

## APPENDIX E

### PLOT PLANTINGS

Tables E-1 and E-2 list the species/collections planted in the 144 experimental plots at the BP Put River No. 1 gravel pad in 1990 and 1991, respectively. The seedlot germination rate and purity are used to derive the seeding rate which is given as grams seed per plot, grams seed per sq. foot, PLS (Pure Live Seed) per sq. foot, and lbs. PLS per acre.

Table E-1. Record of species and amount of seed planted in each of 144 plots at the BP Put River No. 1 gravel pad during 21-27 June 1990

Species	Collection Location	Number Seeds/g	Germ.	Purity	Number PLS/g *1	SEEDING RATE			
						Grams per Plot *2	Grams/sq. Foot	# PLS/sq. Foot *1	Lbs. PLS/Acre *1
GRASSES:									
<i>Agropyron boreale</i>	Kuparuk River Bridge	281	99.0X	99X	275	1.000	0.031	8.6	3.00
<i>Alopecurus alpinus</i>	B.P. Put River No. 1	1163	93.0X	70X	757	0.063	0.002	1.5	0.19
<i>Alopecurus alpinus</i>	Pump Station No. 1	2083	28.3X	70X	413	0.005	0.000	0.1	0.02
<i>Alopecurus alpinus</i>	IBP Plots	1163	90.0X	70X	733	0.057	0.002	1.3	0.17
<i>Arctagrostis latifolia</i>	M.P. 31 Dalton Highway	3704	80.0X	99X	2934	0.087	0.003	8.0	0.26
<i>Arctagrostis latifolia</i>	Pump Station No. 1	4000	68.7X	99X	2721	0.030	0.001	2.5	0.09
<i>Arctagrostis latifolia</i>	Sag. River E. of Airport	3261	98.0X	99X	3164	0.196	0.006	19.4	0.59
<i>Arctagrostis latifolia</i>	IBP Plots	4225	55.0X	99X	2301	0.147	0.005	10.6	0.44
<i>Arctagrostis latifolia</i>	72 Haul Road (introduced)	3659	88.3X	99X	3199	0.039	0.001	3.9	0.12
<i>Bromus pumpellianus</i>	Kuparuk River Bridge	261	91.7X	99X	237	0.100	0.003	0.7	0.30
<i>Deschampsia caespitosa</i>	1972 Haul Road	3061	95.3X	99X	2888	0.106	0.003	9.5	0.32
<i>Deschampsia caespitosa</i>	Kuparuk Haul Road	3125	92.0X	99X	2846	0.203	0.006	18.1	0.61
<i>Deschampsia caespitosa</i>	Kuparuk River Bridge	3061	94.0X	99X	2849	0.338	0.011	30.1	1.01
<i>Deschampsia caespitosa</i>	Sohio-Kuparuk Reserve Pit	3000	94.7X	99X	2813	0.122	0.004	10.7	0.37
<i>Elymus arenarius mollis</i>	East Dock Dunes	164	97.3X	99X	158	0.736	0.023	3.6	2.21
<i>Festuca brachyphylla</i>	Sohio-Kuparuk Reserve Pit	1775	89.0X	99X	1564	0.087	0.003	4.2	0.26
<i>Festuca brachyphylla</i>	IBP Plots	1667	88.7X	99X	1464	0.133	0.004	6.1	0.40
<i>Festuca ovina</i>	East Dock Dunes	1045	86.7X	99X	897	0.055	0.002	1.5	0.16
<i>Festuca rubra</i>	Kuparuk River Bridge	1370	61.7X	99X	837	0.043	0.001	1.1	0.13
<i>Festuca 'vivipara'</i>	B.P. Put River No. 1	299	78.7X	10X	24	0.140	0.004	0.1	0.42
<i>Poa arctica</i>	East Dock Dunes	2174	87.0X	99X	1872	0.225	0.007	13.2	0.67
<i>Puccinellia langetana</i>	B.P. Put River No. 1	6667	96.7X	99X	6383	1.319	0.041	263.1	3.95
<i>Puccinellia langetana</i>	IBP Plots	6667	97.3X	99X	6422	1.493	0.047	299.6	4.48
<i>Trisetum spicatum</i> *3	B.P. Put River No. 1	3000	88.0X	99X	2614	0.625	0.020	51.0	1.87
<i>Trisetum spicatum</i> *3	IBP Plots								
GRASSLIKE:									
<i>Carex maritima</i>	72 Haul Road	1111	95.0X	99X	1045	0.046	0.001	1.5	0.14
<i>Carex maritima</i>	B.P. Put River No. 1	1478	96.0X	99X	1405	0.004	0.000	0.2	0.01
<i>Carex maritima</i>	Sohio-Kuparuk Reserve Pit	1271	94.3X	99X	1187	0.120	0.004	4.4	0.36
TOTAL GRAMINOID SEEDS =								774.9	

\*1 Pure Live Seed (PLS) reflects the percentage of pure seed that has the ability to germinate; PLS = % Germination X % Purity

\*2 Seed was weighed into 144 equal lots (one for each test plot) for each of the 30 species planted.

\*3 *Trisetum* seedlots were mixed together because of their close proximity and similar harvest dates.

Table E-1. (Cont.) Record of species and amount of seed planted in each of 144 plots at the BP Put River No.1 gravel pad during 21-27 June 1990

Species	Collection Location	Number Seeds/g	Germ.	Purity	Number PLS/g #1	SEEDING RATE			
						Grams per Plot #2	Grams/sq. Foot	# PLS/sq. Foot #1	Lbs. PLS/Acre #1
FORBS:									
<i>Armeria maritima</i>	Arco Discovery Well Site	773	59.7%	99%	457	0.025	0.001	0.4	0.07
<i>Artemisia arctica</i>	Kuparuk River Bridge	1911	99.7%	99%	1886	0.077	0.002	4.5	0.23
<i>Artemisia arctica</i>	M.P. 40 Dalton Highway	2206	79.3%	99%	1732	0.073	0.002	4.0	0.22
<i>Artemisia borealis</i>	Kuparuk River Bridge	2013	97.3%	99%	1939	0.030	0.001	1.8	0.09
<i>Artemisia glomerata</i>	Kuparuk River Bridge	2479	96.3%	99%	2363	0.083	0.003	6.1	0.25
<i>Aster sibericus</i>	Sag. River E. of Airport	3571	47.3%	99%	1672	0.050	0.002	2.6	0.15
<i>Braya pilosa &amp; purpurascens</i>	Put R. #27 Gravel Pit	7692	10.7%	99%	815	0.450	0.014	11.5	1.35
<i>Cerastium beeringianum</i>	72 Haul Road	8108	94.0%	99%	7545	0.015	0.000	3.5	0.04
<i>Descurainia sophioides</i>	Sohio-Kuparuk Reserve Pit	14286	67.0%	99%	9476	0.100	0.003	29.6	0.30
<i>Draba</i> spp. (white-flowered)	B.P. Put River No. 1	6522	9.0%	99%	581	0.060	0.002	1.1	0.18
<i>Epilobium latifolium</i>	B.P. Put River No. 1	7143	91.0%	99%	6435	0.017	0.001	3.5	0.05
<i>Epilobium latifolium</i>	Put River #27 Gravel Pit	6977	88.0%	99%	6078	0.045	0.001	8.5	0.13
<i>Eutrema edwardsii</i>	Arco State No. 1	2000	32.0%	99%	634	0.180	0.006	3.6	0.54
<i>Eutrema edwardsii</i>	B.P. Put River No. 1	1630	0.0%	99%	0	0.010	0.000	0.0	0.03
<i>Melandrium apetalum</i>	72 Haul Road	3093	3.3%	99%	101	0.062	0.002	0.2	0.19
<i>Parrya nudicaulis</i>	Sag. River E. of Airport	303	1.7%	99%	5	0.160	0.005	0.0	0.48
<i>Sedum rosea</i>	Big Skookum	6667	80.3%	99%	5300	0.125	0.004	20.7	0.37
<i>Senecio congestus</i>	M.P. 40 Dalton Highway	6522	70.0%	99%	4520	0.021	0.001	3.0	0.06
<i>Silene acaulis</i>	Arco State No. 1	2222	1.7%	99%	37	0.100	0.003	0.1	0.30
								TOTAL FORB SEEDS =	104.6
TOTAL AMOUNT OF SEED FOR 31 SPECIES PLANTED IN EACH OF 144 TEST PLOT						9.203	0.288	879.5	27.59

Summary of seeds planted at the BP Put River No. 1 gravel plot in 1990

Graminoids	= 14 species in 28 seedlots
Forbs	= 17 species in 19 seedlots
Totals	= 31 species in 47 seedlots

Table E-2. Record of species and amount of seeds planted in each of 144 plots at the BP Put River No. 1 gravel pad during 25-27 June 1991 \*1

Species	Collection Location	Wt 320 Seeds	Grams PLS Required per Plot #2	Total Grams PLS Required	Purity	Germ.	Total Gms. Seed Required	Seeding Rate #3			
								Gms. per Plot #1	# PLS/sq. Ft. #3	Lbs. PLS/ Acre #2	
<b>GRASSES:</b>											
<i>Elymus innovatus</i>	M.P. 365 Dalton Hwy	1.467	0.1467	21.125	0.90	0.770	30.483	0.212	1.00	0.440	
<i>Poa glauca</i>	Endicott Road - 1 mile West of W Caribou Ramp	0.076	0.0456	6.566	0.75	0.557	15.718	0.109	6.00	0.137	
<b>GRASSLIKE:</b>											
<i>Carex ursina</i>	East Dock	0.141	0.0846	12.182	0.95	0.700	18.319	0.127	6.00	0.254	
TOTAL GRAMINOID SEEDS =									13.00		
<b>FORBS:</b>											
<i>Androsace chamaejasme</i>	72 Haul Road #4 East Dock Dunes	0.142			0.92	0.012	5.500	0.038			
<i>Arabis arenicola</i>	M.P. 405 Dalton Hwy	0.025	0.0150	2.160	0.99	0.583	3.742	0.026	6.00	0.045	
<i>Armeria maritima</i>	East Dock Dunes #4	0.321	0.0642	9.245	0.85	0.433	25.118	0.174	2.00	0.192	
<i>Armeria maritima</i>	Kuparuk River Bridge										
<i>Armeria maritima</i>	M.P. 405 Dalton Hwy										
<i>Armeria maritima</i>	Sag River East of Airport										
<i>Artemisia arctica</i>	M.P. 377.5 Dalton Hwy	0.122	0.0732	10.541	0.99	0.987	10.788	0.075	6.00	0.219	
<i>Artemisia glomerata</i>	Kuparuk River Bridge #4	0.132	0.0396	5.702	0.89	0.939	6.846	0.048	3.00	0.119	
<i>Artemisia glomerata</i>	M.P. 405 Dalton Hwy										
<i>Astragalus alpinus</i>	M.P. 405 Dalton Hwy	0.574	0.0861	12.398	0.99	0.201	62.431	0.434	1.50	0.258	
<i>Astragalus eucosmus</i>	M.P. 399 Dalton Hwy	0.343			1.00	0.040	14.400	0.100			
<i>Astragalus nutzotinensis</i>	M.P. 395.9 Dalton Hwy 84 #4	0.761			1.00	0.059	14.400	0.100			
<i>Astragalus nutzotinensis</i>	M.P. 405 Dalton Hwy										
<i>Castilleja elegans</i>	M.P. 395.9 Dalton Hwy	0.043	0.0065	0.929	0.95	0.313	3.124	0.022	1.50	0.019	
<i>Cerastium beeringianum</i>	72 Haul Road	0.036	0.0216	3.110	0.95	0.825	3.969	0.028	6.00	0.065	
<i>Chrysanthemum bipinnatum</i>	Kuparuk River Bridge	0.080			0.10	0.000	21.600	0.150			
<i>Descurainia sophioides</i>	M.P. 398.7 Dalton Hwy	0.039	0.0234	3.370	0.98	0.897	3.833	0.027	6.00	0.070	
<i>Epilobium latifolium</i>	M.P. 405 Dalton Hwy	0.045	0.0270	3.888	0.90	0.737	5.862	0.041	6.00	0.081	

\*1 Seed was weighed into 144 equal lots (one for each test plot) for each of 28 species planted.

