



# Rural Roadside Strategy Pilot

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Process and Learnings



County of Huron | 2024  
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## Land Acknowledgement

We acknowledge that the land we stand upon today is the traditional territories of the Anishinaabe, Haudenosaunee, and Neutral peoples and is connected to the Dish with One Spoon wampum, under which multiple nations agreed to care for the land and its resources by the Great Lakes in peace.

We also acknowledge the Upper Canada Treaties signed in regards to this land, which include Treaty #29 and Treaty #45 ½.

We recognize First Peoples' continued stewardship of the land and water as well as the historical and ongoing injustices they face in Canada. We accept responsibility as a public institution and as treaty people to renew relationships with First Nation, Métis, and Inuit people through reconciliation, community service, and respect.

We acknowledge that the land we stand on holds a deep history of Indigenous land stewardship and a meaningful connection with the environment. We recognize the key role that Indigenous land stewardship plays in protecting and maintaining the biodiversity of the plant and animal species on the land in which we reside. This project aims to help restore and preserve some of the crucial biodiversity traditionally maintained and managed by Indigenous Peoples and taken from them through ongoing processes of colonization.

## Acknowledgments

This entire document and pollinator habitat creation process was designed using guidance from the Canadian Wildlife Federation's staff, and "Managing Rights-of-Way for Pollinators: A Practical Guide for Managers" (2020) document, Lanark County's experience and the Pollinator Partnership "Technical Manual for Maintaining Roadsides for Pollinators establishment, restoration, management and maintenance: a guide for State DOT Managers and Staff" (2016).



## Background

As part of the County's Corporate Climate Change Adaptation Plan, goal 2 and goal 4 outline the County's desire and commitment to invest in modifications to improve the resiliency and capacity of the County's infrastructure and natural assets to the impacts of climate change. One of the actions that complement this goal is to create a strategy to enhance the aesthetics of rural towns/hamlets, increase traffic calming, and expand green infrastructure for climate adaptation and mitigation.

The Rural Roadside Strategy Pilot project will focus on creating pollinator habitat and removing invasive species within and adjacent to the road's right-of-way. The pilot project will help to gain insight and expertise on the best management strategies to control invasive species and establish pollinator habitats in the county. The pilot project will allow County staff to determine which control measures are most effective for the invasive species present along County roads, experiment with native seed mixes, and respond to other variables that may arise to develop a more comprehensive roadside management strategy.

### Pollinator Habitat



Pollinator species are declining in North America due to climate change, the use of pesticides/herbicides, the spread of diseases, and land use changes that lead to a loss of habitat. This decline in pollinator species can have adverse impacts on native ecosystems and agricultural production throughout Ontario.

Pollinators and their habitat provide a diverse range of economic and environmental benefits to a community, including:

- Providing pollen to ensure the reproduction and fruit development of flowering plants
- Sustaining native plants and habitats that humans depend on
- Increasing the yields of different crops, especially fruits and vegetables
- Lower long-term maintenance cost with less herbicide use and mowing required
- Increasing carbon sequestration in the deep root systems of native plants, and lowering greenhouse gas emissions from mowing reduction



- Increase soil stabilization while decreasing erosion
- Water filtration and slower release of precipitation into the stormwater systems
- Reduce snow drift across roadways, particularly near open fields and agricultural land
- Increase tourism through the beautification of roadsides

To create beneficial and impactful pollinator habitats, a diverse selection of native species will help to ensure they have the resources they need to survive such as food and shelter. Pollinators consume nectar from flowering plants throughout the entire growing season. When pollinators move from plant to plant, they often transfer pollen which fertilizes the plant and promotes fruit and seed development for the following generation of flowers. Pollinators are very easy to accommodate as they often nest in woody plants and grasses, create nests in the soil, or lay eggs on particular plant species.

