

LL1 Grant Application



Submit completed application to:

Lauren Sampedro

lauren.sampedro@vlwmo.org

Applicant Information:



Name:	Kristi Herman Hill
Address:	1520 S. Birch Lake Blvd
City/Township, State, Zip:	White Bear Lake, MN 55110
Phone:	612-203-2423
Email:	khermanhill@gmail.com

Project Summary:

\$11,013.96

ESTIMATED TOTAL PROJECT COST (\$)	\$10,748 \$11,000
AMOUNT REQUESTED (\$5,000 reg, \$7,500 curb cut)	\$5,000
EXPECTED PROJECT COMPLETION (Month, Year)	Spring 2024

PROJECT TYPE:

- Raingarden/Infiltration Basin: Curb cut
- Raingarden/Infiltration Basin: Regular
- Shoreline/Streambank Stabilization and/or Restoration
- Filtration
- Other

If other, please describe the proposed project: _____

Project Background:

Describe the project location. Does it connect to a lake, stream, ditch, or wetland in VLWMO? What issues will be addressed with this project?	On the shore of Birch Lake we have 110 feet of shoreline that currently has turf and is eroding. This project will restore the shoreline and provide habitat for pollinators.
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Describe how your project will support the goals of the Landscape Level 1 Grant Program.
(See LL1 policy)

This project will restore eroded shoreline on Birch Lake.

Briefly describe the planned installation and maintenance activities for your project.

Turf will be removed and replaced with natural buffers, mulch, and native grasses and plants that will flower throughout the growing season and provide habitat for pollinators

Project Specifications:

TOTAL PROPERTY AREA (Acres)	.07	Total PROJECT SIZE (Sq Ft)	3,600 SF
IMPERVIOUS (HARD) AREA DRAINING TO PROJECT (Sq Ft):	12,340 SF	PERVIOUS (GRASSY, NON-PAVEMENT) AREA DRAINING TO PROJECT (Sq Ft):	3,600 SF
DEPTH OF PRACTICE (In): <i>Provide if project includes infiltration/filtration</i>		BOTTOM SURFACE AREA (Sq Ft): <i>Provide if project includes infiltration/filtration</i>	



Required Attachments:

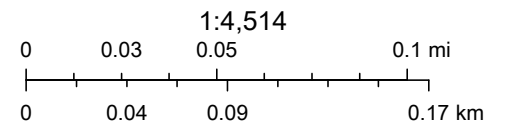
- ⇒ Detailed drawing or plan of the proposed project. If project is complex, VLAWMO may require project final designs to be completed by a qualified professional or engineer. Drawing must include project dimensions that enable VLAWMO staff to model the project for estimated water quality benefits.
- ⇒ At least 2 bids for construction of proposed project.
- ⇒ Detailed project budget estimate with itemized materials and costs that equal the total project cost.

LL1 2023-04 Hill Shoreline



7/10/2023

-  VLAWMO Boundary 2020
-  Project Location
-  VLAWMO Lakes



SHORELAND TRANSITIONAL ZONE

- 1) 300 - 3" AND 4" CONTAINER PLANTS WILL BE INSTALLED AT 2' SPACING IN THE SHORELAND TRANSITIONAL ZONE.
- 2) PLANTING WILL BE RANDOMIZED
- 3) A MIX OF AQUATIC AND WETLAND SPECIES WILL BE INTRODUCED (SEE SPECIES LIST)

~22 ft

~11 ft buffer width

~88 ft

1520

UPLAND BUFFER

- 1) 1,000 - 3" AND 4" CONTAINER PLANTS WILL BE INSTALLED AT 1.5' SPACING IN THE UPLAND BUFFER ZONE.
- 2) PLANTING WILL BE RANDOMIZED
- 3) A MIX OF SHORT GRASS PRAIRIE AND SAVANNA SPECIES WILL BE INTRODUCED (SEE SPECIES LIST)

1512

1520



Restoration Proposal for:

*Kristi and Lars Herman-Hill
1520 S Birch Lake BLVD
White Bear Lake, MN 55110*

Proposal Date: August 11, 2023

Prepared by:

