

## Green Seattle Mix 2016: Background Information & Findings

Seeds Included:

*Lupinus polyphyllus* – Large Leaf Russel Lupine

*Lupinus bicolor* – Miniature Lupine

*Festuca roemeri* – Roemer's Fescue

*Bromus carinatus* – California Brome

*Elymus glaucus* – Blue Wildrye

*Lotus unifoliolatus* – American Bird's-foot Trefoil (Spanish Clover)

*Tellima grandiflora* – Fringecup

*Vicia americana* – American Vetch

*Solidago canadensis* – Canada Goldenrod

*Achillea millefolium* – White Yarrow


*Anaphalis margaritacea* – Pearly Everlasting

*Symphotrichum subsipacatum* – Douglas Aster


*Chamerion angustifolium* - Fireweed

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***Lupinus polyphyllus* – Large Leaf Russell Lupine (Bigleaf Lupine)**

<u>Characteristics/Description</u>	<u>Origins</u>	<u>Uses</u>
<p>The bigleaf lupine has white-pink to purplish-blue flowers, palmate leaves, and pea pods that contain seeds.</p> 	<p>Native to western North America and found from sea level to 2,200 m above sea level, the bigleaf lupine has also been distributed to parts of Europe, eastern Canada, and New Zealand. It is considered invasive in locations that are outside of western North America, but is locally naturalized in parts of Europe. In North America, this plant is invasive in the Midwest, North Central and Northeastern regions.</p>	<p>By attracting native bees, bumble bees, insects, and hummingbirds, the bigleaf lupine helps promote biodiversity of the sites it's located in. It is also a staple for many gardens because it is fragrant and has lovely flowers. It can be planted in order to restore prairies or wetlands, stabilize the soil and protect against erosion with their deep root systems, as well as revegetate previously logged areas to absorb excess nitrogen from the surrounding air.</p>
<u>Habitat</u>	<u>Planting</u>	<u>Management</u>
<p>Bigleaf lupine flourish typically in acidic, nutrient-poor mineral soils that are relatively moist, but do well in a climate that has both wet and dry seasons. These plants can be found in seasonally dry areas, marshy meadows, and wetlands, damp forests, along stream banks, ditches and in disturbed areas.</p>	<p>Common to legumes, the bigleaf lupine's seeds have hard exteriors and require scarification so as to promote even germination. To germinate, the seeds should be in moist to wet soil. Scarified seeds can be sown in fall or spring, but do best in early spring. For direct seeding, it is ideal to sow in the spring in 16- to 30-inch wide rows at 10-20 lbs per acre, at a depth of ½ to ¾ inch. By exposing the seeds to nitrogen-fixing bacteria (<i>Rhizobium lupine</i>), the growing success is greatly increased. The plant will reach maturity at the end of the first year and produce flowers the second year.</p>	<p>Ideal planting time is late fall, with access to some sort of water source or source of irrigation. Once that plants have reached maturity, they become self-sufficient and only require little-to-no irrigation. Aphids and powdery mildew can be potentially hazardous to the plants.</p>


***Lupinus bicolor* – Miniature Lupine**

<u>Characteristics/Description</u>	<u>Origins</u>	<u>Uses</u>
<p>The miniature lupine is distinctive from the bigleaf lupine due to its smaller size, two-toned blue and white flowers, and hairy palmate leaves. This plant also has pea pods which contain seeds.</p> 	<p>Found in western North America, the miniature lupine is most notably native to California, but is also found in surrounding states and areas.</p>	<p>Similar to the bigleaf lupine, the miniature lupine attracts native bees, bumble bees, insects, and hummingbirds, helping promote biodiversity of the sites it's located in. It is also a staple for many gardens because it is fragrant and has lovely flowers. It can be planted in order to restore prairies or wetlands, stabilize the soil and protect against erosion with their deep root systems, as well as revegetate previously logged areas to absorb excess nitrogen from the surrounding air.</p>
<u>Habitat</u>	<u>Planting</u>	<u>Management</u>
<p>Coastal, vernal wet, meadow, west-side forest, east-side forest, and disturbed areas are all locations in which the miniature lupine is able to inhabit. This is very similar to the bigleaf lupine in that both species are very versatile in each habitat.</p>	<p>Typically, the miniature lupine grows rapidly and lives for a year, with germination in early fall and flower blooms by late March, continuing through July.</p>	<p>Little to medium water exposure is most beneficial for the miniature lupine, as well as full sunlight.</p>


