

VASCULAR FLORA OF THE TENDERFOOT CREEK EXPERIMENTAL FOREST, LITTLE BELT MOUNTAINS, MONTANA

SCOTT A. MINCEMOYER¹

USFS, Rocky Mountain Research Station, Fire Sciences Laboratory, Missoula, MT 59807

JENNIFER L. BIRDSALL²

USFS, Rocky Mountain Research Station, Forestry Sciences Laboratory,
Missoula, MT 59807

ABSTRACT

Tenderfoot Creek Experimental Forest (TCEF) is situated in the Little Belt Mountains of Montana, 120 km east of the Continental Divide. TCEF is composed of 3693 ha at elevations between 1840 and 2420 m and is dominated by lodgepole pine forest, which covers about 3366 ha, with interspersed floristically rich meadows. Our floristic inventory is based on collections and field observations made by Scott Mincemoyer during 1996–1999 and collections by Jennifer Birdsall during 2003–2005. We also include collections made by Earle Layser in 1992 and Jessica Fultz in 2002–2003. The vascular flora of TCEF consists of 312 species, representing 162 genera and 44 families. Twenty-seven exotic species occur in TCEF including *Centaurea maculosa*, *Chrysanthemum leucanthemum*, *Cirsium arvense*, and *Tanacetum vulgare* which are listed as noxious weeds in Montana. *Phlox kelseyi* var. *missoulensis* is found in the experimental forest and is listed as sensitive by the USDA Forest Service Northern Region.

Key Words: Tenderfoot Creek, Little Belt Mountains, Montana, plant inventory, vascular flora.

Tenderfoot Creek Experimental Forest (TCEF) was established in 1961 on the Lewis and Clark National Forest for the purpose of watershed research. TCEF is situated 40 km due north of the town of White Sulfur Springs in Meagher County, Montana in the Little Belt Mountains which are 120 km east of the Continental Divide. TCEF is located at approximately 46°55'N latitude and 110°52'W longitude and includes portions of T13–14N, R6–7E. TCEF encompasses the headwaters of Tenderfoot Creek, a west flowing tributary of the Smith River, and consists of 3693 ha at elevations between 1840 and 2420 m (Schmidt and Friede 1996). The watershed comprises seven subdrainages running north-south in a dendritic pattern (Barrett 1993). Included within TCEF is the Onion Park Research Natural Area (RNA) which was established in 1991. Onion Park RNA comprises 474 ha dominated by a floristically rich wet meadow complex in the upper portion of the watershed (Layser 1992). The RNA also includes surrounding forests and a majority of Quartzite Ridge (Fig. 1). Schmidt and Friede (1996) details the climate, geology, and soils of TCEF.

Climate

According to Schmidt and Friede (1996), TCEF is dominated by a continental climate influenced by the mountainous topography. Rainfall averages 880 mm with a range of 594 to 1050 mm from the lowest to the highest elevations. Precipitation usually peaks during the winter months at 100 to 125 mm per month and averages 50 to 60 mm per month during July through October. Temperatures can go below freezing every month of the year, thus the average growing season is fairly short. The season averages a low of 30 to 45 days on the higher ridges and 45 to 75 days at lower elevations (Schmidt and Friede 1996).

Geology and Soils

Schmidt and Friede (1996) describe TCEF as characterized by igneous intrusive sills of quartz porphyry, Wolsey shales, Flathead quartzite, and granite gneiss. The northern part of TCEF occupies the highest elevations and steepest upland topography and is underlain by igneous intrusive granitic rocks. The arched bedrock in the area was formed from metasediments of Cambrian Age consisting mainly of argillites and quartzites. Glaciation has influenced the landform, producing broad basins in which the streams are beginning to regain a water-carved dendritic pattern. Tenderfoot Creek has carved the deepest pattern and is entrenched in a steep canyon with prominent bedrock cliffs. The most

¹Present address: Montana Natural Heritage Program, Montana State Library, 1515 E. Sixth Ave., Helena, MT 59620.