Bill Bartodziej M.S., Senior Restoration Ecologist
Natural Shore Technologies, Inc.
612.730.1542 bill.b@naturalshore.com





USING ECOLOGY TO RESTORE LAND AND WATER

612.703.7581 | naturalshore.com | Office & Nursery 1480 County Rd 90 Independence, MN 55359

August 11, 2023

Dear Kristi and Lars:

Thank you again for giving Natural Shore Technologies the opportunity to bid on your project. Below is a *Project Summary* which outlines our *restoration methods* and *cost breakdown*. We would like to emphasize that we tailor our restoration approach to fit your site characteristics and specific objectives. We look forward to developing a partnership with you to produce an exceptional restoration that exceeds your expectations.

We would enjoy the chance to answer any questions that you have regarding this restoration proposal. We take great pride in our reputation and attention to customer satisfaction. After you have read through and are comfortable with the proposed plan and specified cost, please sign the contract that is provided. A down payment and a signed contract are required to book your project.

Best regards,

Bill Bartodziej, M.S.
Senior Restoration Ecologist
Natural Shore Technologies, Inc.

Project Summary

1. Project site: shoreland – 2,400 SF upland and 1,200 SF shoreland transitional zone (see map)
2. Site assessment and plan development include: detailed site preparation methods, plant selection, and a project timeline and work schedule for our staff. Because most of projects involve the establishment of natural buffers, detailed site drawings and planting plans are not necessary. We have found that over time, native plants will seek out the optimal micro-habitats and flourish.
3. Delineate and verify total restoration project area.
4. Kill selected turf areas with an herbicide appropriate for upland or aquatic use. A licensed herbicide applicator from Natural Shore Technologies will apply the treatment.
5. Cut and remove any weedy plant material from planting area.
6. Apply a 2-3" layer of shredded hardwood mulch in upland buffer areas that will be planted. Install 6" wood fiber log at the lakeward edge of the mulch.
7. Plant selections will provide flowering throughout the growing season, with at least 25 native plant species included in the plan.
8. Lay out plants into plant zones per plan specifications and install at approximately 1.5' centers.
9. Mulch will be moved aside, plant containers installed, and a light mulch layer will be returned around the base of the plants to hold moisture.
10. We will use 1,090 – 3-4" containers for your planting for the upland buffer.
11. The shoreland transitional zone will be planted with 300 – 3"-4" containers @ 2' spacing.
12. Site monitoring will be conducted and appropriate maintenance will be provided through October, 2024.

Installation note: Prior to installation, please let us know of any underground utility lines, sprinkler lines, or other obstacles in the restoration area. It is the owner responsibility to clearly mark lines, and NST will not be held liable for any damages.

Preliminary Plant Species List

Common Name	Scientific Name	Height (ft)	Color	Bloom Time	Sun Exposure
EMERGENT					
Spike rush	<i>Eleocharis palustris</i>	1 to 2	Brown	June-July	S
Broadleaved arrowhead	<i>Sagittaria latifolia</i>	4	White	July - August	S
Hard Stem Bulrush	<i>Schoenoplectus acutus</i>	4 to 6	Brown	July - August	S PS
Three Square Bulrush	<i>Schoenoplectus pungens</i>	2 to 4	Brown	June - July	S PS
WET MEADOW					
Grasses, Sedges, Rushes					
Bebb's Sedge	<i>Carex bebbii</i>	2 to 3	Green	May - June	S PS
Plains Oval Sedge	<i>Carex brevior</i>	1 to 2	Tan	June - July	S SH
Bottlebrush Sedge	<i>Carex comosa</i>	2 to 3.5	Green	May - June	S PS
Lake Sedge	<i>Carex lacustris</i>	2 to 4	Green	June - July	
Prairie Cordgrass	<i>Spartina pectinata</i>	3 to 6	Green-Purple	August-October	S PS
Forbs					
Sweet flag	<i>Acorus calamus</i>	2	Green	May - July	S
Swamp Milkweed	<i>Asclepias incarnata</i>	3 to 4	Lavender	June - August	S PS
Blue Flag Iris	<i>Iris versicolor</i>	2 to 3	Blue	June - July	S PS
PRAIRIE					
Grasses, Sedges					
Side Oats Grama	<i>Bouteloua curtipendula</i>	1.5 to 2.5	Red-green	July - September	S PS
Blue Grama	<i>Bouteloua gracilis</i>	.5 to 1	Green-purple	July-September	S PS
Plains oval sedge	<i>Carex brevior</i>	1 to 2	Green	June-July	S PS Sh
Canada Wild Rye	<i>Elymus canadensis</i>	3 to 4	Green	July - August	S PS
June grass	<i>Koeleria macrantha</i>	1 to 2	Amber	May-June	S
Little Bluestem	<i>Schizachyrium scoparium</i>	1.5 to 3	Amber	July - September	S PS

