Changes to Kentucky's Forestry Best Management Practices

by Jeff Stringer and MacKenzie Schaeffer

Kentucky has required the use of practices to reduce water pollution from forestry operations for over 15 years. Research indicates that changes are needed in these practices and they are on the way. Two laws help protect water quality that directly addresses agriculture and silviculture (forestry): the 1994 Kentucky Agriculture Water Quality Act (AWQA) and the 1998 Kentucky Forest Conservation Act (KFCA). The AWQA established a set of Best Management Practices (BMPs) to protect water quality during agriculture and forestry operations. The AWQA also requires that each landowner with 10 or more contiguous acres engaged in agriculture or forestry have a written water-quality plan that stipulates what BMPs are to be used on their property. BMPs are practices that are implemented to help reduce or eliminate water pollution resulting from agriculture and/or forestry activities. The KFCA requires that a Kentucky Master Logger be on-site and in charge of operations and that timber harvest operations use the appropriate BMPs as set forth by the AWQA. These two laws clearly indicate that both landowners and loggers are responsible for the use of BMPs.

Changes in BMPs are Coming

Periodically, changes occur to the BMPs after research shows more effective ways to protect water quality during timber harvesting and other forestry activities. Changes to the BMPs have been made this year, and beginning in 2017 loggers and landowners will be responsible for making sure those changes are implemented. The changes were largely based on a Streamside Management Zone study conducted by forestry researchers at the University of Kentucky's Robinson Forest. This study was designed to test the effectiveness of the current BMPs, which have been required since 2000. The research showed that many requirements in the BMPs were working to protect water quality; however it also showed there were areas that needed to be addressed. The Kentucky Forestry BMP Board worked for nearly a year determining the changes that were required as specified by the research. Changes also were based on knowledge gained through 15 years of experience with logging BMP inspections. The studies and experience in logging inspections led to several changes regarding stream crossings, minimum distances of woods roads, logging trails, and log decks to bodies of water,

Figure 1. Muddy water runoff from a skid trail in close proximity to a small stream.

All photos courtesy: Jeff Stringer

and giving loggers more discretion on areas of the operation that do not contribute to water quality issues.

Basic Concepts of Forestry Water Quality and BMPs

A few principles are important to understand in order to fully grasp water quality issues associated with forestry operations. This includes understanding the hydrologic network, the web of streams, channels and ditches that convey surface water to our rivers and lakes, and understanding the areas and harvest activities that can produce pollutants (Figure 2). Ultimately our water-quality laws are focused on protecting perennial streams—streams that have water in them all year long. Forestry operations, particularly timber harvesting, can result in direct pollution of a stream if the operations are adjacent to a stream. However, operations that are not directly on a stream can also pollute. This is because muddy water, logging debris, and trash placed anywhere in the hydrologic network—including intermittent streams (flowing only during the winter and spring), naturally occurring ephemeral channels and man-made ditches (carrying water after a rain storm), or sinkholes—invariably wind up in perennial streams, including our large rivers and lakes. While only 20 percent of Kentucky's logging sites have perennial streams in or directly adjacent to them, over 90 percent contain ephemeral channels and 60 percent intermittent streams. This is why our BMPs cover what can and cannot be done around intermittent streams and ephemeral channels that are often far away from a perennial stream or river.

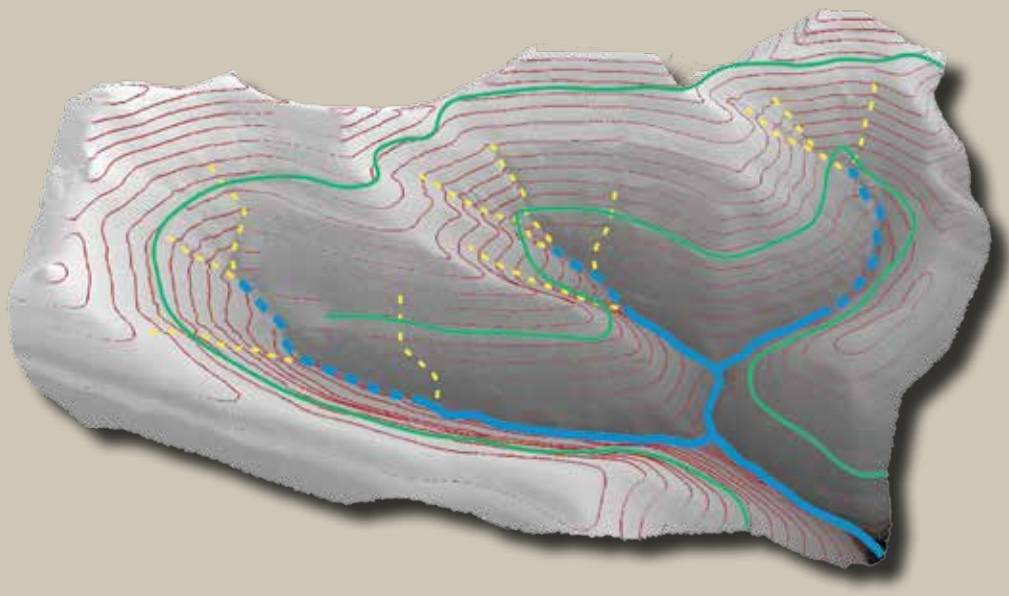

Figure 2. The hydrologic network is composed of perennial streams (solid blue line), intermittent streams (dashed blue line), and ephemeral channels (dotted yellow lines). Solid green lines represent skid trails used in logging.

