UNITED STATES DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE
PLANT MATERIALS CENTER
CORVALLIS, OREGON

and

INSTITUTE FOR APPLIED ECOLOGY
CORVALLIS, OREGON

NOTICE OF RELEASE OF KLAMATH MOUNTAINS GERMPLASM ROEMER'S FESCUE

SELECTED CLASS OF MANIPULATED TRACK GERMPLASM

The U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) and the Institute for Applied Ecology announce the release of a selected class pre-variety of Roemer's fescue (*Festuca roemeri* [Pavlick] E.B. Alexeev., synonym: *Festuca idahoensis* Elmer ssp. *roemeri* [Pavlick] S. Aiken).

This population will be referred to as Klamath Mountains Germplasm Roemer's fescue. It has been assigned USDA NRCS accession number 9079511 and PI 665690. The Oregon Seed Certification Service designated it as PVGOR103. Klamath Mountains Germplasm is released as a selected class of certified seed and plants, manipulated track. There is a conservation need for this material at this level of development and additional selection is not warranted.

Origin: Parental G0 seed of Klamath Mountains Germplasm was collected from five naturally occurring stands (populations) of Roemer's fescue growing within the Klamath Mountains level III ecoregion (USEPA, 2011). At least eight plants were sampled at each location. Four of five collections were first made in 2001–2002 under the coordination of the Institute for Applied Ecology. The fifth (near Ft. Jones, CA) was sampled in 2006. The five collection sites range in elevation from 686 to 975 m (2250–3200 ft) above sea level in an area where the average annual precipitation is between 51 and 203 cm (20–80 in).

Table 1. Origin of five parent populations comprising Klamath Mountains Germplasm

Edgewood-Weed Rd.	Siskiyou Co., CA	Elevation 3200 ft	Lat. 41.4315°N	Long.- 122.4184°W
Hulkill Hollow	Jackson Co., OR	Elevation 2840 ft	Lat. 42.1926°N	Long.- 122.9810°W
Lodgepole Meadow	Curry Co., OR	Elevation 2250 ft	Lat. 42.3436°N	Long.- 124.2895°W
Pyramid Rock	Curry Co., OR	Elevation 2400 ft	Lat. 42.3579°N	Long.- 124.2702°W
Fort Jones	Siskiyou Co., CA	Elevation 3000 ft	Lat. 41.4786°N	Long.- 122.4575°W

Method of selection: From 2003 to 2006 a common-garden study of Roemer's fescue was conducted at the USDA NRCS, Corvallis Plant Materials Center (Benton County, Oregon; elevation 69 m [225 ft]; moderately well-drained Woodburn silt loam; mean annual precipitation 107 cm [42 in]). The study was a cooperative effort among the Institute for Applied Ecology, USDA NRCS, USDI Bureau of Land Management, and USDA Forest Service. Results documented substantial genetic variation within and

among 47 populations from throughout the range of the species in the Pacific Northwest, USA, for growth, fitness, phenological, and morphological traits (Tables 2 and 3). Using climatic and physiographic variables, genetic patterns over the landscape were examined through principal component and regression analysis. Elevation and latitude of the seed source, and to a lesser extent temperature and precipitation, explained a significant proportion of the genetic variation, suggesting that observed variation was associated with adaptation to local environments. Roemer's fescue variation clustered into seed transfer zones corresponding to EPA Level III or Level IV ecoregions (Wilson et al., 2008).

In order to incorporate substantial genetic diversity, four populations collected within the Klamath Mountains ecoregion were selected to form the Klamath Mountains Germplasm (Table 1). One population from within the area was eliminated because of its high elevation origin and genetic variation that did not cluster with the group. Two others not included had lower seed yields, lower survival, and higher rust infection (Tables 2 and 3). A fifth population (Ft. Jones) not in the original study was added to better represent the genetic diversity of the region (Darris et al., 2008).

