

Stream Buffer Fact Sheet

The *Flood Control and Water Quality Protection Manual* establishes requirements for stormwater design on development projects to control flooding and reduce the water quality impacts of stormwater runoff and associated pollutants. Stream buffers are one of the requirements included in Chapter 8 of the manual to control flooding and protect water quality.

What are stream buffers and why are they important? Stream buffers are vegetated areas along and adjacent to streams where clearing, grading, filling, building of structures, and other activities are limited or prohibited. Stream buffers protect water quality, reduce flooding, and provide other benefits. Many other communities in Missouri and nationwide have adopted stream buffers similar to those in the manual.

What streams do the buffers apply to? The stream buffer requirements apply to streams shown on the stream buffer map (<http://maps.springfieldmo.gov/mapgallery/>) that meet the definition of a natural channel as defined in Sections 1.0 and 2.1 of Chapter 8 of the *Flood Control and Water Quality Protection Manual*. It is important to note that the stream buffer map includes sections of stream that do not meet the definition of a natural channel because it was not feasible to make that determination at the time of mapping. That determination will be made at the time of submittal of an application that triggers the stream buffer requirements. The map was developed based on Table 1. Buffers apply to streams with a 40 acre or larger drainage area, including ephemeral and intermittent streams that do not have year-round flow. Stream buffers are important not only for perennial streams, but for ephemeral and intermittent tributary streams as well. These smaller tributary streams comprise a significant portion of the overall stream network, and their physical condition and natural ability to process pollutants affects downstream water quality in perennial streams, rivers, and lakes. Stream buffer requirements also apply to streams located on properties which are annexed after the adoption of the stream buffer map, and have not been added to the stream buffer map, but have a contributing drainage area of 40 acres or greater in accordance with Table 1 below from the *Flood Control and Water Quality Protection Manual*.

What is the required width of the buffers? The required width is based on the drainage area of the stream so that the width increases as the size of the stream increases, as shown in Table 1.

What triggers the stream buffer requirements? The stream buffer requirements apply to all applications for land disturbance permits, building permits, floodplain development permits, public improvements, preliminary plats, subdivisions, and zoning cases.

Table 1. Stream Buffer Width Requirements

Contributing Drainage Area (Acres)	Stream Category	Buffer Width (feet) (Measured Separately on Each Side of Stream)	
		Streamside Zone	Outer Zone
Greater than 4 square miles	A – large stream	50	50
1 to 4 square miles	B – small stream	40	40
160 to 640 acres (1 square mile)	C – large tributary	25	25
40-160 acres	D – small tributary	15	15

Note: Total buffer width is the sum of the widths of the Streamside Zone and the Outer Zone. For example, a buffer width along a large stream (Category A) would be 100 feet on both sides of the stream (200 feet total). The buffer width is measured from the top of bank, or the thalweg if no discernible top of bank exists. The thalweg is the deepest point of the channel.

What does the map of the stream buffers show? The stream buffer map shows stream buffer requirements within the City limits. Not all buffers shown on the map are required. It is important to understand how the map was developed and when stream buffers do not apply, as follows:

- The map shows the entire length of the stream for the two largest stream categories A and B, even if the stream is enclosed in a box culvert or does not meet the definition of a natural channel and buffers are therefore not required. The reason the entire length is shown is to provide a planning tool for encouraging voluntary setbacks on these larger streams, most of which are in the FEMA floodplain. Voluntary setbacks are encouraged to allow adequate space in the event that a future stream restoration project is desired.
- For the two smallest categories, the map shows the sections of stream that are open channels regardless of the type of channel (i.e. natural or engineered). This means that sections of stream are shown which do not have required buffers because they do not meet the definition of a natural channel. For purposes of map creation, it was not feasible to visually inspect all the channel sections to determine if they meet the definition of a natural channel. This will be determined at the time of submittal of an application that triggers stream buffer requirements.
- The buffer widths shown on the map are an estimation for planning purposes only. The actual width will be based on a survey and plan by the applicant.
- The map shows buffers in areas that may not be required. If the buffer area is currently developed and an application for redevelopment of the property is submitted, only the Streamside zone for stream categories A and B is required to be re-established or mitigated. Redevelopment of individual single-family lots is exempt from this requirement to re-establish or mitigate the Streamside Zone. Stream buffers are not required for redevelopment of existing developed buffer areas for the Outer Zone of stream categories A and B or for either zone of categories C and D.
- Stream buffers shown on existing developed lots have no impact on that lot unless an application is submitted that triggers stream buffer requirements. If an application is submitted for redevelopment of an existing developed buffer area, stream buffer requirements only apply if the stream is a natural or naturalized channel and only the Streamside Zone of stream categories A and B is required (see above bullet point).