## **Right-of-Way**

The county rights-of-way (ROW) are the perfect location to create pollinator habitat as ROWs are typically open, sunny, and underutilized areas that require low-lying vegetation to ensure the visibility, and safety of motorists using the roadways. Currently, Huron County manages 775 km of roadways through mowing and herbicide use. The ROWs are mowed twice a year on both sides of the roads which equals out to 3100 km of mowing a year. The traditional ROW management practices create frequently disturbed and monoculture environments that have allowed invasive species to dominate over native species in the area. As herbicides are then used to control the spread of the invasive species during the growing season, this can harm native flowering plants that provide food and shelter to pollinator species.

Reducing the frequency, timing, height, and amount of area mowed on the ROW can improve pollinator habitat and potentially aid in the management of invasive species. Mowing once a year, ideally in spring or autumn, can promote the growth of native species during the flowering season while controlling the growth of any woody species. In addition, it is recommended to mow as little of a ROW as required to maintain a clear zone as this will ensure that pollinators can forage and nest in the unmown vegetation while considering the safety of motorists. The reduction in mowing along County ROWs will lead to reduced maintenance time and cost for the County's Public Works staff and ideally lower the amount of herbicide that is required to manage invasive species long-term.

## Pilot Locations

The first step to creating an impactful pollinator habitat is to choose appropriate, and beneficial locations. To select appropriate locations, County staff considered the following:

- Prevalence of invasive species;
- Visibility to the public;
- Proximity to county-owned properties;
- Current maintenance and monitoring regime;
- Proximity to additional habitats; and,
- Additional benefits to ecosystem services.

With these aspects considered, County staff chose to create pollinator habitat in two locations adjacent to currently established County forests. Huron County is located within the Great Lakes-St. Lawrence Forest region of Ontario. The fourteen established County forests provide nature-based solutions to climate change mitigation and adaptation, along with several ecosystem services including:

- Storage of greenhouse gases
- Moderating temperature
- Providing habitat for species and protecting biodiversity
- Natural stormwater drainage and air quality improvements
- Improving surface water quality
- Managing soil erosion of neighbouring properties
- Improving public health and mental wellbeing

As with many rural roads, the roadsides along some of the County forests are impacted by the rapid spread of invasive species which threaten the diversity and integrity of these forest ecosystems and the services they provide to the community. The county forests offer valuable natural assets, and positive community values as they are widely used by Huron County residents, making them the ideal locations to pilot pollinator habitat in Huron County.

Benefits of creating pollinator habitats adjacent to County forests:

- Regular maintenance and monitoring of the site is currently practiced by county staff;
- Prevention of further invasion into the forest;

- High community visibility;
- Increases the aesthetic appeal of this location; and
- Long-term decrease in maintenance time and costs

## **Invasive Species**

Many invasive species, such as those present at Stevenson and Adams Tracts, are optimal competitors in highly disturbed and open areas that can be found along ROWs. If left unmanaged, these invasive plants will consume roadsides and forest edges which can outcompete or crowd out the native species within the forest. Invasive species management adjacent to County forests will ensure continued forest conservation and protection of edge habitats most vulnerable to invasion. One major challenge in invasive species removal is the potential for other invasive species to establish in these disturbed soils and newly opened canopy. The strategic method, timing, and planting of native wildflower species following invasive species removal will help to minimize this risk.

The four main invasive species the County will manage as part of this pilot project in order of current prevalence are *common and glossy buckthorn*, *common periwinkle*, and *wild chervil*.

## **Mortality of Pollinators**

Pollinators will travel to where flowers are present, both native and invasive plants. While pollinator habitat adjacent to roadsides has the potential to be harmful and lead to mortality, there are positive aspects of these locations:

- Roadsides provide a large amount of space for potential habitat;
- Roadsides provide food, and nesting for pollinators in undisturbed soils;
- Roadsides can connect fragmented habitats; and,
- Larger pollinators are not as impacted by turbulence and noise of roadways.

Best practices for reducing pollinator mortality along roadsides include:

- Focus on creating habitat along low-volume or low-speed roads;
- Avoid creating habitat within vegetated medians; and,
- Focus on restoring one side of the road to avoid pollinators traveling across.