Indian Grass	<i>Sorghastrum nutans</i>	4 to 6	Amber	July - September	S PS
Prairie Dropseed	<i>Sporobolus heterolepis</i>	1.5 to 3	Green	August - October	S PS

Forbs

Anise Hyssop	<i>Agastache foeniculum</i>	2 to 4	Purple	June-October	S SH
Prairie Onion	<i>Allium stellatum</i>	1 to 1.5	Pink	July - September	S PS
Butterfly Milkweed	<i>Asclepias tuberosa</i>	1 to 2	Orange	June - September	S PS
Blue wild indigo	<i>Baptisia australis</i>	4.0	Blue	May-July	S PS
Lance-leaved Tickseed	<i>Coreopsis lanceolata</i>	2 to 3	Yellow	June-August	S
Prairie Coreopsis	<i>Coreopsis palmata</i>	1.5 to 2.5	Yellow	June - September	S PS
Pale purple coneflower	<i>Echinacea pallida</i>	2 to 4	Lavender	June-July	S PS
Purple coneflower	<i>Echinacea purpurea</i>	4.0	Purple	July-September	S PS
Rattlesnake master	<i>Eryngium yuccifolium</i>	4.0	White	July-September	S
Oxeye	<i>Heliopsis helianthoides</i>	5.0	Yellow	June-September August - September	S PS
Prairie blazing star	<i>Liatris pycnostachya</i>	2 to 5	Purple	July-September	S PS
Wild bergamot	<i>Monarda fistulosa</i>	4.0	Pink-Purple	July-September	S PS
Foxglove Beardtongue	<i>Penstemon digitalis</i>	3 to 4	White	July-August	S PS
Prairie Phlox	<i>Phlox pilosa</i>	1.5 to 2	Pink	May - June	S PS
Grey-headed Coneflower	<i>Ratibida pinnata</i>	5.0	Yellow	July-September	S PS
Black Eyed Susan	<i>Rudbeckia hirta</i>	2 to 3	Yellow	June - October	S PS
Stiff Goldenrod	<i>Solidago rigida</i>	2 to 5	Yellow	August-October	S PS
Heath aster	<i>Symphyotrichum ericoides</i>	2 to 4	White	August-September	S PS
Smooth blue aster	<i>Symphyotrichum laeve</i>	4	Blue	August-October	S PS

SAVANNA - WLND

Thimbleweed	<i>Anemone virginiana</i>	1 to 2	white	June-August	PS SH
Wild Columbine	<i>Aquilegia canadensis</i>	1.5 to 3	Red	May - June	PS SH
Wild Ginger	<i>Asarum canadense</i>	0.5	Red	April-June	SH
Sprengel's sedge	<i>Carex sprengelii</i>	1 to 2	yellow	April-June	PS SH
Bottlebrush Grass	<i>Elymus hystrix</i>	2 to 3	Cream	July-September	PS SH
Large Leaf Aster	<i>Eurybia macrophylla</i>	.5 to 1.5	White	August - October	PS SH
Jacobs Ladder	<i>Polemonium reptans</i>	0.5 to 1	blue	April-June August - September	S SH
Zig Zag Goldenrod	<i>Solidago flexicaulis</i>	2.0	Yellow	September	PS SH

Project Cost

This bid includes project design and management, all materials, labor, and a two year maintenance plan. This is a comprehensive bid estimate and valid for thirty days. We require a 50% down payment to schedule your project.

