



Russian River Watershed Association

300 Seminary Ave, Ukiah, CA 95482 • (707)833-2553 • www.rrwatershed.org

RRWA Environmental Column – April 2015 Riparian Buffers and Corridors

If you look at our waterways from above, you can see a rolling and flowing patchwork of managed lands and natural landscapes, including urbanized neighborhoods, agricultural fields, riparian forest, seasonal channels, and open water. More and more we are seeing how our management of these lands influences the others. Over time we have seen how the growth of our agricultural, timber and gravel harvesting, urban and suburban development have shrunk the forest-vegetated areas next to rivers and streams. These riparian areas have a special significance in this patchwork and are increasingly recognized for their ecological and social benefits. Riparian areas are not just patches of green next to water.

“Riparian areas are 3 dimensional zones of direct interaction between terrestrial and aquatic ecosystems ...and occur along all types of waterways, including streams, meadows, flood plains, peatlands, marshes, springs, and lake shores....”
– Moyle et al (1996)

“They extend down into the groundwater, up above the forest canopy, outward across the floodplain, laterally into the near-slopes to various distances into terrestrial areas, and along watercourses” –
(Ilhardt et al. 2000).

The ecological benefits of riparian areas are often referred to as ecosystem services or ecosystem functions. They include:

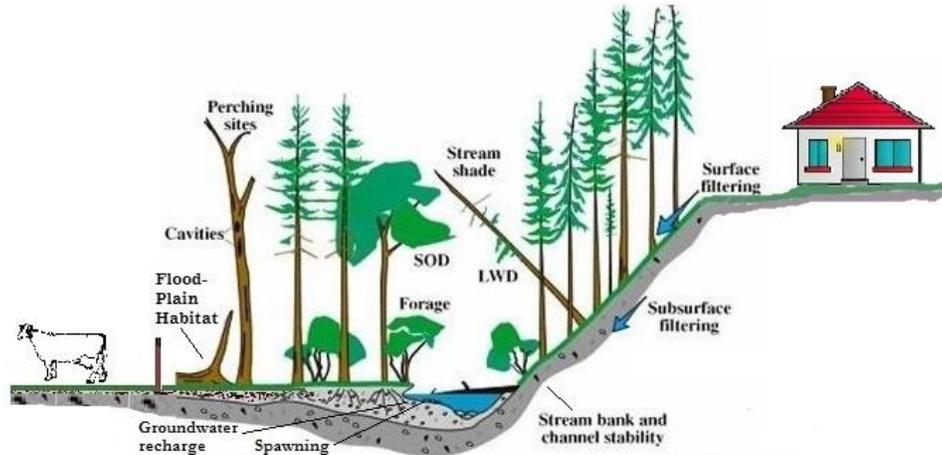
- Reducing erosion by stabilizing stream banks,
- Supporting nesting, feeding, resting, and reproductive habitat for birds, fish, and terrestrial animals,
- Filtering overland flow from upland land uses before it enters a stream,
- Providing shade to lower water temperature,
- Supplying large woody debris cover for fish and freshwater shrimp, and
- Filtering and recharging groundwater.

In effect they protect or *buffer* the living environment along waterways from the impacts of development.



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Ecological functioning of riparian areas (Adapted from Koning. 1999.)

“Riparian areas and corridors will be critical in adapting to climate change, yet they are one of our most heavily degraded ecosystems.”

— Mike Chrisman, California Secretary for Resources, 2007

Trees, shrubs, and soils in riparian areas also help to mitigate global warming and greenhouse gas emissions. Their increased biomass helps carbon sequestration and increases soil carbon stocks (NRCS 2015). In the future we might see riparian areas being restored, purchased, and maintained for carbon credits.

In terms of social benefit, riparian areas are a great place to enjoy outdoor recreation and scenery. On a river, trail, or on a road, there is nothing like paddling, pedaling, walking, or driving through a mature riparian forest. Less fun but extremely important is the flood damage protection that riparian areas provide. During heavy rainfall and runoff events the extra undeveloped space around a river is a buffer protecting our homes and property.

The longer, wider, and taller the riparian area, the better the ecosystem function. In fact, if a riparian area is too small and too isolated, it may not offer enough ecosystem services for animals to survive, reproduce, or migrate. These ecosystem services work on another dimension as well: time. The older and more mature a riparian area is, the greater the value of the ecosystem services it provides and the greater social return. Restoration is very important to riparian corridor management, but conserving and maintaining existing mature riparian areas have more inherent value.

