio-geophysical cycles may be close to breaking point.

Whisenant
Goals: what do we get out of restoration?

- Ecosystem services
- Bio-geochemical and bio-geophysical cycles are critical
- Habitat for important or threatened species
- Natural systems have inherent worth.
Restoration tools

- Horticulture/Agriculture
- Engineering
- Design
- Ecology
- Hydrology
• You may start a restoration project using all of these tools, but the ecology of the site often determines the outcome.
Important Ecological Concepts

- Landscape ecology theories
- Succession
- Non-equilibrium response to disturbance
• Landscape Ecology
Likelihood a site will restore itself.

Condition of the neighborhood:
- Natural
- Modified
• Succession
• Plant succession is a directional, cumulative change in the species that occupy a given area, over time.

(Barbour, Burk, Pitts)
• Non-equilibrium response to disturbance
• The species that occur at a site will be the result of:
  - Site availability
  - Species availability
  - Species performance