Cost Breakdown

Site Design, Project Management, Mobilization		\$1,580.00
Site preparation, herb. trts, clearing, hauling, fine grading		\$1,530.00
Erosion Control - installed - shredded hardwood mulch		\$1,930.50
1,390 Plants - 3" and 4" - containers @ 1.5'-2.0' spacing		\$6,270.00
Maintenance Plan - 3 visits - 2023		\$328.00
Maintenance Plan - 5 visits - 2024		\$820.00

TOTAL = ~~\$12,458.50~~

\$11,310.50

Site maintenance

Site maintenance includes at least 5 visits per year during the growing season to monitor and conduct activities that will ensure proper restoration establishment. We use the most appropriate, up-to-date maintenance techniques such as targeted herbicide application, hand pulling, mowing, and spot weed whipping to effectively control invasive weeds. Our lead maintenance supervisor has a B.S. in Biology and 10 years of field experience.

Watering – We will thoroughly water your site immediately after plant installation. Any necessary watering after installation is the responsibility of the owner. (Generally, normal rainfall during the growing season is adequate for native plant establishment.)

****Note we do offer long-term maintenance contracts. Over 90% of our clients use that service.***

Staff Qualifications

Our company has over 50 years of combined ecological restoration experience. We are a local company that focuses on quality ecological restoration in the Metro area. Our clients vary from private estates on Lake Minnetonka, to large corporate headquarters in Eden Prairie. We also work with many city and county governments and watershed management organizations. We are fully insured.

Our specialty is lakeshore and wetland restoration. We have restored many miles of lakeshore in Minnesota, more than any other company. Please see our portfolio for examples of our restoration projects that include; shorelines, wetlands, prairies, savannas, and rain gardens.

Please see our **project photo book** at: <http://www.blurb.com/books/6034090-natural-shore-technologies-inc-photobook>

Natural Shore Technologies Plant Material

We have commercial and retail greenhouses in Maple Plain. Our plants are Minnesota native perennials that will flourish year after year. Utilizing our own plant material in our projects assure quality control. Our wetland and prairie plants are guaranteed to establish during the first growing season. Perennial plants put most of their energy into establishing root systems so please keep in mind that the first year of growth will be mainly underground. You will see some flowering the first year, but significantly more flowering during the second year of establishment.

Information about our **retail native plant greenhouses** located in Maple Plain is also available at: www.naturalshore.com



Using Ecology to Restore Land and Water

Guarantee

We stand by our native plant material and our ecological restoration services.

Native plants that we install are guaranteed to establish during the first growing season. Any plant material that does not make it through the first growing season will be replaced at no charge to the client.

On projects that we install and manage, we will guarantee successful establishment of your ecological restoration within three full growing seasons. This proposal provides a plan for accomplishing the restoration of the project site. If successful establishment does not occur within three growing seasons, all necessary steps will be taken to ensure the eventual success of the project, at no additional charge. For purposes of this guarantee, successful establishment is defined as follows: That the presence of at least 80% of the original seeded or planted species can be found on the site, and that the overall density of vegetation is comprised of no less than 80% native species.

The only exceptions to this guarantee have to do with plant death due to acts of God (floods or drought) the actions of others (vandalism), or animal herbivory (e.g., geese, muskrats). Watering by the owner during dry periods is necessary, and the lack of adequate watering in this circumstance may nullify this guarantee.

If these extreme circumstances do happen to occur, we will work with the client at a reduced rate to make all necessary repairs.

Our goal will always be to create successful, long-term partnerships with our clients. Our guarantee is the best in the business, and provides you with a clear understanding that we are here to fully support your ecological restoration endeavor.

Contract

- A down payment of \$6,229.00 is required to schedule your project.
- The remainder of the project cost is due at project completion. Any unpaid amount beyond the 30 day period after billing will incur a 3% monthly finance charge.
- *Please note that this proposal is valid for 30 days from the date on this Contract.*

If you would like to proceed with the above outlined project, please sign the contract below.

