

FACT SHEET 2: What does Science Say about the Effectiveness of Construction Setbacks?



As cities and counties consider adopting stream protection measures in Montana, local officials are consistently asked to “show the science” behind their regulations. This fact sheet looks at the science behind stream setbacks for keeping water clean and reducing impacts to fish and wildlife habitat. It also provides background on Montana’s forestry Streamside Management Zones (SMZ), and how SMZ standards are different than construction setbacks.

2.1. Do specific scientific studies show that construction setbacks and vegetative buffers are effective?

Local governments that choose to adopt setbacks and vegetative buffers will consistently be asked to “show the science” behind their regulations.

In order for setback regulations to effectively provide benefits to streams, water quality, wildlife and more, a vegetated buffer is needed around wetlands and streams. This fact is supported by numerous scientific studies. As an example, scientific studies consistently show that vegetative buffers should be a minimum of 100 feet to protect water quality—no matter the size of the stream (see question #2.2 below). A report completed for the Montana Dept. of Environmental Quality in June 2008, cited 77 separate scientific studies that concluded, “In order to protect the water quality of streams, scientific studies generally recommend that at least a 100-foot (30 meter) vegetated buffer be maintained. Steeper slopes and other local factors may require larger vegetated buffers. A minimum of a 50-foot (15-meter) buffer may be sufficient to protect certain aspects of water quality. However, for significant removal of nitrates, sediments, and pathogenic bacteria, at least 100 feet is recommended.” (see below: *The Need for Stream Vegetative Buffers: What Does the Science Say?*)

Stream vegetated buffers also protect our fisheries, as well as critical wildlife and wildlife habitat. For fisheries protection, at least 100 feet—and many times 300 feet—is recommended. In order to protect meaningful wildlife and habitat, vegetated buffers need to expand to at least 300 feet.

To document the science behind setbacks and vegetated buffers for riparian protection, three reports were developed for the Montana Dept. of Environmental Quality in June 2008. The reports summarize information found in almost 200 scientific studies focused on the functions and size of vegetated buffers. The reports appear in 3 parts:

Ellis, J.H. 2008. *The Need for Stream Vegetative Buffers: What Does the Science Say?*, three reports to

the Montana Department of Environmental Quality, EPA/DEQ Wetland Development Grant. Montana Audubon, Helena, MT:

- *Part I: Scientific Recommendations on the Size of Stream Vegetative Buffers Needed to Protect Water Quality.*
- *Part II: Scientific Recommendations of the Stream Vegetative Buffer Size Needed to Protect Fish and Aquatic Habitat.*
- *Part III: Scientific Recommendations on the Size of Stream Vegetative Buffers Needed to Protect Wildlife and Wildlife Habitat.*

These publications are available from the Montana Dept. of Environmental Quality, or from www.mtaudubon.org.

2.2 Are stream setbacks an effective solution to prohibiting nonpoint source pollution (polluted runoff) from entering streams?

The State of Montana's Nonpoint Source Management Plan, which was approved by the U.S. Environmental Protection Agency (EPA) in July 2007 states that a "buffer of at least 100 feet is recommended for water quality protection. . . . Minimum widths for buffers should be 50 feet for low order headwaters streams, with expansion to as much as 200 feet or more for larger streams." Montana's Nonpoint Source Management Plan identifies locally-adopted water body setbacks as important "Best Management Practices" to protect and improve water quality from nonpoint source pollution. Nonpoint sources of pollution in urban areas include parking lots, streets, and roads where stormwater picks up oils, grease, metals, dirt, salts, and other toxic materials. In areas where crops are grown or in areas with landscaping (including grassy areas of residential lawns and city parks), irrigation and rainfall can carry soil, pesticides, fertilizers, herbicides, and insecticides to surface water and groundwater.³

2.3. Are 50-foot setbacks adequate to protect water quality on smaller streams? If not, why does Montana have a mandatory 50-foot stream setback for all commercial logging practices (Streamside Management Zones)?

As described above, there is considerable scientific evidence that indicates that the vegetative buffer protecting streams should be a minimum of 100 feet to protect water quality—regardless of the size of the stream (see question #2.1 and #2.2 above).

Montana's Streamside Management Zone (SMZ) law (77-5-301 MCA), which prohibits clearcutting timber within 50 feet of a stream, was designed to help protect forest streams. Some have argued that the SMZ law and its 50-foot stream setback is adequate to protect water quality under diverse land use practices—and that it should be applied to subdivisions and other development projects too. There are several differences between construction setbacks and the SMZ program, including:

- The main pollutant from timber harvests is sediment, which comes primarily in the form of runoff from roads and other exposed surfaces. In contrast, the pollution associated with the development of homes

³ Montana Department of Environmental Quality. 2007. Montana Nonpoint Source Management Plan. Helena, Montana. Water Quality Planning Bureau, 138 pp.

includes sediment, as well as nutrients, ammonia, fecal coliform, nitrates, nitrogen, pesticides, phosphorus, pesticides, and more. Most scientific studies on protection of water quality indicate that, while a 50-foot setback helps protect water quality, it is not adequate under most circumstances.

- One of the main reasons that local governments adopt stream setbacks for new development is to *protect* water quality. The SMZ law was not designed to meet this standard. Instead, it: “acts as an effective sediment filter...provides shade to regulate stream temperature...protects the stream channel and banks; and promotes flood plain stability.”

During the fall 2008 process to adopt stream setbacks in subdivision regulations in Flathead County, one timber executive from Stoltze Lumber Company wrote to Flathead County Commissioners arguing that the 50-foot setback found in SMZs protected water quality and that larger setbacks were not needed. The letter stated that, “The forest products industry has years of local proof of the effectiveness of implementing this buffer width in protecting water quality as it is the basis of the Streamside Management Zone Law for forest practices. Over 20 years of third party audits prove the effectiveness of this combination of regulation and voluntary best management practices in protecting water quality.”⁴

While it is true that every two years audits are conducted under the SMZ program, it is not true that the audits examine water quality impacts of timber projects. Instead these audits specifically document the number of randomly selected logging operations that follow SMZ rules; water quality in streams adjacent to logging operations is not measured for improvements or impacts from logging operations. Therefore, although the SMZ program helps maintain water quality, it is impossible to say that this law protects water quality.

For a copy of an SMZ audits, contact the Montana Department of Natural Resources and Conservation:

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⁴ McKenzie, Paul. F.H. Stoltze Land & Lumber Company Letter to Flathead County Commissioners. 28 October 2008. Flathead County Planning Office, Kalispell, Montana