

# Impacts of Mech Fuel Reduction



Inter-Regional Mechanical Fuels  
Treatment Training



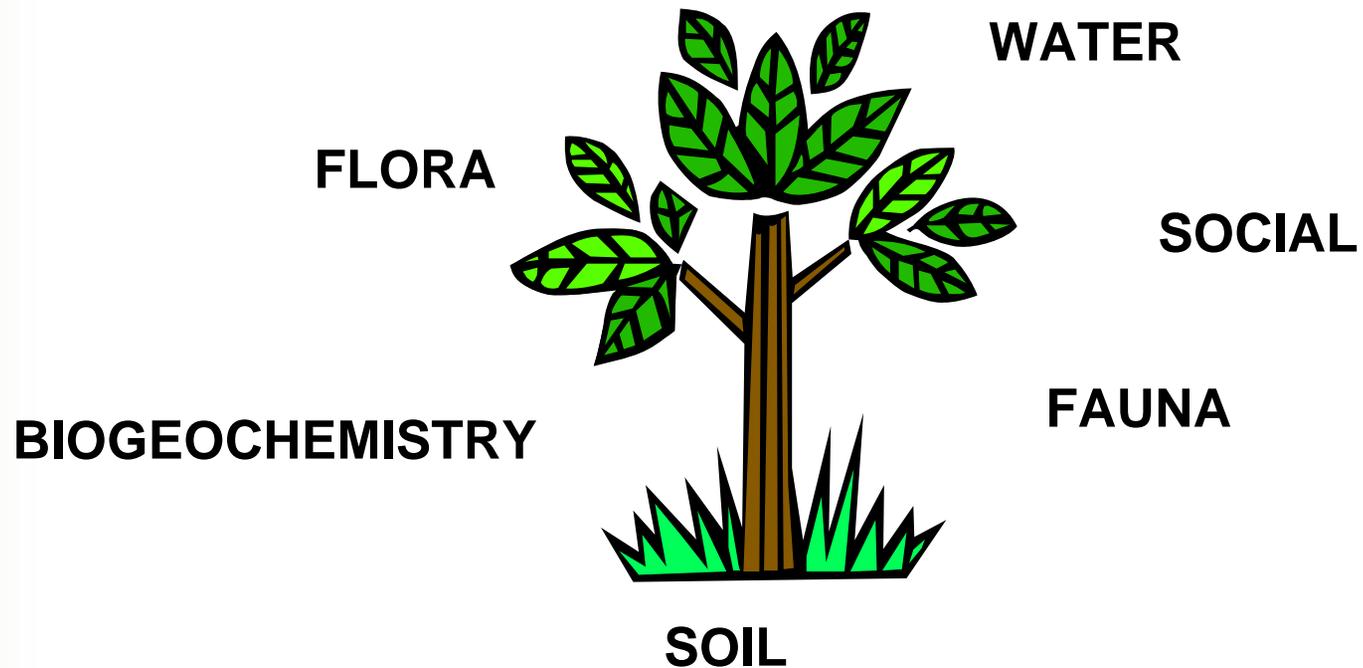
# Site Impact

*--a local alteration of an ecosystem or components of an ecosystem as a result of forest operations*

3-dimensional:

- (1) Severity
- (2) Spatial Distribution
- (3) Temporal Variation

# Types of impact



# Direct vs. Indirect Impacts

- Pushing soil into stream
- Root damage



- Soil compaction leads to reduced infiltration which leads to increased runoff which leads to increased erosion which leads to impaired water quality

# Vegetation Impact



# Sprouting



*Liquidambar styraciflua*, Ft. Benning, GA



*Manzanita, Eldorado NF*

# Herbaceous Response



*Winn District, Kisatchie NF*

# Advance Regeneration



# Nutrient Cycling



*Idaho City, Boise NF*



# Vegetation

- Selective removal of vegetation
- Potential increase in invasives
- Potential beneficial increase in richness
- Re-sprouting
- Damage to advance regeneration
- Nutrient cycling considerations
- Time dimension is important