\*2 Pure Live Seed (PLS) reflects the amount of seed that has the ability to germinate; PLS = % Germination X % Purity.

\*3 Planting 6 PLS per sq. ft. for each species was the goal, where germination and quantity of seed allowed.

\*4 Seed weight, purity, and germination prorated by percent of seed lot used

Table E-2. (Cont.) Record of species and amount of seeds planted in each of 144 plots at the BP Put River No. 1 gravel pad during 25-27 June 1991 \*1

Species	Collection Location	Wt 320 Seeds	Grams PLS Required per Plot *2	Total Grams PLS Required	Purity	Germ.	Total Gms. Seed Required	Seeding Rate *3		
								Gms. per Plot #1	# PLS/sq. Ft. *3	Lbs. PLS/ Acre #2
<b>FORBS (Cont.):</b>										
<i>Eutrema edwardsii</i>	72 Haul Road	0.038	0.0114	1.642	0.99	0.367	4.518	0.031	3.00	0.034
<i>Hedysarum mackenzii</i>	M.P. 369.5 Dalton Hwy *4	1.719	0.1719	24.754	0.98	0.057	443.136	3.077	1.00	0.515
<i>Hedysarum mackenzii</i>	M.P. 405 Dalton Hwy									
<i>Oxytropis borealis</i>	M.P. 405 Dalton Hwy	0.400	0.1600	23.040	0.96	0.209	114.534	0.795	4.00	0.480
<i>Oxytropis nigrescens</i>	E-2 Dunes *4	0.927	0.3708	53.395	1.00	0.225	236.996	1.646	4.00	1.112
<i>Oxytropis nigrescens</i>	E-2 Pond/Pipeline									
<i>Pedicularis lanata</i> subsp. <i>kanei</i>	M.P. 405 Dalton Hwy	0.130	0.0195	2.808	0.90	0.113	27.611	0.192	1.50	0.058
<i>Potentilla hookeriana</i>	Big Skookum	0.041	0.0051	0.738	0.99	0.217	3.435	0.024	1.25	0.015
<i>Sedum rosea</i>	East Dock	0.045	0.0270	3.888	0.99	0.867	4.530	0.031	6.00	0.081
<i>Senecio congestus</i>	M.P. 377.5 Dalton Hwy	0.024	0.0036	0.518	0.50	0.100	10.368	0.072	1.50	0.011
<i>Silene wahlbergella</i>	72 Haul Road	0.105	0.0158	2.268	0.95	0.610	3.914	0.027	1.50	0.047
								TOTAL FORB SEEDS =		61.75
<b>SHRUBS:</b>										
<i>Dryas integrifolia</i>	East Dock Dunes *4	0.070	0.0368	5.292	0.60	0.202	43.663	0.303	5.25	0.110
<i>Dryas integrifolia</i>	Endicott-mid Caribou Ramp									
<i>Salix arctica</i>	1972 Haul Road *4	0.063	0.0189	2.722	0.86	0.963	3.279	0.023	3.00	0.057
<i>Salix arctica</i>	Endicott-N Caribou Ramp									
<i>Salix ovalifolia</i>	E-2 Dunes *4	0.059	0.0295	4.248	0.71	0.592	10.050	0.070	5.00	0.088
<i>Salix ovalifolia</i>	East Dock Dunes									
<i>Salix ovalifolia</i>	M.P. 405 Dalton Hwy									
								TOTAL SHRUB SEEDS =		13.25
TOTAL AMOUNT OF SEED FOR 28 SPECIES PLANTED IN EACH OF 144 TEST PLOTS:							1152.17	8.001	88.00	4.509

\*1 Seed was weighed into 144 equal lots (one for each test plot) for each of 28 species planted.

\*2 Pure Live Seed (PLS) reflects the amount of seed that has the ability to germinate; PLS = X Germination X X Purity.

\*3 Planting 6 PLS per sq. ft. for each species was the goal, where germination and quantity of seed allowed.

\*4 Seed weight, purity, and germination prorated by percent of seed lot used

Summary of seeds planted at BP Put River No. 1 gravel pad in 1991

Graminoids	=	3 species in 3 seedlots
Forbs	=	22 species in 30 seedlots
Shrubs	=	3 species in 7 seedlots
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Totals	=	28 species in 40 seedlots

## APPENDIX F

### COVER POINT FRAME DATA AND ANALYSES

The point hit cover data sampled at the BP Put River No. 1 gravel pad during 2-4 September 1991 are listed and converted to percent cover (number of hits/30 hits total) in Tables F-1 through F-5. Tables F-1 through 4 (a,b) present data from the 1990 planted plots, Tables F-5 and F-5a present data from the unplanted plots located between the center 1990 planting and the eastern 1991 planting plots. The means of the three 1990 planting replicates are presented in Tables F-1a through F-4a. Finally, the means of the various treatments (block, gravel thickness, presence or absence of topsoil, and whether or not the substrate was tilled) are presented in Tables F-1b through F-4b and F-5a.

Table F-1. 1991 point frame hits and percent cover for plots planted in 1990 in Block 1 at the BP Put River No. 1 gravel pad, n=30

Block	Snow	Fence	Poa	Gravel	Aerial Cover										Ground Cover										
					Repl	Thick.	Soil	Tilled	Grass	X	Forb	X	Plant	X	Moss	X	Rock	X	Barren	X	Mulch	X	Wood	X	Feces
1	1	1	1	1	5	0	1	14	46.7	2	6.7	1	3.3	0.0	0.0	29	96.7	0	0.0	0	0.0	0	0.0	0	0.0
1	1	1	1	1	5	0	0	11	36.7	1	3.3	2	6.7	0.0	0.0	24	80.0	4	13.3	0	0.0	0	0.0	0	0.0
1	1	1	1	1	5	1	1	19	63.3	3	10.0	8	26.7	0.0	0.0	7	23.3	15	50.0	0	0.0	0	0.0	0	0.0
1	1	1	1	1	5	1	0	15	50.0	2	6.7	6	20.0	0.0	0.0	3	10.0	21	70.0	0	0.0	0	0.0	0	0.0
1	1	1	1	1	3	0	1	6	20.0	0	0.0	0	0.0	0.0	0.0	26	86.7	4	13.3	0	0.0	0	0.0	0	0.0
1	1	1	1	1	3	0	0	9	30.0	0	0.0	0	0.0	0.0	0.0	24	80.0	6	20.0	0	0.0	0	0.0	0	0.0
1	1	1	1	1	3	1	1	15	50.0	3	10.0	1	3.3	0.0	0.0	3	10.0	26	86.7	0	0.0	0	0.0	0	0.0
1	1	1	1	1	3	1	0	8	26.7	1	3.3	0	0.0	0.0	0.0	1	3.3	29	96.7	0	0.0	0	0.0	0	0.0
1	1	1	1	1	2	0	1	14	46.7	1	3.3	2	6.7	0.0	0.0	24	80.0	3	10.0	1	3.3	0	0.0	0	0.0
1	1	1	1	1	2	0	0	15	50.0	2	6.7	1	3.3	0.0	0.0	29	96.7	0	0.0	0	0.0	0	0.0	0	0.0
1	1	1	1	1	2	1	1	26	86.7	0	0.0	8	26.7	0.0	0.0	2	6.7	20	66.7	0	0.0	0	0.0	0	0.0
1	1	1	1	1	2	1	0	20	66.7	0	0.0	4	13.3	0.0	0.0	2	6.7	24	80.0	0	0.0	0	0.0	0	0.0
1	1	1	1	2	5	0	1	6	20.0	1	3.3	0	0.0	0.0	0.0	27	90.0	1	3.3	2	6.7	0	0.0	0	0.0
1	1	1	1	2	5	0	0	3	10.0	1	3.3	0	0.0	0.0	0.0	26	86.7	4	13.3	0	0.0	0	0.0	0	0.0
1	1	1	1	2	5	1	1	13	43.3	2	6.7	0	0.0	0.0	0.0	13	43.3	17	56.7	0	0.0	0	0.0	0	0.0
1	1	1	1	2	5	1	0	21	70.0	3	10.0	7	23.3	0.0	0.0	5	16.7	18	60.0	0	0.0	0	0.0	0	0.0
1	1	1	1	2	3	0	1	6	20.0	0	0.0	0	0.0	0.0	0.0	22	73.3	5	16.7	3	10.0	0	0.0	0	0.0
1	1	1	1	2	3	0	0	9	30.0	0	0.0	0	0.0	0.0	0.0	27	90.0	3	10.0	0	0.0	0	0.0	0	0.0
1	1	1	1	2	3	1	1	17	56.7	1	3.3	1	3.3	0.0	0.0	14	46.7	15	50.0	0	0.0	0	0.0	0	0.0
1	1	1	1	2	3	1	0	21	70.0	2	6.7	4	13.3	0.0	0.0	1	3.3	25	83.3	0	0.0	0	0.0	0	0.0
1	1	1	1	2	2	0	1	16	53.3	0	0.0	1	3.3	0.0	0.0	28	93.3	1	3.3	0	0.0	0	0.0	0	0.0
1	1	1	1	2	2	0	0	6	20.0	1	3.3	0	0.0	0.0	0.0	26	86.7	4	13.3	0	0.0	0	0.0	0	0.0
1	1	1	1	2	2	1	1	13	43.3	0	0.0	0	0.0	0.0	0.0	4	13.3	26	86.7	0	0.0	0	0.0	0	0.0
1	1	1	1	2	2	1	0	14	46.7	1	3.3	1	3.3	0.0	0.0	2	6.7	27	90.0	0	0.0	0	0.0	0	0.0
1	1	1	1	3	5	0	1	5	16.7	1	3.3	0	0.0	0.0	0.0	24	80.0	6	20.0	0	0.0	0	0.0	0	0.0
1	1	1	1	3	5	0	0	13	43.3	2	6.7	1	3.3	0.0	0.0	26	86.7	3	10.0	0	0.0	0	0.0	0	0.0
1	1	1	1	3	5	1	1	27	90.0	0	0.0	10	33.3	0.0	0.0	3	10.0	17	56.7	0	0.0	0	0.0	0	0.0
1	1	1	1	3	5	1	0	15	50.0	1	3.3	3	10.0	0.0	0.0	5	16.7	22	73.3	0	0.0	0	0.0	0	0.0
1	1	1	1	3	3	0	1	16	53.3	4	13.3	0	0.0	0.0	0.0	27	90.0	3	10.0	0	0.0	0	0.0	0	0.0
1	1	1	1	3	3	0	0	10	33.3	1	3.3	0	0.0	0.0	0.0	28	93.3	2	6.7	0	0.0	0	0.0	0	0.0
1	1	1	1	3	3	1	1	17	56.7	1	3.3	2	6.7	0.0	0.0	10	33.3	17	56.7	1	3.3	0	0.0	0	0.0
1	1	1	1	3	3	1	0	10	33.3	1	3.3	2	6.7	0.0	0.0	5	16.7	23	76.7	0	0.0	0	0.0	0	0.0
1	1	1	1	3	2	0	1	19	63.3	1	3.3	4	13.3	0.0	0.0	23	76.7	2	6.7	0	0.0	1	3.3	0	0.0
1	1	1	1	3	2	0	0	14	46.7	0	0.0	3	10.0	0.0	0.0	22	73.3	5	16.7	0	0.0	0	0.0	0	0.0
1	1	1	1	3	2	1	1	23	76.7	2	6.7	15	50.0	8.0	26.7	2	6.7	5	16.7	0	0.0	0	0.0	0	0.0
1	1	1	1	3	2	1	0	24	80.0	1	3.3	16	53.3	4.0	13.3	2	6.7	8	26.7	0	0.0	0	0.0	0	0.0

