**Appendix**

**Table S1**. Scientific name, common name, functional type, and nativity status of all plant species used in analysis after rare species were removed.

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| **Scientific name** | **Common name** | **Functional type** | **Nativity** |
| *Artemisia ludoviciana* | White sagebrush | Forb | Native |
| *Carex rossii* | Ross’ Sedge | Grass | Native |
| *Ceanothus fendleri* | Fendler’s Buckbrush | Shrub | Native |
| *Chenopodium album* | Lamb’s-Quarter | Forb | Native |
| *Cologania angustifolia* | Long-Leaf Cologania | Forb | Native |
| *Elymus elymoides* | Western Bottle-Brush Grass | Grass | Native |
| *Festuca arizonica* | Arizona Fescue | Grass | Native |
| *Heliomeris multiflora* | Nevada Showy False Goldeneye | Forb | Native |
| *Houstonia wrightii* | Pygmy Bluet | Forb | Native |
| *Linaria dalmatica* | Dalmatian Toadflax | Forb | Exotic |
| *Lotus wrightii* | Wright's deervetch | Forb | Native |
| *Muhlenbergia montana* | Mountain Muhly | Grass | Native |
| *Muhlenbergia straminea* | Screwleaf muhly | Grass | Native |
| *Piptochaetium pringlei* | Pringle's Spear Grass | Grass | Native |
| *Pseudognaphalium macounii* | Macoun's cudweed | Forb | Native |
| *Quercus gambelii* | Gambel's Oak | Tree | Native |
| *Salsola tragus* | Prickly Russian-Thistle | Forb | Exotic |
| *Schizachyrium scoparium* | Little False Bluestem | Grass | Native |
| *Verbascum thapsus* | Great Mullein | Forb | Exotic |

**Table S2.** Database or primary literature sources for plant functional traits.

a) Seed mass sources for all plant species included in the study. (SER SID: Society for Ecological Restoration Seed Information Database, [https://ser-sid.org](https://ser-sid.org/))

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| --- | --- |
| **Scientific name** | **Source** |
| *Artemisia ludoviciana* | SER SID: RBG Kew, Wakehurst Place. |
| *Carex rossii* | SER SID: RBG Kew, Wakehurst Place.  *subbed Carex pellita* |
| *Ceanothus fendleri* | SER SID: Forest Service. 1974. Seeds of Woody Plants in the United States. Agriculture Handbook Number 450. Forest Service, U.S. Department of Agriculture, Washington, D.C. Keeley, J.E. 1991. |
| *Chenopodium album* | SER SID: Funes, G., Basconcelo, S., Díaz, S. and Cabido, M.1999. Seed size and shape are good predictors of seed persistence in soil in temperate mountain grasslands of Argentina. Seed Science Research, 9:341-345.    Earle, F.R. and Jones, Q. 1962. Analyses of seed samples from 113 plant families. Economic Botany, 16:221-250.    Stevens, O.A. 1932. The number and weight of seeds produced by weeds. American Journal of Botany, 19:784-794.    Thompson, K., Band, S.R. and Hodgson, J.G. 1993. Seed size and shape predict persistence in soil. Functional Ecology, 7:236-241.    Baker Seed Herbarium, California. RBG Kew, Wakehurst Place. |
| *Cologania angustifolia* | NA |
| *Elymus elymoides* | SER SID: Baker Seed Herbarium, California. |
| *Festuca arizonica* | SER SID: RBG Kew, Wakehurst Place. |
| *Heliomeris multiflora* | SER SID: RBG Kew, Wakehurst Place.  *subbed Heliomeris longifolia* |
| *Houstonia wrightii* | SER SID: RBG Kew, Wakehurst Place.  *subbed Houstonia micrantha* |
| *Linaria dalmatica* | SER SID: Rutledge, C.R. and T. McLendon. sine anno. An Assessment of Exotic Plant Species of Rocky Mountain National Park. Department of Rangeland Ecosystem Science, Colorado State University. Online. Available: http://www.npwrc.usgs.gov/resource/plants/explant/index.html |
| *Lotus wrightii* | USDA NRCS Plant Database |
| *Muhlenbergia montana* | SER SID: RBG Kew, Wakehurst Place. |
| *Muhlenbergia straminea* | SER SID: RBG Kew, Wakehurst Place. |
| *Piptochaetium pringlei* | SER SID: RBG Kew, Wakehurst Place.  *subbed Piptochaetium fimbriatum* |
| *Pseudognaphalium macounii* | SER SID: RBG Kew, Wakehurst Place.  *subbed Pseudognaphalium viscosum* |
| *Quercus gambelii* | SER SID: Earle, F.R. and Jones, Q. 1962. Analyses of seed samples from 113 plant families. Economic Botany, 16:221-250. |
| *Salsola tragus* | SER SID: Young, F. L. and R. E. Whitesides. 1987. Efficacy of postharvest herbicides on Russian thistle (Salsola iberica) control and seed germination. Weed Sci. 35:554–559. |
| *Schizachyrium scoparium* | SER SID: Tilman, D. 1997. Community invasibility, recruitment limitation, and grassland biodiversity. Ecology, 78:81-92. |
| *Verbascum thapsus* | SER SID: Grime, J.P., Mason, G., Curtis, A.A., Rodman, J., Band, S.R., Mowforth, M.A.G., Neal, A.M. and Shaw, S. 1981. A comparative study of germination characteristics in a local flora. Journal of Ecology, 69:1017-1059. |

