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.

<table>
<thead>
<tr>
<th>Effectiveness of Riparian Buffer</th>
<th>Annual Effectiveness (lb/ac/yr)</th>
<th>Effectiveness in 30 yrs (lb/ac)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benefit (1)</td>
<td>1.73</td>
<td>51.90</td>
</tr>
<tr>
<td>Benefit (2)</td>
<td>3.15</td>
<td>94.50</td>
</tr>
<tr>
<td>Total</td>
<td>4.88</td>
<td>146.40</td>
</tr>
</tbody>
</table>

Detailed Benefit Descriptions and Assumptions:
1) Benefit is due to change land use
   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
   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:

\[ \text{Size (Acres) \times 4.88(lbs/Acre/Year) \times 30 Years = Total Pounds of Total Phosphorus Removed from Riparian Buffer Project} \]