**Supplemental Material**

Appendix 1. Mean percent (±1SE) plant cover, litter cover and bare ground (A); and functional groups: graminoids, shrubs and exotic plant cover (B) for pre-treatment plant canopy cover census in 2007 and 2 post-treatment censuses in 2008 and 2009 across treatments and controls. The statistics for 2-way ANOVAs are shown in the right column. Different capital letters indicate a significant difference in time and lowercase letters indicate a significant difference among treatments (Tukey-Kramer HSD p<0.05). \* indicates a significant result.

A. Mean % cover of plants, litter and bare ground

|  |  |
| --- | --- |
| **Mean % plant cover (±) 1SE**  |   |
| **Treatments**  | **Pre-2007A** | **Post-2008B** | **Post-2009A** | **2-Way ANOVA** |
| Seed + Herbicide | 84.77 (6.5) | 60.97 (7.9)a | 72.45 (10.2) | Trt\*Time: F = 3.6, *P* = 0.01\* (Significant interaction) |
| Herbicide | 81.9 (8.6) | 60.48 (11.0)a | 70.02 (8.1) |
| Seed | 79.48 (10.5) | 73.01 (13.2)b | 72.18 (8.4) | F and P values for 1-way ANOVAs in text |
| Control | 82.61 (8.0) | 77.29 (9.6)b | 70.92 (12.2) |
| **Mean % litter cover (±) 1SE**  |  |
| **Treatments**  | **Pre-2007** | **Post-2008** | **Post-2009** | **2-Way ANOVA** |
| Seed + Herbicide | 61.51 (10.5) | 58.02 (10.8) | 66.43 (8.2) | Trt-F = 0.09, P = 0.97 |
| Herbicide | 66.61 (6.7) | 62.8 (7.5) | 63.55 (5.6) | Time-F = 3.2, P = 0.14 |
| Seed | 54.61 (7.0) | 60.06 (7.7) | 70.17 (4.4) | Trt\*Time-F = 0.81, P = 0.51 |
| Control | 47.35 (9.4) | 59.25 (9.8) | 73.18 (6.4) |   |
| **Mean % bare ground (±) 1SE**  |  |
| **Treatments**  | **Pre-2007** | **Post-2008** | **Post-2009** | **2-Way ANOVA** |
| Seed + Herbicide | 17.14 (4.6) | 15.01 (2.7) | 16.06 (2.9) | Trt-F = 1.6, P = 0.21 |
| Herbicide | 12.89 (3.7) | 17.28 (2.7) | 12.01 (1.8) | Time-F = 1.77, P = 0.19 |
| Seed | 7.55 (1.7) | 12.08 (2.8) | 12.61 (2.9) | Trt\*Time-F = 1.88, P = 0.92 |
| Control | 6.09 (2.2) | 9.66 (4.1) | 10.11 (4.0) |   |

B. Mean % cover of functional groups: graminoid, shrub, exotic species (forb cover is shown in Fig. 3A)

|  |  |
| --- | --- |
|  **Mean % graminiod cover (±) 1SE**  |  |
| **Treatments**  | **Pre-2007A** | **Post-2008B** | **Post-2009A** | **2-Way ANOVA** |
| Seed + Herbicide | 79.43 (7.8) | 58.31 (9.8) | 69.32 (11.7) | Trt-F = 0.26, P = 0.89 |
| Herbicide | 77.34 (9.4) | 59.59 (11.4) | 70.69 (7.1) | Time-F = 14.3, P = 0.001\* |
| Seed | 72.22 (12.8) | 60.87 (10.3) | 66.65 (12.2) | Trt\*Time-F = 2.59, P = 0.088 |
| Control | 77.64 (8.3) | 64.72 (9.7) | 63.74 (11.2) |   |
| **Mean % shrub cover (±) 1SE**  |  |
| **Treatments**  | **Pre-2007** | **Post-2008** | **Post-2009** | **2-Way ANOVA** |
| Seed + Herbicide | 0.94 (0.4) | 0.85 (0.3) | 0.91 (0.4) | Trt-F = 0.76, P = 0.54 |
| Herbicide | 0.72 (0.6) | 0.85 (0.6) | 1.04 (0.7) | Time-F = 1.75, P = 0.23 |
| Seed | 0.62 (0.5) | 0.96 (0.5) | 1.43 (0.8) | Trt\*Time-F = 0.55, P = 0.76 |
| Control | 0.06 (0.4) | 0.14 (0.1) | 0.31 (0.3) |   |
| **Mean % exotic cover (±) 1SE**  |  |
| **Treatments**  | **Pre-2007 A** | **Post-2008 B** | **Post-2009 A** | **2-Way ANOVA** |
| Seed + Herbicide | 65.35 (8.1) | 35.82 (4.9) a | 63.99 (7.3) | Trt\*Time: F = 10.24, P = 0.003 (Significant interaction) |
| Herbicide | 62.35 (8.1) | 34.09 (5.7) a | 54.03 (7.1) |
| Seed | 59.08 (8.5) | 46.16 (6.2) b | 58.41 (7.8) | F and P values for 1-way ANOVAs in text |
| Control | 66.27 (8.0) | 53.91 (7.6) b | 54.36 (7.2) |