b) Resprouting sources for all plant species included in the study. (SER SID: Society for Ecological Restoration Seed Information Database, [https://ser-sid.org](https://ser-sid.org/))

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| **Scientific name** | **Source** |
| *Artemisia ludoviciana* | Paschke, Mark W.; DeLeo, Claire; Redente, Edward F. 2000. Revegetation of roadcut slopes in Mesa Verde National Park, U.S.A. Restoration Ecology. 8(3): 276-282. [39033] |
| *Carex rossii* | Smith, Jane Kapler; Fischer, William C. 1997. Fire ecology of the forest habitat types of northern Idaho. Gen. Tech. Rep. INT-GTR-363. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Research Station. 142 p. [27992] |
| *Ceanothus fendleri* | Ffolliott, P.F., Clary, W.P., Larson, F.R., 1977. Effects of a prescribed fire in an Arizona ponderosa pine forest. USDA For. Serv. Res. Note RM-336.    Vose, James M., and Alan S. White. “Biomass Response Mechanisms of Understory Species the First Year after Prescribed Burning in an Arizona Ponderosa-Pine Community.” Forest Ecology and Management 40, no. 3 (May 31, 1991): 175–87. https://doi.org/10.1016/0378-1127(91)90037-V. |
| *Chenopodium album* | No resprouting ability |
| *Cologania angustifolia* | No resprouting ability |
| *Elymus elymoides* | Bradley, Anne F.; Noste, Nonan V.; Fischer, William C. 1992. Fire ecology of forests and woodlands of Utah. Gen. Tech. Rep. INT-287. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Research Station. 128 p. [18212] |
| *Festuca arizonica* | Gucker, Corey L. 2006. Festuca arizonica. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: https://www.fs.usda.gov /database/feis/plants/graminoid/fesari/all.html [2025, April 28]. |
| *Heliomeris multiflora* | No resprouting ability |
| *Houstonia wrightii* | No resprouting ability |
| *Linaria dalmatica* | Dodge, Rita S., Peter Z. Fulé, and Carolyn Hullsieg. “Dalmatian Toadflax *(Linaria Dalmatica)* Response to Wildfire in a Southwestern USA Forest.” Écoscience 15, no. 2 (June 1, 2008): 213–22. https://doi.org/10.2980/15-2-3043. |
| *Lotus wrightii* | No resprouting ability |
| *Muhlenbergia montana* | Vose, James M.; White, Alan S. 1991. Biomass response mechanisms of understory species the first year after prescribed burning in an Arizona ponderosa-pine community. Forest Ecology and Management. 40: 175-187. [15570] |
| *Muhlenbergia straminea* | Rapid increase in MUST one year post fire observed; see (Taber & Mitchell 2023) for cover values  Taber, E. M., & Mitchell, R. M. (2023). Rapid changes in functional trait expression and decomposition following high severity fire and experimental warming. *Forest Ecology and Management*, *541*, 121019. <https://doi.org/10.1016/j.foreco.2023.121019> |
| *Piptochaetium pringlei* | Rapid increase in PIPR one year post fire observed; see (Taber & Mitchell 2023) for cover values  Taber, E. M., & Mitchell, R. M. (2023). Rapid changes in functional trait expression and decomposition following high severity fire and experimental warming. *Forest Ecology and Management*, *541*, 121019. <https://doi.org/10.1016/j.foreco.2023.121019>  Peláez, D. V., Bóo, R. M., Elia, O. R., & Mayor, M. D. (1997). Effect of fire intensity on bud viability of three grass species native to central semi-arid Argentina. Journal of Arid Environments, 37(2), 309–317. https://doi.org/10.1006/jare.1997.0266 |
| *Pseudognaphalium macounii* | No resprouting ability |
| *Quercus gambelii* | Engle, D. M.; Bonham, C. D.; Bartel, L. E. 1983. Ecological characteristics and control of Gambel oak. Journal of Range Management. 36(3): 363-365. [3361] |
| *Salsola tragus* | No resprouting ability |
| *Schizachyrium scoparium* | Limb, Ryan F., Samuel D. Fuhlendorf, David M. Engle, and Jay D. Kerby. “Growing-Season Disturbance in Tallgrass Prairie: Evaluating Fire and Grazing on Schizachyrium Scoparium.” Rangeland Ecology & Management 64, no. 1 (January 1, 2011): 28–36. https://doi.org/10.2111/REM-D-10-00022.1. |
| *Verbascum thapsus* | No resprouting ability |