²Author for correspondence, email: thelegume@hotmail.com

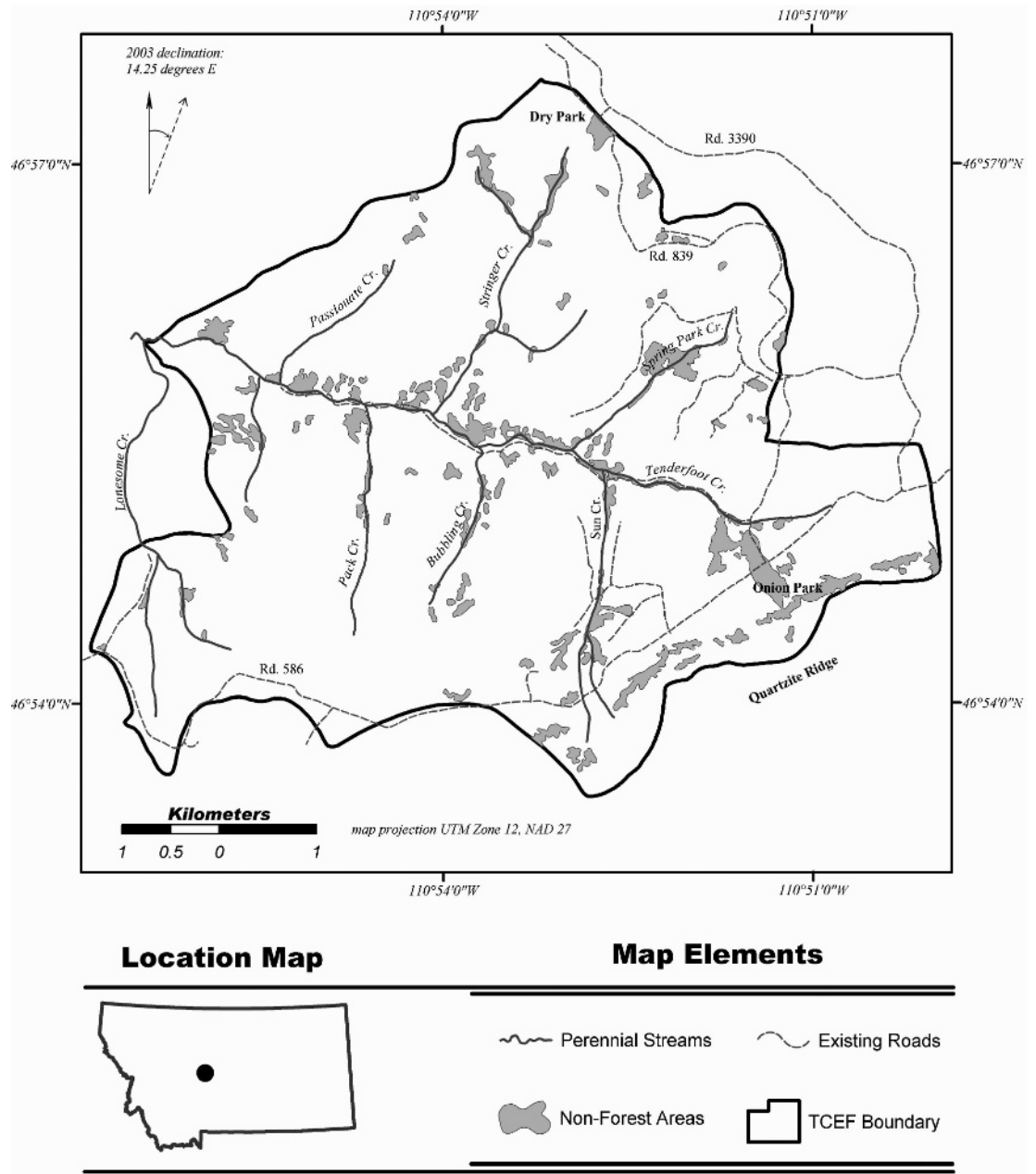


FIG. 1. Location and map of Tenderfoot Creek Experimental Forest, Meagher County, Montana. (Prepared by Rob Ahl, formerly of the USFS, Rocky Mountain Research Station, Missoula, MT 59807 and now at the University of Montana, College of Forestry and Conservation, Missoula, MT 59812).

extensive soil groups are the loamy skeletal, mixed Typic Cryochrepts and clayey, mixed Aquic Cryoboralfs. Rock talus slopes are prominent on the perimeter, but rock outcrops are confined chiefly to areas adjacent to main stream channels. Grassland parks are prominent at the heads of the drainages. Soils in the parks range from well to poorly drained. Seeps and springs are common.

Plant Communities

The study area falls within the subalpine or Hudsonian life zone of Merriam and is dominated by lodgepole pine, which covers about 3366 ha. Other habitats of considerable size include 125 ha of floristically-rich wet meadows and 54 ha of open, grassy or rocky slopes (Schmidt and Friede 1996). Forested communities are domi-

nated by even-age lodgepole pine stands with low species diversity. Late seral or more mesic stands may have a significant component of subalpine fir and/or Engelmann spruce in the understory or overtopping the lodgepole pine.

Five forested habitats described by Pfister et al. (1977) account for the majority of the area in TCEF. These five types in order of abundance are:

1. *Abies lasiocarpa/Vaccinium scoparium* habitat type—occurs on most well-drained, mid to upper slopes.
2. *Abies lasiocarpa/Vaccinium globulare* habitat type—occurs on slopes at low to mid elevations.
3. *Abies lasiocarpa/Calamagrostis canadensis* habitat type—occurs on moist swales, slopes and draws.
4. *Abies lasiocarpa*—*Pinus albicaulis/Vaccinium scoparium* habitat type—limited mainly to the ridge on the northeast border above 2380 m.
5. Forested Scree—occurs mainly along Quartzite Ridge and on other slopes scattered throughout the drainage. This may better be described as *Abies lasiocarpa*/scree habitat type in most of the study area.

