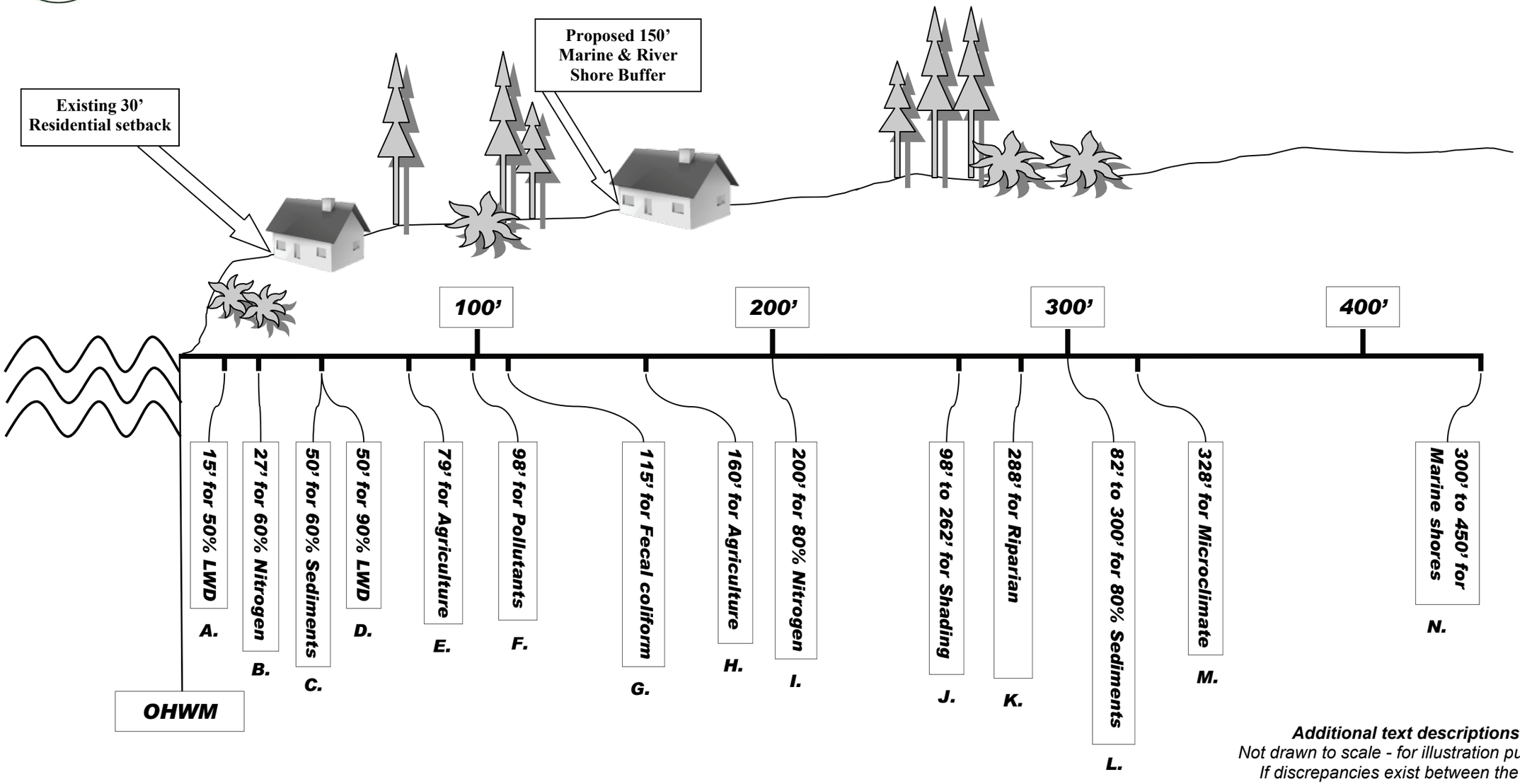
Jefferson County Shoreline Master Program (SMP) Comprehensive Update

Buffer Science Summary

Source: Chapter 5.2 of the November 2008 *Final Shoreline Inventory & Characterization Report*



Additional text descriptions on reverse.
Not drawn to scale - for illustration purposes only.
If discrepancies exist between the text and this diagram, the text shall prevail.
9-2-09

Buffer Science Summary - page 2

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Excerpted Text Descriptions

A. **Large Woody Debris (LWD):** In riverine environments, more than half of all large woody debris is recruited from within 15 feet of streams.
B. **Nitrogen:** According to the literature, buffer widths as small as 27 feet could reduce nitrogen by as much as 60 percent, while widths up to 200 feet would be required to reduce nitrogen by 80 percent (Desbonnet et al., 1994, in Pentec, 2001).
C. **Sediment:** In general, a 50-foot buffer is estimated to be approximately 60 percent effective at removing sediments, while an 82- to 300-foot buffer would remove approximately 80 percent of sediment load (Brennan and Culverwell, 2004; Pentec 2001).
D. **LWD:** About 90 percent of all large woody debris comes from trees growing within about 50 feet of streams (Herrera, 2005).
E. **Agriculture:** Minimum buffer recommendations for controlling agricultural runoff are 79 feet for 20 percent slopes with slight erosion, and 160 feet for 30 percent slopes with severe erosion (Brennan and Culverwell, 2004).
F. **Pollutants:** Although sediment carried into nearshore marine environments will seldom be of a magnitude to significantly compromise water clarity, the minimum recommended buffer width for sediment control and pollutant removal is 98 feet (30 meters) (May, 2003).
G. **Fecal Coliform:** Control of fecal coliform inputs from agriculture or septic systems to acceptable levels for primary contact recreational use could be achieved by a 115 feet buffer (Young et al., 1980, in Pentec, 2001).
H. **Agriculture:** See 'E' above.
I. **Nitrogen:** See 'B' above.
J. **Shading:** Buffer recommendations range from 98 to 262 feet for natural temperature regulation and shading, or providing equivalent shading as a mature forest (May, 2003).
K. **Riparian Habitat:** For Washington State, the average width reported to retain riparian function for wildlife habitat is 288 feet (Knutson and Naef, 1997).
L. **Sediment:** See 'C' above.
M. **Microclimate:** The minimum recommended buffer for microclimate protection is 328 feet (May, 2003).
N. **Marine Shores:** Levings and Jamieson (2001) cite findings from the Canadian Ministry of Forestry in British Columbia recommending buffers of 300 to 450 feet for marine shores depending on the type of shore, wind conditions, and other factors.

Buffers protect shoreline ecological functions and processes, water quality and habitat:

- Nutrient cycling
- Groundwater recharge
- Soil stability
- Erosion
- Siltation
- Soil-bound contaminants
- Particulate nutrients, metals, organic chemicals
- Fecal coliform bacteria
- Feeding/foraging
- Perch/refuge
- Breeding & Nesting
- Microclimate for plant growth/ decomposition
- Prey production
- Migration/travel corridor
- Habitat structure
- LWD = large woody debris

Standard Buffers	Planning Commission Recommendation (7/15/09)	DCD Staff Recommendation (8/20/09)
Lake Shoreline	100'	100'
River Shoreline	150'	150'
Marine Shoreline	Natural = 150' Conservancy = 150' Shoreline Residential = 50' High Intensity = 50'	150'

NOTE: Options to adjust standard buffer width given specific criteria include: 1) Buffer reduction, 2) Buffer averaging, 3) Non-conforming Lots Standards, 4) Common Line Buffer, 5) Critical Area Stewardship Plan, and 6) Shoreline Variance.