***Festuca roemerii* – Roemer’s Fescue**

<u>Characteristics/Description</u>	<u>Origins</u>	<u>Uses</u>
<p>Bunchgrass that is short, finely textured, with a dense bunch at the base. It can grow 35 to 100 cm tall.</p> 	<p>Found west of the Cascade and northern Sierra Nevada Mountains, up to British Columbia, in elevations ranging from sea level to about 2500ft that are mostly in areas of glacial outwash material.</p>	<p>This grass is restorative to upland prairie and oak savanna habitats by helping revegetate areas that have previously lost vegetation as well as aiding in erosion control. It can also be used as a nice cover crop in locations such as lawns, vineyards and/or young orchards.</p>
<p><u>Habitat</u></p> <p>Roemer’s fescue is mostly found in dry habitats as seen in prairies, savannas, meadows, and grassy openings within woods. The grass can tolerate dry summers and locations susceptible to fires.</p>	<p><u>Planting</u></p> <p>Fall seeding is usually best, as spring seeding results in flowering the second year of full growth. Roemer’s fescue likes full sun to partial shade and medium to fine textured soil. Seeds typically germinate within 8 to 10 days in a soil mixture of sphagnum peat moss, vermiculite, fine perlite, gypsum and dolomite lime.</p>	<p><u>Management</u></p> <p>Tolerant to drought and non-aggressive growth allows for this grass to be well-fit for being around other plants, such as the bigleaf and miniature lupine plants. Roemer’s fescue is well adapted to fire, but susceptible to stem and leaf rust which can severely weaken them.</p>


***Bromus carinatus* – California Brome**

<p><u>Characteristics/Description</u></p> <p>Tall, perennial bunchgrass with flat, coarse, broad and hairy leaf blades. Root system is well-branched and can root in shallow or deep soils.</p> 	<p><u>Origins</u></p> <p>Perennial grass mainly found from British Columbia and Alberta south to California and Mexico and eastward to Montana, Wyoming, Colorado, and New Mexico.</p>	<p><u>Uses</u></p> <p>Although a competitive plant, it is good for revegetating areas and helping in erosion control. Used also for rehabilitating areas that have experienced wildfires and mining, improving rangeland, and restoring upland plant communities. Although livestock, elk, deer, bears, geese, and various rodents feed off of California brome, it is a resilient plant that can withstand quite a beating. It does have a short longevity so it would not be ideal to have as the sole crop for a large expanse of land.</p>
<p><u>Habitat</u></p> <p>Mainly grows in open areas such as prairies, mountain slopes, meadows, coastal prairies, waste places, open woodlands, oak savanna, sagebrush, and chaparral from sea level to about 11,000ft elevation. Soils with good drainage are ideal for root growth.</p>	<p><u>Planting</u></p> <p>California brome is self-pollinating. Germinates quickly and successfully on both bare soil and from beneath the soil surface, during mid to late spring. Germination usually occurs 10 to 14 days.</p>	<p><u>Management</u></p> <p>Competitive and spreads seed easily, which gives it potential to be more of a weed. The plant is susceptible to head smut disease and seeds should be carefully checked to make sure they don't have the disease and treating with a fungicide.</p>


***Elymis glaucus* – Blue Wildrye**

<u>Characteristics/Description</u>	<u>Origins</u>	<u>Uses</u>
<p>Large perennial bunchgrass, with height getting up to about 5 feet. Only a few stems per plant. Similar to slender wheatgrass. Leaf color varies from green to blue green.</p> 	<p>Can be found in western North America from Alaska to Ontario and southward to New Mexico, northern Arizona, California, and Mexico in a variety of plant communities.</p>	<p>Provides larval food for the Chytonix moth, and good for streambank restoration, meadow and swale seeding. It can help restore burned or disturbed areas in forests or oak woodlands. Can withstand fire relatively well and helps support wildlife such as birds, mammals, and waterfowl.</p>
<u>Habitat</u>	<u>Planting</u>	<u>Management</u>
<p>Blue wildrye like open areas, native prairie lands, chaparral, woodland areas, as well as forests best. It is tolerant of alkaline soil, sand, clay, serpentine, and seasonal flooding, but likes nitrogen-rich soils best. You can find blue wildrye in cooler temperatures, in elevations from sea level to 11,000ft.</p>	<p>Best time to plant is during the fall in depths of about 1 cm and then covered with mulch. Sowing in the spring – from March through early May – is good timing. It is more successful in unmulched soils. Seeds usually mature in late spring to summer.</p>	<p>Nitrogen starter fertilizer is recommended at first and then a complete fertilizer when the seedlings are popping up through the soil. Trimming of the grass helps in regeneration. Prone to leaf rust.</p>