In addition to the five types mentioned, twelve grassland or riparian types have been mapped by Layser (1992) in Onion Park RNA. Most, if not all, of the non-forested sites in TCEF would fall into these vegetation types. However, the nomenclature of a few of the species that define the types mapped by Layser is now considered out of date. *Agropyron caninum* is called *Elymus trachycaulis* in most newer floras, including Dorn (1984), and *Carex utriculata* is the updated name for the taxa previously referred to as *Carex rostrata* throughout much of the west. The true *Carex rostrata* is a boreal species and is rare in Montana (Reznicek 1997). Types with either of these names could be relabeled with their currently accepted names, though we have retained the original nomenclature herein. The non-forested types mapped by Layser are:

1. *Deschampsia cespitosa/Carex spp.* habitat type—most common seasonal wetland type. Described by Meuggler & Stewart (1980).
2. *Festuca idahoensis/Deschampsia cespitosa* habitat type—common in drier areas than *Deschampsia cespitosa/Carex spp.* ht. Described by Meuggler & Stewart (1980).
3. *Festuca idahoensis/Agropyron caninum* habitat type, *Geranium viscosissimum* phase—more mesic than the typic phase, probably limited in distribution to Onion Park and Dry Park. Described by Meuggler & Stewart (1980).

4. *Eriophorum chamissonis/Carex spp.* community type—occurs in very wet sites, limited to Onion Park and Sun Creek areas. Previously undescribed type in Montana (Layser 1992).
5. *Alopecurus alpinus/Carex spp.* community type—probably limited to Onion Park. Previously undescribed type in Montana (Layser 1992).
6. *Deschampsia cespitosa/Carex spp.* habitat type wet phase—more mesic phase of habitat type. Undescribed phase of *Deschampsia cespitosa/Carex spp.* habitat type.
7. *Mertensia ciliata/Senecio triangularis* community type—minor type next to springs, seeps and rivulets. Would now key to *Senecio triangularis* community type in Hansen et al. (1995).
8. *Festuca idahoensis/Agropyron caninum/Melica spectabilis* habitat type—minor type in Onion Park and probably elsewhere in TCEF. Previously undescribed type, but would key to *Festuca idahoensis/Agropyron caninum* habitat type in Meuggler & Stewart (1980).
9. *Carex rostrata/Deschampsia cespitosa* habitat type—occurs in wet areas adjacent to streams or springs on in seeps. Described by Hansen et al. (1995).
10. *Salix geyeri/Carex rostrata* habitat type—occurs adjacent to streams, springs, seeps and rivulets. Would now key to *Salix drummondiana/Carex rostrata* habitat type in Hansen et al. (1995).
11. *Salix geyeri/Calamagrostis canadensis* habitat type—occurs adjacent to streams, springs, seeps and rivulets. Would now key to *Salix drummondiana/Calamagrostis canadensis* habitat type in Hansen et al. (1995).
12. *Picea engelmannii/Salix spp./Carex spp.* community type—occurs adjacent to streams, springs, seeps and boggy areas. Would now key to *Picea spp./Calamagrostis canadensis* community type in Hansen et al. (1995).

Development of Flora

The flora is mainly based on collections and field observations made in 1996–1999 by Scott A. Mincemoyer and 2003–2005 by Jennifer L. Birdsell. Collection dates in 1996 included time spans throughout the field season. 1997 collecting was limited to June 23–26 and August 13–15. 1998 was limited to June 27–28 and August 8–9. 1999 was limited to July 13–15. 2003 was limited to July 28–30. 2004 was limited to August 17–19. 2005 was limited to August 23–25. Collections by Earle F. Layser in August, 1992 in Onion Park RNA are included in the flora as are collections made by Jessica E. Fultz during the summers of 2002 and 2003. A search of the MRC herbarium

(Rocky Mountain Research Station, Forestry Sciences Laboratory, Missoula, MT) for additional specimens resulted in three vouchers collected by Frank A. Clark in 1914 and 1915 in Onion Park. Taxa previously reported for TCEF or Onion Park RNA by others are not included in the main body of the flora since no voucher specimens were collected and some reported taxa are believed to be outside of the boundary of the experimental forest. However, these taxa are listed separately and their presence in TCEF should be sought and documented if possible.

