

Woodland Edge Northwest 36-412

Updated: 2023

This woodland edge mix has been designed for Northwest Minnesota in areas with dry to mesic soils and part sun for at least 50% of the day where land is being converted from other uses such as lawn, or agricultural fields like row crops or pasture.



Partners also include collaboration among Non-profits, Seed vendors, SWCD, Tribal Governments, Consultants, County and Cities. (See partners list on [website](#))

36-412 Woodland Edge Northwest Mix

Code	Common Name	Scientific Name	PLS lb/ac	% by PLS lb/ac	Seeds/ft2	% by Seeds/ft2
andger	Big Bluestem	Andropogon gerardii	0.41	1.22%	1.51	2.37%
boucur	Sideoats Grama	Bouteloua curtipendula	1.00	2.97%	2.20	3.46%
brocil	Fringed Brome	Bromus ciliatus	0.74	2.20%	2.99	4.70%
brokal	Prairie Brome	Bromus kalmii	1.02	3.03%	3.00	4.71%
calcan	Bluejoint Grass	Calamagrostis canadensis	0.06	0.18%	6.17	9.69%
danspi	Poverty Oats	Danthonia spicata	0.10	0.30%	0.92	1.44%
elycan	Canada Wild Rye	Elymus canadensis	1.00	2.97%	1.91	3.00%
elytra	Slender Wheatgrass	Elymus trachycaulus	1.00	2.97%	2.53	3.98%
elyvir	Virginia Wild Rye	Elymus virginicus	1.30	3.86%	2.01	3.15%
schsco	Little Bluestem	Schizachyrium scoparium	0.12	0.36%	0.66	1.04%
sornut	Indiangrass	Sorghastrum nutans	0.45	1.34%	1.98	3.12%
		Grasses Subtotal	7.20	21.40%	25.88	40.65%
achmil	Common Yarrow	Achillea millefolium	0.04	0.12%	2.62	4.11%
agafoe	Anise Hyssop	Agastache foeniculum	0.09	0.27%	2.98	4.67%
amocan	Lead Plant	Amorpha canescens	0.05	0.15%	0.22	0.35%
anevir	Tall Thimbleweed	Anemone virginiana	0.03	0.09%	0.31	0.48%
aqucan	Wild Columbine	Aquilegia canadensis	0.03	0.09%	0.42	0.66%
artlud	Prairie Sage	Artemisia ludoviciana	0.02	0.06%	1.84	2.88%
dalcan	White Prairie Clover	Dalea candida	0.08	0.24%	0.56	0.88%
dalpur	Purple Prairie Clover	Dalea purpurea	0.18	0.53%	0.99	1.56%
doeumb	Flat-topped Aster	Doellingeria umbellata	0.03	0.09%	0.74	1.16%
helhel	Ox-eye Sunflower	Heliopsis helianthoides	0.04	0.12%	0.09	0.15%
rosbla	Smooth Wild Rose	Rosa blanda	0.08	0.24%	0.08	0.12%
rudhir	Black-eyed Susan	Rudbeckia hirta	0.31	0.92%	10.48	16.45%
solpta	Upland White Goldenrod	Solidago ptarmicoides	0.06	0.18%	1.41	2.22%

solrig	Stiff Goldenrod	Solidago rigida	0.07	0.21%	1.05	1.66%
symlat	Calico Aster	Symphotrichum lateriflorum	0.02	0.06%	1.84	2.88%
thadas	Purple Meadow Rue	Thalictrum dasycarpum	0.19	0.56%	0.51	0.80%
zizaur	Golden Alexanders	Zizia aurea	0.13	0.39%	0.53	0.82%
		Forbs Subtotal	1.45	4.31%	26.65	41.86%
cover	Oats/Winter Wheat	Avena sativa/Triticum aestivum	25.00	74.29%	11.14	17.49%
		Cover Crop Subtotal	25.00	74.29%	11.14	17.49%
		Total	33.65	100.00%	63.67	100.00%

36-412 Woodland Edge Northwest Seed Mix Guidance

(MIX IMAGE)

Seed mix name: 36-412 Woodland Edge Northwest (Previously 36-411)

Geographic area: Tallgrass Aspen Parklands Province. Mn/DOT District 2(west)

Year of development: 2009

Year/s of update: 2023

Status (*Standard or Pilot mix*): Standard

Primary and Secondary Functions:

Primary – Partly shaded grassland planting for native roadsides, reclamation, etc.