“Establishing riparian management zones (or “bufferstrips”) of adequate width is probably the single most effective strategy for protection and maintenance of the ecological values of riparian areas” - (Kondolf et al. 1996).

“Supervisors unanimously approved the measure shielding 82,000 acres of land outside city limits, most of it on private property, from future farming and development.” - The Press Democrat, November 24, 2014



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The challenge inherent to land use planning for riparian buffers is how to balance the need to protect threatened, endangered, and more common species with our need to maintain our means to grow food, to earn a living, and to sustain our traditions and values. A number of local agencies have taken up this challenge. In November 2014, the Sonoma County Board of Supervisors adopted zoning code changes to implement the stream protection policies and rezoned properties to add the *Riparian Corridor Combining Zone* to all designated streams shown on the General Plan Open Space maps. The protected area includes the streambed, the stream bank, and a 50, 100, or 200 foot streamside conservation area on each side of the stream, as measured from the top of the higher bank. Within each streamside conservation area only the practices defined in the County Ordinance are allowed.

Sonoma County Department of Agriculture has provided best management practices (BMPs) for agricultural cultivation within riparian corridors and streamside conservation areas (SCAs). The intent of the BMPs is to prevent controllable sources of sediment, nutrients, pathogens, and pesticides from discharging into streams.

Also, *Mendocino County code Sec. 20.496.035 - Riparian Corridors and other Riparian Resource Areas*, was adopted to protect and maintain riparian habitat. The code section applies buffer areas and widths adjacent to all environmentally sensitive habitats from possible significant disruption caused by a proposed development.

The Sonoma County Water Agency performs a significant amount of habitat restoration and channel maintenance throughout Sonoma County to protect endangered native species and increase flood protection. In most cases, activities include bank stabilization and replanting of native species, and may include grading and installation of in-stream structures to improve refuge and spawning habitat for protected species.

This article was authored by William Stockard of Sonoma County, on behalf of RRWA. RRWA (www.rrwatershed.org) is an association of local public agencies in the Russian River Watershed that have come together to coordinate regional programs for clean water, fisheries restoration, and watershed enhancement.



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References and Further Reading

Also see rrwatershed.org

Koning, 1999. Watershed Restoration Technical Circular No. 6. Watershed Restoration Program Ministry of Environment, Lands and Parks The University of British Columbia.

<http://www.env.gov.bc.ca/wld/documents/wrp/wrt6/index.html>

Matzek, Puleston, and Gunn. 8 DEC 2014. Can carbon credits fund riparian forest restoration? Restoration Ecology. Volume 23, Issue 1, pages 7–14, January 2015. : Shaffer, K. and A. Chrisney (Tech. Coordinators) Riparian Habitat Conservation and Flood Management in California. Riparian Habitat Joint Venture 2007 Conference Proceedings, Sacramento, CA, p. 60. Available on-line at:

<http://www.prbo.org/calpif/rhivconference/proceedings/>

Mendocino County Code Chapter 20.496 Environmentally Sensitive Habitat and Other Resource Areas.

http://www.co.mendocino.ca.us/planning/pdf/CHAPTER_20.496.pdf

Moyle et al, 1996. Management of Riparian Areas in the Sierra Nevada. Sierra Nevada Ecosystem Project: Final report to Congress, vol. III, Assessments and scientific basis for management options. Davis: University of California, Centers for Water and Wildland Resources, 1996.

THE PRESS DEMOCRAT, November 24, 2014. County vote OKs stream setbacks. ANGELA HART.

<http://www.pressdemocrat.com/home/3161247-181/county-vote-oks-stream-setbacks>. Accessed 12/5/2014. 8:45AM.

Richard D Rheinhardt, Mark M Brinson, Gregory F Meyer and Kevin H Miller. February 14, 2012. Carbon storage of headwater riparian zones in an agricultural landscape.

Sonoma County Code. https://www.municode.com/library/ca/sonoma_county/codes/code_of_ordinances

Soyotome Resource Conservation District. Stewardship Guide for the Russian River.

WWW.SOTOYOMERCD.ORG

USDA, Natural Resource Conservation Service, 2015. GHG and Carbon Sequestration Ranking Tool. NRCS Practice Standards for Greenhouse Gas Emission Reduction and Carbon Sequestration.

<http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/climatechange/?cid=stelprdb1044982> accessed 3/9/2015 9:30AM.