Floristic Summary

The vascular flora of TCEF consists of 312 species, representing 162 genera and 44 families (Tables 1–3). Twenty-seven exotic species occur on the experimental forest. These are: *Arabis glabra*, *Artemisia absinthium*, *Bromus inermis*, *Carduus nutans*, *Centaurea maculosa*, *Chrysanthemum leucanthemum*, *Cirsium arvense*, *Cirsium vulgare*, *Dactylis glomerata*, *Filago arvensis*, *Lactuca serriola*, *Medicago lupulina*, *Melilotus officinalis*, *Phleum pratense*, *Poa pratensis*, *Polygonum convolvulus*, *Rumex acetosella*, *Sonchus arvensis*, *Spergularia rubra*, *Tanacetum vulgare*, *Taraxicum laevigatum*, *Taraxicum officinale*, *Thlaspi arvense*, *Tragopogon dubius*, *Trifolium hybridum*, *Trifolium pratense*, and *Trifolium repens*. The nativity of two species, *Festuca rubra* and *Poa palustris*, is uncertain. *Centaurea maculosa*, *Chrysanthemum leucanthemum*, *Cirsium arvense*, and *Tanacetum vulgare* are listed as noxious weeds by the Montana Department of Agriculture. Their distributions in TCEF are limited to a few scattered individuals or small clumps mainly along roads and in meadows adjacent to roads. *Phlox kelseyi* var. *missoulensis* is the only documented rare species in TCEF and is listed by the USDA Forest Service Northern Region as a sensitive plant and by the Montana Natural Heritage Program as a Species of Concern in the state. This study, though attempting to be comprehensive, almost certainly has missed taxa that occur within the study area, and several small meadows and openings remain basically unsurveyed.

TABLE 1. SUMMARY OF TENDERFOOT CREEK EXPERIMENTAL FOREST FLORA.

Taxon	Families	Genera	Species
Ferns and fern allies	3	6	6
Pinophyta	2	5	9
Magnoliopsida	34	115	211
Liliopsida	5	36	86
Totals	44	162	312

TABLE 2. LARGEST FAMILIES OF TENDERFOOT CREEK EXPERIMENTAL FOREST FLORA.

Family	Species
Asteraceae	57
Poaceae	39
Cyperaceae	19
Rosaceae	16
Scrophulariaceae	16
Ericaceae	12

Floristic Affinities

The ecology and floristic diversity of an area may be better understood by looking at the floristic affinities of the species comprising the flora of the area in question. Insights into colonization events and migration patterns may also be gained by conducting analyses and summaries of floristic affinities. A species is considered to have an affinity with a particular floristic province when its distribution largely corresponds with that particular region (Gleason and Conquist 1964; Lesica 2002). TCEF itself sits near the boundary of two floristic provinces, the Cordilleran and the Great Plains (Grassland).

For the TCEF flora, we assigned species to the floristic provinces described by Gleason and Cronquist (1964). The flora of TCEF is dominated by species from two floristic provinces, the Boreal (Northern Conifer) and the Cordilleran. Approximately 47% of the species in the flora have a predominantly Cordilleran affinity and 25% have a Boreal affinity. This is not unexpected for an area such as TCEF, which occurs within the Cordilleran province at moderate to high elevations of the Northern Rocky Mountains and is dominated by subalpine conifer forests. Of the remaining species, the majority are widely distributed across two or more floristic regions and cannot be assigned to a specific province (18% are classified as widespread). Although elevations in the study area are not high enough to support an alpine life zone, a few meadows and exposed areas have conditions similar enough to alpine zones to support a few species from the Arctic-alpine province. Six species or roughly 2% of the flora fall into this category, including *Poa alpina* and *Sibbaldia*

TABLE 3. LARGEST GENERA OF TENDERFOOT CREEK EXPERIMENTAL FOREST FLORA.

Genera	Species
<i>Carex</i>	17
<i>Poa</i>	8
<i>Salix</i>	8
<i>Juncus</i>	7
<i>Aster</i>	6
<i>Erigeron</i>	6

procumbens. The remaining 8% of species are exotic to North America and do not fall into one of the floristic provinces. Many of the exotics were not collected during surveys in the 1990s but were observed in the 2003–2005 surveys, mainly along roads and in meadows adjacent to roads. Introductions of these species may be arising from increased human activity in the area. Currently, these exotics are a small component of the flora in terms of their area of extent and their contribution to floristic diversity. In comparison, the percent of the TCEF flora composed of exotics is slightly less but similar to the percent of exotics found in two other recent Montana floras from Flathead National Forest and Glacier National Park which cover larger and more diverse areas (Lesica 2002; Mantas 1999). No species with Great Plains affinities occur in TCEF probably because of the relatively high elevations of the study area. Species with Great Plains affinities do occur along the lower slopes of the Little Belt Mountains.