Table F-1a. Means for 1991 point frame hits and percent cover for three replicates at each 1990 planted plot in Block 1 at the BP Put River No. 1 gravel pad

Block	Snow Fence	Poa Glauca	Gravel Thick.	Soil Tilled	Aerial Cover							Ground Cover											
					Grass	%	Forb	%	Plant	%	Moss	%	Rock	%	Barren	%	Mulch	%	Wood	%	Feces	%	
1	1	1	5	0	1	8.3	27.8	1.3	4.4	0.3	1.1	0.0	0.0	26.7	88.9	2.3	7.8	0.7	2.2	0.0	0.0	0.0	0.0
1	1	1	5	0	0	9.0	30.0	1.3	4.4	1.0	3.3	0.0	0.0	25.3	84.4	3.7	12.2	0.0	0.0	0.0	0.0	0.0	0.0
1	1	1	5	1	1	19.7	65.6	1.7	5.6	6.0	20.0	0.0	0.0	7.7	25.6	16.3	54.4	0.0	0.0	0.0	0.0	0.0	0.0
1	1	1	5	1	0	17.0	56.7	2.0	6.7	5.3	17.8	0.0	0.0	4.3	14.4	20.3	67.8	0.0	0.0	0.0	0.0	0.0	0.0
1	1	1	3	0	1	9.3	31.1	1.3	4.4	0.0	0.0	0.0	0.0	25.0	83.3	4.0	13.3	1.0	3.3	0.0	0.0	0.0	0.0
1	1	1	3	0	0	9.3	31.1	0.3	1.1	0.0	0.0	0.0	0.0	26.3	87.8	3.7	12.2	0.0	0.0	0.0	0.0	0.0	0.0
1	1	1	3	1	1	16.3	54.4	1.7	5.6	1.3	4.4	0.0	0.0	9.0	30.0	19.3	64.4	0.3	1.1	0.0	0.0	0.0	0.0
1	1	1	3	1	0	13.0	43.3	1.3	4.4	2.0	6.7	0.0	0.0	2.3	7.8	25.7	85.6	0.0	0.0	0.0	0.0	0.0	0.0
1	1	1	2	0	1	16.3	54.4	0.7	2.2	2.3	7.8	0.0	0.0	25.0	83.3	2.0	6.7	0.3	1.1	0.3	1.1	0.0	0.0
1	1	1	2	0	0	11.7	38.9	1.0	3.3	1.3	4.4	0.0	0.0	25.7	85.6	3.0	10.0	0.0	0.0	0.0	0.0	0.0	0.0
1	1	1	2	1	1	20.7	68.9	0.7	2.2	7.7	25.6	2.7	8.9	2.7	8.9	17.0	56.7	0.0	0.0	0.0	0.0	0.0	0.0
1	1	1	2	1	0	19.3	64.4	0.7	2.2	7.0	23.3	1.3	4.4	2.0	6.7	19.7	65.6	0.0	0.0	0.0	0.0	0.0	0.0

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Table F-1b. 1991 treatment means for point frame hits and percent cover at 1990 planted plots in Block 1, BP Put River No. 1 gravel pad

Block	Snow Fence	Poa Glauca	Gravel Thick.	Soil Tilled	Aerial Cover							Ground Cover											
					Grass	%	Forb	%	Plant	%	Moss	%	Rock	%	Barren	%	Mulch	%	Wood	%	Feces	%	
1	1	1				14.2	47.2	1.2	3.9	2.9	9.5	0.3	1.1	15.2	50.6	11.4	38.1	0.2	0.6	0.0	0.1	0.0	0.0
1	1	1	5			13.5	45.0	1.6	5.3	3.2	10.6	0.0	0.0	16.0	53.3	10.7	35.6	0.2	0.6	0.0	0.0	0.0	0.0
1	1	1	3			12.0	40.0	1.2	3.9	0.8	2.8	0.0	0.0	15.7	52.2	13.2	43.9	0.3	1.1	0.0	0.0	0.0	0.0
1	1	1	2			17.0	56.7	0.8	2.5	4.6	15.3	1.0	3.3	13.8	46.1	10.4	34.7	0.1	0.3	0.1	0.3	0.0	0.0
1	1	1		0		10.7	35.6	1.0	3.3	0.8	2.8	0.0	0.0	25.7	85.6	3.1	10.4	0.3	1.1	0.1	0.2	0.0	0.0
1	1	1		1		17.7	58.9	1.3	4.4	4.9	16.3	0.7	2.2	4.7	15.6	19.7	65.7	0.1	0.2	0.0	0.0	0.0	0.0
1	1	1			0	13.2	44.1	1.1	3.7	2.8	9.3	0.2	0.7	14.3	47.8	12.7	42.2	0.0	0.0	0.0	0.0	0.0	0.0
1	1	1			1	15.1	50.4	1.2	4.1	2.9	9.8	0.4	1.5	16.0	53.3	10.2	33.9	0.4	1.3	0.1	0.2	0.0	0.0



Table F-2. 1991 point frame hits (n=30) and percent cover for plots planted in 1990 in Block 2 at the BP Put River No. 1 gravel pad

Block	Snow	Poa	Gravel	Aerial Cover							Ground Cover													
				Fence	Glauca	Repl	Thick.	Soil	Tilled	Grass	% Forb	% Plant	% Moss	% Rock	% Barren	% Mulch	% Wood	% Feces	%					
2	0	1	1	5	0	1	7	23.3	4	13.3	0	0.0	0	0.0	28	93.3	1	3.3	1	3.3	0	0.0	0	0.0
2	0	1	1	5	0	0	3	10.0	0	0.0	0	0.0	0	0.0	20	66.7	10	33.3	0	0.0	0	0.0	0	0.0
2	0	1	1	5	1	1	12	40.0	1	3.3	1	3.3	0	0.0	3	10.0	26	86.7	0	0.0	0	0.0	0	0.0
2	0	1	1	5	1	0	10	33.3	0	0.0	1	3.3	0	0.0	3	10.0	26	86.7	0	0.0	0	0.0	0	0.0
2	0	1	1	3	0	1	11	36.7	4	13.3	0	0.0	0	0.0	22	73.3	4	13.3	3	10.0	1	3.3	0	0.0
2	0	1	1	3	0	0	10	33.3	0	0.0	0	0.0	0	0.0	21	70.0	9	30.0	0	0.0	0	0.0	0	0.0
2	0	1	1	3	1	1	23	76.7	5	16.7	6	20.0	0	0.0	9	30.0	15	50.0	0	0.0	0	0.0	0	0.0
2	0	1	1	3	1	0	21	70.0	0	0.0	8	26.7	0	0.0	5	16.7	17	56.7	0	0.0	0	0.0	0	0.0
2	0	1	1	2	0	1	17	56.7	0	0.0	4	13.3	0	0.0	21	70.0	5	16.7	0	0.0	0	0.0	0	0.0
2	0	1	1	2	0	0	8	26.7	1	3.3	0	0.0	0	0.0	22	73.3	8	26.7	0	0.0	0	0.0	0	0.0
2	0	1	1	2	1	1	24	80.0	0	0.0	10	33.3	0	0.0	2	6.7	18	60.0	0	0.0	0	0.0	0	0.0
2	0	1	1	2	1	0	22	73.3	2	6.7	8	26.7	0	0.0	0	0.0	22	73.3	0	0.0	0	0.0	0	0.0
2	0	1	2	5	0	1	3	10.0	1	3.3	0	0.0	0	0.0	27	90.0	3	10.0	0	0.0	0	0.0	0	0.0
2	0	1	2	5	0	0	9	30.0	1	3.3	0	0.0	0	0.0	22	73.3	8	26.7	0	0.0	0	0.0	0	0.0
2	0	1	2	5	1	1	15	50.0	0	0.0	3	10.0	0	0.0	2	6.7	25	83.3	0	0.0	0	0.0	0	0.0
2	0	1	2	5	1	0	2	6.7	0	0.0	0	0.0	0	0.0	6	20.0	24	80.0	0	0.0	0	0.0	0	0.0
2	0	1	2	3	0	1	9	30.0	1	3.3	0	0.0	0	0.0	27	90.0	3	10.0	0	0.0	0	0.0	0	0.0
2	0	1	2	3	0	0	8	26.7	1	3.3	0	0.0	0	0.0	25	83.3	5	16.7	0	0.0	0	0.0	0	0.0
2	0	1	2	3	1	1	18	60.0	0	0.0	4	13.3	0	0.0	8	26.7	18	60.0	0	0.0	0	0.0	0	0.0
2	0	1	2	3	1	0	12	40.0	0	0.0	0	0.0	0	0.0	7	23.3	23	76.7	0	0.0	0	0.0	0	0.0
2	0	1	2	2	0	1	9	30.0	0	0.0	0	0.0	0	0.0	26	86.7	4	13.3	0	0.0	0	0.0	0	0.0
2	0	1	2	2	0	0	12	40.0	0	0.0	2	6.7	0	0.0	24	80.0	4	13.3	0	0.0	0	0.0	0	0.0
2	0	1	2	2	1	1	30	100.0	0	0.0	23	76.7	0	0.0	1	3.3	6	20.0	0	0.0	0	0.0	0	0.0
2	0	1	2	2	1	0	26	86.7	2	6.7	14	46.7	0	0.0	4	13.3	11	36.7	0	0.0	0	0.0	1	3.3
2	0	1	3	5	0	1	8	26.7	0	0.0	0	0.0	0	0.0	24	80.0	5	16.7	1	3.3	0	0.0	0	0.0
2	0	1	3	5	0	0	4	13.3	0	0.0	0	0.0	0	0.0	20	66.7	10	33.3	0	0.0	0	0.0	0	0.0
2	0	1	3	5	1	1	7	23.3	0	0.0	1	3.3	0	0.0	8	26.7	20	66.7	0	0.0	0	0.0	1	3.3
2	0	1	3	5	1	0	5	16.7	0	0.0	0	0.0	0	0.0	7	23.3	23	76.7	0	0.0	0	0.0	0	0.0
2	0	1	3	3	0	1	4	13.3	1	3.3	0	0.0	0	0.0	27	90.0	3	10.0	0	0.0	0	0.0	0	0.0
2	0	1	3	3	0	0	10	33.3	1	3.3	0	0.0	0	0.0	25	83.3	5	16.7	0	0.0	0	0.0	0	0.0
2	0	1	3	3	1	1	14	46.7	0	0.0	2	6.7	0	0.0	2	6.7	26	86.7	0	0.0	0	0.0	0	0.0
2	0	1	3	3	1	0	11	36.7	4	13.3	1	3.3	0	0.0	2	6.7	27	90.0	0	0.0	0	0.0	0	0.0
2	0	1	3	2	0	1	23	76.7	0	0.0	6	20.0	0	0.0	17	56.7	7	23.3	0	0.0	0	0.0	0	0.0
2	0	1	3	2	0	0	15	50.0	0	0.0	1	3.3	0	0.0	24	80.0	5	16.7	0	0.0	0	0.0	0	0.0
2	0	1	3	2	1	1	28	93.3	0	0.0	8	26.7	0	0.0	4	13.3	18	60.0	0	0.0	0	0.0	0	0.0
2	0	1	3	2	1	0	9	30.0	0	0.0	1	3.3	0	0.0	5	16.7	24	80.0	0	0.0	0	0.0	0	0.0