## Stevenson Tract

Stevenson Tract is located near the village of Brussels on Morris Line, just east of Clyde Line in the Municipality of Morris-Turnberry. Currently, Stevenson tract is affected by extensive glossy and common invasive buckthorn and periwinkle along the roadsides and into the forest edge.

**Proposed pilot location:** The entire length of the forest's frontage on Morris Road, approximately 865 meters long and extends on both the east and west side of the Maitland River (as shown in *Figure 1*) with an area of 0.36 hectares (0.88 acres) of pollinator habitat creation.

Location for Stevenson pilot site shown along Morris Road near Brussels.



## Adams Tract

Adams Tract is located near the village of Gorrie, on Gorrie Line just south of Creamery Road in the Township of Howick. Currently, Adams Tract is impacted by several invasive species including common and glossy buckthorn, invasive phragmites, and wild chervil. Many of the buckthorn along the Adams Tract are well established, reaching 2-3 metres in height (*Figure 2*).



**Proposed pilot location:** The entire length of the forest's frontage on Gorrie Road, approximately 980 meters long (shown in Figure 3) with approximately 0.64 hectares (1.59 acres) of pollinator habitat.



Location for Adams pilot site shown along Gorrie Road near Gorrie.

## Native Seed Selection

To select regionally adapted species, Huron County used a [native seed calculator](#) developed by the Canadian Wildlife Federation which is geared towards each eco-region in the province of Ontario. Seeds were purchased from [Northern Wildflowers](#) based in northern Ontario after receiving several competitive quotes.

Seed selection was based on Northern Wildflowers' availability, and they attempted to balance native species traditionally found in Huron County with species that can adapt to future changing climates. In addition, the native species chosen to represent a variety of pollinator habitats for foraging and nesting purposes, and the timing of each species' flowering season was considered to ensure there are wildflowers available from the spring to early fall.

## Site Preparation

### Existing Conditions

An inventory of existing vegetation was taken to identify any native desirable species that should be left on site. Local native vegetation experts from Maitland Valley Conservation Authority (MVCA) came to both sites on July 31, 2023, to identify the existing vegetation on both sites. MVCA staff outlined which species may grow better or worse in those areas based on what is growing. In addition to vegetation cover, MVCA staff conducted preliminary pollinator surveys at both sites to understand what existing pollinators visited these sites before the deliberate creation of a wildflower habitat.

### Seeding Process and Equipment

Site preparation is key to ensuring the area provides the best opportunity for the wildflower seeds to be established. Wildflower seeds need direct contact with the soil over the winter to ensure they can grow the following spring/summer.