Changes to Kentucky's Forestry BMPs

The following is a summary of the changes that have been made to Kentucky's Forestry BMPs for water quality protection and why.

1. **Streamside Management Zones (SMZs) –** SMZs are areas directly adjacent to streams where a specific number of trees are left to shade streams and disturbed soil is kept to a minimum (Figure 3). Previously, the minimum requirement for SMZs stipulated that 50 percent of the original overstory trees be left within 25 feet of the bank for ground with less than 15 percent slope, or 55 feet for steeper slopes. This same distance was used to determine how far roads, trails, and log decks needed to be from the bank of perennial water bodies. The new requirements separate the standing tree distance and the minimum distance from the bank that roads, trails, and log decks should be. The latter has been extended to 50 feet and 100 feet depending upon slope steepness. For roads, trails, and decks closer than that, special measures must be used above and beyond the norm to keep muddy water runoff from entering streams.
2. **Stream Crossings –** Research showed that the current requirement to use elevated crossings was appropriate (Figure 4). However, the new BMPs require techniques to stabilize disturbed ground associated with a crossing be immediately implemented. Also, where it was not feasible to cross with an elevated structure, a firm bed must be present at the crossing point, either naturally occurring or improved.
3. **Temporary BMPs –** when a harvest operation is temporarily suspended (defined as 14 days or longer) or a logging road, trail, or landing is temporarily not in use, then some type of measures are required to control erosion and runoff.
4. **Measures to Improve Revegetation –** Over the last 15 years with our BMPs, we have been inspecting only for the presence of seed on areas that need to be revegetated (i.e. roads and trails with greater than 10 percent slope). Only inspecting for seeding has led to a revege-

Figure 3. A Streamside Management Zone (SMZ) around a small headwater stream in Eastern Kentucky.

tation success rate of less than 40 percent in most years. The new BMPs require that one or more practices associated with seeding are used to help revegetation success.

5. **Logger Discretion –** the new BMP requirements place more focus on areas next to streams and channels, often ramping up the requirements and costs for working near streams and channels. In recognition of this, the new BMPs allow for more logger discretion in areas of a harvest where there is no possibility of creating pollution. For example, loggers will not be required to fix all ruts if they are not in an area that will contribute runoff to a stream.

Figure 4. Wooden mats used to form a temporary elevated stream crossing for skidding logs in south-central Kentucky.

Woodland Owner Responsibility

Woodland owners are required to have a water-quality plan and make sure that loggers follow the BMPs. The University of Kentucky Department of Forestry publication FOR-96 "Forestry Water Quality Plan" (available at www.ukforesty.org) is designed to help woodland owners develop their plan and understand the BMPs. This publication is provided by the Kentucky Division of Forestry to every landowner receiving a Stewardship Plan. It is also strongly encouraged, even though loggers will be inspected for BMP use, that woodland owners stipulate Kentucky BMP use in a timber sale contract or agreement. If an operation is creating significant pollution, Kentucky's water quality regulations provide for fines for both the landowner and the operator (in this case a logger). Selecting a good logger is extremely important, and Kentucky has many. However, there are loggers who have proven that they have a hard time adhering to the BMP standards and have been deemed "Bad Actors", a designation established by the KFCA. You can go to www.masterlogger.org for a list of Bad Actors. You can also search for the Kentucky Master Logger database for names of loggers in your area, and it will indicate whether they are a bad actor or not. Regardless, as a woodland owner you are responsible for operations on your property and understanding your water quality responsibility is important.

Common Pollutants from Forestry and Timber Harvesting Operations

Suspended Sediment – commonly referred to as muddy water. The majority of sediment comes from erosion during a rainstorm on log decks, woods roads, and trails used for skidding timber from the stump to the landing. The closer the roads, trails, and landings are to water, the more potential there is for pollution. An especially sensitive area is where trails and roads cross streams or drainage channels. Suspended sediment is the most common and prevalent pollutant from logging operations.

Increased Temperature – often referred to as thermal pollution. The trees directly along streams produce shade that moderates water temperature.

Fluids and Chemicals – resulting from equipment leakage and spills are obvious sources of pollution. Chemicals (pesticides) can also be generated from forestry operations, however this issue is relatively minor in Kentucky.

Trash – defined as man-made articles left on-site that can be carried or deposited into streams.

Logging Debris – limbs, tops, and discarded parts of trees in streams and channels can cause altered flow which erodes stream and channel banks.

About the Authors:

Jeff Stringer, Ph.D., *is an extension professor at the University of Kentucky and is responsible for continuing education and research in hardwood silviculture and forest operations. He is also an editor of the Kentucky Woodlands Magazine.*

Cooperative Extension Service, Department of Forestry, University of Kentucky, 201 Thomas Poe Cooper Building, Lexington, KY 40546-0073; Phone: 859.257.5994; Fax: 859.323.1031; E-mail: stringer@uky.edu

MacKenzie Schaeffer, *Research Assistant with the University of Kentucky Department of Forestry.*

Cooperative Extension Service, Department of Forestry, University of Kentucky, Thomas Poe Cooper Building, Lexington, KY 40546-0073; E-mail: mackenzie.schaeffer@uky.edu; Phone: 859.257.7597 Fax: 859.323.1031