***Lotus unifoliolatus* – American Bird's-foot Trefoil (Spanish Clover)**


<u>Characteristics/Description</u>	<u>Origins</u>	<u>Uses</u>
<p>Usually has a single stem that is 8-18 in tall, with hairy branches. There are leaves on the main stem with a long stalk growing above the stem. These stalks have single white to pale pink flowers.</p> 	<p>Most places where the American bird's-foot trefoil can be found are in Siskiyou, Olympic National Park, West Gorge, and North Cascades National Park. It is native to these areas, but can be found in various locations around the United States.</p>	<p>The American bird's-foot trefoil is attractive to bees and butterflies, which is beneficial for the improvement of the biodiversity of the surrounding area and plants. It is also used by the Kawaiisu tribe as a spice in which they make a mat for the juniper cake, improving its flavor. The Miwok tribe uses the plant as a cooking agent by taking green leaves and pounding them with oily acorns to absorb some of the oil.</p>
<p><u>Habitat</u></p> <p>Normally found in habitats that vary in different types of soil consistency, the American bird's-foot trefoil can be found along roadsides, edges of moist place, coastal, subalpine, and west-side forest habitats.</p>	<p><u>Planting</u></p> <p>Unable to find planting information.</p>	<p><u>Management</u></p> <p>The American bird's-foot trefoil is an annual plant that flowers throughout the summer and into autumn.</p>

***Tellima grandiflora* – Fringecup**


<p><u>Characteristics/Description</u></p> <p>Fringecup usually has a hairy stalk with many small pink flowers. The stalk can grow to about two feet, with small pink flowers that have half-inch diameters. Leaves are staggered along the stalk but remain mostly toward the base of the plant.</p> 	<p><u>Origins</u></p> <p>Fringecup can be found in Siskiyou, Olympic National Park, Mt. Rainier National Park, North Cascades National Park, and West Gorge. It is native to these areas. It can also be seen in areas of Alaska all the way south to California, and very occasionally in eastern Washington and the Columbia Gorge.</p>	<p><u>Uses</u></p> <p>The fringecup attracts birds, butterflies, and bees, bringing a great amount of biodiversity to the areas that it inhabits.</p>
<p><u>Habitat</u></p> <p>The fringecup is commonly found in damp wooded areas, along streams from sea level to moderate elevations, in moist but well-drained soil such as sand, chalk and loam. It does not take to full sun or drought very well.</p>	<p><u>Planting</u></p> <p>Freely self-sowing and highly adaptable to surroundings. It germinates quite easily.</p>	<p><u>Management</u></p> <p>There is no concern of conservation of the fringecup. It is a very common, very resilient plant. Flowers bloom from April through to July. Leaves can be attacked by slugs, and the flower</p>




***Vicia americana* – American Vetch**

<p><u>Characteristics/Description</u></p> <p>Native, perennial, climbing vine. Single stems can grow 1 to 2 feet tall. Purple flowers, gathered together create pea pods that produce brown seeds.</p> 	<p><u>Origins</u></p> <p>Widely distributed west of the Mississippi River and in the northeastern United States.</p>	<p><u>Uses</u></p> <p>American vetch plants attract game birds, small mammals, black bear, grizzly bear, mule deer, horses, sheep and cattle, as well as insects. The plant helps with nitrogen fixation.</p>
<p><u>Habitat</u></p> <p>Grows in fine to medium textured soils that are either moist or dry in full sun. The American vetch enjoys living in swampy woods, road banks, fencerows, borders, mixed forests, meadows, foothill canyons, and clearings that have open patches.</p>	<p><u>Planting</u></p> <p>Fall is the best time to directly sow the American vetch seeds. The plant can also self-reseed. Scarification helps decrease germination time. Rye is a good friend for the American vetch because it can use the rye as a support.</p>	<p><u>Management</u></p> <p>Listed as an endangered plant in Maryland and can become invasive in some areas when it has not been managed well. For the large part, the plant plays nice with other wildflowers and rye plants that can be in the same area. The American vetch can only grow taller if it has a supporting structure nearby.</p>