Table F-2a. Means for 1991 point frame hits and percent cover for three replicates at each 1990 planted plot in Block 2 at the BP Put River No. 1 gravel pad

Block	Snow Fence	Poa Glauca	Gravel Thick.	Soil Tilled	Aerial Cover						Ground Cover												
					Grass	%	Forb	%	Plant	%	Moss	%	Rock	%	Barren	%	Mulch	%	Wood	%	Feces	%	
2	0	1	5	0	1	6.0	6.0	1.7	1.7	0.0	0.0	0.0	0.0	26.3	26.3	3.0	3.0	0.7	0.7	0.0	0.0	0.0	0.0
2	0	1	5	0	0	5.3	5.3	0.3	0.3	0.0	0.0	0.0	0.0	20.7	20.7	9.3	9.3	0.0	0.0	0.0	0.0	0.0	0.0
2	0	1	5	1	1	11.3	11.3	0.3	0.3	1.7	1.7	0.0	0.0	4.3	4.3	23.7	23.7	0.0	0.0	0.0	0.0	0.3	0.3
2	0	1	5	1	0	5.7	5.7	0.0	0.0	0.3	0.3	0.0	0.0	5.3	5.3	24.3	24.3	0.0	0.0	0.0	0.0	0.0	0.0
2	0	1	3	0	1	8.0	8.0	2.0	2.0	0.0	0.0	0.0	0.0	25.3	25.3	3.3	3.3	1.0	1.0	0.3	0.3	0.0	0.0
2	0	1	3	0	0	9.3	9.3	0.7	0.7	0.0	0.0	0.0	0.0	23.7	23.7	6.3	6.3	0.0	0.0	0.0	0.0	0.0	0.0
2	0	1	3	1	1	18.3	18.3	1.7	1.7	4.0	4.0	0.0	0.0	6.3	6.3	19.7	19.7	0.0	0.0	0.0	0.0	0.0	0.0
2	0	1	3	1	0	14.7	14.7	1.3	1.3	3.0	3.0	0.0	0.0	4.7	4.7	22.3	22.3	0.0	0.0	0.0	0.0	0.0	0.0
2	0	1	2	0	1	16.3	16.3	0.0	0.0	3.3	3.3	0.0	0.0	21.3	21.3	5.3	5.3	0.0	0.0	0.0	0.0	0.0	0.0
2	0	1	2	0	0	11.7	11.7	0.3	0.3	1.0	1.0	0.0	0.0	23.3	23.3	5.7	5.7	0.0	0.0	0.0	0.0	0.0	0.0
2	0	1	2	1	1	27.3	27.3	0.0	0.0	13.7	13.7	0.0	0.0	2.3	2.3	14.0	14.0	0.0	0.0	0.0	0.0	0.0	0.0
2	0	1	2	1	0	19.0	19.0	1.3	1.3	7.7	7.7	0.0	0.0	3.0	3.0	19.0	19.0	0.0	0.0	0.0	0.0	0.3	0.3

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Table F-2b. 1991 treatment means for point frame hits and percent cover at 1990 planted plots in Block 2, BP Put River No. 1 gravel pad

Block	Snow Fence	Poa Glauca	Gravel Thick.	Soil Tilled	Aerial Cover						Ground Cover												
					Grass	%	Forb	%	Plant	%	Moss	%	Rock	%	Barren	%	Mulch	%	Wood	%	Feces	%	
2	0	1				12.8	42.5	0.8	2.7	2.9	9.6	0.0	0.0	13.9	46.3	13.0	43.3	0.1	0.5	0.0	0.1	0.1	0.2
2	0	1	5			7.1	23.6	0.6	1.9	0.5	1.7	0.0	0.0	14.2	47.2	15.1	50.3	0.2	0.6	0.0	0.0	0.1	0.3
2	0	1	3			12.6	41.9	1.4	4.7	1.8	5.8	0.0	0.0	15.0	50.0	12.9	43.1	0.3	0.8	0.1	0.3	0.0	0.0
2	0	1	2			18.6	61.9	0.4	1.4	6.4	21.4	0.0	0.0	12.5	41.7	11.0	36.7	0.0	0.0	0.0	0.0	0.1	0.3
2	0	1		0		9.4	31.5	0.8	2.8	0.7	2.4	0.0	0.0	23.4	78.1	5.5	18.3	0.3	0.9	0.1	0.2	0.0	0.0
2	0	1		1		16.1	53.5	0.8	2.6	5.1	16.9	0.0	0.0	4.3	14.4	20.5	68.3	0.0	0.0	0.0	0.0	0.1	0.4
2	0	1			0	10.9	36.5	0.7	2.2	2.0	6.7	0.0	0.0	13.4	44.8	14.5	48.3	0.0	0.0	0.0	0.0	0.1	0.2
2	0	1			1	14.6	48.5	0.9	3.1	3.8	12.6	0.0	0.0	14.3	47.8	11.5	38.3	0.3	0.9	0.1	0.2	0.1	0.2

Table F-3. 1991 point frame hits (n=30) and percent cover for plots planted in 1990 in Block 3 at the BP Put River No. 1 gravel pad

Block	Snow Fence	Poa Glauca	Gravel Repl	Thick.	Soil Tilled	Aerial Cover						Ground Cover												
						Grass %	Forb %	Plant %	Moss %	Rock %	Barren %	Mulch %	Wood %	Feces %										
3	1	0	1	5	0	1	16	53.3	2	6.7	0	0.0	0	0.0	24	80.0	6	20.0	0	0.0	0	0.0	0	0.0
3	1	0	1	5	0	0	6	20.0	0	0.0	0	0.0	0	0.0	23	76.7	7	23.3	0	0.0	0	0.0	0	0.0
3	1	0	1	5	1	1	13	43.3	0	0.0	0	0.0	0	0.0	6	20.0	24	80.0	0	0.0	0	0.0	0	0.0
3	1	0	1	5	1	0	13	43.3	1	3.3	0	0.0	0	0.0	14	46.7	16	53.3	0	0.0	0	0.0	0	0.0
3	1	0	1	3	0	1	12	40.0	1	3.3	0	0.0	0	0.0	28	93.3	2	6.7	0	0.0	0	0.0	0	0.0
3	1	0	1	3	0	0	10	33.3	2	6.7	1	3.3	0	0.0	27	90.0	2	6.7	0	0.0	0	0.0	0	0.0
3	1	0	1	3	1	1	10	33.3	1	3.3	0	0.0	0	0.0	3	10.0	27	90.0	0	0.0	0	0.0	0	0.0
3	1	0	1	3	1	0	12	40.0	1	3.3	4	13.3	0	0.0	5	16.7	21	70.0	0	0.0	0	0.0	0	0.0
3	1	0	1	2	0	1	14	46.7	5	16.7	1	3.3	0	0.0	20	66.7	9	30.0	0	0.0	0	0.0	0	0.0
3	1	0	1	2	0	0	5	16.7	1	3.3	0	0.0	0	0.0	26	86.7	4	13.3	0	0.0	0	0.0	0	0.0
3	1	0	1	2	1	1	6	20.0	0	0.0	0	0.0	0	0.0	17	56.7	13	43.3	0	0.0	0	0.0	0	0.0
3	1	0	1	2	1	0	12	40.0	2	6.7	4	13.3	0	0.0	7	23.3	19	63.3	0	0.0	0	0.0	0	0.0
3	1	0	2	5	0	1	6	20.0	0	0.0	0	0.0	0	0.0	28	93.3	2	6.7	0	0.0	0	0.0	0	0.0
3	1	0	2	5	0	0	8	26.7	0	0.0	0	0.0	0	0.0	22	73.3	8	26.7	0	0.0	0	0.0	0	0.0
3	1	0	2	5	1	1	19	63.3	1	3.3	15	50.0	0	0.0	4	13.3	11	36.7	0	0.0	0	0.0	0	0.0
3	1	0	2	5	1	0	5	16.7	0	0.0	3	10.0	0	0.0	9	30.0	18	60.0	0	0.0	0	0.0	0	0.0
3	1	0	2	3	0	1	2	6.7	0	0.0	0	0.0	0	0.0	23	76.7	7	23.3	0	0.0	0	0.0	0	0.0
3	1	0	2	3	0	0	7	23.3	1	3.3	0	0.0	0	0.0	24	80.0	6	20.0	0	0.0	0	0.0	0	0.0
3	1	0	2	3	1	1	10	33.3	0	0.0	3	10.0	0	0.0	7	23.3	20	66.7	0	0.0	0	0.0	0	0.0
3	1	0	2	3	1	0	20	66.7	0	0.0	11	36.7	0	0.0	4	13.3	15	50.0	0	0.0	0	0.0	0	0.0
3	1	0	2	2	0	1	5	16.7	0	0.0	0	0.0	0	0.0	28	93.3	2	6.7	0	0.0	0	0.0	0	0.0
3	1	0	2	2	0	0	8	26.7	1	3.3	0	0.0	0	0.0	29	96.7	1	3.3	0	0.0	0	0.0	0	0.0
3	1	0	2	2	1	1	10	33.3	0	0.0	1	3.3	0	0.0	8	26.7	21	70.0	0	0.0	0	0.0	0	0.0
3	1	0	2	2	1	0	3	10.0	0	0.0	0	0.0	0	0.0	5	16.7	25	83.3	0	0.0	0	0.0	0	0.0
3	1	0	3	5	0	1	10	33.3	0	0.0	1	3.3	0	0.0	26	86.7	3	10.0	0	0.0	0	0.0	0	0.0
3	1	0	3	5	0	0	4	13.3	0	0.0	1	3.3	0	0.0	19	63.3	10	33.3	0	0.0	0	0.0	0	0.0
3	1	0	3	5	1	1	13	43.3	2	6.7	5	16.7	0	0.0	7	23.3	18	60.0	0	0.0	0	0.0	0	0.0
3	1	0	3	5	1	0	15	50.0	0	0.0	3	10.0	0	0.0	9	30.0	18	60.0	0	0.0	0	0.0	0	0.0
3	1	0	3	3	0	1	8	26.7	1	3.3	0	0.0	0	0.0	27	90.0	3	10.0	0	0.0	0	0.0	0	0.0
3	1	0	3	3	0	0	5	16.7	2	6.7	0	0.0	0	0.0	25	83.3	5	16.7	0	0.0	0	0.0	0	0.0
3	1	0	3	3	1	1	17	56.7	0	0.0	5	16.7	0	0.0	1	3.3	24	80.0	0	0.0	0	0.0	0	0.0
3	1	0	3	3	1	0	14	46.7	1	3.3	3	10.0	0	0.0	6	20.0	21	70.0	0	0.0	0	0.0	0	0.0
3	1	0	3	2	0	1	10	33.3	2	6.7	0	0.0	0	0.0	28	93.3	2	6.7	0	0.0	0	0.0	0	0.0
3	1	0	3	2	0	0	7	23.3	1	3.3	0	0.0	0	0.0	26	86.7	4	13.3	0	0.0	0	0.0	0	0.0
3	1	0	3	2	1	1	11	36.7	0	0.0	1	3.3	0	0.0	8	26.7	21	70.0	0	0.0	0	0.0	0	0.0
3	1	0	3	2	1	0	14	46.7	1	3.3	2	6.7	0	0.0	4	13.3	24	80.0	0	0.0	0	0.0	0	0.0

Table F-3a. Means for 1991 point frame hits and percent cover for three replicates at each 1990 planted plot in Block 3 at the BP Put River No. 1 gravel pad

