Appendix E

Table of Riparian Buffer Widths

Appendix E. Draft summary of riparian buffer widths to protect selected riparian functions for San Geronimo Creek watershed.

Riparian Function: *Goal shown in italics.* Key riparian functions associated with each goal listed below.	**Recommended buffer width** to protect riparian function.	**Rationale**	**Literature Sources**
Channel morphology: promote bedform complexity and improve habitat feature value 1. **LWD recruitment**: riparian conifers provide for in-channel LWD 2. **Bank stability**: riparian vegetation can reduce bank erosion	1.a. 100 ft 1.b. 150 ft where conifers are dominant species of potential vegetation; 80 to 100 ft where California bay laurel is the dominant species of potential vegetation. 1.c. 50 to 150 ft. 2. 35' no touch zone for native riparian tree species	1.a. Three to five dominant tree widths suggested (NRCS) Redwood crown width averages 25 to 35 feet (Gilman and Watson 1994), so that three tree widths approximates 100 feet. Canopy widths for Douglas-fir and California bay are at least as wide. In order to support the LWD recruitment function, this would need to encompass areas and trees that can reasonably be allowed to fall into the channel by the land owners and/or managers. 1.b. Over half of the potential LWD recruitment occurs within 0.6x the tree height (FEMAT 1993). Where 0.6x redwood and Douglas-fir (both 250 feet) tree heights are 150 feet (Burns and Honkala 1990), and 0.6x California bay laurel height (80 feet) is 48 feet (Burns and Honkala 1990). 1.c. Bank erosion and both streamside landsliding and windthrow are likely major processes for LWD recruitment (>50% for bank erosion and 25 to 50%, respectively). In the Mendocino County redwood region, these processes are dominant in the first 50 and 150 feet of channel bank, respectively. 2. Where tree roots intersect channel banks, buffer strips reduce bank erosion.	1.a. NRCS; Gilman and Watson 1994. 1.b. Burns and Honkala 1990; 1b. FEMAT 1993 1.b. Benda et al. 2003 1.b. Benda et al. 2002 1.c. Benda 2004 1.c. Reid and Hilton 1998 1.c. Liquori et al. 2008 2. Abernethy and Ruterhfurd 1999 2. Simon and Collison 2002
Biological communities: Protect and promote native aquatic and riparian vegetation and wildlife 1a. Sources of **biodiversity** in landscape (including plants)	1a. 150 foot buffer minimum (based in most narrow source listed to right) 1b. The wider the better; the	1a. Quote from Jones and Stokes TM 200210.18.pdf (page 4): "In general, research indicates that a minimum **80-foot** wide buffer is essential for maintaining some semblance of terrestrial biodiversity (Levey et al. 2002)." (Levey et al. 2002 not listed in the literature cited in this document and could not be located independently.)	1a. Levey et al. 2002 1a. RHJV 2000 1a. Hagar 1999 1a. Hilty and

Riparian Function: *Goal shown in italics.* Key riparian functions associated with each goal listed below.	**Recommended buffer width** to protect riparian function.	**Rationale**	**Literature Sources**
1b. Maintaining **native species** dominance	older the stand the better.	1a. Regarding terrestrial animals and plants: 1a. Birds: 250 feet: RHJV 2000 - bird species in CA. >130 feet: Hagar 1999 – birds in Oregon 1a. Mammals: >1000 feet: Hilty and Merenlander 2004: Napa vineyard landscape 1a. Maintaining the intermediate level of disturbance most likely to support greatest biodiversity (e.g. intermediate disturbance hydpothesis). Natural disturbance processes of flooding maintain diversity of habitats within riparian zone -- this requires maintenance or restoration of the floodplain and flooding process, as well as topographic diversity within that floodplain. 1b. The wider the stand, the lower the invasive plant species cover (Russell 2004)	Merenlander 2004 1a. Naiman et al. 2005; 1a. Pollack et al. 1999; 1a. Everson and Boucher 1998 1b. Russell 2004
Water quality: Protect and improve surface and groundwater quality 1a. **Filtration of fine sediment**, and sediment associated **phosphorus** through interception of surface runoff	1a. 35 feet buffer to support dense cover of riparian herbaceous and woody species (with a focus on site-appropriate rhizomaceous species).	1a. Native plants, particularly rhizomaceous sedge species, are effective in providing bank stability and the greater the coverage along channel banks, the greater the reduction in surface erosion and bank sloughing into the channel. Most hillslope sediment delivery to channels originates from areas within 30 feet of channel.	1a. Micheli et al. 2004 1a. Liquori and Benda 2008 1a. Castelle, A.J. and A.W. Johnson 2000 1a. Rashin et al. 2006 1a. CH2MHill and Western Watershed Associates

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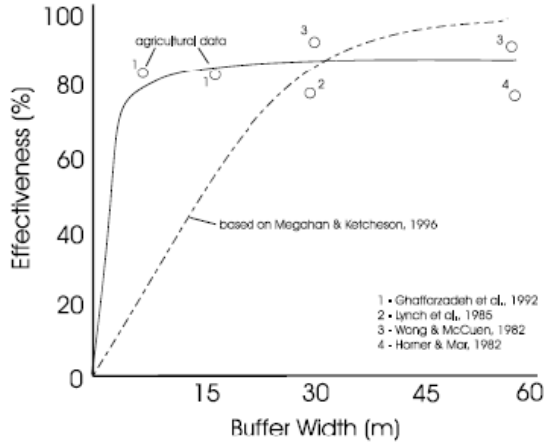
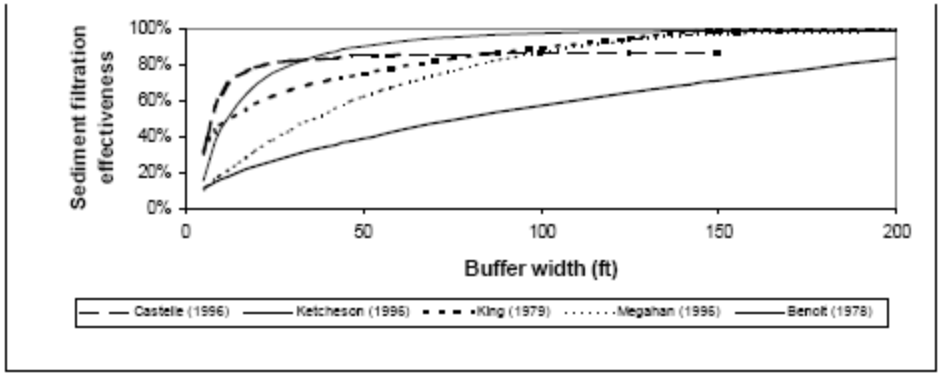


Figure 3. Effectiveness of Vegetation: Sediment Removal

From Castelle and Johnson 2000; regarding fine sediment filtration



From CH2MHill and WWA 1999; regarding fine sediment filtration