Secondary – Carbon sequestration, wildlife habitat, emission reductions, water quality

Similar State Mixes: 36-212, 36-312, 36-712

Compatible NRCS Practice Standards: None

Compatible Minnesota CRP Practices: None

Suitable Site Conditions

Areas with dry to mesic soils and part sun for at least 50% of the day where land is being converted from other uses such as lawn, or agricultural fields like row crops or pasture.

How to Modify for Site Conditions and Goals

Use species substitution and diversity list to adjust as needed for site conditions. Use the [BWSR Seed Mix Substitution Table](#) when species are not available from vendors, or the landowner has alternative goals for the site.

Site Preparation

The primary goal of site preparation is to control weed species and provide ideal growing conditions for native seeds or plants to be installed. Preparation methods vary depending on the current site conditions. For example, sites with introduced perennial grasses require different suppression techniques than sites that have been farmed with row crops. Specific conditions should be considered when selecting site preparation techniques: unique biology of current (unwanted) vegetation, potential desirable and undesirable species in the seed bank, previous pesticide use on site, and potential for soil erosion. Annual cover crops or row crops can be used in preparation for a native planting, as long as they are not grown with persistent pesticides such as neonicotinoids or other long-lasting chemicals that may negatively impact pollinators or desirable vegetation establishment. For example, following soybean harvest, an un-tilled soybean field provides a good seedbed with potentially little plant residue for planting native prairie mixes. For fields where persistent chemicals have been used (including neonicotinoids or long-lived herbicides) it is recommended to plant a temporary cover crop for one or two

seasons to allow the chemicals to break down in the soil. For more details on organic or pesticide-free site preparation techniques, see the Xerces Society guide, [Organic Site Preparation for Wildflower Establishment](#).

Seeding Dates

Forb-dominated pollinator seed mixes can be installed in the spring or fall but fall dormant plantings allow seeds to naturally stratify and settle into the soil through periods of freezing and thawing over the winter. Spring seedings should be done on or around May 1-July 1 when soil temperatures are at least 60 degrees Fahrenheit or higher. Fall seeding should occur when soil temperatures fall below 50 degrees Fahrenheit for a consistent period of time (usually around October 15 in the northern half of the state and November 1 in the southern half of the state). Fall dormant seedings can help reduce weed pressure during the first year of growth because native cool-season grasses and forbs germinate earlier and start competing with weed species right away. Frost seedings are also an option if the snow cover is shallow, ice-free, and winds are calm. For a frost seeding, seeding rates may need to be increased by 25 -50 percent due to lower germination rates and loss of seed that is consumed by wildlife over the winter months.

Seedbed Preparation

Methods that are used to prepare a seedbed can vary depending on the type of seeding equipment to be used. If a traditional native seed drill will be used, a smooth, firm seedbed is required. Soybean fields usually are sufficiently prepared for a native seed drill. Corn fields should be raked and bailed if possible or light tillage should be used to remove leftover corn residue that would prevent sufficient seed to soil contact. Sites that were recently tilled will require additional soil treatment such as field cultivation, harrowing and rolling to prepare a firm seedbed and prevent seed from being buried too deep. Native seeds will have difficulty germinating if they are buried more than ¼" deep. Broadcast seeding can be conducted on soybean or corn fields; fields that have been disked, should be cultipacked or allowed to settle before seeding. Some practitioners have found that broadcast seeding on a smooth surface (not tilled or disked) leads to the establishment of higher diversity. It is important that the soil surface is not too hard packed, so cultipacking or light harrowing of crop fields before broadcast seeding may be needed. Seed can be lost on smooth surfaces, so it is recommended to seed into temporary cover crops or to roll sites after broadcast seeding. BWSR has seedbed preparation guidance based on current site conditions on our website: <https://bwsr.state.mn.us/habitat-establishment-management-resources>