Random mating among all five populations was promoted by using a Latin Square G1 crossing block in order to form a polycross (Darris et al., 2008). Some individuals within each population overlapped in flowering periods despite a 6 day range in mean flowering dates among populations (Table 2. Data for individual families within each population are not shown). Mean flowering and seed maturity dates for the Ft. Jones population are also within the timeframe of the original four. Thus some plants within each population had the opportunity to randomly cross with individuals from all other populations. Seed production, testing, and conservation use involves G2 and later generations.

Description: Klamath Mountains Germplasm Roemer's fescue is a native cool season, perennial bunchgrass with variable longevity and mostly basal foliage. The foliage is fine textured and densely tufted (cespitose). Morphological diversity among the five parent populations appears moderately high. Leaves are sometimes glaucous (covered with a whitish waxy coating) and their color varies throughout a wide spectrum of green and pale blue for this germplasm. Plants rarely flower until the second full growing season. Stem color ranges from yellowish green to purple or red, turning mostly straw colored at seed maturity. Mean culm (plant) heights varied from 73 to 82 cm (29–32 in) and mean basal width ranged from 10 to 14 cm (3.9–5.5 in) making plants in this germplasm smaller on average than four other germplasms evaluated (Table 2).

The botanical traits for the five populations that form Klamath Mountains Germplasm Roemer's fescue fall within the taxonomic limits of *Festuca roemeri*. The panicle (seed head or inflorescence) is loosely open to moderately contracted and 5–20 cm (2–8 in) long; branches are erect to slightly spreading. The spikelets are 9–13.5 mm (0.35–0.53 in) long with 4–6 florets. Glumes are exceeded by the upper florets. Lemma awns are 2–5 mm (0.08–0.20 in) long. Leaf sheaths are closed for less than one half their length and collars are glabrous; ligules are 0.1–0.5 mm (0.004–0.02 in) long; blades are 0.5–1.2 mm (0.02–0.05 in) in diameter (Darbyshire and Pavlick, 2007).

Further division into two subspecific taxa described by Wilson (2007) occurs within this germplasm. Two parent populations (Pyramid Rock and Lodgepole Meadow) have

shorter, sparser hairs on the lower (abaxial) side of the leaves typical of *F. roemeri* var. *roemeri*, while three parent populations (Edgewood Weed Rd., Hulkill Hollow, and Ft. Jones) possess longer, more abundant hairs at same position, typical of *F. roemeri* var. *klamathensis*. Both botanical varieties and apparent hybrids between the two occurred in the G2 seed increase field after open crossing among the five populations in the crossing block at the Corvallis Plant Materials Center (B.L. Wilson, personal communication, 2012). Roemer's fescue is an allotetraploid (2n=28) and is highly cross-pollinated by wind.

For the original four parent populations representing Klamath Mountains Germplasm, mean anthesis ranged from Julian dates 136 to 142 (May 16–May 22) and seed maturity ranged from Julian dates 166 to182 (June 15–July 1) (Table 2). Julian date is the number of days counted from January 1st as day 1. The subsequent generation (G2) has a narrower range of seed maturity among plants within the germplasm (3–6 days). Incidence of rust disease was low to moderately low (2–13%) (Table 2). The Ft. Jones population falls within the same ranges as the original four for these traits.

Suggested area of use: Based on results of the common garden study, the origin of parent populations, and what is known about the species, Klamath Mountains Germplasm Roemer's fescue is primarily recommended for use within the Klamath Mountains Level III ecoregion from southwest Oregon to northwest California at elevations from 305 to 1220 m (1000–4000 ft) above sea level. Movement of the germplasm within this provisional seed transfer zone should pose minimal risk of maladaptation. This zone lies within USDA Plant Hardiness Zones 7a to 9a (U.S. National Arboretum, 2012). Pending further investigations on adaptation, area of use may extend to adjacent ecoregions for select purposes outside of restoration. Use should not extend beyond the species natural range.

As with the species in general, Klamath Mountains Germplasm is likely to grow best in full sun and part shade near trees on moderately well to well-drained, medium to fine-textured soils that are moderately acidic to slightly basic. Although Roemer's fescue is considered drought tolerant and has extensive roots, it favors more mesic rather than xeric habitats within a site. While the species is known for tolerance to serpentine soils common in the region as well as moderate to low fertility conditions and fire, the specific adaptation of Klamath Mountains Germplasm to such extremes remains to be tested.