***Solidago canadensis* – Canada Goldenrod**

<p><u>Characteristics/Description</u></p> <p>Canada Goldenrod is part of the sunflower family. Native, long-lived perennial that has stems covered with fine hairs at the top and are sharply teathed. Flowers at each stem are yellow.</p> 	<p><u>Origins</u></p> <p>The Canada goldenrod can be found in all states except for the southwest corner of the United States, Hawaii, and Canada. There are five different varieties of Canada goldenrod that can be found in different parts of the United States.</p>	<p><u>Uses</u></p> <p>Insects and bees like to pay visit to the Canada goldenrod like solitary wasps, pollen-eating beetles, oligolectic bees, and honey bees. This plant is good for revegetating a space that became empty or disturbed, as well as mine spoil reclamation, and soil stabilization.</p>
<p><u>Habitat</u></p> <p>This plant greatly enjoys life in areas that contain moist soil and moderate levels of organic matter. Your best bet to find this plant is in sites like damp meadows, waterways, and ditches, as well as dry, open slopes in prairies and forests.</p>	<p><u>Planting</u></p> <p>Seeds can be planted 0.3 to 0.6 cm deep in areas that don't contain weeds. Because these seeds are non-dormant, they can be planted in either the spring or the fall. Using the rhizomes from the plant, folks can help in the collection and cultivation of future plants.</p>	<p><u>Management</u></p> <p>The Canada goldenrod spreads through its seeds and rhizomes. These plant can be prevented from seeding by trimming off the flowers right before they reach full maturity. This plant is susceptible to pathogens powdery mildew, root rot, and needle blister rust. Blister beetles eat the pollen and flowers which can mess with the ability to mature to spread more seeds.</p>


***Achillea millefolium* – White Yarrow**

<p><u>Characteristics/Description</u></p> <p>One to several stems grow 8 to 16 inches tall. The white yarrow has leaves that are evenly distributed along the stem and get smaller towards the top of the stem. Flowers are white with some yellow and have a flattened dome shape.</p> 	<p><u>Origins</u></p> <p>The white yarrow can be found all over the North American Continent from the coast to alpine zones, as well as in Europe and Asia.</p>	<p><u>Uses</u></p> <p>Aside from attracting bees and insects to improve the biodiversity of the area it is inhabiting, crushing the plant creates a medicinal, healing ailment for wounds and burns. Dried leaves can be used as tea to soothe colds, fevers, and headaches.</p>
<p><u>Habitat</u></p> <p>White yarrow is mainly found in grasslands and open forests. Lack of moisture during the summer months keep the plants short and low to the ground.</p>	<p><u>Planting</u></p> <p>This plant naturally disperses its own seed. Although desiring of moisture, the plant can withstand drought fairly easily and can be planted ¼ inch in the soil during mid to late spring.</p>	<p><u>Management</u></p> <p>White yarrow has the potential to become invasive, while also being susceptible to mildew or root rot if the soil it is planted in does not drain well.</p>


***Anaphalis margaritacea* – Pearly Everlasting**

<p><u>Characteristics/Description</u></p> <p>Tall and herbaceous, with stems growing up to 3 feet tall. The leaves on the stem are long and skinny with hairy undersides. The flowers are yellow in the center with white petals surrounding it.</p> 	<p><u>Origins</u></p> <p>Pearly everlasting can be found in India, south Asia, and Europe as well as naturally in North America.</p>	<p><u>Uses</u></p> <p>This plant is also good for ailments of sores and can be boiled in tea or a steam bath for rheumatism, and smoked to treat colds, as well as increasing biodiversity of the surrounding area it is inhabiting by attracting bees and other insects.</p>
<p><u>Habitat</u></p> <p>The lovely pearly everlasting likes dry, stony, or clay-rich soils that normally occur in mountain meadows, prairies, and fallow fields.</p>	<p><u>Planting</u></p> <p>The plant can be propagated by dividing the root-ball of already grown pearly everlasting or directly sowing the seeds after the last frost. It does self-sow freely but relies on crosspollination as well.</p>	<p><u>Management</u></p> <p>This plant needs some water but can handle drought during the summer months and can easily colonize without fertilization. Fertilizing will cause the plant to rapidly spread.</p>