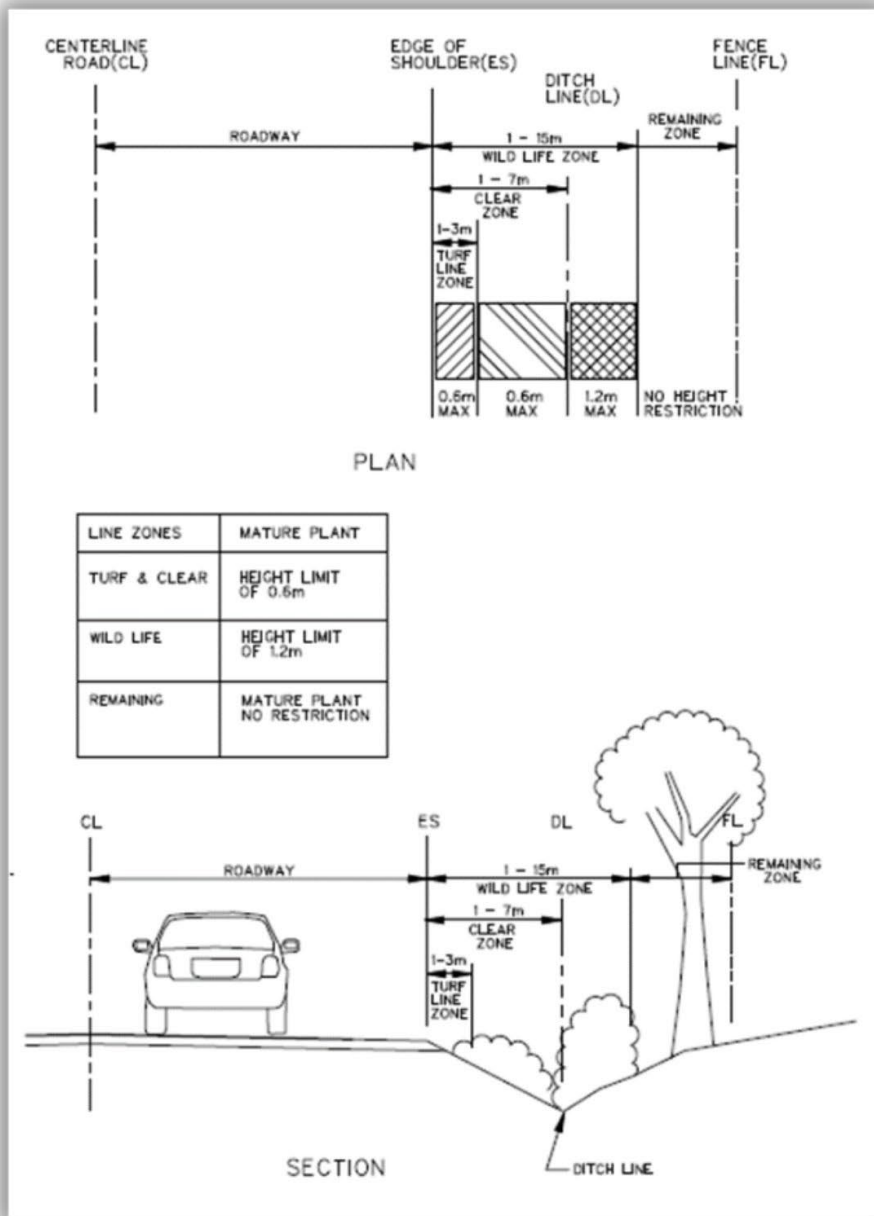
The process that the County took to prepare our ROW sites for seeding is as follows:

#### 1. Spring Mowing

Mowing was done in the spring/early summer by the public works staff as part of their current bi-annual mowing practice.

Using the CWF recommended planting zones (see *Figure 10*), County staff left a 7-ft section of grass adjacent to the roadway that will continue to be mowed twice a year by public works staff to maintain visibility.





Recommended planting zones within the right-of-way, including the maximum height of plants that are permitted within each zone.

## 2. Summer Invasive Species Spraying

To manage the *common and glossy buckthorn*, County staff chose to spot spray herbicide, Garlon, on the bark of the stem to kill the plants before they seed out to minimize the seed bank that was left in the soil. All spot spraying was conducted by Ausable Bayfield Conservation Authority staff and the County Forester who is licensed in its application.

All the common and glossy buckthorn along the forest edge, ROW, and 10 meters into the forest were sprayed on July 10<sup>th</sup> at Stevenson Tract and July 31<sup>st</sup> at Adams Tract. After 1 week, the buckthorn die-off was noticeable and by September 1<sup>st</sup>, the buckthorn at Adams Tract was brown and wilted (see *Figure 8*). While applying Garlon to common and glossy buckthorn, staff took away these key learning:

- Backpack spraying of Garlon was not as beneficial in the forest's edge as there were thick areas of brush – the 3-litre canisters of Garlon were easier to maneuver in these situations, and;
- Garlon has increased in price making it less financially obtainable – could be worth exploring other options in the future for buckthorn management (such as a [fungal application](#) suggested by CWF staff)



The results of spot spraying Garlon on common and glossy buckthorn at Adams Tract in the summer of 2023.

To reduce the coverage and seed banks of *periwinkle* and *wild chervil*, which are both present in the ROW, a 3% Round-Up Weather Max was used along the frontage of both County tracts in the area that will be seeded with wildflowers. This version of Round-Up is a higher percentage which is supposed to adhere to the vegetation better leading to a better die-off result. While staff originally projected that two applications of Round-Up would be needed, after the first application in mid-July, staff were happy with the die-off results and chose not to apply more herbicide to the seeding areas (see *Figure 9* for visual on September 1). Based on the existing conditions, round-up was not applied to the entire ROW at Adams tract to maintain the beneficial pollinator species currently present (goldenrod, joe pye weed, etc.).