Client name: _____

Contract Value: \$12,458.50

Signed: _____

Date _____

Contractor: **Natural Shore Technologies, Inc.**

Signed:

Contract Date: Contract Date for 30 Day term



William M. Bartodziej, M.S.

Senior Restoration Ecologist, Natural Shore Technologies

Please return a signed copy of this contract and a check to:

Natural Shore Technologies, Inc.
6275 Pagenkopf Rd.
Maple Plain, MN 55359



Using Ecology to Restore Land and Water



MNL (Minnesota Native Landscapes)
 8740 - 77th Street NE
 Otsego, MN 55362
 763-295-0010
info@MNLcorp.com
www.MNLcorp.com

Herman, Kristi
 1520 S. Birch Lake Blvd
 White Bear Lake, MN 55110
 Kristi
 612-203-2423 khermanhill@gmail.com

MNL Project #:
Prepared by: Tony Rieger-Borer
MNL Division: Construction
Quotation Date: 6/14/2023
Revision Date:

Project Name: Krist Herman Hill
Project Location: White Bear Lake, MN 55110

Category	Description	Qty.	Unit	Unit Price	Total
Site Preperation	Site preperation tasks - Herbicide treatment	1	Lump	\$ 466.78	\$ 466.78
Site Preperation	Site preperation tasks - 2nd herbicide treatment	1	Lump	\$ 466.78	\$ 466.78
Site Preperation	Site preperation tasks -Prepare seed bed	1	Lump	810	\$ 810.00
Erosion Control	Erosion Control Measure - 6" coir logs used to create a lip/edge to keep wood mulch in place when and if the waves get close to	120	Lin. Ft.	25	\$ 3,000.00
Live Plant Installation	Installation of live plants - 2.5" plugs	540	Each	\$ 7.72	\$ 4,170.41
Landscape Services	General Landscape Tasks - Installation of Twice Shredded	14	Cu. Yds.	\$ 150.00	\$ 2,100.00
				\$ -	\$ -
				\$ -	\$ -
				\$ -	\$ -
				\$ -	\$ -
				\$ -	\$ -

Project Notes: **Grand Total** \$ 11,013.96

Pricing does not include prevailing wage rates.
 Pricing assumes the project area is as shown on the attached map/plan.
 Pricing based upon plans, designs, &/or specs. provided to MNL by others.
 MNL is not liable for project delays due to situations beyond our control.
 Pricing assumes access and parking for crew and equipment.
 Pricing does not include any permits.

Pricing good for: 30 Days
Terms: 30 Days Net Invoice

Accepted by: _____ **Provided by:** Tony Rieger-Borer
Date: 6/14/2023

Heal the Earth



MNL Sedge Meadow Mix

Designed for wet/saturated sites and low-lying areas. Height 2-6'