Block	Snow Fence	Poa Glauca	Gravel			Aerial Cover								Ground Cover									
			Thick.	Soil	Tilled	Grass	%	Forb	%	Plant	%	Moss	%	Rock	%	Barren	%	Mulch	%	Wood	%	Feces	%
3	1	0	5	0	1	10.7	35.6	0.7	2.2	0.3	1.1	0.0	0.0	26.0	86.7	3.7	12.2	0.0	0.0	0.0	0.0	0.0	0.0
3	1	0	5	0	0	6.0	20.0	0.0	0.0	0.3	1.1	0.0	0.0	21.3	71.1	8.3	27.8	0.0	0.0	0.0	0.0	0.0	0.0
3	1	0	5	1	1	15.0	50.0	1.0	3.3	6.7	22.2	0.0	0.0	5.7	18.9	17.7	58.9	0.0	0.0	0.0	0.0	0.0	0.0
3	1	0	5	1	0	11.0	36.7	0.3	1.1	2.0	6.7	0.0	0.0	10.7	35.6	17.3	57.8	0.0	0.0	0.0	0.0	0.0	0.0
3	1	0	3	0	1	7.3	24.4	0.7	2.2	0.0	0.0	0.0	0.0	26.0	86.7	4.0	13.3	0.0	0.0	0.0	0.0	0.0	0.0
3	1	0	3	0	0	7.3	24.4	1.7	5.6	0.3	1.1	0.0	0.0	25.3	84.4	4.3	14.4	0.0	0.0	0.0	0.0	0.0	0.0
3	1	0	3	1	1	12.3	41.1	0.3	1.1	2.7	8.9	0.0	0.0	3.7	12.2	23.7	78.9	0.0	0.0	0.0	0.0	0.0	0.0
3	1	0	3	1	0	15.3	51.1	0.7	2.2	6.0	20.0	0.0	0.0	5.0	16.7	19.0	63.3	0.0	0.0	0.0	0.0	0.0	0.0
3	1	0	2	0	1	9.7	32.2	2.3	7.8	0.3	1.1	0.0	0.0	25.3	84.4	4.3	14.4	0.0	0.0	0.0	0.0	0.0	0.0
3	1	0	2	0	0	6.7	22.2	1.0	3.3	0.0	0.0	0.0	0.0	27.0	90.0	3.0	10.0	0.0	0.0	0.0	0.0	0.0	0.0
3	1	0	2	1	1	9.0	30.0	0.0	0.0	0.7	2.2	0.0	0.0	11.0	36.7	18.3	61.1	0.0	0.0	0.0	0.0	0.0	0.0
3	1	0	2	1	0	9.7	32.2	1.0	3.3	2.0	6.7	0.0	0.0	5.3	17.8	22.7	75.6	0.0	0.0	0.0	0.0	0.0	0.0

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Table F-3b. 1991 treatment means for point frame hits and percent cover at 1990 planted plot in Block 3, BP Put River No. 1 gravel pad

Block	Snow Fence	Poa Glauca	Gravel			Aerial Cover								Ground Cover									
			Thick.	Soil	Tilled	Grass	%	Forb	%	Plant	%	Moss	%	Rock	%	Barren	%	Mulch	%	Wood	%	Feces	%
3	1	0				10.0	33.3	0.8	2.7	1.8	5.9	0.0	0.0	16.0	53.4	12.2	40.6	0.0	0.0	0.0	0.0	0.0	0.0
3	1	0	5			10.7	35.6	0.5	1.7	2.3	7.8	0.0	0.0	15.9	53.1	11.8	39.2	0.0	0.0	0.0	0.0	0.0	0.0
3	1	0	3			10.6	35.3	0.8	2.8	2.3	7.5	0.0	0.0	15.0	50.0	12.8	42.5	0.0	0.0	0.0	0.0	0.0	0.0
3	1	0	2			8.8	29.2	1.1	3.6	0.8	2.5	0.0	0.0	17.2	57.2	12.1	40.3	0.0	0.0	0.0	0.0	0.0	0.0
3	1	0		0		7.9	26.5	1.1	3.5	0.2	0.7	0.0	0.0	25.2	83.9	4.6	15.4	0.0	0.0	0.0	0.0	0.0	0.0
3	1	0		1		12.1	40.2	0.6	1.9	3.3	11.1	0.0	0.0	6.9	23.0	19.8	65.9	0.0	0.0	0.0	0.0	0.0	0.0
3	1	0			0	9.3	31.1	0.8	2.6	1.8	5.9	0.0	0.0	15.8	52.6	12.4	41.5	0.0	0.0	0.0	0.0	0.0	0.0
3	1	0			1	10.7	35.6	0.8	2.8	1.8	5.9	0.0	0.0	16.3	54.3	11.9	39.8	0.0	0.0	0.0	0.0	0.0	0.0

Table F-4. 1991 point frame hits and percent cover for plots planted in 1990 in Block 4 at the BP Put River No. 1 gravel pad, n=30

Block	Snow Fence	Poa Glauca	Gravel Repl	Thick.	Soil	Aerial Cover							Ground Cover											
						Tilled	Grass	X	Forb	X	Plant	X	Moss	X	Rock	X	Barren	X	Mulch	X	Wood	X	Feces	X
4	0	0	1	5	0	1	3	10.0	0	0.0	0	0.0	0	0.0	28	93.3	2	6.7	0	0.0	0	0.0	0	0.0
4	0	0	1	5	0	0	4	13.3	0	0.0	0	0.0	0	0.0	22	73.3	8	26.7	0	0.0	0	0.0	0	0.0
4	0	0	1	5	1	1	14	46.7	1	3.3	4	13.3	0	0.0	8	26.7	18	60.0	0	0.0	0	0.0	0	0.0
4	0	0	1	5	1	0	6	20.0	0	0.0	0	0.0	0	0.0	8	26.7	22	73.3	0	0.0	0	0.0	0	0.0
4	0	0	1	3	0	1	8	26.7	0	0.0	0	0.0	0	0.0	30	100.0	0	0.0	0	0.0	0	0.0	0	0.0
4	0	0	1	3	0	0	7	23.3	1	3.3	0	0.0	0	0.0	25	83.3	5	16.7	0	0.0	0	0.0	0	0.0
4	0	0	1	3	1	1	16	53.3	0	0.0	3	10.0	0	0.0	10	33.3	16	53.3	0	0.0	0	0.0	1	3.3
4	0	0	1	3	1	0	10	33.3	0	0.0	2	6.7	0	0.0	9	30.0	19	63.3	0	0.0	0	0.0	0	0.0
4	0	0	1	2	0	1	10	33.3	0	0.0	0	0.0	0	0.0	29	96.7	1	3.3	0	0.0	0	0.0	0	0.0
4	0	0	1	2	0	0	6	20.0	0	0.0	0	0.0	0	0.0	25	83.3	5	16.7	0	0.0	0	0.0	0	0.0
4	0	0	1	2	1	1	7	23.3	0	0.0	0	0.0	0	0.0	9	30.0	21	70.0	0	0.0	0	0.0	0	0.0
4	0	0	1	2	1	0	6	20.0	1	3.3	2	6.7	0	0.0	9	30.0	19	63.3	0	0.0	0	0.0	0	0.0
4	0	0	2	5	0	1	1	3.3	0	0.0	0	0.0	0	0.0	22	73.3	8	26.7	0	0.0	0	0.0	0	0.0
4	0	0	2	5	0	0	8	26.7	0	0.0	1	3.3	0	0.0	21	70.0	8	26.7	0	0.0	0	0.0	0	0.0
4	0	0	2	5	1	1	13	43.3	0	0.0	2	6.7	0	0.0	7	23.3	21	70.0	0	0.0	0	0.0	0	0.0
4	0	0	2	5	1	0	1	3.3	0	0.0	0	0.0	0	0.0	10	33.3	20	66.7	0	0.0	0	0.0	0	0.0
4	0	0	2	3	0	1	9	30.0	0	0.0	1	3.3	0	0.0	21	70.0	8	26.7	0	0.0	0	0.0	0	0.0
4	0	0	2	3	0	0	9	30.0	0	0.0	0	0.0	0	0.0	25	83.3	5	16.7	0	0.0	0	0.0	0	0.0
4	0	0	2	3	1	1	22	73.3	0	0.0	7	23.3	0	0.0	8	26.7	15	50.0	0	0.0	0	0.0	0	0.0
4	0	0	2	3	1	0	11	36.7	1	3.3	4	13.3	0	0.0	6	20.0	20	66.7	0	0.0	0	0.0	0	0.0
4	0	0	2	2	0	1	10	33.3	1	3.3	1	3.3	0	0.0	25	83.3	4	13.3	0	0.0	0	0.0	0	0.0
4	0	0	2	2	0	0	4	13.3	0	0.0	0	0.0	0	0.0	26	86.7	4	13.3	0	0.0	0	0.0	0	0.0
4	0	0	2	2	1	1	12	40.0	1	3.3	2	6.7	0	0.0	12	40.0	16	53.3	0	0.0	0	0.0	0	0.0
4	0	0	2	2	1	0	15	50.0	2	6.7	1	3.3	0	0.0	8	26.7	21	70.0	0	0.0	0	0.0	0	0.0
4	0	0	3	5	0	1	11	36.7	0	0.0	1	3.3	0	0.0	24	80.0	5	16.7	0	0.0	0	0.0	0	0.0
4	0	0	3	5	0	0	6	20.0	0	0.0	0	0.0	0	0.0	22	73.3	8	26.7	0	0.0	0	0.0	0	0.0
4	0	0	3	5	1	1	13	43.3	0	0.0	0	0.0	0	0.0	8	26.7	22	73.3	0	0.0	0	0.0	0	0.0
4	0	0	3	5	1	0	7	23.3	0	0.0	2	6.7	0	0.0	9	30.0	19	63.3	0	0.0	0	0.0	0	0.0
4	0	0	3	3	0	1	12	40.0	2	6.7	2	6.7	0	0.0	25	83.3	3	10.0	0	0.0	0	0.0	0	0.0
4	0	0	3	3	0	0	5	16.7	0	0.0	0	0.0	0	0.0	23	76.7	7	23.3	0	0.0	0	0.0	0	0.0
4	0	0	3	3	1	1	24	80.0	0	0.0	5	16.7	0	0.0	3	10.0	22	73.3	0	0.0	0	0.0	0	0.0
4	0	0	3	3	1	0	18	60.0	2	6.7	2	6.7	0	0.0	7	23.3	21	70.0	0	0.0	0	0.0	0	0.0
4	0	0	3	2	0	1	8	26.7	2	6.7	1	3.3	0	0.0	27	90.0	2	6.7	0	0.0	0	0.0	0	0.0
4	0	0	3	2	0	0	1	3.3	0	0.0	0	0.0	0	0.0	25	83.3	5	16.7	0	0.0	0	0.0	0	0.0
4	0	0	3	2	1	1	10	33.3	0	0.0	5	16.7	0	0.0	8	26.7	17	56.7	0	0.0	0	0.0	0	0.0
4	0	0	3	2	1	0	15	50.0	0	0.0	0	0.0	0	0.0	7	23.3	23	76.7	0	0.0	0	0.0	0	0.0

Table F-4a. Means for 1991 point frame hits and percent cover for three replicates at each 1990 planted plot in Block 4 at the BP Put River No. 1 gravel pad