Temporary Cover Crops and Mulch

Short-lived temporary cover crops can help stabilize project sites in preparation for planting native seed mixes. Cover crops such as oats (the most commonly used species) should be mowed to 10-12 inches before seeds mature (or harvested upon maturity) to prevent re-seeding. Other cover crops typically used in agricultural fields, such as buckwheat, winter wheat, sorghum sudangrass, and radishes, can help stabilize soil, build soil health, or provide weed competition as part of restoration projects. Residues from temporary covers should be minimized prior to seeding to increase seed to soil contact.

Seeding Methods

A variety of seeding equipment is used for upland pollinator plantings including broadcast seeders, no-till native seed drills, Brillion seeders and Trillion seeders. Specialized native seed drills can handle a wide variety of seed (fluffy, smooth, large and small) and low seeding rates. Conventional grain drills are not capable of handling diverse seed sizes and will not provide satisfactory results. Broadcast seeding is common for planting pollinator mixes. Broadcast seeding equipment should be used that is designed to spread mixes with different sized seeds (e.g., Vicon Seeders). NRCS recommends broadcast seeding at a rate of 1.5 times the normal seeding rate and cultipacking after seeding (based on Agronomy Tech Note 31).

Management Methods

Integrated Pest Management – Land managers and seed mix practitioners should utilize [Integrated Pest Management](#) in their efforts to establish and manage plantings. Integrated Pest Management, or IPM, is an environmentally sensitive approach to pest management that relies on the use of a combination of practices (conservation grazing, haying, prescribed burning, etc.) to successfully establish and manage native vegetation while minimizing the use of chemicals and accomplishing goals such as the protection and restoration of pollinators and other beneficial insects. Ultimately, using a variety of practices is the most effective, sustainable, and culturally appropriate way to achieve project goals.

Establishment Mowing – Mowing can be an important step in the establishment of upland prairie restoration sites that have high pressure from annual weeds. Mowing at least twice the first season and once the second season with a flail mower or stalk chopper (to prevent smothering plants) may be needed to decrease competition and to provide sufficient sunlight for seedlings. Haying is another method to remove mowed vegetation that prevents smothering of the new seeding. Mowing should be conducted before weeds mature and seed out and it is important that mowed vegetation does not smother the planting. Problematic weeds should be mowed to between five and eight inches before seed is allowed to set (usually as weeds reach 12-14 inches). Mowing height should be raised as native plants establish. Mowing too short can be detrimental to the outcomes of a successful planting. The timing and frequency of mowing should be planned to allow sufficient light to reach native plant seedlings and to prevent weed seed production. Some grassland managers see success without mowing but the need will vary depending on site conditions (such as soil productivity) and weed pressure.

Prescribed Burning – Prescribed burning is beneficial to remove thatch, control invading woody and invasive plants in prairies, fertilize the soil with ashes, stimulate seed germination and new plant growth, and increase diversity in plantings. Burning is typically initiated after the third or fourth years of establishment, after native vegetation is reaching maturity. Uplands benefit from burning every three to five years. The timing of a burn can help with management goals. Late spring burns are used to combat cool-season non-native species such as brome and reed canary grass. Burning a portion of the property each spring instead of an “all at once” burn will leave undisturbed nesting cover for ground nesting birds. Fall and spring burns should be alternated periodically to simulate natural variation. Burn plans are needed to define the details of how the burn will be conducted, who will be involved and for contingency planning. In many cases, permits are also required. It is recommended to only burn one-half or less of a project site at a time if they are large (over 50 acres), or don’t have any adjacent refuge such as other conservation lands adjacent to the site for wildlife species. Partial burns and burns that are patchy may also benefit pollinator populations if timed correctly (when pollinators are not actively foraging, or pollinators have pupated and are mobile).