***Syphotrichum subspicatum* – Douglas Aster**

<p><u>Characteristics/Description</u></p> <p>Tall stems that grow up to 32 inches that have many toothed, hairy leaves and lovely purple-to-blue flowers.</p> 	<p><u>Origins</u></p> <p>This flower can be found in Mount Rainier National Park, Wallowas, Olympic National Park, West Gorge, and North Cascades National Park. It can also be found in coastal Alaska, northern British Columbia and parts of Alberta. Along with Washington, it can also be found in Oregon, northern California, Idaho and Montana.</p>	<p><u>Uses</u></p> <p>The douglas aster is especially attractive to butterflies and bees which benefit the biodiversity of the garden.</p>
<p><u>Habitat</u></p> <p>This resilient flower can grow on beaches and meadows, and also along streams at low to middle elevations. It can tolerate drought during the summer months.</p>	<p><u>Planting</u></p> <p>Douglas aster grows quickly and successfully from seed. It spreads nicely on its own and requires some moisture in the germination process. Flowering usually occurs in July through October.</p>	<p><u>Management</u></p> <p>This flower is quite drought resistant, grows quite easily, and requires little to no maintenance.</p>

***Chamerion angustifolium* – Fireweed**

<p><u>Characteristics/Description</u></p> <p>Tall wildflower with purple-red flowers staggered up one solid red stem that can grow 4 to 6ft high. It has long, skinny leaves that are also staggered up the central stem.</p> 	<p><u>Origins</u></p> <p>Fireweed can be found throughout the United States except in southeastern states, including Texas. It can also be found throughout Eurasia (and is the national flower of Russia).</p>	<p><u>Uses</u></p> <p>The plant is called fireweed because it can quickly grow and colonize areas that have been previously burned by fires. The flowers provide good nectar for pollinators and food for insects and butterflies.</p>
<p><u>Habitat</u></p> <p>This plant likes coastal to elevated climates that experience short, warm summers and long, cold winters. Soils that have been disturbed by fire are particularly appealing for the successful growth of the plant, as well as swamps, avalanche areas, riverbars, roadsides, waste locations, and old fields. It can also grow in forests, meadows, and grasslands.</p>	<p><u>Planting</u></p> <p>Flowers usually bloom from June through August and colonizes very quickly. Vegetative reproduction is the way to go for this flower. Fireweed can grow from cuttings or seeds. Seeds germinate rapidly in warm, well-lighted and humid conditions.</p>	<p><u>Management</u></p> <p>An aggressive plant, fireweed does not need much watering or care after seeds have germinated.</p>

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## **Findings**

*Introduction*

Replanting in urban restoration sites has a variety of unique factors; it can be challenging to find the right method in plant application after invasive species have been removed. There are pros and cons to each method of plant application. The advantages of seeds are that they are inexpensive compared to fully-grown plants, easier to handle, and a variety of seeds are readily available.

The disadvantages are that seed mixes have diverse species with differing germination and storage requirements. Table 1, listed below, compares a full list of advantages and disadvantages between plant materials in restoration planning.

When planting seeds, it is important to note where constraints, i.e. roads, utilities and structures are as well as vulnerability possibilities to dispersal limitation [on their own] and non-native seed predators (Oldfield, et al). Due to the various challenges, it is especially important to correctly apply the seed mix in the specified area.

#### *Best Seeding Time*

The Department of Ecology (DOE) found that for riparian restoration project sites, fall season planting both outperforms in growth and uses less water than spring planting. DOE suggest that the plants be installed in early October to mid-December due to more rainfall and time for roots to sufficiently grow and absorb moisture and nutrients for the soil. DOE states that the soil in the fall is aerated and warm, and since the winters are generally mild, the vigorous root growth occurs in late winter, or early spring (Washington Conservation Corps, p. 19). Although the DOE focused on riparian restoration sites with more mature plants, other sources have recommended similar seeding dates.

Dorner states that seeds should be planted at a time of year when there is a lot of moisture since the seeds require moisture in order to germinate. For many places, including Seattle, this time of year is typically fall or spring. However, if irrigation isn't accessible at the site, spring through summer for germination could have potential issues (Dorner, p. 46). The seeding should also occur soon after invasive species have been removed in order to minimize any soil erosion. If there is a significant amount of time in between site preparation and seeding, it is suggested that a cover crop be planted or mulch to be laid down to prevent erosion (Dorner, p. 19).

