

NC Division of Water Quality - Methodology and Calculations for determining Total Phosphorus Removal associated with Riparian Buffer Establishment in Tar Pamlico River Basin

Water Quality Benefits for Riparian Buffer Restoration

- 1). Benefit of Land Use Change
- 2). Benefit of Nutrient Removal from Nonpoint Source Runoff

General Assumptions:

1. Life expectancy of Riparian Buffer is assumed to be 30 years.

Effectiveness of Riparian Buffer	Annual Effectiveness (lb/ac/yr)	Effectiveness in 30 yrs (lb/ac)
Benefit (1)	1.73	51.90
Benefit (2)	3.15	94.50
Total	4.88	146.40

Detailed Benefit Descriptions and Assumptions:

- 1) Benefit is due to change land use ^{2,3}
 Export coefficient for agricultural land is 2.15 (lb/ac/yr).
 Export coefficient for riparian buffer is 0.42 (lb/ac/yr).
 The annual total phosphorus (TP) output is decreased by 1.73 lb/ac annually by land use changing.
- 2) Benefit is due to TP removal from nonpoint source runoff ^{4,5}
 Mass load for TP reductions for buffer is estimated to be 3.15 lb/ac/yr.

Assumptions:

Riparian buffer restorations only occur on agricultural lands.
 Width of restored riparian buffer is 50 feet, and with mixture of grass and forest.

References:

- ² NC Division of Water Quality memo 'Export Coefficients Revisited' (1996)
- ³ Comparison of Selected TP Loading Coefficients (Jim Blose, 2001)
- ⁴ Cost-Effectiveness Study of Selected Agricultural Best Management Practices in the Neuse and Tar-Pamlico River Basins (Todd Kennedy, 2001)
- ⁵ A Review of the Scientific Literature on Riparian Buffer Width, Extent and Vegetation. (Seth Wenger, 1999)

Formula for Calculating Phosphorus Offset Reductions on Riparian Buffer Restoration Sites:

*Size (Acres) * 4.88(lbs/Acre/Year) * 30 Years = Total Pounds of Total Phosphorus Removed from Riparian Buffer Project*