**Table 13**

**Association Table**

# Artemisio michauxianae-Potentilletum fruticosae ass. nov.

| | Artemisio michauxianae-Potentilletum fruticosae | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Var. of Festuca scabrella | | | | | | | | | | typicum | | | | | | | | | | | | Var. of Penstemon | | | | | | | Var. Fragaria | | | Constancy | | | |
| **Location** | Spo | Spo | SpV | Spo | AkV | SpV | ApV | ApV | SpV | AlS | ApV | ApV | ApV | Lon | ApV | Spo | FLN | SML | OtS | OtS | ScT | Red | Pit | Pit | Pit | Pit | Pit | Fif | Pta | Old | Pie | Gri | | | | |
| **Plot-Number** | 221 | 217 | 104 | 215 | 84 | 111 | 258 | 494 | 110 | 483 | 243 | 244 | 249 | 218 | 460 | 216 | 72 | 722 | 45 | 44 | 466 | 308 | 376 | 390 | 375 | 389 | 391 | 551 | 788 | 701 | 741 | 715 | | | | |
| **Elevation [m/10]** | 208 | 196 | 194 | 192 | 189 | 204 | 174 | 194 | 199 | 175 | 188 | 193 | 201 | 199 | 185 | 193 | 204 | 207 | 225 | 218 | 216 | 238 | 227 | 224 | 227 | 224 | 225 | 223 | 225 | 212 | 231 | 188 | | | | |
| **Aspect [°]** | 70 | 84 | 90 | 94 | 30 | 190 | 55 | 280 | 196 | 180 | 260 | 220 | 240 | 86 | 234 | 80 | 140 | 180 | 180 | 170 | 226 | 185 | 195 | 195 | 195 | 190 | 185 | 220 | 220 | 190 | 180 | - | | | | |
| **Slope [°]** | 33 | 29 | 23 | 22 | 28 | 23 | 32 | 26 | 19 | 36 | 27 | 29 | 33 | 34 | 18 | 26 | 25 | 20 | 17 | 17 | 28 | 23 | 35 | 34 | 25 | 30 | 34 | 28 | 35 | 12 | 33 | - | | | | |
| **Rocks >6cm** | 25 | 5 | 2 | 5 | 50 | 75 | 12 | 60 | 35 | 8 | 70 | 70 | 75 | 32 | 70 | 4 | 58 | 65 | 37 | 65 | 50 | 40 | 60 | 35 | 60 | 42 | 50 | 25 | 30 | 5 | 13 | - | | | | |
| **Rocks <6cm** | 35 | 85 | 85 | 80 | 35 | 12 | 75 | 25 | 25 | 12 | 18 | 20 | 20 | 50 | 15 | 80 | 15 | 25 | 37 | 15 | 40 | 35 | 15 | 40 | 20 | 50 | 45 | 25 | 65 | - | 10 | 25 | | | | |
| **Fine Soil <1mm** | 5 | - | f | <1 | 0 | 0 | - | - | 0 | - | - | .5 | - | - | <.1 | - | .5 | <5 | - | - | .1 | - | .5 | - | 1 | - | .5 | - | - | - | 20 | - | | | | |
| **Litter Cover [%]** | 6 | <1 | 3 | 3 | 8 | 1 | 3 | 6 | 1 | - | 10 | 3 | 6 | 4 | 7 | <1 | 5 | I | 1 | 1 | 2 | 5 | 2 | 3 | 2 | 2 | 3 | 12 | - | - | - | 10 | | | | |
| **Vascular Plant Cover [%]** | 35 | 12 | 40 | 20 | 25 | 12 | 12 | 15 | 25 | 40 | 17 | 7 | 6 | 20 | 2 | 12 | 30 | 10 | 25 | 17 | 7 | 20 | 10 | 8 | 8 | 8 | 8 | 24 | - | 70 | 50 | 60 | | | | |
| **Moss Cover [%]** | .1 | .1 | .1 | <1 | 10 | 0 | 2 | - | 1 | - | <1 | .1 | 0 | 0 | <.1 | .1 | .5 | 0 | <1 | 3 | 1 | .2 | .1 | .1 | .1 | .1 | .2 | 2 | - | 10 | 0 | 15 | | | | |
| **Lichen Cover [%]** | 1 | 0 | 0 | .1 | 2 | .1 | .1 | 2 | .2 | - | 2 | .2 | 1 | 0 | <1 | 0 | .5 | I | 2 | 10 | .2 | 0 | 0 | 0 | 0 | .1 | .1 | .5 | - | - | 0 | - | | | | |
| **Number** | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | | | | |
| **Association Diagnostic species** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| AC Potentilla fruticosa | + | + | + | 1 | 1 | 2 | r | 1 | + | + | 1 | + | + | + | + | + | 3 | + | 1 | 1 | 3 | 3 | + | + | + | + | + | 2 | x | 2 | 2 | 2 | V | V | V | 3 |
| AC Artemisia michauxiana | r | + | + | r | . | . | r | r | . | . | r | + | r | r | . | r | r | . | r | r | . | r | r | + | . | r | . | 2 | x | . | . | . | III | IV | IV | . |
