

Species Selection



Photo: Phil Czaplak (AK PMC)

American Sloughgrass (*Beckmannia syzigachne*) at the Kanuti pit materials site on the Dalton Highway

Section 3:

Adapted Plants

- *Eco-regions of Interior Alaska*
- *Vegetation Communities*
- *Revegetation Suggestions*

Plant Species

Adapted Plants

Selecting an appropriate species mixture



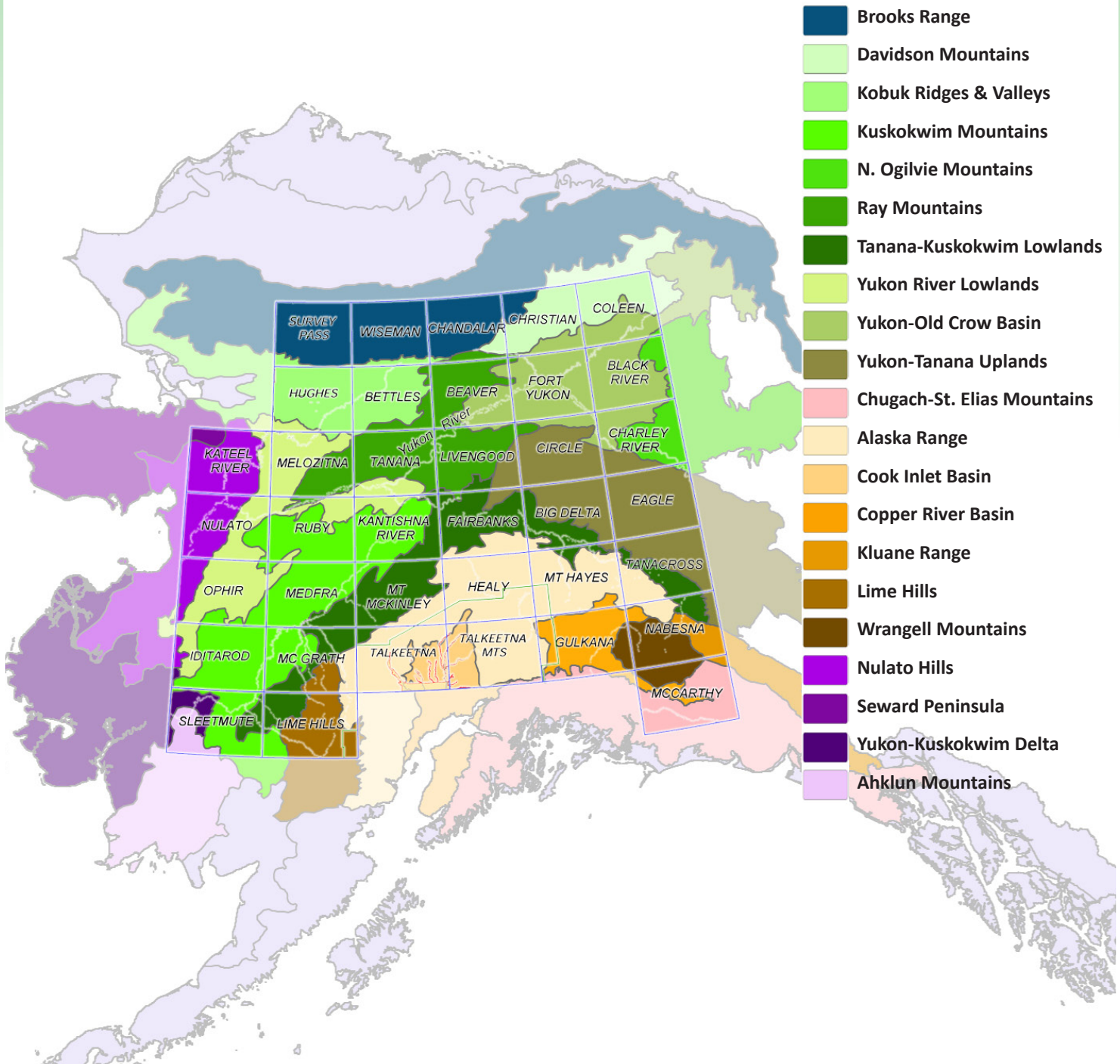
Photo: Stoney Wright (AK PMC)

A stand of sedge established on a rocky slope.

Species diversity is a critical component of successful revegetation. Predicting which species will grow at a site is an inexact science. Native plant varieties which are adapted to the region and the specific characteristics of the site are most likely to become established. The use of several different plant species increases the diversity of the stand, and increases the ability of the vegetated area to withstand unforeseen complications or changing site conditions. It is always prudent to use more than one species in a seed mix. The chart within this section can be used to develop adapted planting mixtures appropriate for Interior Alaska.

Eco-regions of Interior Alaska:

Alaska contains thirty-one unique eco-regions, defined as large areas of land and waters containing vegetation communities that share ecological dynamics, environmental conditions, and interactions that are critical for their long-term persistence. (Nowaki et. al., 2001). Sixteen of these regions are represented in Interior Alaska. Each eco-region of Alaska has a dominant vegetation community, and it is necessary to address the issue of revegetation in the context of these communities, as this will effect species selection and other planting requirements.



Vegetation Communities:

INTERIOR ALASKA



Photo: Phil Czapla (AK PMC)

This taiga landscape near Coldfoot is dominated by Spruce forest, characteristic of Interior Alaska

Interior Alaska ecosystem is classified as a boreal forest, or taiga. The climate is continental with extremes of temperature common. Long, cold winters can drop temperatures to -40°F , although this rarely lasts long. The summers, while short, are generally warm with a few 90°F days common around Fairbanks. Annual precipitation for the region is approximately 10-15 inches. There is little evaporation in summer due to melting snow, relatively low temperatures, and a permafrost layer. Marshes, wetlands, fens, and bogs are prevalent.