Since most native seeds will need a period of 'cold stratification' to germinate, planting in fall before leaf drop will be the most successful. By allowing the leaves to fall on top of the planted seeds, they will naturally protect the seed from the elements and naturally mulch the soil (Bohan).

#### *Raking and Roughing Soil*

The soil should be raked or roughed up using a pitchfork or broad fork in order to aerate the soil (Guide to Volunteer Organizations...). Other techniques include using a plow, gouge or ripping the soil's surface to its natural contours. By roughing the soil, it will increase the water infiltration and retention, reduce erosion and increase the aeration (Dorner, J. p. 47).

#### *Top Soil and Compost*

There are many seeding techniques that can be used to properly apply the seeds. Because a restoration site often has disturbed soils from the removal of invasive species, there is usually a loss of nutrients, soil structure, and ability to retain moisture. To amend the soil, it is important to add materials such as organic fertilizer, peat, lime or topsoil (Dorner, J p. 42). Topsoil should be implemented if removed or damaged during the invasive removal. Topsoil contains important microbes and invertebrate animals that help aerate the soil, retain soil structure and cycle nutrients (Dorner, J. p. 42). If the topsoil can be salvaged from the same site, that would be ideal. However, it should not be overly dried out or too high in moisture. If the soil must come from an outside site, it should be checked for weeds or weed seeds beforehand. If topsoil is not available but the soil needs more nutrients and structure, organic matter is a common recommended method.

Adding organic matter, such as weed-free mulch, can offer many benefits. The benefits include: reducing soil erosion, retaining moisture necessary for successful germination, physical protection from extreme temperatures, and a physical barrier so seeds aren't blown or washed away. Another reason why mulch is a good option is due to the slow release of nutrients. If nutrients are added too quickly, it could encourage weed growth. The slow release can maintain nutrient levels over a longer period of time and help the new plant community to establish its own nutrient cycle (Dorner, J. p. 42). Some common types of mulch materials are: leaves, weed-free straw or native hay, bio solids, wood chips or erosion-control fiber mat material. The mulch should be placed in a thin layer so the seeds are not buried too deep ("Planting the Site...").

The best approach to mulching a large restoration site is to divide it into zones and sheet mulch each zone individually. Sheet mulch refers to the application of 4 to 6 inches deep of mulch over an entire area (“2.2 Mulching”). In areas where the slopes are 15% or less, composted wood chips are a better alternative to mulch. The wood chips are not suitable for steeper areas of the park, but is an easier method than transferring large quantities of mulch into a difficult to reach area.

#### *Seed Protection*

Covering the seeds with shredded leaves or bark can help protect them from the elements. It is especially important to stabilize the soil temperature in order to provide a shelter for the seeds. The seeds should be protected from drying out, so placing them under deciduous trees or shaded areas is beneficial (“Growing Native Plants from Seed...”). The protection from shredded leaves or bark can also keep predators at bay and provide a barrier from other potential dangers (Dorner, J).

#### *Additives for Dispersal*

In order to amend poor soil, inorganic additives such as sand can increase drainage and balance the density of the soil. It is important to add an amendment that is uniform and made up of larger-sized particles. If high quality sand, containing a range of particle sizes, is added, the smaller particles will nest inside the larger ones and reduce the pore space.

The best amendment should have equal-sized particles so that when they touch each other inside the soil large pores will start to form. However, it is extremely difficult to have enough inorganic amendment in the soil to make a large difference. It is recommended that either new soil be brought into a site or that mulch is used in the planting location (Bassuk).

### *Photo Monitoring*

In order to establish consistency with photo monitoring, forming permanent photo points at each restoration site is most beneficial to record growth. By using wooden stakes in specified areas, sets of photos can easily be taken in the same location during site visits as the plants grow from seed (Washington Conservation Corps, p.13).



