North Carolina Division of Forest Resources (N.C. Forest Service): July 2005

**Video Outline & Desired Learning Objectives: Video run time 24:24**

***"Forestry Stream Crossings"***

## Avoid Crossings

Stream crossings can be a primary location for non-point source pollution and runoff.

Because of that, stream crossings should not be installed unless no other way is available to access the land and resources on the other side of the stream.

## FPG Summary on Stream Crossings

There are rules in place that specify minimum standards that you must meet if stream crossings are installed or used. These rules fall under Section .0203 of the FPGs. A summary includes:

- If the situation allows, stream crossings should be avoided.
- Stream flow must not be obstructed
- Do not use streams as skid trails or access roads
- Protect the stream banks and channel from damage and erosion
- Divert sediment and runoff from the crossing location
- Provide ground cover within 10 working days of the initial soil disturbance.

## Stream Crossing Locations

Get the most "bang-for-your-buck", to gain as much access as possible to the land on the other side of stream. This avoids the need for several crossings on the same tract.

Cross at a location that has ground suitable for controlling runoff with BMPs:

1. Narrow section of stream / ditch channel
2. Right-angle approach across the channel
3. Firm ground for solid footing on each side
4. Flat ground, where possible

***>> If in doubt, seek advice and assistance when scouting a crossing location <<***

## Using Bridgemats for Crossings

Consider bridgemats your 1st option for a crossing -- It's the best way to protect water quality.

- Carefully install the bridgemats in a way that protects the stream or ditch bank.
- Don't drive your equipment through the stream to install the bridgemats.
- Set the mats in place from one side, then adjust them into proper position.

***>> Don't leave a center gap between the mat panels! <<***

Use another mat, logs, or something sturdy in the middle to keep debris & soil out of the water

- Select a location that is firm, with solid footing for the bridgemat panels.
- Check the bridgemats periodically to insure safe operations & water quality protection.
- Install BMPs and control runoff on the approachways to the crossing.
- When removing bridgemats, keep equipment out of the stream & rehab the site for close-out.

## Using Culverts for Crossings

Use a proper-sized culvert that can handle the heavy flow of water runoff after precipitation. Obtain technical advice on proper sized culvert - - Consider both the pipe diameter and length.

Determine if the culvert will be temporary, or permanent:

- For temporary: Suitable to place culvert directly on stream bottom
- For permanent: Suitable to place culvert slightly below-grade in the stream bottom

Back-fill with appropriate materials to secure culvert in place and provide adequate traffic support. Periodically pack down the fill material to eliminate air pockets and gaps in the fill.

- Top of fill should be no less than 12". Recommended to be equal to ½ the pipe diameter.

Protect the culvert ends and maintain open inlet / outlets, to avoid blockages and water backup.

When removing culverts, try to re-create the natural position of the streambank and stream channel bottom as it was before the culvert was installed.

Rehab and stabilize the area to prevent accelerated erosion.

## Using Fords for Crossings

Fords are the least preferred way to cross streams.

***>> Fords should not be used for skid trail crossings <<***

Places where a ford may be appropriate:

1. A stream that has an existing rocky bottom surface
2. Areas with active populations of beavers that could dam-up a culvert pipe crossing
3. Streams that are too wide for bridgemats or multiple culvert pipes

Use geotextile fabric for the approachways and stream crossing. This keeps the stone and rock on the surface, and keeps it from getting packed down into the soil.

Grade the approachways with a gentle slope, and install BMPs to control runoff from flowing into the stream.

Spread stone in the ford as level as possible, and avoid dips or humps that alter the stream flow.

***>> Do not block the natural flow of water in the channel <<***

***Only build or use a ford during low water & low-flow conditions ~ Safety First!***

- Drive slowly through a ford
- Use an appropriate vehicle
- Stagger the tire-tracks through the ford to minimize creation of tire ruts
- Inspect the crossing to insure safe usage, proper water flow, and water quality protection.

## Summary

North Carolina has required FPGs and buffer rules that set standards of performance for stream crossings on forestry operations. Use BMPs to help comply with these rules.

***The best BMP for stream crossings is to not have a crossing at all.***

If a crossing is needed, only establish as few as needed to access across the stream.

***>> Get the most bang for your buck <<***

When locating a suitable spot for a stream crossing, remember the key elements to look for:

1. A narrow section of stream channel
2. Solid footing on each stream bank
3. Right-angle alignment
4. Efficient site access

**Bridgemats** can be used over & over again:

- Close-off the center gap between the travel lanes to keep debris & soil out of the water
- Keep equipment out of the stream when installing and removing mats
- Install BMPs to control runoff on the approachways
- Inspect mats for safety and water quality protection

***The N.C. Forest Service has wood & steel bridgemats statewide for temporary loan-out***
***Learn more in "Water Quality" on the Web at: www.dfr.state.nc.us***

**Culverts** may be used for temporary or permanent crossings:

- Size the culvert to allow adequate water flow and prevent 'blow out' of the crossing
- Backfill with enough material to support the traffic, and protect the culvert from damage
- Install BMPs to control runoff on the approachways
- Stabilize the crossing when completed, or when it's removed

**Fords** should only be used for truck-road crossings:

- Suitable for use in rocky streams or place with a wide crossing
- Install and use fords only during safe, low-water and low-flow conditions
- Use geotextile fabric to secure the stone in place
- Install BMPs to control runoff on the approachways
- Drive slowly through the ford, and stagger the tire tracks