Vegetation in the Interior is dominated by conifer species of White and Black spruce. On river bars and recently burned areas with south facing slopes, broadleaf deciduous species of Alaskan Paper Birch, Balsam Poplar, and Quaking Aspen are common. North facing slopes and low lying areas tend to be wetter. Black Spruce and Tamarack, a deciduous conifer, are common trees growing in this poorly drained permafrost environment. Black Spruce is common after fire because the cones open and spread abundant seed. Heat is needed for Black Spruce cones to open and disperse seed. Grasses, sedges, mosses, lichens, and ericaceous (adapted to acidic soils) shrubs are also present. (Viereck & Little, 2007). Several shrub thicket types are also common in the Interior. Shrubs of willow and alder are found on the river floodplains across the region. Closer to the treeline, thickets consisting of birch, alder, and willow are prevalent (Viereck & Little, 2007).

Revegetation Suggestions:

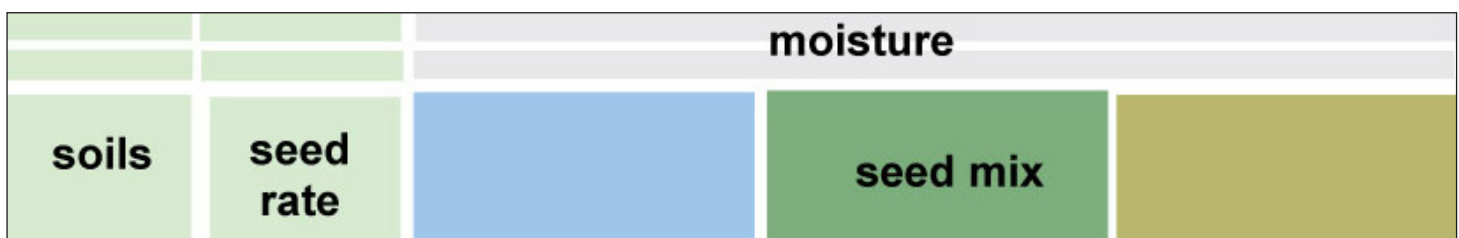
How to use the Species Chart :

1. Estimate soil moisture conditions. (**Saturated, Average, Very Dry**)
2. Select the soil type based on the Uniform Soil Classification engineering soil classification table. For more information about the Uniform Soil Classification System, refer to the 'Construction Site Considerations' section on page 11.

Uniform Soil Classification Table	
Symbol	Soil Type
GW	well-graded gravel
GP	poorly-graded gravel
GM	silty gravel
GC	clayey gravel
SW	well-graded sand
SP	poorly-graded sand
SM	silty sand
SC	clayey sand
ML	silt
MH	elastic silt
CL	lean clay
CH	flat clay
OL	organic clay/silt - low plasticity
OH	organic clay/silt -high plasticity
PT	peat - high organic

3. Select an effective seed mix from the primary and secondary species lists for the region.
4. **Primary Species**, selected from the primary species list, should account for 80–100% of the seed mix (relative weighting is indicated by a '1' or '2' preceding the species name on chart). If soil conditions at the site are uniform, a two or three species mix composed of exclusively primary species will suffice. Conversely, if soil conditions vary considerably, secondary species should be included as well.
5. **Secondary Species** represent the smallest percentage of a seed mix, often species that are costly or in short supply (indicated by a '3' on chart). Secondary material adds a degree of variability to the mix and is recommended to address special environmental concerns, such as stream crossings. Material for a given secondary species should not exceed 5% of the total mix.

6. Seeding rates for the entire mix are listed in the column "Seed Rate". This number is interchangeable for either lbs / acre or kg / hectare.
7. If the site is determined to be an erosion hazard, add no more than 10% Annual Ryegrass to the previously developed mix. This species, while giving temporary erosion protection, competes for nutrients with long-term perennial species. Also, Annual Ryegrass is a highly palatable forage species that can attract wildlife. Annual Ryegrass cannot be used in conjunction with Alpine Bluegrass (*Poa alpina*). The allelopathic effects of Annual Ryegrass will kill Alpine Bluegrass.



Revegetation Suggestion Chart Structure

Revegetation Suggestions:

INTERIOR ALASKA

Primary Species:

- 'Alyeska' **Polargrass**, *Arctagrostis latifolia*
- 'Kenai' **Polargrass**, *Arctagrostis latifolia*
- 'Egan' **American Sloughgrass**, *Beckmannia syzigachne*
- 'Nortran' **Tufted Hairgrass**, *Deschampsia caespitosa*
- Wainwright **Slender Wheatgrass**, *Elymus trachycaulus*
- 'Arctared' **Red Fescue**, *Festuca rubra*
- 'Boreal' **Red Fescue**, *Festuca rubra*
- 'Gruening' **Alpine Bluegrass**, *Poa alpina*
- 'Tundra' **Glaucous Bluegrass**, *Poa glauca*