Anticipated use: Recommended uses for Klamath Mountains Germplasm include restoration of upland prairies, oak savanna, rangelands, and similar native plant communities, as well as wildlife habitat improvement. This includes food or cover for various song and game birds, small mammals, and beneficial insects. Roemer's fescue can be sown alone or in a mixture with forbs or other grasses. After further evaluation, other uses may include general revegetation and erosion control of disturbed sites and roadsides where a fine-textured perennial grass is desired, low input turf, and cover crop for vineyards or young orchards. Roemer's fescue is a potential native alternative to introduced sheep, hard, and chewings red fescues in several applications. Potential as a forage grass may be similar to Idaho fescue but remains to be tested.

Ecological considerations and evaluation: Klamath Mountains Germplasm is the result of geographic selection and open crossing of five populations for one generation for the

limited purpose of enhancing genetic diversity over single wild populations. While two lesser performing populations were excluded, this germplasm is not anticipated to have substantial genetic improvement or hybrid vigor in terms of ease of establishment, reproductive capability, and plant growth over other naturally occurring, fit populations of Roemer's fescue found within the same ecoregion.

This germplasm is recommended for use primarily within the ecoregion (Klamath Mountains seed transfer zone) and elevation range from which the five parent populations originated. Within this area and adjacent seed zones, the species is not considered weedy and is widely accepted as beneficial rather than detrimental to natural plant communities. According to the NRCS "Worksheet for Environmental Evaluation of Plant Releases" as applied to the intended area and type of use, this germplasm was deemed to have a low chance of adversely affecting the environment, be easy to control, have a moderate level of importance for conservation use, and a moderate chance to propagate and maintain itself under natural conditions. Klamath Mountains Germplasm is not necessarily intended to replace on-site sources of Roemer's fescue for ecological restoration plantings. Individuals with such concerns for a particular environment or ecosystem should make their decisions on a case by case basis. Uses beyond habitat restoration should be tested using standard precautions.

Klamath Mountains Germplasm Roemer's fescue is a known host of stem rust disease of grasses (*Puccinea graminis*). It may be also be host to other rusts (*Puccinea* spp.) and trace amounts of ergot (*Claviceps purpurea*) have been observed in similar populations of Roemer's fescue. The rust and ergot potentially carried by this species occur commonly on other introduced and endemic grasses in the suggested area of use. Therefore, their occurrence on Klamath Mountains Germplasm, if detected, is not considered to pose a unique problem or special risk to other new or already susceptible species. In the unlikely event of ergot becoming abundant, special precautions should be considered to avoid toxicity to grazing animals (such as mowing or temporary livestock exclusion).

Release production: Seed of Klamath Mountains Germplasm Roemer's fescue is readily produced using cultural practices similar to those for other fine fescues in the Pacific Northwest, USA. Post-harvest residue (straw, older foliage) should be removed and remaining stubble should be 4–7 cm (1.6–2.8 in) tall. From 2010 to 2012, seed yields ranged from 42 to 83 kg per ha (37–73 lb per acre). Yields were low due in part to atypical wide spacing among plants within and between rows.

In Oregon, seed certification requires a minimum isolation distance of 274 m (900 ft) between fields of different Roemer's fescue populations, regardless of pre-variety class or generation. In addition, Roemer's fescue can hybridize with fescues in the sheep fescue complex (sheep, hard, and Idaho fescues), so similar isolation distances from these species may be applicable. Roemer's fescue does not cross with species in the red fescue complex.

Red fescue often contaminates Roemer's fescue seed fields and can be difficult to distinguish for removal using anatomical differences alone. An ammonia florescence test conducted by a seed lab in conjunction with a seed lot germination test will detect red fescue contamination in a field. The roots of red fescue (and species in the red fescue complex) fluoresce yellow while the roots of Roemer's fescue (and species in the sheep

fescue complex) fluoresce green when sprayed with a 0.5% solution of ammonium hydroxide. For seed certification of pre-variety Roemer's fescue germplasm in Oregon, the maximum allowable red fescue seed content determined by this test is 1 percent for all classes and generations.