ACKNOWLEDGMENTS

We would like to thank Dr. Matt Lavin and Cathy Seibert at MONT for their assistance verifying collections by Earle Laysen; Rob Ahl for producing the included map; Peter Lesica for providing data and assistance on assignment of floristic provinces; and Colin Hardy and Cameron Johnston at the USFS, Rocky Mountain Research Station, Fire Sciences Laboratory for granting the time to collect and process specimens. Finally, we give special thanks to Peter Stickney of MRC for assistance and guidance on all aspects of this project including identification of difficult taxa, specimen curation and review of early drafts.

LITERATURE CITED

- BARRETT, S. W. 1993. Fire history of Tenderfoot Creek Experimental Forest, Lewis and Clark National Forest. Unpublished report of Research Joint Venture Agreement INT-92679 on file at: U. S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Intermountain Fire Sciences Laboratory, Missoula, MT.
- DORN, R. D. 1984. Vascular plants of Montana. Mountain West Publishing, Cheyenne, WY.
- GLEASON, H. A. AND A. CRONQUIST. 1964. The natural geography of plants. Columbia University Press, New York, NY.
- HANSEN, P. L., R. D. PFISTER, K. BOGGS, B. J. COOK, J. JOY, AND D. K. HINCKLEY. 1995. Classification and management of Montana's riparian and wetland sites. Miscellaneous Publication 54. University of Montana, School of Forestry, Montana Forest and Conservation Experiment Station, Missoula, MT.
- HENDERSON, D. M., R. K. MOSELEY, AND A. F. CHOLEWA. 1990. A new *Agoseris* (Asteraceae) from Idaho and Montana. *Systematic Botany* 15: 462–465.
- HITCHCOCK, C. L. AND A. CRONQUIST. 1973. Flora of the Pacific Northwest: an illustrated manual. University of Washington Press, Seattle, WA.
- LAYSER, E. 1992. Onion Park Research Natural Area: botanical and ecological resources inventory, mapping and analysis. Unpublished report, contract #43-84M8-2- 0705. U.S. Department of Agriculture, Forest Service, Lewis and Clark National Forest.
- LESICA, P. 2002. A flora of Glacier National Park, Montana. Oregon State University Press, Corvallis, OR.
- MANTAS, M. 1999. Vascular plant checklist for the Flathead National Forest, Montana. Unpublished report. U.S. Department of Agriculture, Forest Service, Flathead National Forest, Kalispell, MT.
- MUEGLER, W. F. AND W. L. STEWART. 1980. Grassland and shrubland habitat types of Western Montana. General Technical Report INT-66. U.S. Department of Agriculture, Forest Service, Intermountain Forest and Range Experiment Station, Ogden, UT.
- PALMER, M. W., G. L. WADE, AND P. NEAL. 1995. Standards for the writing of floras. *Bioscience* 45:339–345.
- PFISTER, R. D., B. L. KOVALCHIK, S. F. ARNO, AND R. C. PRESBY. 1977. Forest habitat types of Montana. General Technical Report INT-34. U.S. Department of Agriculture, Forest Service, Intermountain Forest and Range Experiment, Station, Ogden, UT.
- REZNICEK, A. A. 1997. The true *Carex rostrata* in the American Rockies. *Sage Notes* 19:11–13.
- SCHMIDT, W. C., J. L. FRIEDE, AND COMPILERS. 1996. Experimental forests, ranges and watersheds in the Northern Rocky Mountains: a compendium of outdoor laboratories in Utah, Idaho and Montana. General Technical Report INT-GTR 334. U.S. Department of Agriculture, Forest Service, Intermountain Research Station, Ogden, UT.

APPENDIX I

ANNOTATED CHECKLIST

The checklist is arranged by division and class, then alphabetically by family and species. Nomenclature generally follows Dorn (1984). Common names are generally from Hitchcock and Cronquist (1973). Exotic species are preceded by an asterisk (*). *Festuca rubra* and *Poa palustris* are preceded by double astrices (**) since their nativity is uncertain. Geographic abundance is included in the checklist using the following scale suggested by Palmer, Wade and Neal (1995):

Abundant—Dominant or codominant in one or more common habitats.

Frequent—Easily found in one or more common habitats, but not dominant in any common habitat.

Occasional—Widely scattered, but not difficult to find.

Infrequent—Difficult to find with few individuals or colonies, but found in several locations.

Rare—Very difficult to find and limited to one or very few locations.