	Scientific Name	Common Name	% of Mix	Seeds/Sq Ft	PLS lbs/ac	Bloom Season	
Grasses:	Calamagrostis canadensis	Blue-joint Grass	0.30	2.16	0.02		
	Elymus virginicus	Virginia Wild Rye	10.00	1.08	0.70		
	Glyceria grandis	Reed Manna Grass	2.75	5.64	0.19		
	Glyceria striata	Fowl Manna Grass	1.00	2.31	0.07		
	Leersia oryzoides	Rice Cutgrass	5.00	4.37	0.35		
	Poa palustris	Fowl Bluegrass	4.00	13.37	0.28		
Sedges/Rushes:	Carex comosa	Bottlebrush Sedge	4.00	3.09	0.28		
	Carex hystericina	Porcupine Sedge	6.00	4.63	0.42		
	Carex crinita	Fringed Sedge	1.50	1.33	0.11		
	Carex scoparia	Pointed Broom Sedge	4.95	10.69	0.35		
	Carex stipata	Awl-fruited Sedge	5.00	4.37	0.35		
	Carex vulpinoidea	Fox Sedge	8.00	16.66	0.56		
	Juncus dudleyi	Dudley's Rush	0.10	8.23	0.01		
	Schoenoplectus tabernaemontani	Softstem Bulrush	1.15	1.27	0.08		
	Scirpus atrovirens	Green Bulrush	1.00	11.83	0.07		
	Scirpus cyperinus	Woolgrass	0.25	10.93	0.02		
Forbs:	Acorus americanus	Sweet Flag	7.50	1.27	0.53	Summer	
	Alisma subcordatum	American Water Plantain	2.50	3.86	0.18	Summer	
	Amorpha fruticosa	False Indigo	1.75	0.22	0.12	Summer	
	Anemone canadensis	Canada Anemone	0.50	0.10	0.04	Spring	
	Asclepias incarnata	Swamp Milkweed	6.50	0.80	0.46	Summer	
	Bidens cernua	Nodding Beggarstick	2.00	1.08	0.14	Summer	
	Boltonia asteroides	False Aster	0.40	1.65	0.03	Fall	
	Doellingeria umbellata	Flat-topped Aster	0.15	0.26	0.01	Fall	
	Eutrochium maculatum	Joe-pye Weed	0.75	2.33	0.05	Summer	
	Eupatorium perfoliatum	Boneset	0.20	0.82	0.01	Fall	
	Helenium autumnale	Sneezeweed	0.50	1.67	0.04	Fall	
	Iris versicolor	Northern Blueflag Iris	2.00	0.07	0.14	Spring	
	Liatris pycnostachya	Prairie Blazing Star	2.25	0.64	0.16	Summer	
	Lobelia cardinalis	Cardinal Flower	0.20	2.06	0.01	Summer	
	Lobelia siphilitica	Great Blue Lobelia	0.25	3.21	0.02	Summer	
	Lythrum alatum	Winged Loosestrife	0.20	4.86	0.01	Summer	
	Mimulus ringens	Monkey Flower	0.25	14.78	0.02	Summer	
	Physostegia virginiana	Obedient Plant	0.25	0.07	0.02	Summer	
	Pycnanthemum virginianum	Mountain Mint	0.20	1.13	0.01	Summer	
	Solidago riddellii	Riddell's Goldenrod	0.80	1.91	0.06	Fall	
	Solidago uliginosa	Bog Goldenrod	0.20	0.75	0.01	Fall	
	Sparganium eurycarpum	Giant Burreed	9.00	0.12	0.63	Summer	
	Symphyotrichum novae-angliae	New England Aster	1.10	1.87	0.08	Fall	
	Thalictrum dasycarpum	Purple Meadow Rue	0.75	0.39	0.05	Summer	
	Verbena hastata	Blue Vervain	1.00	2.39	0.07	Summer	
	Vernonia fasciculata	Ironweed	3.70	2.28	0.26	Summer	
	Veronicastrum virginicum	Culver's Root	0.10	2.06	0.01	Summer	
				100.00	154.59	7.00	

Seeds/sq ft: 155.00
 Grass Species: 6
 Sedges/Rushes: 10
 Forb Species: 27

Seed mixes are subject to change based on availability



MNL Wet Prairie Mix

Mixed height prairie mix for wet but not saturated soils. Height 3-6'