Availability of plant materials: The USDA NRCS Plant Materials Center, Corvallis, Oregon, will maintain G2 and G3 generation seed. Beginning in 2012, a limited quantity of selected class certified (green tag) seed will be available to qualified commercial growers upon request. G2, G3, and G4 seed are recommended for certification. There is no limitation on the number of years a field can be in production. Seed is expected to be commercially available by late 2013 or 2014.

References:

Darbyshire, S.J. and L.E. Pavlick. 2007. *Festuca*, modified by Barkworth from Barkworth et al. (eds.), Flora of North America vol. 24. http://herbarium.usu.edu/webmanual (accessed 03 July 2012).

Darris, D.C., B.L. Wilson, R. Fiegener, R. Johnson, and M.E. Horning. 2008. Polycross populations of the native grass *Festuca roemeri* as pre-varietal germplasm, their derivation, release, increase, and use. Native Plants Journal 9:304–312.

USEPA. 2011. Level III ecoregions of the continental United States. US EPA, National Health and Environmental Effects Research Laboratory, Western Ecology Division, Corvallis, OR.

U.S. National Arboretum. 2012. USDA plant hardiness zone map. USDA Agricultural Research Service. Washington, DC. http://planthardiness.ars.usda.gov/ (accessed 11 July 2012).

Wilson, B.L. 2007. A new variety of *Festuca roemeri* (Poaceae) from the California floristic province of North America. Journal of the Botanical Research Institute of Texas 1:59–67.

Wilson, B.L., D.C. Darris, R. Fiegener, R. Johnson, M. Horning, and K. Kuykendall. 2008. Seed transfer zones for a native grass *Festuca roemeri*: genecological evidence. Native Plants Journal 9:287–301.

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Table 2. Morphology, phenology, and disease occurrence of Roemer's fescue. Selected populations for each germplasm (seed zone) are highlighted.