In conjunction with an abundance category, the generalized habitats in which a species usually occurs are provided. Specific locations are provided for some species when they are only known to occur in one or two distinct areas. Collection numbers, listed at the end of each entry, are Scott Mincemoyer's unless otherwise

noted. Mincemoyer's collections are deposited at the MRC herbarium (Rocky Mountain Research Station, Forestry Sciences Laboratory, Missoula, MT) with some duplicates deposited at the MONT herbarium (Montana State University, Bozeman, MT). Taxa lacking collection numbers were identified by Scott Mincemoyer during field observations. Collections by Jennifer Birdsall are denoted by the initials JLB followed by a collection number and are on file at MRC. Collections by Earle Layser are distinguished by Layser followed by a collection number and are deposited at MONT. Collections by Jessica Fultz are distinguished by TCEF followed by a collection number and are deposited at MONT. Some additional specimens and duplicates are also included and are identified as such.

Division Equisetophyta

Equisetaceae

Equisetum arvense L. common horsetail. Infrequent. Wet meadows and streambanks. 245.

Division Pterophyta

Polypodiaceae

Athyrium filix-femina (L.) Roth. Lady fern. Rare. Passionate Creek. 403.

Cryptogramma acrostichoides R. Br. rock-brake. Rare. Rocky slopes. Quartzite Ridge.

Cystopteris fragilis (L.) Bernh. brittle bladder fern. Infrequent. Rocky slopes, crevasses and streambanks. 27, 65.

Woodsia oregana D.C. Eaton. woodsia. Rare. Rocky slopes. 336.

Selaginellaceae

Selaginella densa Rydb. selaginella. Rare. Open ridgetop above gravelpit. 296.

Division Pinophyta

Cupressaceae

Juniperus communis L. common juniper. Occasional. Upland forests. 264.

Juniperus scopulorum Sarg. Rocky Mtn. juniper. Rare. Steep, south slope near bottom of drainage. 337.

Pinaceae

Abies lasiocarpa (Hook.) Nutt. subalpine fir. Abundant. *Picea engelmannii* Parry. Engelmann spruce. Frequent. Most habitats except drier slopes.

Pinus albicaulis Engelm. whitebark pine. Frequent. Mature individuals at higher elevations and scattered seedlings and saplings elsewhere.

Pinus contorta Dougl. lodgepole pine. Abundant.

Pinus flexilis James. limber pine. Rare. Steep, south slope near bottom of drainage. 350.

Pinus ponderosa Dougl. ponderosa pine. Rare. Steep, south slope near bottom of drainage. 349.

Pseudotsuga menziesii (Mirbel) Franco. Douglas-fir. Rare. Scattered individuals in lower elevations.

Division Magnoliophyta

Class Magnoliopsida

Aceraceae

Acer glabrum Torr. Rocky Mountain maple. Rare. Lower portion of drainage. 251.

Apiaceae

Angelica arguta Nutt. Lyall's angelica. Occasional. Streambanks with deep, rich soils.

Heracleum sphondylium L. cow-parsnip. Infrequent. Streambanks with deep, rich soils.

Lomatium cous (Wats) Coult. & Rose. cous biscuitroot. Infrequent. Dry Park and possibly in other dry meadows. 92, 278.

Lomatium dissectum (Nutt.) Math. & Cronst. fern-leaved lomatium. Rare. Steep, south slope near bottom of drainage. 216.

Lomatium triternatum (Pursh) Coult. & Rose. nine-leaf lomatium. Rare. Lower portion of drainage along roadside. 253.

Osmorhiza chilensis H. & A. mountain sweet-cicely. Occasional. Moist forests. 106.

Osmorhiza occidentalis (Nutt. Ex T. & G.) Torr. western sweet-cicely. Infrequent. Riparian forests. 271.

Perideridia gairdneri (H. & A.) Mathias. Gairdner's yampah. Infrequent. Vernal moist meadows. 18.

Apocynaceae

Apocynum androsaemifolium L. spreading dogbane. Rare. Steep, south slope near bottom of drainage. 344.

Asteraceae

Achillea millefolium L. common yarrow. Occasional. Meadows and drier slopes. 301.

Agoseris aurantiaca (Hook.) Greene. orange agoseris. Infrequent. Roadsides and drier meadows. 70, 118, 309.

Agoseris glauca (Pursh) Raf. pale agoseris. Occasional. Meadows. 16, 42.

Agoseris lackschewitzii Henderson & Mosely. pink agoseris. Rare. Wet meadows. Species described in Henderson et. al. (1990).

Anaphalis margaritacea (L.) B. & H. pearly everlasting. Occasional. Roadsides. 52.

Antennaria anaphaloides Rydb. tall pussy-toes. Rare. Open ridgetop above gravelpit. 307.

Antennaria corymbosa E. Nels. meadow pussy-toes. Rare. Wet meadows; Sun Creek area. 122; Layser 3289, 3337.

Antennaria microphylla Rydb. rosy pussy-toes. Infrequent. Dry meadows. 305, 419 (*A. rosea* of some authors).

Antennaria parvifolia Nutt. Nuttall's pussy-toes. Rare. Open slope just west of Passionate Creek. 366 (MONT).