Soil Group (Refer to Soil Type Chart)	Seed Rate (Refer to Directions)	Species/Cultivar Selection (Refer to Species/Cultivar Characteristic Chart For Category Ratings)		
High Organic		Suggest fertilizer only. If seeding is stipulated use suggestions for MH, CH, OH Mesic or Xeric depending on site.		
GW, GP		Suggest scarification and fertilizer only. If seeding is stipulated use suggestions for GM, GC soils and soil moisture.		
		Soil Moisture Characteristics		
		Saturated (Hydric)	Average (Mesic)	Very Dry (Xeric)
GM, GC	20	1 'Egan' American Sloughgrass 1 'Norcoast' Bering Hairgrass 1 'Alyeska' Polargrass 1 'Arctared' Red Fescue 2 'Nortran' Tufted Hairgrass 2 'Boreal' Red Fescue 2 'Kenai' Polargrass 2 'Gruening' Alpine Bluegrass 3 'Sourdough' Bluejoint Reedgrass	1 Wainwright Slender Wheatgrass 1 'Arctared' Red Fescue 1 'Gruening' Alpine Bluegrass 1 'Nortran' Tufted Hairgrass 2 'Alyeska' Polargrass 2 'Boreal' Red Fescue 2 'Norcoast' Bering Hairgrass 3 'Egan' American Sloughgrass 3 'Sourdough' Bluejoint Reedgrass	1 Wainwright Slender Wheatgrass 1 'Arctared' Red Fescue 1 'Gruening' Alpine Bluegrass 1 'Nortran' Tufted Hairgrass 2 'Boreal' Red Fescue 2 'Norcoast' Bering Hairgrass 3 'Sourdough' Bluejoint Reedgrass
SW, SP, SM, SC	40			
ML, CL, OL				
MH, CH, OH	30	1 'Norcoast' Bering Hairgrass 1 'Egan' American Sloughgrass 2 'Alyeska' Polargrass 2 'Gruening' Alpine Bluegrass 2 'Arctared' Red Fescue 3 'Sourdough' Bluejoint		

Revegetation Suggestions for Interior Alaska

Revegetation Suggestions:

INTERIOR ALASKA



Photo: Stoney Wright (AK PMC)

'Sourdough' Bluejoint Reedgrass, *Calamagrostis canadensis*

Interior Alaska is largely a temperate continental climactic zone. Mountainous eco-regions include the Davidson, Kuskowkim, North Ogilvie, Ray, and Wrangell Mountains, as well as the Brooks Range to the north and the Alaska Range to the south. Notable lowland areas include the Yukon River lowlands, Yukon - old crow basin, Tanana-Kuskokwim lowlands, and the Copper River basin. Additional eco-regions of the Interior are the Kobuk ridges and valleys, Yukon-Tanana uplands and the Lime hills.

The Alaska range is a barrier to north-south air movements and precipitation from maritime influences to the south, thus creating a transitional climate. Areas on the south side of the range receive precipitation amounts at least twice those measured on the north side. Temperatures on the south side of the Alaska range exhibit less seasonal temperature variation, tending to be warmer in winter and cooler in summer (Laursen & Seppelt, 2009).

Secondary Species:

- Twenty Mile **Boreal Yarrow**, *Achillea millefolium*
- 'Caiggluk' **Tilesius' Wormwood**, *Artemisia tilesii*
- 'Sourdough' **Bluejoint Reedgrass**, *Calamagrostis canadensis*
- Pioneer Peak **Nootka Reedgrass**, *Calamagrostis nutkaensis*
- Kobuk **Dwarf Fireweed**, *Chamerion latifolium*
- Jakutsk **Snowparsley**, *Cnidium cniidiifolium*
- Solomon **Thickspike Wheatgrass**, *Elymus macrourus*
- Safety **Viviparous Fescue**, *Festuca viviparoidea*
- Paxson **Alpine Sweetvetch**, *Hedysarum alpinum*
- Knik **Wild Iris**, *Iris setosa*
- Cantwell **Downy Wildrye**, *Leymus innovatus*
- **Annual Ryegrass**, *Lolium multiflorum*
- Black Rapids **Field Oxytrope**, *Oxytropis campestris*
- Franklin Bluffs **Nodding Locoweed**, *Oxytropis deflexa*
- Teller **Alpine Bluegrass**, *Poa alpina*
- Council **Arctic Bluegrass**, *Poa arctica*
- Nome **Glaucous Bluegrass**, *Poa glauca*
- Butte **Beautiful Jacob's Ladder**, *Polemonium pulcherrimum*
- Nelchina **Spike Trisetum**, *Trisetum spicatum*

Plant Species

for use in Interior Alaska

Revegetation Species	Page
Boreal Yarrow , <i>Achillea millefolium</i>	55
Polargrass , <i>Arctagrostis latifolia</i> [primary]	56
Tilesius' Wormwood , <i>Artemisia tilesii</i>	57
American Sloughgrass , <i>Beckmannia syzigachne</i> [primary]	58
Bluejoint Reedgrass , <i>Calamagrostis canadensis</i>	59
Nootka Reedgrass , <i>Calamagrostis nutkaensis</i>	60
Dwarf Fireweed , <i>Chamerion latifolium</i>	61
Jakutsk Snowparsley , <i>Cnidium cnidiifolium</i>	62
Tufted Hairgrass , <i>Deschampsia caespitosa</i> [primary]	63
Thickspike Wheatgrass , <i>Elymus macrourus</i>	64
Slender Wheatgrass , <i>Elymus trachycaulus</i> [primary]	65
Red Fescue , <i>Festuca rubra</i> [primary]	66
Viviparous Fescue , <i>Festuca rubra</i>	67
Alpine Sweetvetch , <i>Hedysarum alpinum</i>	68
Wild Iris , <i>Iris setosa</i>	69
Downy Wildrye , <i>Leymus innovatus</i>	70
Annual Ryegrass , <i>Lolium multiflorum</i>	71
Field Oxytrope , <i>Oxytropis campestris</i>	72
Nodding Locoweed , <i>Oxytropis deflexa</i>	73
Alpine Bluegrass , <i>Poa alpina</i> [primary]	74
Arctic Bluegrass (viviparous form) , <i>Poa arctica</i>	75
Arctic Bluegrass , <i>Poa arctica</i>	76
Glaucous Bluegrass , <i>Poa glauca</i> [primary]	77
Beautiful Jacob's Ladder , <i>Polemonium pulcherrimum</i>	78
Spike Trisetum , <i>Trisetum spicatum</i>	79

Plant species listed in this section are known to be useful in revegetation. Each species is listed with the most commonly available varieties and cultivars. Primary species; those which should compose the bulk of a seed mixture, are labeled with a tab on the outer edge of the page.