Block	Snow Fence	Poa Glauca	Gravel			Aerial Cover							Ground Cover										
			Thick.	Soil	Tilled	Grass	%	Forb	%	Plant	%	Moss	%	Rock	%	Barren	%	Mulch	%	Wood	%	Feces	%
4	0	0	5	0	1	5.0	16.7	0.0	0.0	0.3	1.1	0.0	0.0	24.7	82.2	5.0	16.7	0.0	0.0	0.0	0.0	0.0	0.0
4	0	0	5	0	0	6.0	20.0	0.0	0.0	0.3	1.1	0.0	0.0	21.7	72.2	8.0	26.7	0.0	0.0	0.0	0.0	0.0	0.0
4	0	0	5	1	1	13.3	44.4	0.3	1.1	2.0	6.7	0.0	0.0	7.7	25.6	20.3	67.8	0.0	0.0	0.0	0.0	0.0	0.0
4	0	0	5	1	0	4.7	15.6	0.0	0.0	0.7	2.2	0.0	0.0	9.0	30.0	20.3	67.8	0.0	0.0	0.0	0.0	0.0	0.0
4	0	0	3	0	1	9.7	32.2	0.7	2.2	1.0	3.3	0.0	0.0	25.3	84.4	3.7	12.2	0.0	0.0	0.0	0.0	0.0	0.0
4	0	0	3	0	0	7.0	23.3	0.3	1.1	0.0	0.0	0.0	0.0	24.3	81.1	5.7	18.9	0.0	0.0	0.0	0.0	0.0	0.0
4	0	0	3	1	1	20.7	68.9	0.0	0.0	5.0	16.7	0.0	0.0	7.0	23.3	17.7	58.9	0.0	0.0	0.0	0.0	0.3	1.1
4	0	0	3	1	0	13.0	43.3	1.0	3.3	2.7	8.9	0.0	0.0	7.3	24.4	20.0	66.7	0.0	0.0	0.0	0.0	0.0	0.0
4	0	0	2	0	1	9.3	31.1	1.0	3.3	0.7	2.2	0.0	0.0	27.0	90.0	2.3	7.8	0.0	0.0	0.0	0.0	0.0	0.0
4	0	0	2	0	0	3.7	12.2	0.0	0.0	0.0	0.0	0.0	0.0	25.3	84.4	4.7	15.6	0.0	0.0	0.0	0.0	0.0	0.0
4	0	0	2	1	1	9.7	32.2	0.3	1.1	2.3	7.8	0.0	0.0	9.7	32.2	18.0	60.0	0.0	0.0	0.0	0.0	0.0	0.0
4	0	0	2	1	0	12.0	40.0	1.0	3.3	1.0	3.3	0.0	0.0	8.0	26.7	21.0	70.0	0.0	0.0	0.0	0.0	0.0	0.0

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Table F-4b. 1991 treatment means for point frame hits and percent cover at 1990 planted plots in Block 4, BP Put River No. 1 gravel pad

Block	Snow Fence	Poa Glauca	Gravel			Aerial Cover							Ground Cover										
			Thick.	Soil	Tilled	Grass	%	Forb	%	Plant	%	Moss	%	Rock	%	Barren	%	Mulch	%	Wood	%	Feces	%
4	0	0				9.5	31.7	0.4	1.3	1.3	4.4	0.0	0.0	16.4	54.7	12.2	40.7	0.0	0.0	0.0	0.0	0.0	0.1
4	0	0	5			7.3	24.2	0.1	0.3	0.8	2.8	0.0	0.0	15.8	52.5	13.4	44.7	0.0	0.0	0.0	0.0	0.0	0.0
4	0	0	3			12.6	41.9	0.5	1.7	2.2	7.2	0.0	0.0	16.0	53.3	11.8	39.2	0.0	0.0	0.0	0.0	0.1	0.3
4	0	0	2			8.7	28.9	0.6	1.9	1.0	3.3	0.0	0.0	17.5	58.3	11.5	38.3	0.0	0.0	0.0	0.0	0.0	0.0
4	0	0		0		6.8	22.6	0.3	1.1	0.4	1.3	0.0	0.0	24.7	82.4	4.9	16.3	0.0	0.0	0.0	0.0	0.0	0.0
4	0	0		1		12.2	40.7	0.4	1.5	2.3	7.6	0.0	0.0	8.1	27.0	19.6	65.2	0.0	0.0	0.0	0.0	0.1	0.2
4	0	0			0	7.7	25.7	0.4	1.3	0.8	2.6	0.0	0.0	15.9	53.1	13.3	44.3	0.0	0.0	0.0	0.0	0.0	0.0
4	0	0			1	11.3	37.6	0.4	1.3	1.9	6.3	0.0	0.0	16.9	56.3	11.2	37.2	0.0	0.0	0.0	0.0	0.1	0.2



Table F-5. 1991 point frame hits (n=30) and percent cover from Replicate 2 unplanted plots at the BP Put River No. 1 gravel pad

Block	Snow	Poa	Gravel	Aerial Cover										Ground Cover										
				Fence	Glauca	Repl	Thick.	Soil	Tilled	Grass	X	Forb	X	Plant	X	Moss	X	Rock	X	Barren	X	Mulch	X	Wood
1	1	1	2	5	0	1	0	0.0	0	0.0	0	0.0	0	0.0	26	86.7	2	6.7	2	6.7	0	0.0	0	0.0
1	1	1	2	5	0	0	0	0.0	0	0.0	0	0.0	0	0.0	27	90.0	3	10.0	0	0.0	0	0.0	0	0.0
1	1	1	2	5	1	1	0	0.0	0	0.0	0	0.0	0	0.0	15	50.0	15	50.0	0	0.0	0	0.0	0	0.0
1	1	1	2	5	1	0	0	0.0	0	0.0	0	0.0	0	0.0	2	6.7	24	80.0	4	13.3	0	0.0	0	0.0
1	1	1	2	3	0	1	0	0.0	0	0.0	0	0.0	0	0.0	29	96.7	0	0.0	1	3.3	0	0.0	0	0.0
1	1	1	2	3	0	0	0	0.0	0	0.0	0	0.0	0	0.0	23	76.7	7	23.3	0	0.0	0	0.0	0	0.0
1	1	1	2	3	1	1	0	0.0	0	0.0	0	0.0	0	0.0	16	53.3	14	46.7	0	0.0	0	0.0	0	0.0
1	1	1	2	3	1	0	0	0.0	0	0.0	0	0.0	0	0.0	8	26.7	22	73.3	0	0.0	0	0.0	0	0.0
1	1	1	2	2	0	1	0	0.0	1	3.3	1	3.3	1	3.3	24	80.0	3	10.0	1	3.3	0	0.0	0	0.0
1	1	1	2	2	0	0	7	23.3	0	0.0	0	0.0	0	0.0	28	93.3	2	6.7	0	0.0	0	0.0	0	0.0
1	1	1	2	2	1	1	4	13.3	0	0.0	0	0.0	0	0.0	6	20.0	24	80.0	0	0.0	0	0.0	0	0.0
1	1	1	2	2	1	0	4	13.3	1	3.3	0	0.0	0	0.0	8	26.7	21	70.0	0	0.0	0	0.0	1	3.3
2	0	1	2	5	0	1	0	0.0	0	0.0	0	0.0	4	13.3	23	76.7	3	10.0	0	0.0	0	0.0	0	0.0
2	0	1	2	5	0	0	0	0.0	0	0.0	0	0.0	0	0.0	22	73.3	8	26.7	0	0.0	0	0.0	0	0.0
2	0	1	2	5	1	1	0	0.0	0	0.0	0	0.0	0	0.0	7	23.3	23	76.7	0	0.0	0	0.0	0	0.0
2	0	1	2	5	1	0	0	0.0	0	0.0	0	0.0	0	0.0	6	20.0	24	80.0	0	0.0	0	0.0	0	0.0
2	0	1	2	3	0	1	0	0.0	0	0.0	0	0.0	0	0.0	28	93.3	2	6.7	0	0.0	0	0.0	0	0.0
2	0	1	2	3	0	0	0	0.0	0	0.0	0	0.0	0	0.0	24	80.0	6	20.0	0	0.0	0	0.0	0	0.0
2	0	1	2	3	1	1	1	3.3	0	0.0	0	0.0	0	0.0	11	36.7	19	63.3	0	0.0	0	0.0	0	0.0
2	0	1	2	3	1	0	0	0.0	0	0.0	0	0.0	0	0.0	13	43.3	17	56.7	0	0.0	0	0.0	0	0.0
2	0	1	2	2	0	1	0	0.0	0	0.0	0	0.0	0	0.0	26	86.7	4	13.3	0	0.0	0	0.0	0	0.0
2	0	1	2	2	0	0	1	3.3	0	0.0	0	0.0	0	0.0	19	63.3	11	36.7	0	0.0	0	0.0	0	0.0
2	0	1	2	2	1	1	0	0.0	0	0.0	0	0.0	0	0.0	14	46.7	16	53.3	0	0.0	0	0.0	0	0.0
2	0	1	2	2	1	0	1	3.3	0	0.0	0	0.0	0	0.0	4	13.3	26	86.7	0	0.0	0	0.0	0	0.0
3	1	0	2	5	0	1	0	0.0	0	0.0	0	0.0	0	0.0	20	66.7	10	33.3	0	0.0	0	0.0	0	0.0
3	1	0	2	5	0	0	0	0.0	0	0.0	0	0.0	0	0.0	22	73.3	8	26.7	0	0.0	0	0.0	0	0.0
3	1	0	2	5	1	1	0	0.0	0	0.0	0	0.0	0	0.0	8	26.7	22	73.3	0	0.0	0	0.0	0	0.0
3	1	0	2	5	1	0	0	0.0	0	0.0	0	0.0	0	0.0	16	53.3	14	46.7	0	0.0	0	0.0	0	0.0
3	1	0	2	3	0	1	0	0.0	0	0.0	0	0.0	0	0.0	25	83.3	5	16.7	0	0.0	0	0.0	0	0.0
3	1	0	2	3	0	0	0	0.0	0	0.0	0	0.0	0	0.0	22	73.3	8	26.7	0	0.0	0	0.0	0	0.0
3	1	0	2	3	1	1	0	0.0	0	0.0	1	3.3	0	0.0	12	40.0	17	56.7	0	0.0	0	0.0	0	0.0
3	1	0	2	3	1	0	0	0.0	0	0.0	0	0.0	0	0.0	17	56.7	13	43.3	0	0.0	0	0.0	0	0.0
3	1	0	2	2	0	1	0	0.0	0	0.0	0	0.0	0	0.0	24	80.0	6	20.0	0	0.0	0	0.0	0	0.0
3	1	0	2	2	0	0	0	0.0	0	0.0	0	0.0	0	0.0	25	83.3	5	16.7	0	0.0	0	0.0	0	0.0
3	1	0	2	2	1	1	0	0.0	0	0.0	0	0.0	0	0.0	11	36.7	19	63.3	0	0.0	0	0.0	0	0.0
3	1	0	2	2	1	0	0	0.0	0	0.0	0	0.0	0	0.0	13	43.3	17	56.7	0	0.0	0	0.0	0	0.0
4	0	0	2	5	0	1	0	0.0	2	6.7	0	0.0	0	0.0	28	93.3	2	6.7	0	0.0	0	0.0	0	0.0
4	0	0	2	5	0	0	0	0.0	0	0.0	0	0.0	0	0.0	26	86.7	4	13.3	0	0.0	0	0.0	0	0.0
4	0	0	2	5	1	1	0	0.0	0	0.0	0	0.0	0	0.0	16	53.3	14	46.7	0	0.0	0	0.0	0	0.0
4	0	0	2	5	1	0	0	0.0	0	0.0	0	0.0	0	0.0	12	40.0	18	60.0	0	0.0	0	0.0	0	0.0
4	0	0	2	3	0	1	0	0.0	0	0.0	0	0.0	0	0.0	29	96.7	1	3.3	0	0.0	0	0.0	0	0.0
4	0	0	2	3	0	0	0	0.0	0	0.0	0	0.0	0	0.0	27	90.0	3	10.0	0	0.0	0	0.0	0	0.0
4	0	0	2	3	1	1	0	0.0	0	0.0	0	0.0	0	0.0	17	56.7	13	43.3	0	0.0	0	0.0	0	0.0
4	0	0	2	3	1	0	1	3.3	0	0.0	0	0.0	0	0.0	7	23.3	23	76.7	0	0.0	0	0.0	0	0.0
4	0	0	2	2	0	1	0	0.0	0	0.0	0	0.0	0	0.0	27	90.0	3	10.0	0	0.0	0	0.0	0	0.0
4	0	0	2	2	0	0	0	0.0	0	0.0	0	0.0	0	0.0	25	83.3	5	16.7	0	0.0	0	0.0	0	0.0
4	0	0	2	2	1	1	0	0.0	0	0.0	0	0.0	0	0.0	11	36.7	19	63.3	0	0.0	0	0.0	0	0.0
4	0	0	2	2	1	0	0	0.0	0	0.0	0	0.0	0	0.0	13	43.3	17	56.7	0	0.0	0	0.0	0	0.0

