Nantahala Field Trip  
*and Intro to Grouse Habitat Management*

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**Study Area**  
*(Wine Spring Creek Ecosystem Management Area)*

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Wine Spring Creek  
Ecosystem Management Area

- 5,000 ac on Wine Spring Creek watershed
- Nantahala National Forest (233,000 ac)
  - USFS Wayah Ranger District
  - Coweeta Hydrologic Lab  
    (USFS Southern Research Station)
  - NC Wildlife Resources Commission
Background Info

- Forest Management Challenges
  - Regeneration of Oaks
  - Public opinion
- Methods to regenerate forest stands
  - Shelterwood, Two-Age, Group Selection
  - Grouse habitat?

Background Info

- 11 stands harvested via alternative regeneration techniques.
- 276 grouse radio-tagged since 1999.
- Field data collection ended August 2004.

Background Info

- Aves
  - Galliforma
    - Tetraonidae
      - *Bonasa umbellus*
- 18 spp. worldwide
  - Pheasant, Quail, Ruffed Grouse, Rough grouse
Habitat Associations

- Habitat specialist
- Dense stands with >5,000 stems/acre
Habitat Associations

- Early successional habitats

Timber harvest

Old field succession

A Historical Perspective

Habitat Associations

Gordon W. Gullion
Forest Types

Habitat delineation

Forest Cover Types

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rhodo</td>
<td>Rhododendron dominated riparian</td>
</tr>
<tr>
<td>Mesic/Cove</td>
<td>Cove, northern hardwoods</td>
</tr>
<tr>
<td>Subxeric</td>
<td>Mixed oak, oak-hickory</td>
</tr>
<tr>
<td>Xeric</td>
<td>Scarlet, chestnut oak, pitch pine-oak</td>
</tr>
</tbody>
</table>

Ages

1. 0-5 Young Regen
2. 6-20 Regen
3. 21-35 Pole
4. 36-80 Mature
5. >80 Past Rotation

Habitat Types

<table>
<thead>
<tr>
<th>MesCov1</th>
<th>Subxer1</th>
<th>Xeric2</th>
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</thead>
<tbody>
<tr>
<td>MesCov2</td>
<td>Subxer2</td>
<td>Xeric4</td>
</tr>
<tr>
<td>MesCov3</td>
<td>Subxer3</td>
<td>Xeric5</td>
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<td>MesCov4</td>
<td>Subxer4</td>
<td>Rhodo</td>
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<tr>
<td>MesCov5</td>
<td>Subxer5</td>
<td>WLO</td>
</tr>
</tbody>
</table>
Forest Management

• Appalachian Grouse Habitat
• Shelterwood
• Two-Age
• Group Selection
• Prescribed Fire
• Forest Roads

Appalachian Grouse Habitat

• Cover-stem density
• Hard mast, soft mast
• Buds-birch, cherry
• Herbaceous groundcover

Shelterwood

• Oak regen. depends on advance reproduction.
• Partial canopy removal increases seedling growth (35-65 ft²/ac residual).
• Residual canopy removed (7-10 yrs).
Shelterwood

- Stem densities similar to clearcuts (10yrs).

Shelterwood

- Herb understory, soft mast production increases.
Shelterwood

- Provisions for shade intolerants (birch, cherry).

Shelterwood

- Reduced visual impact.

Shelterwood

- [Map of Shelterwood area]
Two-Age

- AKA irregular shelterwood, or shelterwood with reserves.
- Residuals retained through the rotation.
- Not meant to "shelter" regeneration (basal area $\leq 30\text{ft}^2/\text{acre}$).
- Stand with two distinct age classes.

Two-Age

- Stems, soft mast, understory similar to clearcut.
- No time lag in hard mast production.

Two-Age

- Increased hard mast production
- Diversity of hard mast species in residuals
Group Selection

• Small openings, <2x the surrounding canopy height (0.25 – 1.0ac).

Group Selection

• Brood habitat use
  • 70+ yr-old mixed oak, submesic/subxeric
  • Herbaceous understory
  • Canopy gaps
Prescribed Fire

- Herbaceous understory
- Vigorous sprouting

Forest Roads

- Roads can provide grouse habitat
- In NC, use of roads increased in late winter (March), and fall (mid-November).
- Herbaceous protein sources: cinquefoil, strawberry, coltsfoot
Forest Roads

- Road closure, site preparation.
- In acidic soils (pH<5.8), liming necessary.
- Plant mix of clover, birdsfoot trefoil, with annual grass (winter wheat).
- Avoid perennial cool-season grasses: bluegrass, timothy, orchardgrass, fescue.
- Outcompete clovers, poor cover, poor forage, low invertebrates.

- Over time, pH will fall