Seed Zone or Group	Population	rust03	col03	ht04	wid04	til04	fol04	phen	anth	an-e	an-l	mat	surv05	fol05	ferl05	surv06
Coastal (Oregon)	Cummins Creek Trail	3%	1.0	110	17	6.1	4.7	2.4	130	127	135	170	98%	5.4	3.5	13%
Coastal (Oregon)	Cape Perpetua	2%	2.1	87	16	5.8	5.5	1.9	136	131	139	175	97%	6.1	4.0	28%
Coastal (California)	Mt. Tamalpais	5%	1.9	82	16	6.6	5.1	2.4	130	124	136	172	81%	5.3	3.2	8%
Coastal (California)	San Bruno Mt.	2%	2.1	68	13	5.2	4.8	1.8	133	130	137	179	84%	5.0	3.1	10%
Columbia Gorge	Memaloose Park	0%	1.3	65	15	5.8	3.4	2.9	136	126	145	172	67%	3.2	4.0	0%
Columbia Gorge	Drano Lake	19%	1.1	97	14	4.1	3.7	2.2	141	127	148	180	75%	3.3	0.6	6%
High elevation	Fairview Peak	31%	1.2	90	17	5.4	5.2	2.0	132	127	138	169	88%	4.4	3.2	8%
High elevation	Blue Mt. near Deer Park	6%	1.1	74	14	3.2	4.3	2.4	121	114	131	161	83%	3.8	0.3	13%
High elevation	Mary's Peak	11%	1.0	76	16	1.8	5.7	1.4	144	136	155	176	77%	5.0	0.6	13%
High elevation	Hurricane Ridge	5%	1.9	66	9	2.2	2.3	1.8	125	121	132	163	29%	2.0	0.5	2%
High elevation	Silver Fork Elliot Cr.	13%	1.0	81	14	5.1	4.5	3.2	125	122	131	160	81%	3.6	3.7	5%
High elevation	Horse Rock Ridge	20%	1.0	89	18	5.3	4.7	2.2	136	127	140	172	83%	4.3	1.1	0%
High elevation	Table Rock Wilderness	5%	1.1	81	15	3.1	4.4	1.8	134	130	142	169	75%	3.4	0.6	2%
Puget Lowland	Glacial Heritage Preserve	11%	1.1	103	15	3.6	5.0	2.1	134	128	138	167	95%	5.2	2.1	13%
Puget Lowland	Mortar Pt. 3	13%	1.1	106	14	4.0	4.5	2.2	135	133	140	167	89%	5.1	2.6	14%
Puget Lowland	Thirteenth Division Prairie	13%	1.0	102	14	3.6	4.5	2.1	134	131	142	168	92%	4.8	2.0	13%
Puget Lowland	Scatter Creek	9%	1.1	102	13	3.7	4.5	1.9	134	129	138	167	89%	4.8	2.3	17%
Puget Lowland	Mima Mounds	8%	1.0	101	11	3.2	3.6	1.9	134	131	142	167	80%	5.1	1.8	5%
Puget Lowland	Johnson Prairie	16%	1.0	99	13	3.5	4.1	2.0	136	129	144	167	86%	4.2	1.8	9%
Puget Lowland	Yelm	10%	1.0	94	11	3.4	4.0	2.0	136	133	141	169	59%	4.2	2.2	5%
Puget Lowland	Upper Weir Prairie	11%	1.0	102	11	3.2	3.5	2.1	135	129	141	168	89%	3.0	1.3	13%
Puget Lowland	Rocky Prairie N.A.P.	5%	1.0	103	11	3.0	3.9	1.8	141	134	145	169	81%	3.9	1.3	11%
San Juan/Olympic	Fidalgo Island; Ravine Trail	2%	2.6	88	14	4.3	3.9	2.0	136	131	141	172	66%	3.9	1.3	6%
San Juan/Olympic	Yellow Island	4%	1.4	88	14	4.1	6.0	2.0	136	130	143	172	96%	6.2	1.2	24%
San Juan/Olympic	Smith Prairie, Whidbey Is.	0%	2.7	86	12	3.0	4.9	1.6	136	130	145	170	77%	5.2	1.3	6%
Klamath Mountains	Pyramid Rock	11%	1.5	73	14	4.4	3.9	2.0	139	129	148	177	79%	4.0	2.9	2%
Klamath Mountains	Lodgepole Meadow	8%	2.8	79	12	4.0	3.3	1.6	142	127	149	182	81%	3.4	0.9	5%
Klamath Mountains	Hukill Hollow	2%	2.2	78	10	4.1	2.9	2.8	136	126	142	166	56%	2.4	1.8	3%
Klamath Mountains	Edgewood-Weed Road	13%	1.0	82	12	2.7	4.7	2.0	136	130	140	169	69%	3.9	2.3	0%
Klamath Mountains	Cobleigh Road	21%	1.1	74	10	2.7	2.9	1.7	144	137	152	178	34%	2.9	1.8	5%
Klamath Mountains	Ace Williams Mt.	19%	1.2	79	10	2.8	2.8	1.6	140	136	147	178	52%	2.5	0.4	2%
Klamath Co.	Duncan Springs	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*

Table 2 continued on next page.

Table 2. (cont.) Morphology, phenology, and disease occurrence of Roemer's fescue. Selected populations for each germplasm (zone) are highlighted.