Antennaria racemosa Hook. woods pussey-toes. Frequent. Upland forests. 21; Clark 36.

Arnica cordifolia Hook. heartleaf arnica. Infrequent. Upland forests, more common at lower elevations.

Arnica latifolia Bong. mountain arnica. Abundant. Upland forests and open slopes. 321.

Arnica mollis Hook. hairy arnica. Infrequent. Wet meadows and streamsides. Layser 3297.

Arnica rydbergii Greene. Rydberg's arnica. Frequent. Upland forests; Sun Creek area. TCEF 004 (MONT).

**Artemisia absinthium* L. wormwood. Infrequent. Roadsides. JLB 25.

Artemisia ludoviciana Nutt. gray sagewort. Rare. Steep, south slope near bottom of drainage. 348 (MRC, Dupl. MONT).

Aster ciliolatus Lindl. Lindley aster. Rare. Steep, south slope near bottom of drainage. 351.

Aster conspicuus Lindl. showy aster. Infrequent. Tenderfoot Creek. 365.

- Aster foliaceus* Lindl. leafy aster. Infrequent. Moist meadows and streamsides. 56.
- Aster hesperius* Gray. western willow aster. Frequent. Stream banks and meadows; Sun Creek area. *TCEF* 006 (MONT).
- Aster integrifolius* Nutt. thick-stemmed aster. Frequent. Dry meadows; Onion Park. *TCEF* 008 (MONT).
- Aster meritus* A. Nels. arctic aster. Frequent. Open, upland forests. 81, 83, 127.
- Aster modestus* Lindl. few-flowered aster. Rare. Lower portion of Tenderfoot Creek. 358.
- Aster occidentalis* (Nutt.) T. & G. western aster. Frequent. Moist meadows and moist, open forests. 43, 75, 137, 313 (MONT), 327 (MONT); *Layser* 3288, 3302.
- **Carduus nutans* L. musk thistle. Rare. Roadsides. *JLB* 17.
- **Centaurea maculosa* Lam. spotted knapweed. Rare. Roadsides. *JLB* 9.
- Chaenactis douglasii* (Hook.) H. & A. hoary chaenactis. Rare. Lower portion of drainage along road.
- **Chrysanthemum leucanthemum* L. oxeye-daisy. Infrequent. Roadsides. *JLB* 6.
- **Cirsium arvense* (L.) Scop. Canada thistle. Infrequent. Roadsides and meadows.
- Cirsium hookerianum* Nutt. Hooker's thistle. Occasional. Meadows.
- **Cirsium vulgare* (Savi) Tenore. bull thistle. Infrequent. Roadsides. *JLB* 5.
- Crepis runcinata* (James) T. & G. meadow hawksbeard. Rare. Dry Park. 423.
- Erigeron compositus* Pursh. cutleaf daisy. Infrequent. Rocky slopes and outcrops in lower portion of drainage. 64, 266.
- Erigeron ochroleucus* Nutt. buff fleabane. Rare. Open ridgetop above gravelpit. 297.
- Erigeron peregrinus* (Pursh) Greene. Occasional. Onion Park area. *Clark* 55.
- Erigeron simplex* Greene. alpine daisy. Rare. Meadows. 132.
- Erigeron speciosus* (Lindl.) DC. showy fleabane. Infrequent. Lower portion of drainage. 352 (MONT), 357 (MONT).
- Erigeron ursinus* DC. Eat. Bear River fleabane. Rare. Meadows; Stringer Creek area. 422.
- **Filago arvensis* L. filago. Rare. Along Road 586 west of Bubbling Springs. 401.
- Heterotheca villosa* (Pursh) Shinn. hairy goldaster. Rare. Roadsides. *JLB* 26.
- Hieracium albiflorum* Hook. white-flowered hawkweed. Frequent. Upland forests. 367; *Layser* 3316.
- Hieracium cynoglossoides* Arv.-Touv. hounds-tongue hawkweed. Infrequent. Open forests in lower portion of drainage. 361 (MRC, Dupl. MONT).
- Hieracium gracile* Hook. slender hawkweed. Frequent. Upland forests, more common with increasing elevation. *Layser* 3317.
- **Lactuca serriola* L. prickly lettuce. Rare. Logged area. *JLB* 27.
- Microseris nutans* (Geyer ex. Hook.) Schultz-Bip. Rare. Dry meadows; Stringer Creek area. 420.
- Nothocalais nigrescens* (Henderson) Heller. black-hairy nothocalais. Occasional. Dry meadows. 91.
- Senecio pseudoureus* Rydb. streambank butterweed. Infrequent. Streamsides. 138; *Layser* 3284, 3308.
- Senecio sphaerocephalus* Greene. mt-marsh butterweed. Infrequent. Meadows and roadsides. 79, 109; *Layser* 3282.
- Senecio triangularis* Hook. arrowleaf groundsel. Frequent. Riparian forests, wet meadows and streamsides.
- Solidago canadensis* L. Canada goldenrod. Rare. Lower portion of Tenderfoot Creek. 405.
- Solidago missouriensis* Nutt. Missouri goldenrod. Infrequent. Steep, south slope near bottom of drainage. 345 (MRC, Dupl. MONT).
- Solidago multiradiata* Ait. northern goldenrod. Infrequent. Dry meadows and open slopes. 15, 316 (MONT).
- **Sonchus arvensis* L. perennial sow-thistle. Rare. Roadsides. *JLB* 27.
- **Tanacetum vulgare* L. common tansy. Rare. Roadsides. *JLB* 16.
- **Taraxacum laevigatum* (Willd.) DC. red-seeded dandelion. Rare. Roadsides.
- **Taraxacum officinale* Weber. common dandelion. Occasional. Meadows and roadsides.
- **Tragopogon dubius* Scop. yellow salsify. Rare. Steep, south slope near bottom of drainage. 341.