Table F-5a. 1991 treatment means for point frame hits and percent cover for Replicate 2 unplanted plots at the BP Put River No. 1 gravel pad

Block	Snow Fence	Poa Glauca	Gravel Thick.	Soil Tilled	Aerial Cover								Ground Cover									
					Grass	X	Forb	X	Plant	X	Moss	X	Rock	X	Barren	X	Mulch	X	Wood	X	Feces	X
1	1	1			1.3	4.2	0.2	0.6	0.1	0.3	0.1	0.3	17.7	58.9	11.4	38.1	0.7	2.2	0.0	0.0	0.1	0.3
1	1	1	5		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	17.5	58.3	11.0	36.7	1.5	5.0	0.0	0.0	0.0	0.0
1	1	1	3		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	19.0	63.3	10.8	35.8	0.3	0.8	0.0	0.0	0.0	0.0
1	1	1	2		3.8	12.5	0.5	1.7	0.3	0.8	0.3	0.8	16.5	55.0	12.5	41.7	0.3	0.8	0.0	0.0	0.3	0.8
1	1	1		0	1.2	3.9	0.2	0.6	0.2	0.6	0.2	0.6	26.2	87.2	2.8	9.4	0.7	2.2	0.0	0.0	0.0	0.0
1	1	1		1	1.3	4.4	0.2	0.6	0.0	0.0	0.0	0.0	9.2	30.6	20.0	66.7	0.7	2.2	0.0	0.0	0.2	0.6
1	1	1		0	0.7	2.2	0.2	0.6	0.2	0.6	0.2	0.6	19.3	64.4	9.7	32.2	0.7	2.2	0.0	0.0	0.0	0.0
1	1	1		1	1.8	6.1	0.2	0.6	0.0	0.0	0.0	0.0	16.0	53.3	13.2	43.9	0.7	2.2	0.0	0.0	0.2	0.6
2	0	1			0.3	0.8	0.0	0.0	0.0	0.0	0.3	1.1	16.4	54.7	13.3	44.2	0.0	0.0	0.0	0.0	0.0	0.0
2	0	1	5		0.0	0.0	0.0	0.0	0.0	0.0	1.0	3.3	14.5	48.3	14.5	48.3	0.0	0.0	0.0	0.0	0.0	0.0
2	0	1	3		0.3	0.8	0.0	0.0	0.0	0.0	0.0	0.0	19.0	63.3	11.0	36.7	0.0	0.0	0.0	0.0	0.0	0.0
2	0	1	2		0.5	1.7	0.0	0.0	0.0	0.0	0.0	0.0	15.8	52.5	14.3	47.5	0.0	0.0	0.0	0.0	0.0	0.0
2	0	1		0	0.2	0.6	0.0	0.0	0.0	0.0	0.7	2.2	23.7	78.9	5.7	18.9	0.0	0.0	0.0	0.0	0.0	0.0
2	0	1		1	0.3	1.1	0.0	0.0	0.0	0.0	0.0	0.0	9.2	30.6	20.8	69.4	0.0	0.0	0.0	0.0	0.0	0.0
2	0	1		0	0.2	0.6	0.0	0.0	0.0	0.0	0.7	2.2	18.2	60.6	11.2	37.2	0.0	0.0	0.0	0.0	0.0	0.0
2	0	1		1	0.3	1.1	0.0	0.0	0.0	0.0	0.0	0.0	14.7	48.9	15.3	51.1	0.0	0.0	0.0	0.0	0.0	0.0
3	1	0			0.0	0.0	0.0	0.0	0.1	0.3	0.0	0.0	17.9	59.7	12.0	40.0	0.0	0.0	0.0	0.0	0.0	0.0
3	1	0	5		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	16.5	55.0	13.5	45.0	0.0	0.0	0.0	0.0	0.0	0.0
3	1	0	3		0.0	0.0	0.0	0.0	0.3	0.8	0.0	0.0	19.0	63.3	10.8	35.8	0.0	0.0	0.0	0.0	0.0	0.0
3	1	0	2		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	18.3	60.8	11.8	39.2	0.0	0.0	0.0	0.0	0.0	0.0
3	1	0		0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	23.0	76.7	7.0	23.3	0.0	0.0	0.0	0.0	0.0	0.0
3	1	0		1	0.0	0.0	0.0	0.0	0.2	0.6	0.0	0.0	12.8	42.8	17.0	56.7	0.0	0.0	0.0	0.0	0.0	0.0
3	1	0		0	0.0	0.0	0.0	0.0	0.2	0.6	0.0	0.0	16.7	55.6	13.2	43.9	0.0	0.0	0.0	0.0	0.0	0.0
3	1	0		1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	19.2	63.9	10.8	36.1	0.0	0.0	0.0	0.0	0.0	0.0
4	0	0			0.1	0.3	0.2	0.6	0.0	0.0	0.0	0.0	19.8	66.1	10.2	33.9	0.0	0.0	0.0	0.0	0.0	0.0
4	0	0	5		0.0	0.0	0.5	1.7	0.0	0.0	0.0	0.0	20.5	68.3	9.5	31.7	0.0	0.0	0.0	0.0	0.0	0.0
4	0	0	3		0.3	0.8	0.0	0.0	0.0	0.0	0.0	0.0	20.0	66.7	10.0	33.3	0.0	0.0	0.0	0.0	0.0	0.0
4	0	0	2		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	19.0	63.3	11.0	36.7	0.0	0.0	0.0	0.0	0.0	0.0
4	0	0		0	0.0	0.0	0.3	1.1	0.0	0.0	0.0	0.0	27.0	90.0	3.0	10.0	0.0	0.0	0.0	0.0	0.0	0.0
4	0	0		1	0.2	0.6	0.0	0.0	0.0	0.0	0.0	0.0	12.7	42.2	17.3	57.8	0.0	0.0	0.0	0.0	0.0	0.0
4	0	0		0	0.0	0.0	0.3	1.1	0.0	0.0	0.0	0.0	21.3	71.1	8.7	28.9	0.0	0.0	0.0	0.0	0.0	0.0
4	0	0		1	0.2	0.6	0.0	0.0	0.0	0.0	0.0	0.0	18.3	61.1	11.7	38.9	0.0	0.0	0.0	0.0	0.0	0.0
4	0	0			0.2	0.6	0.1	0.3	0.0	0.0	0.2	0.6	18.1	60.4	11.7	39.0	0.0	0.0	0.0	0.0	0.0	0.0
4	0	0			0.6	2.1	0.1	0.3	0.1	0.3	0.0	0.1	17.8	59.3	11.7	39.0	0.3	1.1	0.0	0.0	0.0	0.1
4	0	0			0.0	0.1	0.1	0.3	0.0	0.1	0.0	0.0	18.9	62.9	11.1	36.9	0.0	0.0	0.0	0.0	0.0	0.0
4	0	0			0.8	2.5	0.1	0.3	0.0	0.1	0.2	0.7	17.0	56.8	12.3	41.1	0.3	1.1	0.0	0.0	0.0	0.1
4	0	0	5		0.0	0.0	0.1	0.4	0.0	0.0	0.3	0.8	17.3	57.5	12.1	40.4	0.4	1.3	0.0	0.0	0.0	0.0
4	0	0	3		0.1	0.4	0.0	0.0	0.1	0.2	0.0	0.0	19.3	64.2	10.6	35.4	0.1	0.2	0.0	0.0	0.0	0.0
4	0	0	2		1.1	3.5	0.1	0.4	0.1	0.2	0.1	0.2	17.4	57.9	12.4	41.3	0.1	0.2	0.0	0.0	0.1	0.2
4	0	0		0	0.3	1.1	0.1	0.4	0.0	0.1	0.2	0.7	25.0	83.2	4.6	15.4	0.2	0.6	0.0	0.0	0.0	0.0
4	0	0		1	0.5	1.5	0.0	0.1	0.0	0.1	0.0	0.0	11.0	36.5	18.8	62.6	0.2	0.6	0.0	0.0	0.0	0.1
4	0	0		0	0.2	0.7	0.1	0.4	0.1	0.3	0.2	0.7	19.0	63.2	10.6	35.3	0.2	0.6	0.0	0.0	0.0	0.0
4	0	0		1	0.6	1.9	0.0	0.1	0.0	0.0	0.0	0.0	16.5	55.0	12.0	40.1	0.2	0.6	0.0	0.0	0.0	0.1



## APPENDIX G

### TEMPERATURE DATA

Cumulative positive ( $>0$  degrees) and negative ( $\leq 0$  degrees) degree hours are listed for the months of June, July and August for 1988 through 1991 for a coastal (Big Skookum) and foothill (M.P. 62) site on the North Slope, Alaska.

Table G-1. Summaries of positive (>0) and negative (= or <0) degree hours during July through September for four years (1988 -1991) at coastal (Big Skookum) and foothill (M.P. 62) sites

Site	Year	Degree Hours							
		July		August		September		Cumulative	
		Positive	Negative	Positive	Negative	Positive	Negative	Positive	Negative
<u>Coastal</u>									
Air									
	1988	4513	15	3652	181	457	1106	8622	1302
	1989	7971	2	6802	0	1743	380	16516	382
	1990	5548	0	3067	22	703	545	9318	567
	1991	2236	133	1578	215	324	895	4138	1243
Soil									
	1988	5011	0	3657	13	300	188	8968	201
	1989	7299	0	6337	0	1538	138	15174	138
	1990	5719	0	3483	0	593	132	9795	132
	1991	4445	0	2672	0	369	165	7486	165
<u>Foothill</u>									
Air									
	1988	9927	12	5489	225	1471	1296	16887	1533
	1989	10834	2	9251	3	2848	1220	22933	1225
	1990	10399	22	6154	81	1013	1372	17566	1475
	1991	6277	64	3941	372	1770	1564	11988	2000
Soil									
	1988	1550	0	2117	0	261	149	3928	149
	1989	4027	0	5815	0	1652	82	11494	82
	1990	3473	0	2119	0	233	118	5825	118
	1991	2657	0	1794	0	424	119	4875	119

APPENDIX H

LISTING OF VASCULAR PLANT SPECIES OCCURRING ON TEN GRAVEL  
SITES ON THE ALASKA NORTH SLOPE, 1984 AND 1991

Appendix H. Listing of 125 vascular plant species colonizing upper surfaces and side slopes on ten man-made gravel structures in the Alaska Arctic. Site surveys occurred during the following years: 1984, 1987, 1988, and 1991.