Appendix 2. Plant species list for 2009 final census, including scientific names, common names, and life history (annual (A), perennial (P) or biennial (B)). \*\* Exotic species; ☼ species found in previous years, but not in 2009; and ♣ new species found in 2009.

|  |  |  |
| --- | --- | --- |
| Functional group and species | Common name | Life History |
| **Graminiods** |   |   |
| *Achnatherum hymenoides* (Roem. & Schult.) Barkworth | Indian ricegrass | P |
| *Aristida purpurea* Nutt. *var. purpurea*  | Purple threeawn | P |
| *Bouteloua gracilis* (Willd. ex Kunth) Lag. ex Griffiths | Blue grama | P |
| *Bromus tectorum* L.\*\* | Downy brome | A |
| *Elymus elymoides* (Raf.) Swezey | Squirreltail | P |
| *Elymus trachycaulus* (Link) Gould ex Shinners | Slender wheat-grass | P |
| *Eragrostis cilianensis (All.) Vign. ex Janchen\*\** | Stinkgrass | A |
| *Hesperostipa comata* (Trin. & Rupr.) Barkworth  | Needle and thread | P |
| *Koeleria macrantha* (Ledeb.) Schult. | Prairie Junegrass | P |
| *Monroa squarrosa (Nutt.) Torr.*  | False buffalograss | A |
| *Pleuraphis jamesii Torr.*  | James' galleta | P |
| *Sporobolus cryptandrus* (Torr.) A. Gray | Sand dropseed | P |
| **Forbs** |   |   |
| *Amaranthus* *blitoides* S. Watson \*\* | Prostrate pigweed | A |
| *Argemone* *munita* Durand & Hilg. ssp. *rotundata* (Rydb.) G.B. Ownbey | Flatbud Pricklypoppy | AP |
| *Calochortus nuttallii* Torr. & A. Gray | Sego lily | P |
| *Ceratocephala testiculata* (Crantz) Roth*\*\**♣ | Bur buttercup  | A |
| *Chamaesyce serpens* (Kunth) Small  | Creeping spurge | A P |
| *Chenopodium* *sp.* |  | A |
| *Descurainia sophia* (L.) Webb ex Prantl\*\* | Flixweed | A B |
| *Erigeron divergens* Torr. & A. Gray | Spreading fleabane | B |
| *Eriogonum alatum Torr. var. alatum*  | Winged buckwheat | P |
| *Eriogonum cernuum* Nutt.  | nodding buckwheat | A |
| *Eriogonum microthecum* Nutt. var. *simpsonii* (Benth.) Reveal | Simpson's buckwheat | P |
| *Eriogonum racemosum* Nutt.  | Redroot buckwheat | P |
| *Eriogonum umbellatum* Torr. var. *subaridum* S. Stokes | sulphur-flower buckwheat | P |
| *Erodium cicutarium* (L.) L'Hér. ex Aiton\*\* | Redstem filaree | A B |
| *Helianthus annuus* L. | Common sunflower | A |
| *Heliomeris longifolia (B.L. Rob. & Greenm.) Cockerell var. annua (M.E. Jones) Yates*  | Longleaf false goldeneye | A |
| *Hymenopappus filifolius Hook. var. lugens (Greene) Jeps.* | Fineleaf hymenoppapus | P |
| *Hymenoxys cooperi* (A Grey) Cockerell | Cooper's rubberweed | A B P  |
| *Lactuca serriola* L.\*\* | Prickly lettuce | A B |
| *Linum lewisii* Pursh var. *lewisii* | Prairie flax | P |
| *Lomatium dissectum* (Nutt.) Mathias & Constance | Fernleaf biscuitroot | P |
| *Machaeranthera canescens (Pursh) A. Gray*  | Hoary tansyaster | A P B |
| *Penstemon pachyphyllus* A. Gray ex Rydb. var. *congestus* (M.E. Jones) N.H. Holmgren | thickleaf beardtongue | P |
| *Phlox hoodii* Richardson | Spiny phlox | P |
| *Physalis hederaefolia*A. Grey | Ivyleaf groundcherry | P |
| *Physaria arizonica* (S. Watson) O'Kane& Alshehbaz | Arizona bladderpod | P |
| *Plantago patagonica* Jacq. | Woolly plantain | A |
| *Portulaca oleracea* L.\*\* | Common purslane | A |
| *Sphaeralcea parvifolia* A. Nelson | Smallflower globemallow | P |
| *Tragopogon dubius* Scop.\*\* | Western salsify | A B |
| *Zigadenus elegans* Pursh | Mountain deathcamus | P |
| Unknown forb 1☼ |  |  |
| Unknown forb 2☼ |  |  |
| **Shrubs/Cacti** |   |   |
| *Artemisia* *tridentata* Nutt. ssp. *wyomingensis* Beetle & Young | Wyoming big sagebrush | P |
| *Cylindropuntia* *whipplei* (Engelm. & Bigelow) F.M. Knuth | Whipple cholla | P |
| *Ephedra viridis* Coville | Mormon tea | P |
| *Ericameria nauseosa* (Pall. ex Pursh) G.L. Nesom & Baird  | Rubber rabbitbrush | P |
| *Opuntia phaeacantha* Engelm.  | Tulip pricklypear | P |
| *Purshia mexicana* (D. Don) Henrickson  | Mexican cliffrose | P |