Boreal Yarrow, *Achillea millefolium*

Boreal Yarrow does well in coastal settings, but has sufficient adaptability to be useful in inland areas also. Yarrow has the ability to create the appearance of a natural meadow stand in reseeded areas; the presence of the white/cream flowers breaks up the usual homogeneity of grass plantings.

Boreal Yarrow is a colonizer, found in meadows and fields, in both wet and dry areas. It grows on soil and gravel. It is a long lived perennial.

ADAPTED COMMERCIAL VARIETIES OR RELEASES:

Twenty Mile selected class germplasm



Twenty Mile **Boreal Yarrow**, *Achillea millefolium*

Availability	Growth Form	Average Height	pH Range	Saline Tolerance	Drought Tolerance	Wet Soil Tolerance	Competitiveness
Poor	Sod	24 in.	6.0-8.0	Poor	Good	Good	Strong



Polargrass, *Arctagrostis latifolia*

Polargrass is a species that is ideal for forage and revegetation in Alaska (Mitchell, 1987). Polargrass is adapted to moderately wet areas (Wright, 1992). It is tolerant of low temperatures and acidic soils. Polargrass is a pioneer species in disturbed areas, especially those that are moist and acidic (Walkup, 1991). Polargrass does not grow well with competition.

ADAPTED COMMERCIAL VARIETIES OR RELEASES:

'Kenai' is from southern Alaska, and should be planted appropriately.

'Alyeska' is suitable for revegetation in western and arctic Alaska (Mitchell, 1980).



'Alyeska' **Polargrass**, *Arctagrostis latifolia*

Availability	Growth Form	Average Height	pH Range	Saline Tolerance	Drought Tolerance	Wet Soil Tolerance	Competitiveness
Fair	Sod	24 in.	4.9-6.8	Poor	Poor	Good	Weak

- **Hultén, E.** 1968. *Flora of Alaska and Neighboring Territories*. Stanford University Press, Stanford, CA
- **Mitchell, W.** 1987. Notice of Release of 'Kenai' Polargrass. *Agroborealis* Vol. 19, No. 1, p.5.
- **Walkup, C.** 1991. *Arctagrostis latifolia*. In: Fire Effects Information System, [Online]. USDA, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory. www.fs.fed.us/
- **Mitchell, W.** 1980. Registration of 'Alyeska' Polargrass, *Crop Science* Vol. 20, 671.



Tilesius' Wormwood, *Artemisia tilesii*

Tilesius' Wormwood is a broadleaf forb with a wide range of adaptations throughout Alaska (Wright, 1991). Tilesius' Wormwood is a perennial, non-woody sagebrush species. It has been found on many different soil types. Tilesius' Wormwood prefers full sun. The common name, stinkweed, refers to its smell when the leaves of *Artemisia tilesii* are crushed.

ADAPTED COMMERCIAL VARIETIES OR RELEASES:

'Caiggluk'



'Caiggluk' **Tilesius' Wormwood**, *Artemisia tilesii*

Availability	Growth Form	Average Height	pH Range	Saline Tolerance	Drought Tolerance	Wet Soil Tolerance	Competitiveness
Poor	Bunch	20 in.	4.0-8.5	Poor	Excellent	Good	Strong

- **Wright, S.** 1991. Registration of 'Caiggluk' Tlesy Sagebrush. Crop Science 31: 1380.

American Sloughgrass, *Beckmannia syzigachne*

American Sloughgrass has a high potential for wetland reclamation (Wright, 1991). Additionally, the species benefits wildlife by providing forage and seed for waterfowl. Revegetation and erosion control plantings in seasonally wet places between 60 degrees north latitude and the Arctic Circle will benefit from including Sloughgrass as part of the seed mix (Wright, 1991).

ADAPTED COMMERCIAL VARIETIES OR RELEASES:

'Egan'



'Egan' American Sloughgrass, *Beckmannia syzigachne*

Availability	Growth Form	Average Height	pH Range	Saline Tolerance	Drought Tolerance	Wet Soil Tolerance	Competitiveness
Good	Bunch	18 in.	5.5-7.5	Good	Poor	Excellent	Moderate

- **Wright, S.** 1991. Registration of 'Egan' American Sloughgrass. Crop Science 31, pp. 1380-1381.



Bluejoint Reedgrass, *Calamagrostis canadensis*

Bluejoint Reedgrass is found throughout Alaska on both dry and wet sites. Commercial availability can be limited, and the seed expensive. Bluejoint provides good erosion control because of its aggressive rhizomes and root structure. It can be used to successfully reclaim strip mine sites and oil spills. Bluejoint Reedgrass can thrive in very cold conditions.

ADAPTED COMMERCIAL VARIETIES OR RELEASES:

'Sourdough'



'Sourdough' **Bluejoint Reedgrass**, *Calamagrostis canadensis*

Availability	Growth Form	Average Height	pH Range	Saline Tolerance	Drought Tolerance	Wet Soil Tolerance	Competitiveness
Fair	Sod	36 in.	4.5-8.0	Poor	Good	Good	Strong

- **Mitchell, W.** 1980. Registration of 'Sourdough' Bluejoint Reedgrass, Crop Science Vol. 20, Sept.–Oct., 1980.



