



Northern Kentucky Urban & Community Forestry Council (NKUCFC) 2008 Issue Paper: Forests & Hillside Protection

The Northern Kentucky/Cincinnati region has many steep hillsides that line the valleys of the Ohio and Licking rivers and their tributaries. Most of these hillsides were wooded and provided a scenic backdrop. These hillsides served as natural barriers to urban development until about 1960 when heavy-duty earth moving equipment became widely available and made it much easier to build on hillsides. With this new equipment and technology, population growth, and as level or gently sloping ground became scarcer, urban development began to expand more into hillside areas. Recently these areas with prime views of the river and downtown have become desirable development sites.

Landslides became more common after 1960. Efforts to understand factors that contributed to land sliding and to delineate landslide-prone areas began in the late 1960's and early 1970's. Since that time extensive research and analysis has been done and findings conclude that soils, geology, topography and weather events are key factors. The work included studies related to the roll of trees. While many of the landslide mitigation measures focus on engineering and geology, work by the Hillside Trust has emphasized thoughtful use of hillsides.

DISCUSSION ITEMS:

1. Landslides have been known in the area since before 1850's, but the damage caused by them has become increasingly expensive as urban development has encroached more and more on the area's hillsides. Should greater emphasis be placed on retaining these areas as forested landscapes and open space?
2. Do the current planning guidelines for hillside development adequately recognize the environmental and economic values associated with retaining hillsides in forested conditions?
3. Should evaluation of hillside development include an evaluation of forest conditions and quality in addition to the currently required geotechnical investigations?
4. Can the Northern Kentucky Urban and Community Forest Council's forest quality assessment studies be of value in evaluating hillside development proposals, if so how?

Additional Information

The presence or absence of vegetation cover on steep slopes, typically those greater than 12 percent, greatly affects the erosion potential and stability of the slope. When development takes place on steep slopes, vegetative cover is greatly reduced. Loss of this vegetative cover on steep terrain significantly increases soil instability, and thus the risk of erosion. It is generally regarded as a standard practice to maintain tree and/or vegetation coverage on slopes to protect the soil from erosion and slippage, and to filter toxins from the soil if the slopes are associated with streambanks.

There are tremendous values derived from trees in stabilizing slopes. Roots reinforce the soil, increasing lateral soil shear strength and cohesion during saturated conditions. Many slopes can persist beyond their angle of repose and remain stable as a result of the complex root networks within soil blocks. Large trees can arrest, retard, or reduce the severity and extent of failures by buttressing a slope. This works in much the same way as retaining walls. In the case of trees, the system is to some extent self-repairing, and it becomes progressively stronger over time; whereas engineering structures are strongest when installed and become progressively weaker over time.