



## WHY RIPARIAN SETBACKS?

Riparian areas are naturally vegetated lands along rivers and streams. When appropriately sized, these areas can limit streambank erosion, reduce flood size flows, filter and settle out pollutants, and protect aquatic and terrestrial habitat. Riparian setbacks are a tool local governments can use to maintain riparian area functions. Communities can establish riparian setbacks through a combination of landowner education, land acquisition, and land use controls on new development. County soil and water conservation districts, land trusts, and other organizations are skilled in assisting communities and landowners with education and acquisition efforts. To assist interested members in minimizing the impacts of new development on riparian areas, CRWP has developed a model regulation for riparian setbacks. **This model recommends that Riparian Setbacks:**

- ◆ Range from **25 feet to 300 feet** depending on watercourse drainage area.
- ◆ Are **minimum distances** and apply to **both sides** of designated watercourses.
- ◆ **Conform to community** land development patterns & natural resource management goals.
- ◆ Include provisions for communities to **examine the combined impact of all setbacks** - side yard, rear yard, riparian, etc. - on a subdivision or a parcel and **make reasonable adjustments** to ensure existing **lots remain buildable** and to **maintain lot yields** from new subdivisions to the extent possible.

This document summarizes research on riparian area functions and relates these to each purpose in CRWP's model riparian setback regulation.

### Riparian Areas Limit Streambank Erosion

*Whereas, streambank erosion is a significant threat to public health and safety and public and private property, and vegetated riparian areas slow runoff and stabilize streambanks, thus reducing the erosive force of runoff and strengthening banks against high velocity waters; and,*

*Whereas, the presence of natural vegetation on streambanks provides protection against erosive forces both within streams and on adjacent lands, whether publicly or privately owned;*

- ◆ The root systems of riparian vegetation, particularly trees, hold streambank soils in place against the erosive force of high velocity waters. (Gregory et al., 1991.)
- ◆ Vegetated streambanks are up to 20,000 times more resistant to erosion than bare streambanks. (Ohio EPA, 1994.)

### Riparian Areas Reduce Flood Size Flows

*Whereas, flooding is a significant threat to public health and safety and public and private property, and vegetated riparian areas lessen the damage from such flooding by slowing*



*runoff, enabling water to soak into the ground, and by absorbing excess flow during flood events;*

- ◆ During high flows, streams spread out across the floodplain, dissipating much of the energy of flood flows. (Gregory, et al. 1991.)
- ◆ Adjacent forest vegetation and litter lowered stream flood elevations from 32 feet to 17 feet for a 100-year flood. (Bertulli, 1981 in Castelle et al., 1994.)
- ◆ The combined effect of vegetated floodplains is to reduce flow velocity, increase the storage of water, and minimize downstream flood impacts. (Smardon & Felleman, 1996.)
- ◆ A riparian protection program that prohibits development in both the floodway and the flood fringe preserves natural areas for absorption of flood sized flows and protects structures from flood damage. (Desbonnet, et al., 1994.)

### **Riparian Areas Filter and Settle Out Pollutants**

*Whereas, vegetated riparian areas filter and trap sediments, chemicals, salts, septic discharge, and other pollutants from runoff and floodwaters, thus protecting surface and ground water quality;*

- ◆ Computer modeling of riparian systems shows that a 150 foot riparian setback on a 3% slope reduced sediment transport by 90%. (Wong & McCuen, 1981 in Divelbiss, 1994.)
- ◆ The effectiveness of riparian setbacks at removing sediments is directly related to their width. Most degradation of the aquatic benthic community from sediment deposition is prevented by riparian setbacks 98 feet wide or greater. (Newbold et al., 1980 in Divelbiss, 1994.)
- ◆ Riparian setbacks greater than 52 feet wide remove nitrate from agricultural drainage waters. (Jacobs & Gilliam, 1985.)
- ◆ A 150 foot riparian setback is necessary to protect water quality from sedimentation and pollutants. In developing this number, 34 pollutant specific studies were reviewed. These studies showed an 82 foot setback necessary to remove 80% of sediments; a 197 foot setback necessary to remove 80% of suspended solids and nitrogen; and a 279 foot setback necessary to remove 80% of phosphorus. (Desbonnet et al., 1994.)

### **Riparian Areas Protect Aquatic and Terrestrial Habitat**

*Whereas, vegetated riparian areas can provide a dense tree canopy that helps to maintain and improve the stability of watercourse temperatures, thus protecting aquatic ecosystems, and helps to reduce the presence of aquatic nuisance species; and*



*Whereas, the protection of riparian areas can result in a diverse and interconnected riparian corridor that provides habitat to a wide array of wildlife;*

- ◆ A 100 foot forested riparian setback from both sides of a perennial stream minimized the increase and fluctuation in river temperature following timber harvesting. (Lynch & Corbett, 1990.)
  - ◆ In Bear Brook, New Hampshire more than 98% of the organic matter was supplied by the riparian forest. (Fisher & Likens, 1973.)
  - ◆ More than 50% of the breeding bird species in Ohio use riparian wooded areas to nest. (Ohio EPA, 1994.)
  - ◆ During Spring and Fall, migratory birds are 10 to 14 times more abundant in riparian habitat than in surrounding upland habitat. (Ohio EPA, 1994.)
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