Nootka Reedgrass, *Calamagrostis nutkaensis*

Nootka Reedgrass is appropriate for revegetation throughout southeast, southcentral, and southern portions of Interior Alaska. Nootka Reedgrass is a perennial, tufted grass with short rhizomes. It grows in clumps, and requires wet soil (NRCS, 2007). This reedgrass species is found in bogs, marshes, and freshwater swamps.

ADAPTED COMMERCIAL VARIETIES OR RELEASES:

Pioneer Peak selected class germplasm



Pioneer Peak **Nootka Reedgrass**, *Calamagrostis nutkaensis*

Availability	Growth Form	Average Height	pH Range	Saline Tolerance	Drought Tolerance	Wet Soil Tolerance	Competitiveness
Poor	Sod	24 in.	5.5-8.0	Good	Poor	Excellent	Strong

- **USDA, NRCS.** 2007. *Calamagrostis nutkaensis* - Pacific reedgrass
The PLANTS Database (plants.usda.gov). National Plant Data Center, Baton Rouge, LA



Dwarf Fireweed, *Chamerion latifolium*

Dwarf Fireweed is a common species found on river gravel bars throughout Interior Alaska; hence it's other common name - river beauty. Dwarf Fireweed grows on sandy riverbars, roadsides, and foothills (Hunt & Moore, 2003). It prefers soil that is dry to medium-wet. Dwarf Fireweed is a natural perennial colonizer; it will live for several years and helps stabilize the soil.

ADAPTED COMMERCIAL VARIETIES OR RELEASES:

Kobuk selected class germplasm



Kobuk **Dwarf Fireweed**, *Chamerion latifolium*

Availability	Growth Form	Average Height	pH Range	Saline Tolerance	Drought Tolerance	Wet Soil Tolerance	Competitiveness
Poor	Bunch	12 in.	4.8-7.0	Poor	Poor	Good	Weak

- **Hunt, P. and Moore, N.J.** 2003. Propagation protocol for production of container *Chamerion latifolium* (L.) Holub plants; State of Alaska, Department of Natural Resources, Division of Agriculture, Palmer, Alaska. *In*: Native Plant Network., www.nativeplantnetwork.org (accessed 9 June 2004). Moscow (ID): University of Idaho, College of Natural Resources, Forest Research Nursery.



Jakutsk Snowparsley,
Cnidium cnidiifolium

Jakutsk Snowparsley is a colonizer found in meadows, hillsides, and riverbanks. It grows well on gravel and is adapted to arctic conditions, tundra and taiga (USDA, 2000). The plant is named “Jakutsk” after the capital city of Russia’s Sakha Republic - one of the coldest cities in the world, built on continuous permafrost.

The Alaskan swallowtail butterfly uses snowparsley as a host plant on which to lay its eggs (Murphy, 2004). When using Jakutsk Snowparsley for revegetation, animals which eat swallowtail caterpillars may become attracted to the project.

ADAPTED COMMERCIAL VARIETIES OR RELEASES:

Tok selected class germplasm is native to Interior Alaska.



Tok **Jakutsk Snowparsley**, *Cnidium cnidiifolium*

Availability	Growth Form	Average Height	PH Range	Saline Tolerance	Drought Tolerance	Wet Soil Tolerance	Competitiveness
Poor	Bunch	24 in.	6.6 - 8.4	Good	Good	Good	Strong

- **USDA, NRCS**, 2000. *Cnidium cnidifolium* - Jakutsk snowparsley. The PLANTS Database (plants.usda.gov). National Plant Data Center, Baton Rouge, LA



Tufted Hairgrass, *Deschampsia caespitosa*

Tufted Hairgrass grows well throughout Interior Alaska. Tufted Hairgrass is a cool season bunch grass. It will grow in most any soil. Tufted Hairgrass is found in moist or boggy areas. An arctic species, Tufted Hairgrass is well suited for many of Alaska's harshest environments. *Deschampsia caespitosa* is not recommended for revegetation of streambank areas, however, since the tufted fibrous roots provide limited bank stabilization (Mitchell, 1986).

ADAPTED COMMERCIAL VARIETIES OR RELEASES:

'Nortran'



'Nortran' **Tufted Hairgrass**, *Deschampsia caespitosa*

Availability	Growth Form	Average Height	PH Range	Saline Tolerance	Drought Tolerance	Wet Soil Tolerance	Competitiveness
Good	Bunch	20 in.	4.8-7.2	Poor	Good	Good	Strong

- **Mitchell, W.** 1986. Notice of Release of 'Nortran' Tufted Hairgrass. Agroborealis, July, 1986.



Thickspike Wheatgrass, *Elymus macrourus*

Thickspike Wheatgrass is a long lived perennial grass species, a colonizer and considered an indicator of site disturbance (Tsvelev, 1983). It is drought tolerant and well adapted to dry soils. Thickspike Wheatgrass can be found growing on open slopes, gravel or sand bars, and earth embankments in tundra and woodlands (Hultén, 1968). Thickspike Wheatgrass is quick to germinate and become established, allowing it to serve as a nurse plant for slower growing species (Sullivan, 1993).

