

2.3 Channel Protection (CPv)

2.3.1 Background

The increase in the frequency, velocity, and duration of bankfull flow conditions in stream channels after a rainfall event is the primary cause of streambank erosion. Such erosion is common in Knox County, usually in channels and streams where the cumulative effect of development has caused lengthy, increased post-rainfall discharges. The sediment released as a result of streambank erosion is a likely major source of sediment pollutant loads in Knox County streams. Excessive sediment can impact a stream's ability to remain ecologically viable and provide a healthy habitat for aquatic species.

Streambank erosion can cause damaging hydraulic changes in a stream, including excessive widening, deepening, and undercutting. Figure 2-2 presents an example of this problem located on a tributary to Ten Mile Creek in west Knox County. Such changes can be detrimental to the ability of the stream to remain hydraulically stable in the long-term. Moreover, streambank erosion is a common source of complaints from citizens that experience property damage due to fallen trees or outbuildings, or property loss due to widening streams.

Figure 2-2. Example of Significant Streambank Erosion



2.3.2 Design Criteria and Policies

Knox County requires all developments and redevelopments to adhere to channel protection criteria (Minimum Standard #3), herein called the channel protection volume (CPv). This standard requires that the runoff volume from the 1-year frequency, 24-hour storm be captured and discharged over no less than a 24-hour period. In the design of the channel protection control, the 24-hour release period shall be measured from the approximate center-of-mass of inflow to the approximate center-of-mass of outflow.



Downstream channel protection provided by an alternative approach may be considered in lieu of controlling the CPv, provided that sufficient hydrologic and hydraulic analysis shows that the alternative approach will offer adequate channel protection from erosion. Downstream channel protection provided by an alternative approach must be approved by the Director.