| AC Potentilla glandulosa | + | + | r | + | . | + | + | + | + | r | + | + | r | + | + | . | + | + | . | . | . | ad | . | . | . | . | . | + | . | . | . | . | V | IV | I | . |
| Ad Linum perenne | . | + | + | + | r | + | . | r | r | + | . | . | . | . | . | + | . | . | r | r | r | + | . | r | + | r | r | . | . | . | . | . | IV | III | IV | . |
| Ad Arenaria nuttallii | . | + | + | + | . | + | + | + | . | . | . | . | . | . | . | + | 2 | + | r | r | + | + | + | . | r | r | + | . | . | . | . | . | III | III | IV | . |
| Ad Poa secunda | r | + | r | . | . | + | . | . | . | . | . | . | . | . | . | . | r | . | x | . | + | + | + | + | r | + | + | + | x | . | . | . | II | II | V | . |
| Ad Eriogonum androsaceum | . | . | . | + | . | . | . | + | . | . | . | . | . | . | . | r | . | + | + | + | . | + | + | r | + | + | r | . | . | . | . | . | I | III | V | . |
| Ad Heuchera cylindrica | + | . | . | . | . | . | + | r | . | r | + | + | + | r | . | . | + | . | . | . | . | + | . | r | . | . | . | 2 | x | . | + | + | II | III | II | 2 |
| Ad Allium cernuum | r | . | . | r | r | r | r | r | r | . | . | . | . | . | r | . | + | + | . | . | . | . | . | + | . | + | r | . | . | . | . | + | IV | II | III | 1 |
| Ad Heuchera parviflora | . | r | r | r | r | + | r | r | r | . | . | . | . | . | . | . | . | + | + | r | r | . | . | . | . | r | + | . | . | . | . | . | IV | II | II | . |
| **possible SUBASSOCIATION** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Campanula rotundifolia | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | . | + | + | r | r | + | + | . | . | . | . | . | . | x | . | . | + | V | V | . | 1 |
| Phacelia sericea | . | + | + | + | r | + | r | + | r | . | . | r | r | + | r | + | + | + | + | . | + | + | . | . | . | . | . | . | . | . | + | . | IV | V | . | 1 |
| Agoseris glauca | r | + | + | + | + | + | + | + | + | . | + | . | . | + | + | + | . | . | + | + | + | + | . | . | . | . | . | . | . | . | . | . | V | IV | . | . |
| Arenaria obtusiloba | . | . | r | r | + | 1 | + | 1 | + | . | + | ad | r | . | + | . | . | + | + | + | . | 2 | + | . | + | . | . | . | . | . | . | . | IV | IV | II | . |
| Calamagrostis purpurascens | . | + | . | . | + | + | + | + | + | . | + | + | + | + | + | . | r | + | + | . | . | . | . | . | . | . | . | . | . | . | . | . | III | IV | . | . |
| Bupleurum americanum | r | r | + | + | . | + | r | + | + | . | + | r | r | r | + | + | . | . | . | . | + | . | . | . | . | . | . | . | . | . | . | . | IV | III | . | . |
| Festuca idahoensis | + | + | + | + | + | . | r | . | + | 2 | + | . | . | + | . | + | + | . | + | + | . | . | . | . | . | . | . | . | . | + | + | + | IV | III | . | 3 |
| Besseya wyomingensis | + | r | + | + | . | r | + | + | r | . | . | . | . | . | . | . | . | + | + | + | . | + | . | . | . | . | . | . | . | + | . | . | IV | II | . | 1 |
| Phacelia hastata | . | r | r | r | . | . | r | . | . | . | r | ad | . | r | . | r | . | . | . | . | . | . | . | . | . | . | . | . | x | . | + | . | II | II | . | 1 |
| Cladonia pocillum | p[cf] | . | . | p | . | . | p | p[cf] | p | . | p | . | . | . | p | . | p[cf] | . | p | . | p | . | . | . | . | . | . | . | . | . | . | . | III | III | . | . |