Seed Zone or Group	Population	rust03	col03	ht04	wid04	til04	fol04	phen	anth	an-e	an-l	mat	surv05	fol05	ferl05	surv06
Willamette Valley	Kloster Mountain	36%	1.0	105	17	5.3	4.6	2.0	139	136	143	177	83%	4.5	2.7	5%
Willamette Valley	Rock Hill	19%	1.0	94	17	4.4	5.5	2.1	134	130	138	169	83%	5.3	2.3	11%
Willamette Valley	Weiss Road ridgeline	51%	2.8	91	14	4.3	4.3	1.8	144	134	153	175	63%	4.0	1.2	0%
Willamette Valley	Morton Farm	42%	1.3	82	13	4.6	4.5	2.1	139	134	142	172	85%	4.8	1.3	0%
Willamette Valley	Bald Hill west[1]	36%	2.5	81	13	4.1	4.6	1.6	146	139	159	176	70%	5.2	1.4	7%
Willamette Valley	Kingston Prairie	13%	2.2	93	14	3.6	4.9	1.9	142	131	162	171	75%	5.6	1.2	2%
Willamette Valley	Spencer's Butte	30%	2.3	89	16	4.5	4.8	2.0	138	134	143	172	80%	5.0	1.9	2%
Willamette Valley	Row Point, Dorena Reservoir	17%	1.9	90	12	4.1	3.7	2.1	140	135	148	172	52%	2.8	0.4	0%
Willamette Valley	Bald Hill southeast[1]	38%	2.8	80	12	4.0	4.1	1.8	143	138	150	177	67%	4.6	1.4	3%
Willamette Valley	Novick Property	39%	2.5	83	13	3.4	3.9	1.5	142	134	152	175	56%	3.7	0.6	2%
Willamette Valley	Baskett Butte	23%	2.8	84	14	4.0	5.4	1.8	141	134	150	173	73%	5.7	1.2	2%
Willamette Valley	Abiqua Road	14%	1.1	108	14	3.2	3.6	1.8	144	134	157	175	65%	3.4	0.1	2%
Willamette Valley	Fire Knob	17%	1.5	84	13	2.7	4.3	1.5	141	138	145	169	64%	3.8	0.5	0%
Willamette Valley	Open Spaces Park	51%	2.2	69	10	2.6	3.2	1.4	145	133	153	178	58%	3.8	1.5	0%
Willamette Valley	Beazell	31%	1.4	77	10	2.5	3.6	1.4	148	136	155	178	45%	4.4	0.7	0%

[1]Bald Hill west and Bald HIl southeast were treated as one population for the Willamette Valley germplasm

rust03 = % of leaf rust (Puccinia spp.) infection on plants, 2003
col03 = color of foliage score from 1=blue to 3=green, 2003
ht04 = culm height cm, 2004
wid04 = basal width cm, 2004
til04 = fertile tiller score, 1=fewest, 10=most, 2004
fol04 = foliage abundance score, 1=lowest, 10=highest, 2004
phen = phenology score on March 23, 2004 (1=vegetative, 2=boot, 3=jointing, etc.)
anth = Mean Julian date of anthesis for entire population
an-e = earliest Julian date of anthesis for any family in a population
an-l = latest Julian date of anthesis for any family in a population
mat = Mean Julian date of seed maturity
surv05 = % survival of plants in a population, 2005
fol05= foliage abundance score, 1=lowest, 10=highest, 2005
fert05 = fertile tiller score, 1=fewest, 10=most, 2005
surv06 = % survival of plants in a population, 2006

Table 3. Seed Yield of Roemer's fescue. Selected populations for each germplasm (zone) are highlighted.