Visual results from one application of round-up at Adams (left) and Stevenson (right) Tracts.



### **3. Monitoring**

Staff continued to monitor the sites for the prevalence of invasive species and competition for native wildflower seeds. Staff were satisfied with the die-off caused by the herbicide application and therefore decided that a second application was not necessary.

### **4. Site Upkeep**

Before tilling or seeding, staff collected garbage along the ROW to ensure those materials would not be worked into the soil, impact the natural area, or create issues for the equipment. Altogether, staff collected 8 bags of disposed garbage along the 980m of forest frontage at Adams tract and 7 bags along the 850m of frontage at Stevenson tract.

Before using equipment at the site, public works staff used a chainsaw to manage any overhanging branches that would be in the path of the equipment or were significantly overhanging in the ROW.

### **5. Mowing, and Tilling**

Before seeding, the County wanted to ensure that the existing vegetation was removed from the area to prioritize seed-to-soil contact. A front-mounted flail mower was used on a skid steer by Public Work's staff to mow the ROW very close to the soil to break up the dead grasses that remained from the round-up application.





After the area was mowed, a Reist Rotorake was used to till the area that would be seeded to ensure adequate seed-to-soil contact could be made.

Reist Rotorake operated by a public works staff tilling the right-of-way at Adams Tract.



## 6. Seeding

Once the areas were mowed and tilled, staff used a hand broadcast seeder (opening #2) to spread the forbs seed mix onto the tilled ground. The forbs seed mix was divided up based on the area to ensure consistent coverage.

After broadcasting, the Reist Overseeder was attached to the back of a Kubota tractor to seed the grasses. The Reist Overseeder creates small holes in the ground in which the seeds fall in, followed by a roller to ensure minimal, but some, soil covers the seeds. As the grass and forb seeds overwinter on the site, staff wanted the seeds in the soil so they could not be easily blown or washed away with the remaining fall rain.

The Reist Overseeder did multiple passes to disperse the grass seeds along the ROW (opening at 4 on the machine). When the Overseeder had seeded the entire site, there was leftover grass seed at the Stevenson Tract that was used to prioritize a visible,



Hand broadcast seeder with dry wildflower seed mix and Reist Overseeder with grass seed at Stevenson Tract.

and open area along the ROW. Overall, it took approximately 4 hours to seed 0.36 hectares at Stevenson Tract once we knew the application rate of the equipment.

## 7. Follow-up Plantings

To fill in the tree gaps left from removing the buckthorn, native shrubs, and trees will be planted at both sites to reestablish the forest's edge. This will create competition for invasive species and provide additional pollinator habitat and food sources. The County Forester selected the native tree and shrub species to suit the soil conditions and locations using two nurseries in southern Ontario: Winkelmolen Nursery and Little Otter Tree Farm. In addition, 325 wildflower plugs were sourced from Verbinnen's Nursery and planted in the spring to ensure flowers were available for pollinators in the first year and to build the native wildflower seed bank for year two.

Wildflower  
plugs being  
planted at  
Stevenson  
Tract.



As soil conditions were never measured, the salt tolerance of the native tree, shrub, and wildflower species was not considered so we will need to continually monitor the impact of winter salt applications on their survival.

## 8. First-Year Monitoring and Maintenance

Staff have emphasized monitoring to better understand what is growing, what new species are present and to see if the seeds will germinate. Growth of any vegetation was slow at both sites in 2024 apart from wild carrot being prevalent at Adams Tract and periwinkle at Stevenson Tract. In August, staff noticed significant growth from the wildflower plugs, and the emergence of wildflower species from seed, particularly evening primrose and brown eyed susan, was evident within the ROWs. While staff considered mowing the area to reduce the wild carrot seed, the decision was made to leave the area to grow due to the presence of native wildflowers showing promise.



