Forestry Updates: USLE, BMPs, and FAP

2021 North Carolina Erosion & Sedimentation Control Design Workshop

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Forestry Updates

USLE: Universal Soil Loss Equation (Forest Version)
BMPs: Best Management Practices
FAP: Forest Action Plan for North Carolina

How to Stay Updated:

• Quarterly BMP Newsletter... FAQs about Logging... Laws & Rules Briefing Document...
  Statewide Contacts... BMP Manual... Training Videos... BMP Studies... etc.

• Forestry Leaflets on BMPs, Buffer Rules, forest management, bottomland swamps, longleaf pine, shortleaf pine, forest health.
USLE: Universal Soil Loss Equation (Forest Ver.)

A = R(x) K(x) L(x) S(x) C(x) P

A: amount of soil loss/unit area
R: rainfall runoff factor
K: soil erodibility factor
L: slope length
S: slope steepness
C: cover factor
P: practice factor

Reference:
Dissmeyer & Foster
USLE-Forest, at Stream Crossings

• Assessed erosion potential on stream crossing approachways.
• Part of statewide site surveys of BMP monitoring, 2018–’20.
• Active or recently completed timber harvest sites.
• Estimated on-site....and Modeled a “No BMPs” scenario afterwards.

Findings to be Published:
Assessed 434 approachways, on 117 tracts, in 73 counties.

**Type of Access**
- 245 overland skid trail
- 127 bladed skid trail
- 62 haul road

**Type of Crossings**
- 282 bridgemat
- 102 culvert
- 32 ford
- 16 pole/logs
- 2 other/unknown
Estimated:
(Gravel BMP)
A = 37.8 t/a/y
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A = 37.8 t/a/y

Modeled “No BMP”:  
(2x slope length factor)  
A = 86.8 t/a/y

BMP Efficiency:  
\[ \frac{(86.8 - 37.8)}{86.8} \times 100 \]  
= 56%
Estimated:  
(Gravel BMP)  
A = 37.8 t/a/y

Let’s Add a Runoff Diversion BMP:  
A = 9.45 t/a/y

Modeled “No BMP”:  
(2x slope length factor)  
A = 86.8 t/a/y

BMP Efficiency:  
\[ \frac{(86.8 - 37.8)}{86.8} \times 100 = 56\% \]

Re-Calculating…  
...BMP Efficiency:  
\[ \frac{(86.8 - 9.45)}{86.8} \times 100 = 89\% \]
High Amount of Cover,…
Very Short Slope Length,…
Low Slope Angle.
= High BMP Effectiveness.

Forestry BMPs may often look ‘messy’ and are not intensively engineered structures... but are still effective.

Even with 100’s of crossings that “look like this”...there is very low erosion rates.
USLE-Forest, at Stream Crossings

Median Soil Erosion Values

<table>
<thead>
<tr>
<th>North Carolina Ecoregions</th>
<th>Hypothetical No BMPs</th>
<th>Observed BMPs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blue Ridge</td>
<td>140</td>
<td>10</td>
</tr>
<tr>
<td>Piedmont</td>
<td>140</td>
<td>10</td>
</tr>
<tr>
<td>Southeastern Plains</td>
<td>140</td>
<td>10</td>
</tr>
<tr>
<td>Middle Atlantic Coastal Plain</td>
<td>140</td>
<td>10</td>
</tr>
<tr>
<td>Statewide</td>
<td>140</td>
<td>10</td>
</tr>
</tbody>
</table>
Forestry BMPs:

Best Management Practices

N.C. SPCA: Sedimentation Pollution Control Act

FPGs: Forest Practices Guidelines Related to Water Quality, 02 NCAC 60C
(required statewide, narrative performance standards)

BMPs: Best Management Practices
(recommended measures to help comply with FPGs, etc.)
Forestry BMPs

➢ First update since 2006
➢ Modest revision: ~25% changed
➢ 2+ year review & revision process
➢ Engaged w/stakeholders and Forestry TAC
➢ Driven by findings from studies and monitoring

➢ Make connections with emerging issues:
  • Climate-related resiliency
  • Aquatic T&E species habitat
  • Heightened awareness of wetlands
Forestry BMPs

Notable Revisions Related to E&SC

• Standardize recommended SMZ (stream buffer) = 50 ft. [each side].
• Minimum acceptable SMZ width = 20 feet.
• Encourage using the stream as a natural fire-break when doing prescribed fire; minimize soil disturbance along stream.
• Rolled erosion control products: wattles and matting.
• ‘Rolling Dip’ as a runoff diversion.
• BMPs for logging in bottomland swamp forests.
• BMPs for maintaining drainage ditches.
Every 10 years, each state produces its Action Plan
Similar to state’s Wildlife Action Plan
Approval by USDA-Forest Service
Intended as all-inclusive of the forest resources, issues, & needs… Not just the state forestry agency’s
First FAP: 2010-2020
Second FAP: 2021-2030
Within 3 national themes, NC has 5 Goal Statements:

**Goal #4: Manage and Conserve Forests for Clean Water.**

- **Objective 4.1:** Continue to identify and advance the drinking water, stormwater management, and related ecosystem services benefits that are derived from forests.

- **Objective 4.2:** Strive for continuous improvement in the implementation of BMPs.
Analysis by the U.S. Forest Service indicates that 45% of NC’s surface drinking water gets its source from state- or private-owned forestland.

Reference Source: https://www.fs.usda.gov/treesearch/pubs/59645
The Forest Action Plan also has a zoomed-in priority map for each of the 3 major eco-regions.

This analysis also includes considerations of groundwater.
Coming Soon...

✓ 2021 Year in Review
✓ New Forest/Water Educational Workbook
✓ Revised BMP Manual
✓ USLE Study Journal Article
✓ 2018-2020 Statewide BMP Monitoring Survey Report
✓ Revised Forestry BMP Field Guide

Look for quarterly BMP newsletter

www.ncforestservice.gov

Programs & Services >>>
Water Quality...
On Behalf of the Conference Organizers...

Please Remember to Complete the End-of-Workshop Evaluation


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HEALTHY FORESTS = CLEAN WATER
Use Best Management Practices