| Peltigera rufescens | p | . | . | . | p | . | p | p | . | p | p | p | . | . | p | . | . | . | . | p | p | . | . | . | . | . | . | p | . | . | . | . | III | III | I | . |
| **Variant of Festuca scabrella** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Festuca scabrella | + | . | + | + | + | . | + | r | . | + | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | IV | . | . | . |
| Gaillardia aristata | . | + | + | + | . | + | r | + | + | + | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | + | IV | . | . | 1 |
| Silene parryi | r | . | + | r | + | r | r | . | + | + | r | . | . | . | . | . | r | . | . | . | + | . | . | . | . | . | . | . | . | . | . | . | IV | II | . | . |
| Chrysopsis villosa | . | + | + | + | . | r | . | + | + | r | . | . | . | . | r | r | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | IV | I | . | . |
| Senecio canus | . | r | + | ad | . | + | . | + | . | + | + | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | III | + | . | . |
| Penstemon albertinus | . | r | . | r | r | r | . | . | . | r | ad | + | r | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | III | II | . | . |
| Lupinus sericeus | r | . | . | r | . | . | . | . | + | + | . | . | . | + | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | II | + | . | . |
| Mertensia viridis | . | . | + | r | . | . | . | + | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | + | . | . | . | . | . | . | . | . | II | . | I | . |
| **Variant of Penstemon ellipticus** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Penstemon ellipticus | . | . | . | . | . | . | . | . | . | . | . | . | . | r | . | . | . | . | . | . | . | . | + | + | r | + | + | 2 | x | . | + | . | . | + | V | 1 |
| Zigadenus elegans | . | . | . | . | . | . | . | r | . | . | . | . | . | . | . | . | . | + | r | . | + | . | r | + | r | r | + | r | . | 1 | + | . | + | II | V | 2 |
| Hedysarum sulphurescens | 1 | . | r | ad | . | . | . | r | + | . | . | . | . | . | r | . | . | . | . | . | . | . | + | + | + | + | + | . | . | . | + | + | III | + | V | 2 |
| Aster sibiricus | + | . | . | . | . | . | . | . | . | . | . | . | . | + | . | . | . | . | . | . | . | . | + | + | + | + | . | + | . | . | . | + | + | + | V | 1 |
| Agropyron latiglume | . | . | 6 | + | . | . | . | . | . | . | . | . | . | . | . | r | + | . | . | . | . | + | + | + | . | + | + | + | x | . | . | . | I | II | V | . |
| Poa alpina | . | . | . | . | r | . | . | . | . | . | . | . | . | . | . | . | r | . | . | . | + | . | + | . | + | . | + | r | x | + | . | + | + | I | IV | 2 |
| Trisetum spicatum | . | . | . | . | . | . | . | + | . | . | . | . | . | . | . | . | . | + | . | r | . | . | . | . | + | r | + | r | x | . | . | . | + | II | IV | . |
| Cystopteris fragilis | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | r | r | . | r | + | . | . | . | . | . | . | . | IV | . |
| Saxifraga adscendens | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | r | . | r | r | . | . | . | . | . | . | . | III | . |
| Crypthantha celosioides | . | r | + | + | . | . | . | r | . | . | . | . | . | . | . | . | . | . | . | . | . | . | r | . | r | r | . | . | . | . | . | . | II | . | III | . |