ADAPTED COMMERCIAL VARIETIES OR RELEASES:

Solomon selected class germplasm



Solomon **Thickspike Wheatgrass**, *Elymus macrourus*

Availability	Growth Form	Average Height	PH Range	Saline Tolerance	Drought Tolerance	Wet Soil Tolerance	Competitiveness
Poor	Bunch	24 in.	6.6 - 8.4	Good	Good	Good	Strong

- **Tsvelev, N.N.** 1983. *Grasses of the Soviet Union*. Oxonian Press Pvt. Ltd. New Delhi, India
- **Hultén, E.** 1968. *Flora of Alaska and Neighboring Territories*. Stanford University Press, Stanford, CA.
- **Sullivan, J.** 1993. *Elymus macrourus*. In: Fire Effects Information System, USDA, www.fs.fed.us/database/feis.



Slender Wheatgrass, *Elymus trachycaulus*

Slender Wheatgrass is a natural colonizer, adapted to dry, rocky and gravelly soil. Slender Wheatgrass is the largest commercially produced perennial grass in Alaska, both in volume and in the number of producers. This species can be found on moist to dry soils, under trees and in full sun. Slender Wheatgrass grows on either alkaline or acidic substrate. Although it is short lived, Slender Wheatgrass can colonize and stabilize an area, thereby allowing other plants to subsequently become established.

ADAPTED COMMERCIAL VARIETIES OR RELEASES:

Wainwright selected class germplasm



Wainwright **Slender Wheatgrass**, *Elymus trachycaulus*

Availability	Growth Form	Average Height	PH Range	Saline Tolerance	Drought Tolerance	Wet Soil Tolerance	Competitiveness
Excellent	Bunch	20 in.	5.6-9.0	Excellent	Excellent	Good	Strong



Red Fescue, *Festuca rubra*

Red Fescue is outstanding for erosion control, although the overly aggressive, sod-forming nature of this species often makes the species unacceptable in reclamation. Red Fescue's aggressive nature may be utilized to prevent the invasion of native shrub species such as alder and willow.

Red Fescue is a colonizer of disturbed areas, and it provides long-term stabilization as well. It needs little maintenance, establishes quickly, and survives for many years. Red Fescue will survive in sun and shade; in cold and hot; in dry and moist; and in both acidic and alkaline soils.

ADAPTED COMMERCIAL VARIETIES OR RELEASES:

'Arctared' is the most winter-hardy Red Fescue variety. It is especially well adapted to the harsh arctic environment.

'Boreal' is adapted for use across Alaska.



'Arctared' **Red Fescue**, *Festuca rubra*

Availability	Growth Form	Average Height	pH Range	Saline Tolerance	Drought Tolerance	Wet Soil Tolerance	Competitiveness
Poor - Excellent	Sod	14 - 18 in.	5.0-7.5	Poor	Good	Good	Strong



Viviparous Fescue, *Festuca viviparoidea*

Viviparous Fescue reproduces by an asexual means called vivipary. Instead of producing seed, Viviparous Fescue produces small plantlets where the seed heads would be in other grasses. When these plantlets are sufficiently developed, they separate from the parent to fall to the ground. If the plantlet finds a suitable habitat, it will grow. Viviparous Fescue can be a colonizer in mountainous country. It may be found on alpine tundra and rocky slopes. If the purpose of a revegetation project is to stabilize soil in an arctic to sub-arctic area, then Viviparous Fescue could be a good choice.

ADAPTED COMMERCIAL VARIETIES OR RELEASES:

Safety selected class germplasm



Safety **Viviparous Fescue**, *Festuca viviparoidea*

Availability	Growth Form	Average Height	PH Range	Saline Tolerance	Drought Tolerance	Wet Soil Tolerance	Competitiveness
Poor	Bunch	6 in.	6.0-7.5	Poor	Excellent	Poor	Strong



Alpine Sweetvetch, *Hedysarum alpinum*

Alpine Sweetvetch is an easily recognized and frequently encountered legume. This species is most often found on dry, gravelly soils, especially near rivers. It is suspected of being a nitrogen-fixing species.

ADAPTED COMMERCIAL VARIETIES OR RELEASES:

Paxson selected class germplasm



Paxson **Alpine Sweetvetch**, *Hedysarum alpinum*

Availability	Growth Form	Average Height	pH Range	Saline Tolerance	Drought Tolerance	Wet Soil Tolerance	Competitiveness
Poor	Bunch	24 in.	6.0-8.0	Poor	Poor	Good	Strong



Wild Iris, *Iris setosa*

Wild Iris is best used on wet soil and in seed mixes with non-competitive grasses. Wild Iris can be found throughout most of Alaska in bogs, meadows, and on lake shores. It is also found in drier areas where the seed has taken hold.

ADAPTED COMMERCIAL VARIETIES OR RELEASES:

Knik selected class germplasm



Knik **Wild Iris**, *Iris setosa*

Availability	Growth Form	Average Height	pH Range	Saline Tolerance	Drought Tolerance	Wet Soil Tolerance	Competitiveness
Poor	Sod	12 in.	5.0-7.5	Good	Poor	Excellent	Strong



Downy Wildrye, *Leymus innovatus*

Downy Wildrye is a perennial found in low mountainous areas. It prefers sandy to gravelly soil that is moderately basic (Burton and Burton, 2003). Downy Wildrye's deep spreading rhizomes allow it to be a good soil binder. Its true value shows when used for revegetation on dry mine sites and south-facing cut and fill slopes. Lab tests have shown that Downy Wildrye grows well on soils saturated with oil, so it should be considered when revegetating disturbances where hydrocarbons have been spilled (Burton and Burton, 2003).

ADAPTED COMMERCIAL VARIETIES OR RELEASES:

Cantwell selected class germplasm



Cantwell **Downy Wildrye**, *Leymus innovatus*

Availability	Growth Form	Average Height	pH Range	Saline Tolerance	Drought Tolerance	Wet Soil Tolerance	Competitiveness
Poor	Bunch	24 in.	5.8-8.5	Good	Excellent	Good	Strong

- **Burton, C.M. and Burton, P. J., 2003.** A Manual for Growing and Using Seed from Herbaceous Plants Native to the Northern Interior of British Columbia. Symbiosis Research & Restoration, Smithers, British Columbia, pp. 63-66.