FAMILY <u>Genus species</u>	Physiographic Location		Foothills				Coastal Plain							
	Year Surveyed		Lisburne Test Well No. 1	Inigok Test Well No. 1	Franklin Bluffs Pad	Seabee Test Well No. 1	Tunalik Test Well No. 1	TAP Route M.P. 17	TAP Route M.P. 18.6	TAP Route M.P. 19.5	TAP Route M.P. 34	Abandoned Road Sagavan-Irktok Delta		
BETULACEAE:	84	91	84	91	87	84	84	91	88	88	88	87	88	87
<u>Betula nana</u>		•												
BORAGINACEAE:														
<u>Myosotis alpestris</u>													•	
CARYOPHYLLACEAE:														
<u>Cerastium beeringianum</u> var. <u>beeringianum</u>	•	•						•						
<u>Melandrium apetalum</u>									•		•			
<u>Minuartia arctica</u>		•												
<u>Minuartia rubella</u>		•		•					•					•
<u>Sagina intermedia</u>								•						•
<u>Silene acaulis</u>		•												
<u>Stellaria edwardsii</u>	•											•		
<u>Stellaria humifusa</u>								•						
<u>Stellaria longipes</u>							•		•			•		•
<u>Stellaria</u> sp. ( <u>laeta?</u> )														•
COMPOSITAE:														
<u>Achillea borealis</u>							•							
<u>Antennaria friesiana</u>		•												
<u>Arnica lessingii</u>		•												
<u>Artemisia alaskana</u>							•		•	•	•	•		
<u>Artemisia arctica</u>					•				•	•	•	•	•	
<u>Artemisia glomerata</u>									•	•				
<u>Artemisia tilesii</u>	•	•		•			•	•						
<u>Aster sibiricus</u>	•	•			•				•	•		•	•	
<u>Chrysanthemum integrifolium</u>									•					
<u>Crepis nana</u> var. <u>nana</u>		•							•	•	•	•		
<u>Eriqeron</u> spp.		•												
<u>Petasites frigidus</u>		•												

Appendix H. Listing of 125 vascular plant species colonizing upper surfaces and side slopes on ten man-made gravel structures in the Alaska Arctic. Site surveys occurred during the following years: 1984, 1987, 1988, and 1991.

FAMILY <u>Genus species</u>	Physiographic Location		Foothills				Coastal Plain					Abandoned Road Sagavan-irktok Delta		
	Lisburne Test Well No. 1		Inigok Test Well No. 1		Franklin Bluffs Pad	Seabee Test Well No. 1	Tunaliq Test Well No. 1	TAP Route M.P. 17	TAP Route M.P. 18.6	TAP Route M.P. 19.5	TAP Route M.P. 34			
Year Surveyed	84	91	84	91	87	84	84	91	88	88	88	87	88	87
<u>Saussurea angustifolia</u>		*												
<u>Senecio atropurpureus</u>		*							*			*		
<u>Senecio congestus</u>			*		*	*	*	*						
<u>Tanacetum bipinnatum</u>				*										
<u>Taraxacum ceratophorum</u>		*												
CRUCIFERAE:														
<u>Arabis arenicola</u> var. <u>pubescens</u>										*	*			
<u>Braya humilis</u>										*				
<u>Braya pilosa</u>														*
<u>Braya purpurascens</u>									*		*			
<u>Cochlearia officinalis</u> subsp. <u>arctica</u>							*	*						*
<u>Descurainia sophioides</u>	*	*	*		*	*		*		*				
<u>Draba macrocarpa</u>								*						
<u>Eutrema edwardsii</u>									*					*
<u>Parrya nudicaulis</u>									*					
CYPERACEAE:														
<u>Carex aquatilis</u>		*	*	*			*	*						*
<u>Carex bigelowii</u>	*	*		*								*		*
<u>Carex lugens</u>		*												*
<u>Carex maritima</u>														*
<u>Carex misandra</u>		*												
<u>Eriophorum angustifolium</u>		*						*						*
<u>Eriophorum scheuchzeri</u>		*						*						
<u>Eriophorum vaginatum</u>		*					*							
ERICACEAE:														
<u>Arctostaphylos rubra</u>		*												
EQUISETACEAE:														

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FAMILY Genus species	Physiographic Location		Foothills				Coastal Plain							
	Year Surveyed		Lisburne Test Well No. 1	Inigok Test Well No. 1	Franklin Bluffs Pad	Seabee Test Well No. 1	Tunaliik Test Well No. 1	TAP Route M.P. 17	TAP Route M.P. 18.6	TAP Route M.P. 19.5	TAP Route M.P. 34	Abandoned Road Sagavan- irktok Delta		
	84	91	84	91	87	84	84	91	88	88	88	87	88	87
<u>Equisetum arvense</u>	•	•		•		•								
<u>Equisetum scirpoides</u>														•
<u>Equisetum variegatum</u>									•				•	
GENTIANACEAE:														
<u>Gentiana propinqua</u>													•	
GRAMINEAE:														
<u>Agropyron boreale ssp. alaskanum</u>	•	•												
<u>Agropyron macrourum</u>						•			•	•	•	•	•	
<u>Agropyron violaceum</u>		•												
<u>Alopecurus alpinus</u>							•	•						•
<u>Arctagrostis latifolia</u>	•	•	•	•	•	•	•	•	•		•	•	•	•
<u>Arctophila fulva</u>				•			•	•						
<u>Bromus pumpellianus</u>		•				•								
<u>Calamaqrostis holmi</u>						•								
<u>Calamaqrostis inexpansa</u>		•												
<u>Calamaqrostis purpurascens</u>													•	•
<u>Deschampsia caespitosa</u>									•	•			•	•
<u>Dupontia fisheri</u>				•			•	•						•
<u>Festuca baffinensis</u>	•	•												•
<u>Festuca rubra</u>	•	•	•	•		•	•	•	•	•	•		•	
<u>Festuca vivipara</u>														•
<u>Lolium multiflorum</u>										•				
<u>Phippsia algida</u>							•	•						
<u>Poa andersonii</u>	•	•				•	•	•			•			
<u>Poa glauca</u>	•	•	•	•		•	•	•	•			•		
<u>Poa pratensis var. "Nugget"</u>					•			•	•	•		•	•	
<u>Puccinellia arctica</u>				•										
<u>Puccinellia lanqeana</u>														•
<u>Trisetum spicatum</u>	•	•							•	•	•			•

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FAMILY <u>Genus species</u>	Physiographic Location		Foothills				Coastal Plain							
	Year Surveyed		Lisburne Test Well No. 1	Inigok Test Well No. 1	Franklin Bluffs Pad	Seabee Test Well No. 1	Tunaliq Test Well No. 1	TAP Route M.P. 17	TAP Route M.P. 18.6	TAP Route M.P. 19.5	TAP Route M.P. 34	Abandoned Road Sagavan- Irktok Delta		
	84	91	84	91	87	84	84	91	88	88	88	87	88	87
<b>HALORAGACEAE:</b>														
<u>Hippuris vulgaris</u>								*						
<b>JUNCEAE:</b>														
<u>Juncus arcticus</u>				*										
<u>Juncus castaneus</u> subsp. <u>castaneus</u>	*	*										*		
<u>Juncus triglumis</u>									*					
<u>Luzula arcuata</u> subsp. <u>unalaschensis</u>	*													
<u>Luzula confusa</u>								*						
<u>Luzula whalenbergii</u> subsp. <u>whalenbergii</u>								*						
														*
<b>LEGUMINOSAE:</b>														
<u>Astragalus alpinus</u> subsp. <u>alpinus</u>	*	*		*		*			*			*	*	*
<u>Astragalus alpinus</u> subsp. <u>arcticus</u>	*													
<u>Astragalus nuttalinensis</u>									*	*	*			
<u>Hedysarum alpinum</u>		*											*	
<u>Hedysarum hedsyaroides</u>												*		
<u>Hedysarum mackenzii</u>										*	*	*		
<u>Oxytropis borealis</u>									*	*	*	*		*
<u>Oxytropis campestris</u> subsp. <u>gracilis</u>	*												*	
<u>Oxytropis deflexa</u> var. <u>foliolosa</u>		*												
<u>Oxytropis nigrescens</u>											*			
<u>Oxytropis viscida</u>	*	*												
<b>ONAGRACEAE:</b>														
<u>Epilobium angustifolium</u>		*						*	*		*			
<u>Epilobium latifolium</u>	*	*	*	*	*	*			*	*	*	*	*	*
<b>PAPAVERACEAE:</b>														
<u>Papaver lapponicum</u> subsp. <u>porcildii</u>	*	*												
<u>Papaver macounii</u>		*							*					

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FAMILY Genus species	Physiographic Location		Foothills				Coastal Plain							
	Year Surveyed		Uisburne Test Well No. 1	Inigok Test Well No. 1	Franklin Bluffs Pad	Seabee Test Well No. 1	Tunalik Test Well No. 1	TAP Route M.P. 17	TAP Route M.P. 18.6	TAP Route M.P. 19.5	TAP Route M.P. 34	Abandoned Road Sagavan- Irktok Delta		
	84	91			87	84	84	91	88	88	88	87	88	87
<b>PLUMBAGINACEAE:</b>														
<u>Armeria maritima</u>				*						*				
<b>POLEMONIACEAE:</b>														
<u>Polemonium acutiflorum</u>		*				*								
<u>Polemonium boreale</u>	*			*										
<b>POLYGONACEAE:</b>														
<u>Polygonum viviparum</u>	*								*					
<b>PRIMULACEAE:</b>														
<u>Androsace septentrionalis</u>	*	*												
<b>RANUNCULACEAE:</b>														
<u>Aconitum delphinifolium</u> subsp. <u>paradoxum</u>	*	*												
<u>Ranunculus gmelinii</u> subsp. <u>gmelinii</u>					*		*							
<u>Ranunculus hyperboreus</u> subsp. <u>hyperboreus</u>	*													
<b>ROSACEAE:</b>														
<u>Dryas integrifolia</u> subsp. <u>integrifolia</u>		*							*					*
<u>Dryas octopetala</u>		*												
<u>Potentilla fruticosa</u>		*												
<b>SALICACEAE:</b>														
<u>Salix alaxensis</u> var. <u>alaxensis</u>	*	*		*		*				*				
<u>Salix arctica</u>		*							*					*
<u>Salix brachycarpa</u> ssp. <u>nipoclada</u>				*		*		*				*		
<u>Salix glauca</u>		*		*				*						
<u>Salix lanata</u> ssp. <u>richardsonii</u>												*		
<u>Salix ovalifolia</u>								*	*					*



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Physiographic Location		Foothills					Coastal Plain								
FAMILY Genus species	Year Surveyed	Lisburne Test Well No. 1		Inigok Test Well No. 1		Franklin Bluffs Pad	Seabee Test Well No. 1	Tunalik Test Well No. 1		TAP Route M.P. 17	TAP Route M.P. 18.6	TAP Route M.P. 19.5	TAP Route M.P. 34	Abandoned Road Sagavan-irktok Delta	
		84	91	84	91	87	84	84	91	88	88	88	87	88	87
<i>Salix planifolia</i> ssp. <i>pulchra</i> var. <i>pulchra</i>		•	•		•		•		•						
<i>Salix reticulata</i>										•					
SAXIFRAGACEAE:															
<i>Chrysosplenium tetrandrum</i>		•													
<i>Parnassia palustris</i>													•		
<i>Saxifraga cernua</i>		•													
<i>Saxifraga hirculus</i>										•					
<i>Saxifraga oppositifolia</i>										•			•		
<i>Saxifraga punctata</i> var. <i>nelsoniana</i>			•												
<i>Saxifraga tricuspidata</i>			•												
SCROPHULARIACEAE:															
<i>Castilleja caudata</i>													•		
<i>Castilleja elegans</i>			•												
<i>Pedicularis verticillata</i>													•	•	
														•	
VIOLACEAE:															
<i>Viola epipsila</i>			•												
TOTAL FAMILIES		22					20								
TOTAL Genera		53					53								
TOTAL species		82					87								
TOTAL FAMILIES	(25)	16	20	2	12	5	9	6	10	13	5	8	10	9	10
TOTAL Genera	(70)	26	41	4	19	8	16	14	22	27	15	16	21	16	23
TOTAL species	(125)	31	58	4	23	8	20	15	28	33	18	19	25	17	28