**Table S2.** Mean trait values +/- standard errors for SLA and height. Trait values from literature sources in Table S2 for seed mass and resprouting ability. Only one trait value could not be found for a species or a close congener (*Cologania angustifolia*, seed mass). We used the average seed mass of all species included in the species list as a substitute.

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| **Species** | **SLA (**mm2 g−1) | **Height** (m) | **Seed mass** (g) | **Resprouting ability** |
| *Artemisia ludoviciana* | 17.68 | 0.29 | 0.00110 | 1 |
| *Carex rossii* | 14.92 | 0.22 | 0.0181 | 1 |
| *Ceanothus fendleri* | 11.56 | 0.41 | 0.0549 | 1 |
| *Chenopodium album* | 24.24 | 0.90 | 0.0063 | 0 |
| *Cologania angustifolia* | 17.32 | 0.13 | 0.0522 | 0 |
| *Elymus elymoides* | 17.08 | 0.24 | 0.0455 | 1 |
| *Festuca arizonica* | 13.57 | 0.26 | 0.00754 | 1 |
| *Heliomeris multiflora* | 15.08 | 0.55 | 0.0022 | 0 |
| *Houstonia wrightii* | 12.72 | 0.03 | 0.00175 | 0 |
| *Linaria dalmatica* | 14.57 | 0.61 | 0.0394 | 1 |
| *Lotus wrightii* | 11.13 | 0.27 | 0.0151 | 0 |
| *Muhlenbergia montana* | 15.55 | 0.29 | 0.0346 | 1 |
| *Muhlenbergia straminea* | 13.61 | 0.43 | 0.0607 | 1 |
| *Piptochaetium pringlei* | 13.23 | 0.35 | 0.394 | 1 |
| *Pseudognaphalium macounii* | 22.67 | 0.59 | 0.00048 | 0 |
| *Quercus gambelii* | 10.46 | 0.49 | 76.1 | 1 |
| *Salsola tragus* | 9.32 | 0.44 | 0.0135 | 0 |
| *Schizachyrium scoparium* | 17.00 | 0.52 | 0.184 | 1 |
| *Verbascum thapsus* | 27.81 | 0.17 | 0.009 | 0 |