Annual Ryegrass, *Lolium multiflorum*

Annual Ryegrass provides a quick, temporary cover. It should be limited to 10% or less of a seed mix, because Annual Ryegrass uses nutrients intended for the perennial species in the mix. Also, a heavy plant cover can slow the growth of perennial species. Annual Ryegrass is very attractive to herbivores, which can increase the potential for vehicle / animal conflicts.



Annual Ryegrass, *Lolium multiflorum*

Availability	Growth Form	Average Height	pH Range	Saline Tolerance	Drought Tolerance	Wet Soil Tolerance	Competitiveness
Excellent	Annual	16 in.	5.0-7.9	Excellent	Poor	Good	Moderate

- **Hultén, E.** 1968. Flora of Alaska and Neighboring Territories. Stanford University Press, Stanford, CA.



Field Oxytrope,
Oxytropis campestris

Field Oxytrope is a legume adapted to rocky and gravelly dry soils. Field Oxytrope is an early colonizer of disturbed sites. As with most legumes, Field Oxytrope fixes nitrogen, and may increase soil fertility.

ADAPTED COMMERCIAL VARIETIES OR RELEASES:

Black Rapids selected class germplasm



Black Rapids **Field Oxytrope**, *Oxytropis campestris*

Availability	Growth Form	Average Height	pH Range	Saline Tolerance	Drought Tolerance	Wet Soil Tolerance	Competitiveness
Poor	Bunch	8 in.	5.5-8.5	Poor	Excellent	Poor	Strong



Nodding Locoweed, *Oxytropis deflexa*

Nodding Locoweed is highly adapted to gravelly sites, and it is often used in reclamation and revegetation in Alaska. Nodding Locoweed is a perennial legume found growing along riverbanks, meadows, and waste places in nature (Hultén, 1968). It is a natural colonizer of dry, rocky soils. Many of its characteristics are common to many arctic plants; low-growth habit, taproot, hairy leaves, and prolific flowering.

Large seeds enable Nodding Locoweed to survive in inhospitable environments. Since it is a legume, it fixes nitrogen in the soil, helping other plants to survive and creating a healthy ecosystem. Arctic plant studies of nitrogen fixing plants in Alaska have found that rhizobia are associated with locoweed (Allen et. al., 1995).

ADAPTED COMMERCIAL VARIETIES OR RELEASES:

Franklin Bluffs selected class germplasm



Franklin Bluffs **Nodding Locoweed**, *Oxytropis deflexa*

Availability	Growth Form	Average Height	pH Range	Saline Tolerance	Drought Tolerance	Wet Soil Tolerance	Competitiveness
Poor	Bunch	8 in.	6.5-8.0	Poor	Excellent	Poor	Weak

- **Hultén, E.** 1968. Flora of Alaska and Neighboring Territories. Stanford University Press, Stanford, CA.
- **Allen, E.K., Allen, O.N. & Klebesadel L.J.** 1995. An Insight into Symbiotic Nitrogen-Fixing Plant Associations in Alaska. In: Dahlgren, G., ed., Science in Alaska. Proceedings of the 14th Alaskan Science Conference. 54-63.



Alpine Bluegrass, *Poa alpina*

Alpine Bluegrass is found in the northern, southern and eastern portions of Interior Alaska (Hultén, 1968). As the name implies, the species is adapted to high elevation areas. It also performs well on drier sites and has low nutrient needs. Seed availability is limited. Availability of seed should be researched before Alpine Bluegrass is included in a planting plan.

Alpine Bluegrass grows in a wide range of habitats and soil conditions. Some of these are: dry slopes, gravelly sites, rocky sites, alpine and sub-alpine sites, and meadows. *Poa alpina* is a perennial grass that can serve as the pioneer species for a revegetation project. Once established, other plants can follow. *Poa alpina* is tolerant to a wide variety of climatic, soil, fire, and drought conditions. This flexibility makes the species important for high altitude revegetation.

ADAPTED COMMERCIAL VARIETIES OR RELEASES:

'Gruening' is a variety that can be established on dry soil as long as there is some irrigation.

Teller selected class germplasm is a native collection of *Poa alpina* intended for general revegetation projects throughout Alaska.



'Gruening' **Alpine Bluegrass**, *Poa alpina*

Availability	Growth Form	Average Height	pH Range	Saline Tolerance	Drought Tolerance	Wet Soil Tolerance	Competitiveness
Poor - Fair	Bunch	6 - 8 in.	5.0-7.2	Poor	Good	Poor	Weak

- **Hultén, E.** 1968. *Flora of Alaska and Neighboring Territories*. Stanford University Press, Stanford, CA.



Arctic Bluegrass (viviparous form), *Poa arctica*

Arctic Bluegrass (viviparous form) is unique in that it reproduces via asexual reproduction. This variety of Arctic Bluegrass produce small plantlets in the seedhead in place of true seed. Viviparous Arctic Bluegrass performs best on dry upland sites.

Viviparous Arctic Bluegrass is found as raised clumps on gravel, wet meadows, and soils near wetlands. It is a cosmopolitan species, being able to grow on both acidic outcrops and calcareous substrate. Viviparous Arctic Bluegrass can be found on rocks, gravel, soil, moss, sand, silt, and clay (Aiken, et. al., 1995). Geese graze specifically on *Poa arctica*, which means that, in terms of restoration, viviparous Arctic Bluegrass will attract geese to the project-thus creating a more diverse habitat (Aiken et. al., 1995).

