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An outline of the suggested materials and procedures to be used to restore native flora to illegal ATV trails within the Duluth Parks System, Duluth MN

A. Scenarios:

- a. Disturbance to habitat or project area minimal. Erosion potential minimal. Seeding only. Costs based on ½ mile trail repair increments.
- b. Disturbance to habitat or project area moderate, Erosion potential moderate. Smoothing and seeding required. Costs based on ½ mile trail repair increments.
- c. Disturbance to habitat or project area severe, fill needed. Erosion potential severe. Smoothing and seeding required. Costs based on 300 ft. trail repair increments.

B. Site Preparation:

Scenario (a):

1. Lightly till the soil to create an open seedbed.
2. Harrow or rake the soil to create a firm, smooth seedbed.

Scenario (b):

3. Smooth the trail by mechanical means. Typically this would involve scraping existing soil into ruts from edges with a backblade and/or front-end loader.
4. Lightly till the soil to create an open seedbed.
5. Harrow or rake the soil to create a firm, smooth seedbed.

Scenario (c):

6. Add topsoil to heavily damaged areas. Bring trail up to original grade of the adjacent landscape.
7. Lightly till the soil to create an open seedbed.



8. Harrow or rake the soil to create a firm, smooth seedbed.

C. Seed and Seeding:

All Scenarios:

1. Seeding dates shall be in the spring or summer before August 16 or in the fall between September 20 and freeze-up.
2. All seed shall be applied by broadcasting.
3. In areas too steep or small, the seed shall be broadcast and raked into the soil.
4. A harrowing or raking shall follow all grass seeding.
5. The seed mixes shall be determined from the existing plant communities adjacent to project area. On average, the sites could consist of the following seed mixes and amounts:

Note: When calculating seeding rates, it is assumed that average trail width= 8ft.
Therefore ½ mile trail has a project area size of approximately ½ acre.

Grasses **lbs. per 1/2 mile trail section**

Northern upland meadow mix

5% Bluejoint grass, 35% Poverty oat grass, 50% Red fescue,
and 10% Slender wheat grass, by bulk weight..... 20 OR

Northern wet meadow mix

10% Redtop, 5% Big bluestem, 5% Fringed brome,
48% Bluejoint grass, 10% Wild rye, 10% Fowl meadow grass,
4% Green bulrush, 5% Wool grass, 2% Giant bur-reed,
and 1% Cord grass, by bulk weight..... 20

Note: A wheat or oat cover crop will be sown along with the native grasses at a rate of approximately 25 lbs. per acre.
Wheat is an annual grass species that germinates quickly and will reduce the risk of soil erosion on the site.

Wildflowers **oz. per 1/2 mile trail section**

Northern upland flower mix:

4% Yarrow, 4% Calico aster, 16% Large-leaved aster,



1% Fireweed, 2% Northern bedstraw, 2% Stiff sunflower,
6% Common ox-eye, 2% Prairie rose, 35% Black-eyed susan, 12% Gray goldenrod,
6% Stiff goldenrod, 10% Golden alexanders, all by bulk weight..... 12 OR

Northern wet flower mix:

2% Yarrow, 2% Canada anemone, 2% Swamp milkweed,
10% Panicked aster, 4% Red-stalked aster, 8% Flat-topped aster,
4% Marsh marigold, 18% Joe-pye weed, 6% Grass-leaved goldenrod,
2% Giant sunflower, 2% Common ox-eye, 2% Great St. John's wort,
8% Broad-leaved arrowhead, 2% Early goldenrod, 2% Swamp goldenrod,
6% Tall meadow rue, 16% Blue vervain,
and 4% Golden alexanders, all by bulk weight..... 12

D. Erosion Control:

Scenario (a):

Cover crop will be sown along with the native grasses at a rate of 25 lbs/acre.

Scenario (b):

2. Cover crop will be sown along with the native grasses at a rate of 25 lbs/acre.
3. All areas should be mulched with clean straw at the rate of 1.5 tons per acre.
4. Small or inaccessible areas shall be hand mulched.

Scenario (c):

5. Cover crop will be sown along with the native grasses at a rate of 25 lbs/acre.
6. Erosion blanket (\$150 or equivalent) should be applied as per manufacturer's directions to designated areas.
7. All area not blanketed should be mulched with clean straw at the rate of 1.5 tons per acre.
8. Small or inaccessible areas shall be hand mulched.

E. Costs:

Scenario (a):

Site prep, seed and seeding as specified.

\$1600.00 per ½ mile trail



Scenario (b):

Site prep, seed, seeding and mulching as specified \$2000.00 per ½ mile trail

Scenario (c):

Site prep, seed, seeding and erosion control as specified \$3500.00 per 300 ft. trail

F. Notes:

Due to differing site conditions and project locations, the quotes given here are should only be used as estimates and averages. Only by a thorough, site specific evaluation can true costs be determined.

Restoration outline prepared by Prairie Restorations, Inc. (PRI), Princeton, Minnesota
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