How is top of bank defined?

The buffer is measured from the top of bank, or the thalweg if no discernible top of bank exists. Top of bank is defined as the top of bank of the bankfull stage of the active channel. Section 4.2.1 of Chapter 8 describes field indicators to be used to determine the bankfull stage. For stream buffer purposes, a simplified definition of the bankfull stage is the elevation of the water surface when rising water completely fills the active channel and first begins to spill onto the local floodplain as shown in Figure 1.

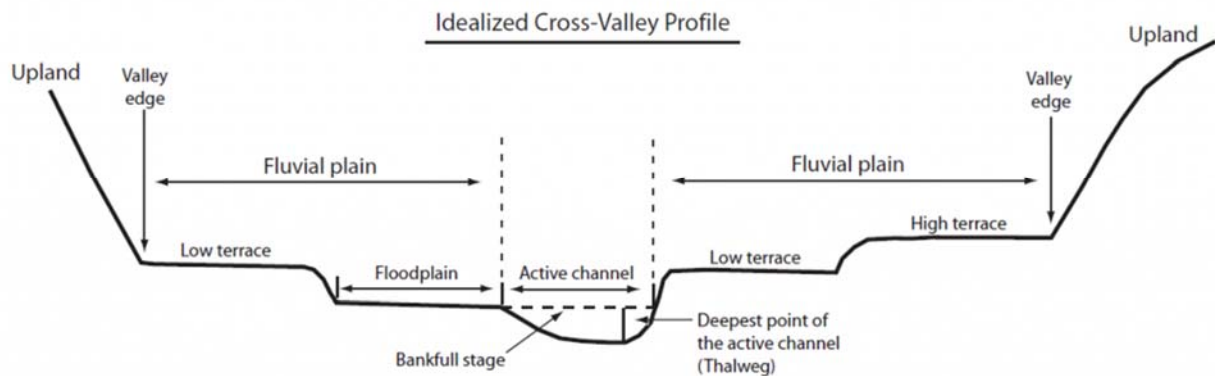


Figure 1. Idealized Cross-Valley Profile (Source: Indiana Fluvial Erosion Hazard Program)

When using buffer width averaging per Chapter 8 Section 4.1.13.1 (1), do existing trees in the area being added to the buffer count for trees removed in the area of encroachment in order to meet the tree replacement requirement in Section 4.1.6?

Existing trees in the area being added to the buffer do not count for trees removed in the area of encroachment. The language in Sections 4.1.2, 4.1.6, and 4.1.13 is written to require both mitigation for the buffer encroachment as well as mitigation for the removal of trees in the buffer. This is also the case when utilizing the buffer reforestation mitigation option in Section 4.1.13.1(2). In this case, reforestation of another area of the buffer to 60% canopy coverage is required in addition to planting replacement tree for the trees removed due to encroachment. This is stated in Section 4.1.6.

Because Section 4.1.4 allows removal of dead or diseased trees and invasive vegetation, it is not required to plant replacement trees for any dead, diseased, or invasive trees that will be removed due to encroachment into the buffer. A diseased tree must be recommended for removal by a certified arborist to meet this requirement. Invasive trees must be on the Missouri Department of Conservation list <https://nature.mdc.mo.gov/status/invasive>. The question has been asked whether cedar trees are considered invasive and whether planting replacement trees is required for those. Although cedar trees are a problem for invading glades and prairies that are not burned periodically, they are not on the invasive list. They are an early colonizer for transforming damaged areas back into a forest and provide

food for birds and mammals. <https://nature.mdc.mo.gov/discover-nature/field-guide/eastern-red-cedar>. Planting replacement trees is required when removing cedar trees in areas of encroachment.

In buffer width averaging, if the area being added to the stream buffer exceeds the area of encroachment (ex. 10,000 sq. ft. added for 7,000 sq. ft. encroachment), existing trees for the additional area may count for trees removed in the encroachment area if all areas being added to the stream buffer are roughly equivalent in tree coverage.