Spot Mowing – After vegetation has established it may be beneficial to spot mow areas with invasive or noxious plants. Spot-mowing can slow some of the aggressive and fast-growing invasive plants while allowing the native species to become established. Spot-mowing should be done at a raised height between 4-6 inches in order to target the invasive plants and to not damage the native species. Spot-mowing for control of invasive or noxious weeds can be done every year to ensure planting health, even during 10 establishment years. Care should be taken to avoid mowing the planting too frequently or too aggressively, such as weekly or shorter than the recommended height as this can damage the native vegetation and cause the planting to fail. A list of noxious/invasive weed species that should be eradicated can be viewed at the Minnesota Department of Agriculture’s website.

Spot Management of Weeds – Problematic perennial weeds that cannot be managed effectively with other methods may require digging, pulling, smothering or spot treatment with herbicide for sufficient control. Examples include reed canary grass, smooth brome, quack grass, purple loosestrife, Canada thistle, Kentucky bluegrass, crown vetch, and birds-foot trefoil. These methods often are not conducted during the first year of establishment due to potential impact to native plant seedlings, but it may be important to control some weeds before they have a chance to spread. If herbicides will be used it is important that monitoring indicates that they

are needed, and treatments are made with the goal of removing only the target plant or plants. Herbicides should be selected and applied in a manner that minimizes risks to human health, beneficial and nontarget organisms, and the environment. For example, they should only be used when pollinators and other insects are not active (A common approach is to mow or graze invasive weeds in the summer followed by herbicide application in the fall). Minimize herbicide first year/spot spray year 2. Unless significant problem weeds show up.

What to Expect in Year 1

During the first year of establishment, many native grasses, sedges and flowers will remain about one to three inches tall. Mowing will help to keep agricultural weeds (foxtail, barnyard grass, ragweed etc.) managed so the native plant seedlings receive sufficient water and sunlight. The planting may have a somewhat weedy appearance in the first year (see establishment mowing paragraph above).

(IMAGE)

What to Expect in Year 2

During year two, some of the native grasses, sedges and flowers may reach their mature height and some of them may even flower. Depending on when the seeding was conducted (spring or dormant), there might also be many first-year native seedlings germinating alongside native plants that established the year prior. Mowing may still play a key role in managing weeds and allowing seedlings to grow.

(IMAGE)

What to Expect in Year 3 and Beyond

By the end of year three many of the native plants will be mature and should start flowering. There may be some species that are slow to establish and may not show up for several years.

Problem Solving

Poor Establishment After Year 1 – It is often difficult to determine if a seeding is successful during the first year as establishment may vary depending on weather conditions and some species may be slow to establish. It is typically best to wait until the second year to conduct any corrective actions. Look for species such as Black-Eyed Susan flowering in year 1 for confirmation the seeding was a success.

Poor Establishment After Year 2 – If native plant seedlings are not establishing about every one to two feet it may be necessary to inter-seed some species into the planting. If this is a concern it is recommended to inspect the site during the growing season to recommend what species could be supplemented.

High Annual and Biennial Weed Competition – Typically, annual and biennial weed competition is not a big problem in prairie plantings as they are short lived and as long as mowing is conducted before seed is set, they should not add additional seed into the planting.

High Perennial Weed Competition – Dense establishment of perennial species can be a problem as it can prevent the establishment of forbs. Prescribed burning, prescribed grazing, and/or herbicide application may be needed to manage perennial weeds.

Low Forb Diversity After Year 3 – If grasses and sedges are establishing successfully but there is a lack of forbs it is recommended to conduct inter-seeding of additional forbs in late fall or after a prescribed fire in spring or fall. See the [Xerces Society guide](#) for additional information about inter-seeding wildflowers.