## Necessary Staff and Financial Contributions

The table below estimates staff and financial contributions for each step in the project. Time contributions include staff time of the project team, other departments, and other organizations (e.g., for herbicide application). Financial contributions include funding received from the Canadian Wildlife Federation but do not include staff salaries for the project team.

Steps	Time Contribution	Financial Contribution
<i>Project planning</i>	100 hours	-
<i>Herbicide application</i>	~65 hours	~\$4,000
<i>Site preparation + equipment rentals</i>	70 hours	\$3,000
<i>Seeding</i>	18 hours	\$4,500 (seed)
<i>Tree planting</i>	~200hrs	\$8,000 \$3,500 (trees)
<i>Wildflower plug planting</i>	21 hours	\$1,000

## Schedule and Project Timing

Steps	Timing
<i>Spring Mowing</i>	Spring 2023 (May-June)
<i>Summer Spraying</i>	
<ul style="list-style-type: none"> <li>• <i>Garlon Application</i></li> <li>• <i>Round-Up Application</i></li> </ul>	July 10 <sup>th</sup> & July 31 <sup>st</sup> 2023 August 22 <sup>nd</sup> 2023
<i>Monitoring</i>	End of August – Beginning of October
<i>Mowing And Tilling</i>	October 23-25 <sup>th</sup> 2023
<i>Seeding</i>	October 24-25 <sup>th</sup> 2023
<i>Continued Monitoring</i>	Ongoing
<i>Follow-up Plantings</i>	Spring 2024 (May-June)



## Species we Saw in Year One



European Honey Bee (*Apis mellifera*) on Common chicory (*Cichorium intybus*)

Common Evening Primrose (*Oenothera biennis*)



Monarch caterpillar (*Danaus Plexippus*) on Swamp milkweed (*Asclepias incarnata*)

Brown Eyed Susan (*Rudbeckia triloba*)



Great Blue Lobelia (*Lobelia siphilitica*)



# How the Sites Looked in Year One



## Adams Tract



- Wet site
- Naturally dominated by Tall, Canada and Late Goldenrod
- Wild Carrot is growing back
- Swamp Milkweed is growing from seed

- Dry site
- Tall and Canada Goldenrod are widespread
- Periwinkle is growing back
- Common Evening Primrose is growing from seed



## Stevenson Tract

## Lessons Learned

The purpose of conducting pilot locations was to understand the process and investigate best practices for our local conditions to know if this naturalization project should be replicated in other locations in Huron County. The following lessons were consolidated based on staff experiences, observations, and knowledge of the local area:

### General

1. Record preparation, planting process, and decision-making to ensure it can be replicated.

### Site Preparation, Seeding, and Planting

2. A no-till approach may be more appropriate in areas with large seed banks of invasive species to prevent them from germinating the following year.
3. Fallowing land for a year before seeding may be beneficial to ensure invasive species can be mowed, sprayed and soil can be tilled to diminish existing seed banks. The more time you have for invasive species management, the better.
4. Fall is the best time to plant wildflower seeds as they traditionally have higher germination rates than when seeded in the spring.
5. Planting winter wheat (at 10 kg/hectare) in the fall may create competition against invasive species and result in fewer invasive species in the first year.
6. Give yourself time and budget to get comfortable with new equipment and practices.
7. Wildflower plugs were a beneficial addition in year one for public perception and seed bank contributions.
8. Soil contact is critical for germination. To increase contact, ensure all dead or fallen debris is removed.



## Seed Mix

9. If nurse crops are added to a seed mix, ensure they are included at a low seed rate. This will ensure they do not dominate the site.
10. An application rate of 7-12kg/hectare is commonly used for native seed mixes. For areas with a large seed bank of invasive species, a higher application rate may be needed to compete.
11. The best practice is to include at least 20 forb/wildflower species in a native seed mix and a lower presence of grass seeds.
12. When receiving quotes for seed mixes, ask vendors to display the mix in seeds per square meter because the weight of each seed can vary.