COMPARISON OF PLANT MATERIAL FOR RESTORATION PLANNING		
TYPE	ADVANTAGES	DISADVANTAGES
BALLED-IN-BURLAP	<ul style="list-style-type: none"> <li>Well-developed root systems increase chances of survival on site</li> <li>Provide shade and earlier establishment of upper canopy on site</li> </ul>	<ul style="list-style-type: none"> <li>Expensive</li> <li>Large and heavy to transport</li> </ul>
BARE-ROOT	<ul style="list-style-type: none"> <li>Less expensive</li> <li>Easier to transport to site, lightweight to carry around for planting</li> <li>Roots have not been restricted by containers</li> </ul>	<ul style="list-style-type: none"> <li>Require care not to let root systems dry out before planting</li> <li>Difficult to establish in dry sties or sites with warm, sunny spring seasons</li> </ul>
CONTAINER	<ul style="list-style-type: none"> <li>Well-established root systems with intact soil</li> <li>Provide “instant” plants on site</li> <li>Available in a variety of sizes, many are available year-round</li> </ul>	<ul style="list-style-type: none"> <li>Native soil not used in nursery, transplant shock may occur when roots try to move in to native soil</li> <li>Can be expensive</li> <li>Can be difficult to transport to and around site if large amount is used</li> <li>Can be difficult to provide irrigation until established, may actually require more maintenance than plugs</li> </ul>
LINERS/PLUGS/SEEDLINGS	<ul style="list-style-type: none"> <li>Well-established root systems with intact soil</li> <li>Easy to transplant, plant material pops out of containers easily</li> </ul>	<ul style="list-style-type: none"> <li>Same as above</li> <li>Smaller plants may take longer to establish, require more initial maintenance</li> </ul>
CUTTINGS	<ul style="list-style-type: none"> <li>Inexpensive to produce</li> <li>Cuttings may easily be taken on site or from nearby site</li> <li>Easy and light to transport</li> <li>Known to work well in rocky areas or areas difficult to access</li> </ul>	<ul style="list-style-type: none"> <li>No established root systems</li> <li>Timing of taking cuttings and planting them is important, varies among species</li> </ul>
SEED	<ul style="list-style-type: none"> <li>Inexpensive compared to plant material</li> <li>Variety of seed available commercially</li> <li>Easier handling than plant material</li> </ul>	<ul style="list-style-type: none"> <li>Seeds of different species have different germination and storage requirements</li> <li>Potential losses from birds, small mammals, etc. eating seeds on site</li> <li>Slower establishment on site</li> </ul>
SALVAGE*	<ul style="list-style-type: none"> <li>Can use plant material that would otherwise be destroyed</li> <li>Plant material could be local to site</li> <li>Relatively inexpensive</li> <li>Small or young salvage plants often adapt more readily to transplant than do mature specimens</li> </ul>	<ul style="list-style-type: none"> <li>Different native plants respond differently to being dug up, some loss could be expected</li> <li>Requires fairly intensive measures to protect plants and ensure they have adequate irrigation</li> </ul>

\* “SALVAGE” refers to the process of removing native plants from a site before ground disturbance at that site occurs. See the previous section, “*Sources of Plants*” to read more about plant salvaging techniques and requirements.

Table 1: A comparison of plant materials, including seeding (Dorner, J)

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*Forest Steward Field Guide Handout*

## GREEN SEATTLE SEED MIX 2016!!

### INGREDIENTS!

Large Leaf Russel Lupine

Miniature Lupine

Roemer's Fescue

California Brome

Blue Wildrye

American Bird's-foot Trefoil  
(Spanish Clover)

Fringecup

American Vetch

Canada Goldenrod

White Yarrow

Pearly Everlasting

Douglas Aster

Fireweed

### WHERE TO PLANT!

Ideal locations for this mix will be soils that are moist, fine to medium in texture and fully weeded. The little seeds in this mix are super tough, so they will be able to grow in many places that are open, or partially shaded!

### WHEN TO PLANT!

The perfect time for planting is during the April through May, when there is rain to help the seeds germinate and warmer weather to help them feel right at home!

### CARETAKING TIPS!

Since these plants are highly resilient, you don't need to do much! Occasional watering throughout the summer is nice if the weather is particularly hot. And positive vibes go a long way too!!!

### HOW TO PLANT!

Once there's an awesome spot to plant the seeds, then the seeds are ready to be planted! To do this, rake a pile of soil off to the side of the site (this will be to cover the seeds after they have been distributed). Then scatter away! Take a handful of seeds and let them fall out of your hand while you swing your arm side to side. This will create a light dusting on the exposed soil. Now it's time to tuck them in for the night! Cover the seeds with about ¼ inch of soil so they don't blow away. Fertilizer will help speed up the germination process, so go ahead and use it. Give the seeds a nice watering and watch them grow!!!

HAPPY  
PLANTING!!