| Candelariella vitellina | . | . | . | . | . | . | . | . | p | . | . | . | . | . | p | . | . | . | . | . | p | p | p | p | p | p | p | p | . | . | . | . | + | II | V | . |
| Hypnum revolutum | . | . | . | p | p | . | p | p | . | . | . | . | . | . | . | . | . | . | p | p | . | . | p | p | p | p | p | . | . | . | . | . | II | I | V | . |
| Lecanora thomsonii cf. | . | . | . | . | . | . | p | . | . | . | p | p | p | . | . | . | . | . | . | . | . | . | p | p | p | p | . | . | . | . | . | . | + | II | IV | . |
| Lecidea marginata | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | p | p | p | . | p | . | . | . | . | . | . | . | IV | . |
| Lecidea umbonata | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | p | . | p | . | p | . | . | . | . | . | . | . | III | . |
| **Variant of Fragaria virginiana** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Fragaria virginiana | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | + | + | + | . | . | . | 3 |
| Carex scirpoidea | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 1 | . | 1 | . | . | . | 2 |
| Carex geyeri | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 1 | + | . | . | . | . | 2 |
| Polygonum bistortoides | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | + | + | . | . | . | . | 2 |
| Cirsium hookerianum | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | r | + | . | . | . | 2 |
| Castilleja miniata | r | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | + | + | + | . | . | 2 |
| **Companion species** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Achillea millefolium | + | + | r | + | + | + | + | + | + | + | + | | + | + | . | . | + | + | + | + | + | + | + | + | + | + | + | + | x | + | + | + | V | V | V | 3 |
| Sedum lanceolatum | + | r | + | + | + | + | + | r | + | r | + | + | + | + | r | r | + | + | r | r | + | + | . | r | r | r | r | . | . | + | . | + | V | V | IV | 2 |
| Galium boreale | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | | + | + | + | . | . | + | + | + | . | . | . | + | + | + | V | V | III | 3 |
| Anemone multifida | r | . | r | . | + | + | r | r | r | r | r | . | . | . | r | r | + | + | . | + | + | r | r | + | r | r | + | + | . | + | + | + | IV | IV | V | 3 |
| Eriogonum ovalifolium | . | + | + | + | . | + | r | + | r | . | + | . | + | ad | . | + | + | + | + | + | + | + | . | + | . | . | + | + | x | . | r | 2 | IV | V | III | 2 |
| Cerastium arvense | + | + | + | + | + | + | + | + | + | + | + | + | + | . | . | . | + | r | + | + | + | . | + | + | + | r | + | . | x | . | . | + | V | IV | V | 1 |
| Solidago multiradiata | + | . | . | . | + | r | + | + | + | + | + | . | . | r | + | . | r | + | + | + | . | r | + | + | + | + | + | . | x | + | + | 1 | IV | IV | V | 3 |
| Potentilla diversifolia | + | . | r | + | + | + | . | r | . | . | . | . | . | r | + | . | + | + | + | + | + | + | . | r | . | r | + | . | . | + | + | + | III | IV | III | 3 |
| Smelovskia calycina | . | r | r | . | + | . | + | r | . | . | . | . | . | . | . | . | + | r | + | + | r | . | + | r | + | + | + | . | . | . | + | . | III | III | V | 1 |
| Oxytropis campestris | . | . | + | r | + | . | . | + | + | . | . | . | . | . | + | . | . | . | + | + | . | r | . | . | r | . | . | . | . | . | . | . | III | II | I | . |