# To Minimize Adverse Effects

- Selection of cutting tool
- Good marking/selection
- Contract specifications
- Invasives controls
- Subsequent treatment (fire, herbicide)
- Removal of limbs and tops

# Residual Damage



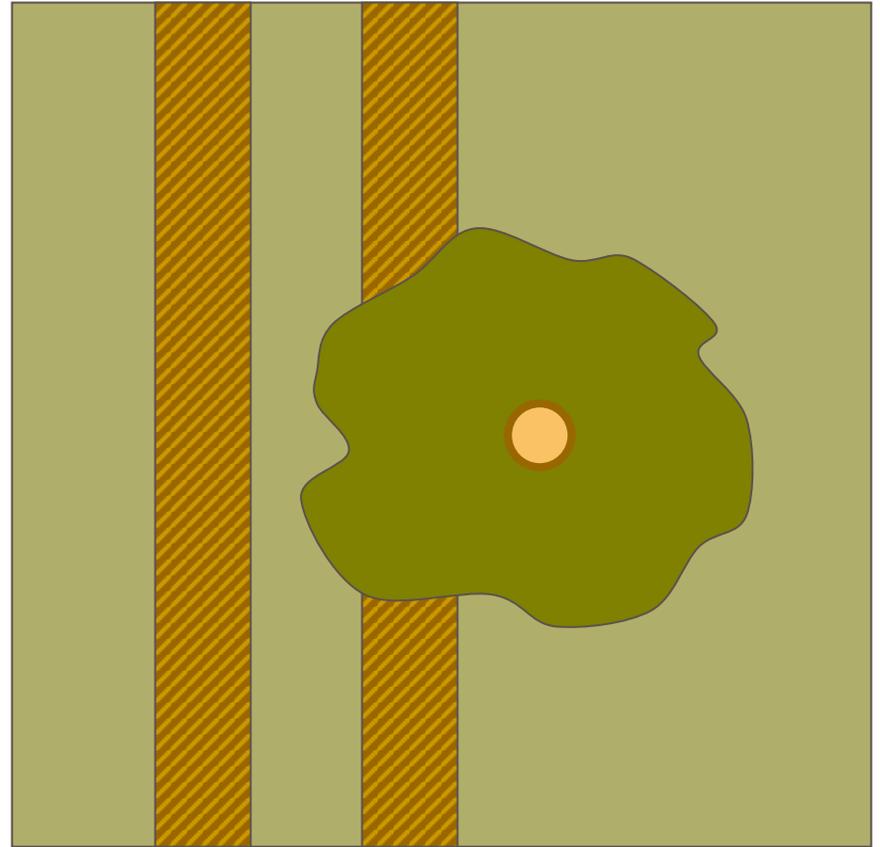
# Bole Damage

- Pathogens
- Degrade
- Growth impact



# Root Damage

- Wounding
- Severing
- Offsetting effects





# To minimize residual damage ...

- Plan the treatment, access
- Leave the residual stand open enough, or pick a smaller machine
- Specify how close to get to residuals
- Supervision

# Water Quality Effects



# Erosion and Sedimentation



# Oil and Fuel Handling





# Water Quality Impacts

- Generally positive impact
- May be less than conventional logging
- Special considerations
- Standard BMP practices



# Soil Impacts

- Extensive trafficking
- Compaction
- Rutting
- Loosening

# Small-scale



*Lincoln NF*

# Number of Passes



# Ground Pressure





# Ground Pressure

- Total weight/contact area
- Dynamic loading
- Unequal distributions
- Tractive forces

# LGP?



# Track Disturbance



# Soft Soils



# Boom-mounted Attachments





# To minimize Soil Impacts

- Limit the area treated or trafficked
- Select lower ground pressure machines
- Slash mats or snow cover
- Fewer passes
- Monitor disturbance

What is the impact of the alternative on residuals, soils, water?





## Bottom line ...

- Minimal operation necessary to achieve objectives
- Big enough to do the job