



Prepared for Ecology on behalf of the Stormwater Workgroup by Washington State University

Goal & Background

Ditches—their maintenance and vegetation choices—represent an opportunity to improve stormwater quality. This work aimed to identify plant blends with the following characteristics: Fast establishment, low-growing, competitive with invasives, and lower long-term maintenance efforts. Six plant blends were evaluated at three sites that covered a ranged in sun exposure, slope, temperature range, soil quality and composition, existing site vegetation, and stormwater inputs.

Study goals for this project include:

- Quantify the percent establishment, quality ratings, and survival of plant blends.
- Identify plant blends for Washington ditches that establish quickly and outcompete invasives.

Stormwater management problem

Regraded roadside ditches present significant challenges for plant growth and establishment due to their harsh environmental conditions. Maintenance of these ditches is often prompted either by complaints from residents about invasive species or when jurisdictions determine that sediment buildup or excessive vegetation has compromised the ditch's ability to convey water effectively. Hundreds of miles of roadside ditches in Washington state provide an opportunity to gain efficiency of maintenance workloads if vegetation choices are optimized to limit invasive plants, prevent erosion, and maintain conveyance.

Project Findings

Across all the replicated planting cells at both sites, the WSDOT blend performed with the most consistent success for the duration of the study. Of this mix, perennial ryegrass and creeping red fescue effectively colonized in full sun and at the more xeric, shady site. Clover struggled to establish and could be removed from the blend. WSU Blend 1 showed performance nearly identical to the WSDOT blend, with the only notable difference being a slightly higher establishment rate for the WSDOT blend at Fife. The WSDOT blend could serve as an alternative if Chewings fescue seed in WSU Blend 1 becomes scarce. PT-442 BES Grassy Swale Native Mix, a commercially available blend of native grasses, consistently underperformed. Soil quality was lacking at both sites, which seemed to be a factor in this blend.

The study affirmed that blending is preferred—monoculture plantings are not recommended. Notably, certain species within the blends performed better during different phases of the growing season. WSU Blend 2 was slower to come out of winter dormancy but tolerated summer heat and drought stress well.

Specific grass species that performed well across the blends, site conditions, and growing season include fine fescues, bentgrass, and perennial ryegrass. Grass species that underperformed or struggled to establish included clover and yarrow. More research is necessary to develop blends that can successfully establish these species.

For more information, including the final report,
see the website at

ecology.wa.gov/sam

To request an ADA accommodation, contact Ecology by
phone at 360-407-6600 or email at
chelsea.morris@ecy.wa.gov, or visit
<https://ecology.wa.gov/accessibility>. For Relay Service
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Recommendations

Managers should consider site-specific factors when selecting a blend.

Ditch condition	Blend recommendation	Performance details	Blend mix
Native site, little-to-no weed competition or soil disturbance	PT-442	Blend struggles to establish in sites lacking topsoil and large adjacent weed seed quantities	25% Meadow Barley 15% California Oatgrass 10% Blue Wildrye 10% California Brome 10% Roemer's Fescue 10% Tufted Hairgrass 10% Spike Bentgrass 5% Water Foxtail 5% Slender Hairgrass
Wide range of ditch conditions	WSDOT	Fast establishing utility blend. The combination of perennial rye grass and strong creeping red fescue is effective at colonizing in full sun and more xeric sites	50% Perennial Ryegrass 40% Creeping Red Fescue 10% White Clover
Wide range of ditch conditions	WSU Blend 1	Could be used interchangeably with WSDOT blend, good for shady sites	50% Creeping Red Fescue 40% Chewings Fescue 10% Highland Bentgrass
Wide range of ditch conditions	WSU Blend 6	Could be used interchangeably with WSDOT blend, good for shady sites	50% Molate Red Fescue 40% Chewings Fescue 10% Redtop Bentgrass
Sites that will allow for extended establishment	WSU Blend 2	Hard and sheep fescues have slower growth, but the blend works well for areas with shade and drought	50% Hard/Sheep Fescue 35% Strawberry Clover 15% Yarrow
Full sun, regenerative sites	WSU Blend 5	Useful blend for sites inundated with bentgrass. Not recommended for shady sites	50% Redtop Bentgrass 50% Highland Bentgrass

Why does this study matter?

Ditches and their maintenance and vegetation choices represent an opportunity to improve stormwater quality. Using plants that can quickly establish after maintenance or reconstruction will limit bank erosion and transport of sediments and associated pollutants. If those plants are also low-growing and outcompete invasive plants significantly, then less frequent ditch maintenance and mowing will be needed.

What should stormwater managers do with this information?

Jurisdictions should consider site-specific factors when selecting a plant blend for roadside ditches. Future studies should consider incorporating flowering plants for pollinators and developing aggressive native blends that quickly colonize disturbed areas, enhancing biodiversity and water quality.

What will Ecology do with this information?

Ecology will consider updating the guidance for roadside ditch maintenance in the stormwater management manuals to recommend the preferred blends.