## Partnerships and Engagement

13. Staff interest has grown as the project has developed and been implemented. Staff have started recognizing other appropriate locations for naturalization projects to reduce mowing.
14. Partnerships and knowledge sharing with industry experts is critical to success. They help provide expertise and resources as well as provide support and build credibility.
15. Take the initial time to learn from other organizations or municipalities with similar projects to reduce making similar mistakes.



## Appendix A – Seed Mix Composition

### Wet Mix applied to ROW at Adams Tract

What we ordered	What we got (wet mix)	Latin Name	% of mix
Green coneflower	<b>Grey headed Coneflower</b>	Ratibida Pinnata	5%
New England Aster	New England Aster	Symphyotrichum novae-angliae	5%
Sweet Oxeye	Oxeye Sunflower	Heliopsis helianthoides	5%
Blue Vervain	Blue Vervain	Verbena hastata	5%
Red (Swamp) Milkweed	Red (Swamp) Milkweed	Asclepias incarnata	4%
Boneset	Boneset	Eupatorium perfoliatum	2%
Grass Leaved Goldentop	<b>Great Blue Lobelia</b>	Lobelia siphilitica	5%
Wild Bergamot	Wild Bergamot	Monarda fistulosa	5%
Flat Topped Aster	White Flat Top Aster	Aster umbellatus	5%
Joe Pye Weed	Common Joe Pye Weed	Eupatorium fistulosum	5%
Rough Goldenrod	<b>Early Goldenrod</b>	Solidago juncea	5%
Evening Primrose	Common Evening-primrose	Oenothera biennis	5%
Smooth Beardtongue	Tall White Beardtongue	Penstemon digitalis	5%
Virginia Mountain Mint	Virginia Mountain Mint	Pycnanthemum virginianum	3%
Switchgrass	Switchgrass	Panicum virgatum	5%
Riverbank Rye	<b>Canada wild rye</b>	Elymus canadensis	5%
Virginia wild Rye	Virginia wild rye	Elymus virginicus	5%
Fringed Brome	<b>Little blue stem</b>	Schizachyrium scoparium	5%
Dark Fruited Rush	<b>Gray's sedge</b>	Carex grayi	5%
Fox Sedge	Fox sedge	Carex vulpinoidea	5%
Soft Stemmed Rush	Path rush	Juncus tenuis	5%

**Dry Mix applied to ROW at Stevenson Tract.**

<b>What we ordered</b>	<b>What we got (dry mix)</b>	<b>Latin Name</b>	<b>% of mix</b>
Common Milkweed	Common Milkweed	Asclepias syriaca	2%
Green coneflower	<b>Grey headed coneflower</b>	Ratibida Pinnata	5%
Arrow aster	<b>Calcio Aster</b>	Symphyotrichum lateriflorum	5%
Butterflyweed	Butterly milkweed	Asclepias tuberosa	2%
Heath aster	<b>Smooth blue aster</b>	Symphyotrichum Laevis	5%
Upland white goldenrod	<b>Canada goldenrod</b>	Solidago canadensis	2%
Wild bergamont	Wild bergamont	Monarda fistulosa	5%
Evening primrose	Common evening-primrose	Oenothera biennis	5%
Showy tick-trefoil	Canada (Showy) tick trefoil	Desmodium Canadense	5%
Bushclover	<b>Stiff goldenrod</b>	Solidago rigida	5%
Hairy pink beardtongue	Hairy penstemon	Penstemon hirsustus	5%
Wild columbine	Eastern columbine	Aquilegia canadensis	5%
Brown eyed susan	Brown-eyed susans	Rudbeckia triloba	5%
Virginia mountain mint	Virginia mountain mint	Pycnanthemum virginianum	3%
Big blue stem	Big Bluestem	Andropogon gerardii	5%
Canada rye	Canada wild rye	Elymus canadensis	5%
Little blue stem	Little blue stem	Schizachyrium scoparium	5%
Savannah grass	Indiangrass	Sorghastrum nutans	5%
Slender wheat	Slender Wheatgrass	Agropyron trachycaulum	5%
Switch grass	Switchgrass	Panicum virigatum	5%
Virginia rye	Virginia wild rye	Elymus virginicus	5%