	Scientific Name	Common Name	% of Mix	Seeds/Sq Ft	PLS lbs/ac	Bloom Season
Grasses:	Andropogon gerardii	Big Bluestem	14.00	4.11	1.12	
	Calamagrostis canadensis	Blue-joint Grass	0.25	2.06	0.02	
	Bromus ciliatus	Fringed Brome	4.00	1.29	0.32	
	Elymus virginicus	Virginia Wild Rye	19.00	2.34	1.52	
	Glyceria grandis	Reed Manna Grass	2.50	5.86	0.20	
	Glyceria striata	Fowl Manna Grass	1.00	2.64	0.08	
	Leersia oryzoides	Rice Cutgrass	6.00	5.99	0.48	
	Panicum virgatum	Switchgrass	7.50	3.09	0.60	
	Sorghastrum nutans	Indian Grass	13.00	4.58	1.04	
	Spartina pectinata	Prairie Cordgrass	4.00	0.78	0.32	
Sedges/Rushes:	Carex comosa	Bottlebrush Sedge	0.75	0.66	0.06	
	Carex stipata	Awl-fruited Sedge	1.15	1.15	0.09	
	Carex vulpinoidea	Fox Sedge	1.25	2.98	0.10	
	Juncus dudleyi	Dudley's Rush	0.10	9.40	0.01	
	Scirpus atrovirens	Green Bulrush	0.25	3.38	0.02	
	Scirpus cyperinus	Woolgrass	0.25	12.49	0.02	
Forbs:	Anemone canadensis	Canada Anemone	0.35	0.08	0.03	Spring
	Asclepias incarnata	Swamp Milkweed	4.50	0.63	0.36	Summer
	Boltonia asteroides	False Aster	0.50	2.35	0.04	Fall
	Desmodium canadense	Showy Tick-trefoil	1.25	0.20	0.10	Summer
	Eutrochium maculatum	Joe-pye Weed	0.50	1.77	0.04	Summer
	Eupatorium perfoliatum	Boneset	0.50	2.35	0.04	Fall
	Heliopsis helianthoides	Common Ox-eye	2.25	0.42	0.18	Summer
	Heracleum maximum	Cow Parsnip	1.25	0.10	0.10	Summer
	Hypericum pyramidatum	Great St. Johnswort	0.70	3.91	0.06	Summer
	Liatris pycnostachya	Prairie Blazing Star	2.15	0.69	0.17	Summer
	Lythrum alatum	Winged Loosestrife	0.20	5.55	0.02	Summer
	Mimulus ringens	Monkey Flower	0.20	13.52	0.02	Summer
	Physostegia virginiana	Obedient Plant	0.65	0.21	0.05	Summer
	Pycnanthemum virginianum	Mountain Mint	0.20	1.29	0.02	Summer
	Silphium perfoliatum	Cup Plant	2.15	0.09	0.17	Summer
	Solidago riddellii	Riddell's Goldenrod	0.50	1.37	0.04	Fall
	Solidago uliginosa	Bog Goldenrod	0.30	1.28	0.02	Fall
	Symphytotrichum novae-angliae	New England Aster	1.20	2.33	0.10	Fall
	Thalictrum dasycarpum	Purple Meadow Rue	1.25	0.73	0.10	Summer
	Verbena hastata	Blue Vervain	0.75	2.05	0.06	Summer
	Vernonia fasciculata	Ironweed	2.00	1.41	0.16	Summer
	Veronicastrum virginicum	Culver's Root	0.15	3.53	0.01	Summer
	Zizia aurea	Golden Alexanders	1.50	0.48	0.12	Spring
			100.00	109.16	8.00	
Seeds/sq ft:	109.00					
Grass Species:	10					
Sedges/Rushes:	6					
Forb Species:	23					

Seed mixes are subject to change based on availability

Stream & Ditch Bank Stabilization Estimator Version 2.1

SOIL = sand (1), silt (2) clay(3), peat(4)	<input type="text" value="1"/>	SD SOIL density lbs/ft ³ tons/ft ³	<input type="text" value="110"/> <input type="text" value="0.055"/>	1 110 2 X 3 X 4 X	CF P Correction Factor	<input type="text" value="0.85"/>	1 0.85 2 X 3 X 4 X
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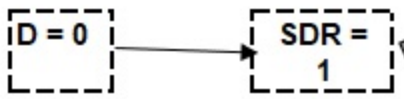
VOLV
volume voided (ft3)

YR
number of years
to erode bank to
current position

SLB = SD*VOLV/YR
Soil Loss Before (Tons/yr)
=
**SLR Soil Loss Reduction
Tons/yr**

SEDR =
SLB*SDR =SLB * 1
(= SLR)
**Sediment Reduction
(Tons/yr)**

PR =
SEDR *(1.0 Lb/Ton)*CF
P reduction (Lbs/yr)



= input

= calculated value

= result

ENTER THIS DATA ON eLINK INDICATORS TAB	
SEDIMENT (TSS) T/yr:	4.84
SOIL (estimated savings) T/yr:	4.84
PHOSPHORUS (est. reduction) lbs/yr:	4.11