Seed Zone or Group	population	yield/plant (g)	Std.Dev.	Minimum	Maximum	Variance
Coastal (Oregon)	Cummins Creek Trail	34.69	5.55	26.38	43.50	30.76
Coastal (Oregon)	Cape Perpetua	34.25	10.24	21.13	51.14	104.87
Coastal (California)	Mt. Tamalpais	33.16	12.85	19.50	53.50	165.03
Coastal (California)	San Bruno Mt.	26.22	8.16	14.88	41.57	66.56
Columbia Gorge	Memaloose Park	19.56	15.90	2.00	33.00	252.93
Columbia Gorge	Drano Lake	17.86	7.44	4.67	31.25	55.40
High elevation	Fairview Peak	27.74	14.88	10.25	48.88	221.40
High elevation	Blue Mt. near Deer Park	9.69	4.77	4.38	19.57	22.73
High elevation	Mary's Peak	5.17	5.36	0.50	14.80	28.69
High elevation	Hurricane Ridge	4.02	1.88	1.40	6.40	3.54
High elevation	Silver Fork Elliot Cr.	24.81	11.28	12.67	43.43	127.31
High elevation	Horse Rock Ridge	24.26	9.64	13.00	41.71	92.91
High elevation	Table Rock Wilderness	10.65	8.12	1.25	26.67	65.91
Puget Lowland	Glacial Heritage Preserve	14.67	5.91	3.17	21.75	34.89
Puget Lowland	Mortar Pt. 3	12.29	4.14	6.50	17.50	17.14
Puget Lowland	Thirteenth Division Prairie	12.05	4.21	7.25	19.29	17.71
Puget Lowland	Scatter Creek	11.11	4.11	4.57	17.14	16.87
Puget Lowland	Mima Mounds	10.93	5.84	2.29	19.17	34.13
Puget Lowland	Johnson Prairie	10.73	4.61	4.80	16.50	21.27
Puget Lowland	Yelm	9.94	5.25	2.33	19.29	27.60
Puget Lowland	Upper Weir Prairie	9.14	4.42	2.20	15.67	19.52
Puget Lowland	Rocky Prairie N.A.P.	7.82	3.85	1.00	13.25	14.85
San Juan/Olympic	Fidalgo Island; Ravine Trail	14.09	4.02	7.00	19.13	16.19
San Juan/Olympic	Yellow Island	10.29	4.25	3.63	15.50	18.07
San Juan/Olympic	Smith Prairie, Whidbey Is.	8.64	2.69	4.60	12.00	7.23
Klamath Mountains	Pyramid Rock	15.80	8.74	1.25	25.50	76.31
Klamath Mountains	Lodgepole Meadow	12.30	4.75	4.50	20.60	22.54
Klamath Mountains	Hukill Hollow	10.51	5.61	4.00	19.88	31.47
Klamath Mountains	Edgewood-Weed Road	7.65	4.17	3.40	14.13	17.43
Klamath Mountains	Cobleigh Road	5.74	3.50	1.40	10.60	12.24
Klamath Mountains	Ace Williams Mt.	5.42	2.39	2.29	10.43	5.73
Klamath Co.	Duncan Spring	4.27	5.32	0.67	16.00	28.33
Willamette Valley	Kloster Mountain	24.24	9.50	11.43	42.00	90.26
Willamette Valley	Rock Hill	15.56	6.32	7.00	22.60	39.99
Willamette Valley	Weiss Road ridgeline	13.70	7.52	0.33	24.40	56.59
Willamette Valley	Morton Farm	13.05	10.65	4.67	28.50	113.47
Willamette Valley	Bald Hill west	12.53	5.32	4.00	20.38	28.33
Willamette Valley	Kingston Prairie	11.45	5.13	4.25	20.00	26.35
Willamette Valley	Spencer's Butte	10.86	6.86	2.86	21.38	47.05
Willamette Valley	Row Point, Dorena Reservoir	9.19	4.43	5.17	19.00	19.59
Willamette Valley	Bald Hill southeast	7.58	1.41	4.86	9.50	2.00
Willamette Valley	Novick Property	7.49	5.82	1.33	17.29	33.87
Willamette Valley	Baskett Butte	6.97	3.58	3.00	12.83	12.85
Willamette Valley	Abiqua Road	6.77	4.46	1.00	12.71	19.90
Willamette Valley	Fire Knob	6.15	6.21	1.20	16.17	38.51
Willamette Valley	Open Spaces Park	5.59	3.86	0.67	9.67	14.92
Willamette Valley	Beazell	5.07	4.60	0.50	14.50	21.16

SIGNATURES for RELEASE of KLAMATH MOUNTAINS GERMPLASM ROEMER'S FESCUE (*Festuca roemeri*)

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Ron Alvarado
State Conservationist, Oregon
Natural Resources Conservation Service

Date:_____

_____

Roylene Rides at the Door
State Conservationist, Washington
Natural Resources Conservation Service

Date:_____

_____

Tom N. Kaye
Executive Director
Institute for Applied Ecology

Date: _____

_____

Terrell Erickson
Director, Ecological Sciences Division
Natural Resources Conservation Service

Date:_____