**Title: “Cost of reducing nutrients from riparian buffers in western Maryland”**

**APPENDIX**

***Table A1.*** *Assumptions used in the economic analysis.*

|  |  |  |  |
| --- | --- | --- | --- |
| Assumptions | Grass Buffer | Forest Buffer | Existing Forest Buffer |
| Interest rate | 5% | 5% | 5% |
| Years in program | 15 years | 15 years | 15 years |
| Base soil rate in Allegany/Washington MD counties | 58/88 | 58/88 | 58/88 |
| Incentive payment in % from the soil rate based on the practice per year | 150% | 200% | 100% |
| One-time SIP and State payments | $200 | $200 | $100 |
| Establishment cost | $392 | $3,291 | $1,646 |
| One-time PIP (40% of establishment cost) | $157 | $1,316 | $658 |
| Cost-share payments (87.5% of establishment cost) | $343 | $2,880 | $1,440 |
| Maintenance payment for replanting1 | $96 | $92 | $92 |
| Mowing cost per year2 | $40 | $40 | $40 |
| Maintenance cost-share per year | $10 | $10 | $10 |
| Foregone income per year in Allegany/Washington MD counties.3 | $107/$162 | $107/$162 | $93/121 |

Note. 1Maintenance for replanting a riparian forest buffer is considered for the 2nd year, and for the riparian grass buffer during the 4th & 8th years only. 2Mowing cost with the riparian grass buffer is considered every other year.

3The opportunity cost of cropland taken out of production is accounted based on estimates of corn production on no-till, non-irrigated cropland from the University of Maryland Extension “MD Crop Budgets”. The additional annual foregone income for an existing forest buffer is assumed at $40 from timber harvests on a half of an acre of natural forest.

***Table A2.*** *Economic costs of nutrient reductions with different discount rates.*

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| County/Nutrients | Allegany County, MD | | | Washington County, MD | | | |
| Nitrogen, $/lb/year | Phosphorus, $/lb/year | | | Nitrogen, $/lb/year | Phosphorus, $/lb/year | |
| *Discount rate, 5%* |  | |  | |  | |  |
| Grass Buffer 1 | $12.3 | | $2,989.0 | | $12.0 | | $1,863.4 |
| Forest Buffer1 | $20.7 | | $1,222.1 | | $17.6 | | $1,425.9 |
| Existing Forest Buffer2 | $5.9 | | – | | $6.9 | | – |
| *Discount rate, 3%* |  | |  | |  | |  |
| Grass Buffer 1 | $13.7 | | $3,3325.3 | | $13.4 | | $2,081.3 |
| Forest Buffer1 | $21.9 | | $1,295.4 | | $18.9 | | $1,529.1 |
| Existing Forest Buffer2 | $6.3 | | – | | $7.4 | | – |
| *Discount rate, 2%* |  | |  | |  | |  |
| Grass Buffer 1 | $14.5 | | $3,521.6 | | $14.2 | | $2,208.7 |
| Forest Buffer1 | $22.7 | | $1,338.2 | | $19.2 | | $1,554.7 |
| Existing Forest Buffer2 | $6.5 | | – | | $7.7 | | – |

Note. 1 The estimates show the present value of annual costs of nutrients reduced per lb based on the corresponding reduction loads by grass or forest buffers, according to CBWM (Phase 6).

2 The estimates show the present value of annual costs of nitrogen reduction from existing and planted forest buffers based on the average loads determined by our synoptic studies (Siemek, 2021).