| Saxifraga bronchialis | + | . | . | . | 1 | . | + | r | . | . | + | . | + | + | r | . | . | + | . | . | . | ad | . | . | . | . | + | + | x | . | . | . | II | III | II | . |
| **Common cryptogams** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Tortula ruralis | p | . | p | p | p | p | p | p | p | p | p | . | . | . | p | p | p | . | p | 01 | p | p | p | p | p | . | p | p | . | . | . | . | V | IV | V | . |
| Bryum sp. | . | p | p | p | . | . | . | p | p | p | p | . | . | . | . | . | . | . | p | p | P | p | . | . | . | . | p | P | . | . | . | . | III | III | II | . |
| Lecidea atrobrunnea | p | . | . | . | . | p | p | p | . | . | p | p | p | . | p | . | . | . | p | . | p | p | p | . | p | p | . | p | . | . | . | . | II | III | IV | . |
| Rhizoplaca melanophthalma | . | . | . | . | . | p | p | p | . | . | p | p | p | . | . | . | . | . | p | p | p | p | p | p | p | p | . | . | . | . | . | . | II | III | IV | . |
| Umbilicaria krascheninnikovii | . | . | . | . | . | p | p | p | . | . | p | p | p | . | p | . | . | . | p | . | p | p | p | . | p | . | . | . | . | . | . | . | II | III | II | . |
| Rhizocarpon geographicum agg. | p | . | . | . | . | . | p | . | . | . | p | p | p | . | p | . | . | . | . | . | . | p | p | . | p | . | . | p | . | . | . | . | I | III | III | . |
| Xanthoria elegans | . | . | r | . | . | . | . | p | p | . | . | . | p | . | p | . | . | . | p | . | p | p | p | . | p | p | p | . | . | . | . | . | II | III | IV | . |

**Minor species:**

Selaginella standleyi: 6:r , 8:+ , 9:r , 13:+ , 21:r ; Selaginella scopulorum 3:+ , 6:+ , 9:+ , 10:r , 17:+ , 20:+ , 21:+ , 22:+ ; Luzula spicata 5:+ , 7:r , 8:+ , 10:+ , 19:r , 20:r , 21:+ , 22:r , 28:+ , 29:+ ; Poa interior 5:r , 8:+ , 9:+ , 19:+ , 20:r , 25:+ , 26:+ , 27:+ ;
Poa sp. 9:+ , 14:r , 18:+ , 20:x , 30:+ ; Potentilla nivea 8:+ , 18:+ , 19:+ , 22:+ , 26:r ; Myosotis alpestris 17:+ , 18:+ , 19:+ , 20:r , 22:r ; Erigeron compositus 8:+ , 15:r , 17:r , 18:+ , 19:+ , 20:+ , 23:+ , 26:+ , 31:r ;Carex phaeocephala 2:r , 14:r , 15:+ , 17:+ , 18:r
19:+ , 20:+ , 28:+ , 31:r ; Festuca brachyphylla 6:r , 8:+ , 18:+ , 19:r , 23:+ , 24:+ , 26:+ , 27:+ ; Aspicilia sp. 1:p , 7:p , 12:p , 21:p , 22:p , 24:p , 26:p , 27:p ; "Black apothecia on rock" 6:p , 7:p , 12:p , 13:p , 15:p , 21:p , 22:p , 24:p ; Lecanora polytropa 7:p , 8:p
19:p , 21:p , 22:p , 28:p ; Physconia muscigena 4:p , 8:p , 9:p , 12:p , 13:p , 19:p , 20:p , 21:p ; Caloplaca tiroliensis 5:p , 8:p , 9:p , 12:p , 13:p , 19:p , 20:p , 21:p ; Caloplaca stillicidiorum 3:p , 5:p , 8:p , 9:p , 19:p , 20:p , 27:p ;
Peltigera didactyla 8:p , 10:p , 19:p , 20:p , 21:p , 22:p , 28:p ;Cladonia sp. 1:p , 8:p , 10:p , 11:p , 13:p , 20:p , 21:p , 28:p ; Peltigera lepidophora 1:p , 3:p , 4:p , 8:p , 11:p , 17:p , 19:p , 28:p ; Ceratodon purpureus 4:p , 6:p , 11:p , 16:p , 17:p , 22:p , 28:p ;
Encalypta rhabdocarpa 3:p , 8:p , 9:p , 10:p , 19:p , 20:p , 28:p ; Tortella tortuosa 6:p , 8:p , 10:p , 21:p , 24:p , 26:p ; Tortella fragilis 8:p , 9:p , 10:p , 11:p , 21:P , 22:p ; Cephalozia? sp. 8:p , 9:p , 11:p , 20:p , 28:p ; Megaspora verrucosa 8:p , 10:p , 11:P , 12:P
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