ADAPTED COMMERCIAL VARIETIES OR RELEASES:

Tin City selected class germplasm



Tin City **Arctic Bluegrass** (viviparous form), *Poa arctica*

Availability	Growth Form	Average Height	pH Range	Saline Tolerance	Drought Tolerance	Wet Soil Tolerance	Competitiveness
Poor	Bunch	12 in.	5.0-7.8	Good	Good	Good	Strong

- **Aiken, S.G, Consaul, L.L. and Dallwitz, M.J.** 1995 onwards. *Poaceae of the Canadian Arctic Archipelago*. www.mun.ca/biology/delta/arcticf.



Arctic Bluegrass, *Poa arctica*

Seed producing varieties of **Arctic Bluegrass** are also available. This species can be used on a wide variety of soils throughout Alaska. Arctic Bluegrass is found as raised clumps on gravel, wet meadows, and soils near wetlands. It is able to grow on both acidic outcrops and calcareous substrate. *Poa arctica* can be found on rocks, gravel, soil, moss, sand, silt, and clay (Aiken, et. al., 1995). Arctic Bluegrass's tolerance of acidity is an important characteristic for mine reclamation. A wetness loving species, Arctic Bluegrass, can effectively grow where other grasses might die from excess water.

ADAPTED COMMERCIAL VARIETIES OR RELEASES:

Council selected class germplasm produces true seed.



Council **Arctic Bluegrass**, *Poa arctica*

Availability	Growth Form	Average Height	pH Range	Saline Tolerance	Drought Tolerance	Wet Soil Tolerance	Competitiveness
Poor	Bunch	12 in.	5.0-7.8	Poor	Good	Good	Strong

- **Aiken, S.G, Consaul, L.L. and Dallwitz, M.J.** 1995 onwards. *Poaceae of the Canadian Arctic Archipelago*. www.mun.ca/biology/delta/arcticf.

Glaucous Bluegrass,

Poa glauca

Glaucous Bluegrass can be found on many types of soil - from slightly acidic to slightly basic; in very dry to slightly moist areas; and on gravel, sand, or organic matter. It is a pioneer species, forming tussocks in disturbed areas. This provides a cover where willows and forbs can become established (Aiken, et. al., 1995). In the extreme arctic, Glaucous Bluegrass's growth form is short and erect. In other areas of Alaska, it is more spreading.

ADAPTED COMMERCIAL VARIETIES OR RELEASES:

'Tundra' is a variety best suited for revegetation in extreme northern areas with severe environmental conditions (Mitchell, 1980).

Nome selected class germ-plasm is a relatively common grass on dry mineral soils in the state. This variety has a wider use range than 'Tundra'; however, it is not recommended for use in arctic regions.



'Tundra' Glaucous Bluegrass, *Poa glauca*

Availability	Growth Form	Average Height	pH Range	Saline Tolerance	Drought Tolerance	Wet Soil Tolerance	Competitiveness
Poor - Fair	Bunch	10 - 12 in.	5.0-8.0	Good	Excellent	Poor	Strong

- **Aiken, S.G, Consaul, L.L. and Dallwitz, M.J.** 1995 onwards. *Poaceae of the Canadian Arctic Archipelago*. www.mun.ca/biology/delta/arcticf.
- **Mitchell, W.W.** 1980. *Registration of Tundra Bluegrass*. *Crop Science* 20(5): 669.



Beautiful Jacob's Ladder, *Polemonium pulcherrimum*

Beautiful Jacob's Ladder is highly adapted to gravelly soils. It has a colorful appearance, and can add to the visual impact of a revegetation project. Using this species enhances diversity, in addition to aesthetic considerations. It grows in alpine, sub-alpine, mid and low elevation sites. When used in seed mixes at 5% by weight, Beautiful Jacob's Ladder performs vigorously.

ADAPTED COMMERCIAL VARIETIES OR RELEASES:

Butte selected class germplasm



Butte **Beautiful Jacob's Ladder**, *Polemonium pulcherrimum*

Availability	Growth Form	Average Height	pH Range	Saline Tolerance	Drought Tolerance	Wet Soil Tolerance	Competitiveness
Poor	Bunch	16 in.	6.5-8.5	Good	Excellent	Poor	Weak



Spike Trisetum, *Trisetum spicatum*

Spike Trisetum is used for revegetation of dry sites with mineral soils. The species has nearly a world-wide distribution and is one of the more cosmopolitan grasses. *Trisetum spicatum* is a common grass found on disturbed sandy or silty soils, on both acid and alkaline substrates, and on rocks, gravel, clay, or tilled earth (Aiken et al., 1999). Spike Trisetum has a high root / shoot ratio. This enables it to be useful for soil building and erosion control (Hardy, 1989).

ADAPTED COMMERCIAL VARIETIES OR RELEASES:

Nelchina selected class germplasm



Nelchina **Spike Trisetum**, *Trisetum spicatum*

Availability	Growth Form	Average Height	pH Range	Saline Tolerance	Drought Tolerance	Wet Soil Tolerance	Competitiveness
Poor	Bunch	18 in.	4.9-7.5	Poor	Good	Good	Strong

- **Aiken, S.G, Consaul, L.L. and Dallwitz, M.J.** 1995 onwards. Poaceae of the Canadian Arctic Archipelago. www.mun.ca/biology/delta/arcticf.
- **Hardy BBT Limited.** 1989. Manual of plant species suitability for reclamation in Alberta, 2nd edition. RRTAC Report No. 89-4. Alberta Land Conservation and Reclamation Council, Edmonton, Alberta.

