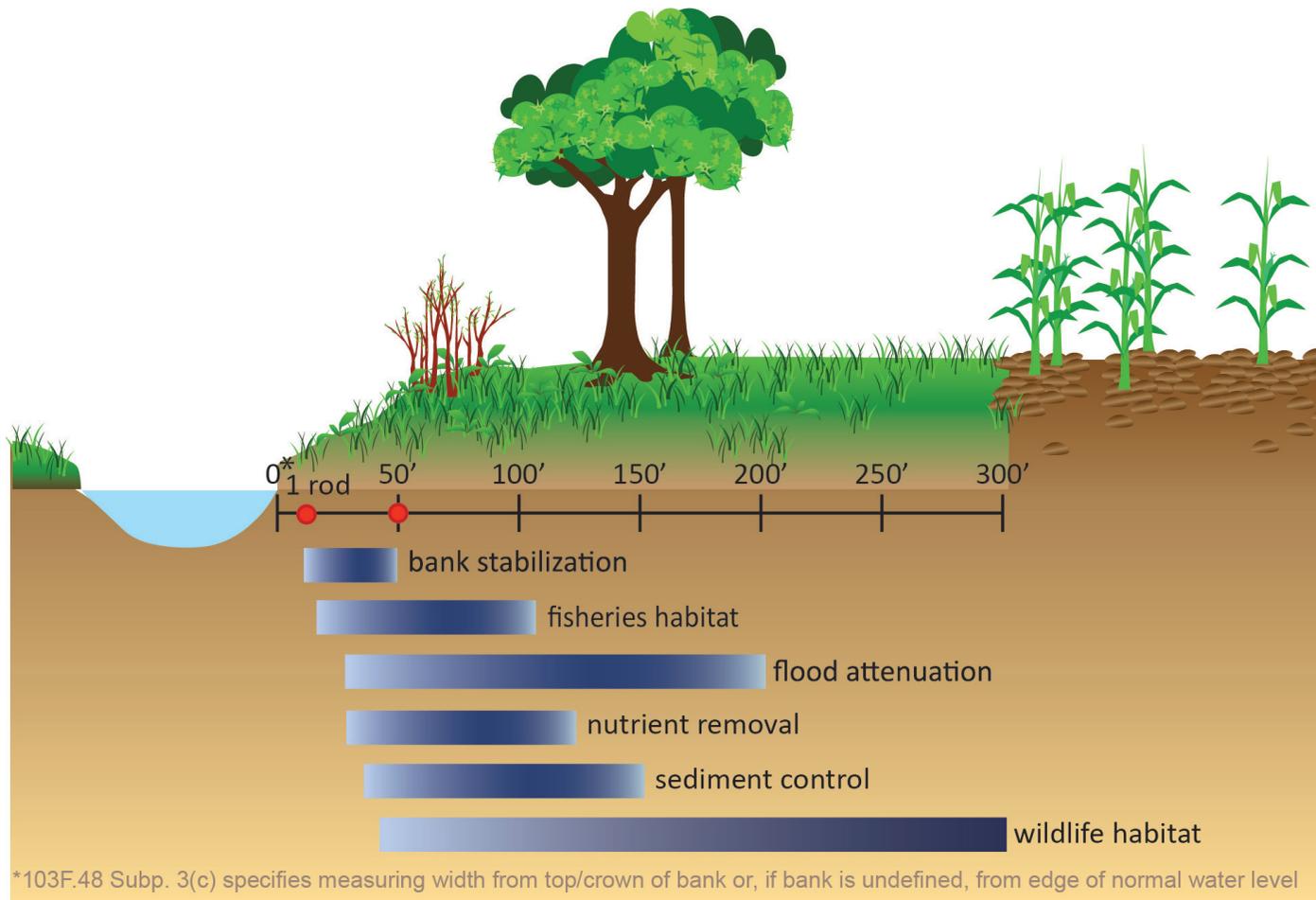


BENEFITS OF BUFFERS



Research conducted at the University of Minnesota and at research institutions across the country has **definitively proven** that riparian buffers (perennial vegetation located along a watercourse) can provide significant improvements to:

- water quality
- flood water storage & attenuation
- in-stream habitat for fish & invertebrates
- riparian area habitat for birds
- pollinators
- wildlife



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RESEARCH

- 1. Hawes, E. and others. (2005). Riparian Buffer Zones: Functions and Recommended Widths.** “Buffers are most effective when they are contiguous. Guidelines for buffer widths recommend that long, continuous buffer strips should often be a higher priority than fragmented strips of greater width.” “While it may be politically infeasible to set wide buffer zones around intermittent and ephemeral streams, this omission is not justified by the science. A University of Georgia study of riparian buffers warns, “Governments that do not apply buffers to certain classes of streams should be aware that such exemptions reduce benefits substantially.”
- 2. Stauffer, J.C. and others. (2001). Relationship of wooded riparian zones and runoff potential to fish community composition in agricultural streams.** Wooded riparian buffers play a beneficial role in improving fish community composition in agricultural watersheds.
- 3. Christensen, V.G., and others. (2011). Relations between Retired Agricultural Land, Water Quality, and Aquatic- Community Health, Minnesota River Basin.** These results indicate that although agricultural land retirement is significantly related to fish communities as measured by the IBI scores, a combination of basin, riparian, and in-stream factors act together to influence IBI scores. Fallow agricultural land and/or land retirement programs may improve stream health (fish assemblage and diversity) and decreased nitrogen concentrations. “...when agricultural land retirement is concentrated near the stream, it may have a positive effect on selected water quality measurements and aquatic-community health.”
- 4. Mankin, K.R., and others. (2007). Grass-shrub riparian buffer removal of sediment, phosphorus, and nitrogen from simulated runoff.** Native grass and shrub riparian buffers remove sediment, nutrients, and chemical pollutants from upland surface runoff.
- 5. Fischer, R.A., and others. (2000). Design Recommendations for Riparian Corridors and Vegetated Buffer Strips.** “In all cases, buffers wider than 10 m should be promoted for optimizing a range of multiple objectives for water quality, stability, and habitat functions.” Buffers on smaller streams important to watershed health “...even the best buffer strips along larger rivers and streams cannot significantly improve water that has been degraded by improper buffer practices higher in the watershed...”
- 6. Dosskey, M.G. and others. (2002) Assessment of concentrated flow through riparian buffers.** Riparian buffers in agricultural fields can make substantial improvements in sediment trapping if they are expanded, increasing uniform distribution of run-off.
- 7. Dabney, S.M. and others. (2006) Integrated management of in-field, edge of field and after field buffers.** “Intuitively, water quality outcomes are most positive when all the buffer types and related conservation practices are used together. In-field buffers can reduce and slow runoff amounts and lower sediment loads, thereby helping to make edge-of-field buffers work more efficiently.”
- 8. Dosskey, M.G. (2001) Toward Quantifying Water Pollution Abatement in Response to Installing Buffers on Crop Land.** “Abundant evidence clearly indicates that buffers can retain pollutants from surface runoff from fields, filter surface and groundwater runoff at field margins, stabilize eroding banks, and contribute to processes that remove pollutants from stream water flow.”
- 9. Mayer, P.M., and others. (2005) Riparian Buffer Width, Vegetative Cover, and Nitrogen Removal Effectiveness: A Review of Current Science and Regulations.** “Current research indicates that riparian buffers of various vegetation types are effective at reducing nitrogen levels in groundwater and streams.”
- 10. Allan, J.D. (1995) Stream ecology: structure and function of running waters. (textbook)** Riparian buffers attenuate nutrients through plant uptake, slow overland sediment transport, and provide shade for stream channels. Stream shading is a factor in algal production and nutrient uptake.