Berberidaceae

- Mahonia repens* (Lindl.) G. Don. creeping Oregon-grape. Infrequent. Forests and open areas in lower portion of drainage. 263.

Betulaceae

- Alnus viridis* (Vill.) Lam. & DC. Sitka alder. Infrequent. Streamsides in lower portion of drainage. 247 (MRC, Dupl. MONT).

Boraginaceae

- Mertensia ciliata* (James ex. Torr.) G. Don. mountain bluebell. Occasional. Streamsides and wet meadows. 250.
- Mertensia oblongifolia* (Nutt.) G. Don. leafy bluebells. Frequent. Meadows; Onion Park. *TCEF* 002 (MONT).
- Mertensia viridis* (A. Nels.) A. Nels. green bluebells. Rare. Infrequent. Meadows; Onion Park area. 229.

Brassicaceae

- Arabis confinis* Wats. spreading pod rockcress. Rare. Open areas in lower portion of drainage. 272 (MONT).
- Arabis drummondii* Gray. Drummond's rockcress. Infrequent. Meadows.
- **Arabis glabra* (L.) Bernh. towermustard. Rare. Meadows; Onion Park area. 78.
- Arabis nuttallii* Robins. Nuttall's rockcress. Occasional. Meadows and open slopes. 275.
- Barbarea orthoceras* Ledeb. wintercress. Infrequent. Moist meadows and streamsides. 44.
- Cardamine breweri* Wats. Brewer's bittercress. Infrequent. Wet meadows and streamsides. *Layser* 3296, 3330.
- Draba stenoloba* Ledeb. slender draba. Occasional. Open areas in meadows and along streams. 93.
- Rorippa curvisiliqua* (Hook.) Bessey. western yellowcress. Rare. Vernal inundated depressions in meadows; one collection from small meadow east of Spring Park. 104.
- **Thlaspi arvense* L. field pennycress. Infrequent. Roadsides. *JLB* 28.
- Thlaspi montanum* L. Fendler's pennycress. Infrequent. Meadows. 31, 234.

Campanulaceae

Campanula rotundifolia L. lady's thimble. Occasional. Meadows. 314.

Caprifoliaceae

Linnaea borealis L. twinflower. Rare. Moist forests. 74.
Lonicera utahensis Wats. Utah honeysuckle. Occasional. Forests and riparian areas.
Sambucus racemosa L. elderberry. Infrequent. Forests; heavily browsed by deer and elk. 244.

Caryophyllaceae

Arenaria congesta Nutt. var. *lithophila* Rydb. ballhead sandwort. Infrequent. Rocky slopes. 53, 329 (MONT) (Hitchcock and Cronquist 1973).
Arenaria lateriflora L. Bluntleaf sandwort. Infrequent. Meadows; Onion Park area. 223.
Cerastium arvense L. field chickweed. Infrequent. Meadows; Onion Park area. 141, 246.
Silene parryi (Wats.) Hitchc. & Mag. Parry's silene. Infrequent. Dry meadows. 310 (MRC, Dupl. MONT).
**Spargularia rubra* (L.) J. & K. Presl. red sandspurry. Rare. Dry meadows and roadsides. 124.
Stellaria crispa Cham. & Schlecht. crisped starwort. Rare. Moist depressions of forests. 58.
Stellaria longifolia Muhl. ex Willd. long-leaved starwort. Infrequent. Meadows; Onion Park area. Layser 3323.
Stellaria sitchana Steud. northern starwort. Rare. Moist depressions of forests. 40.

Crassulaceae

Sedum lanceolatum Torr. lanceleaf stonecrop. Rare. Dry meadows and rocky slopes. 277, 294.

Ericaceae

Arctostaphylos uva-ursi (L.) Spreng. kinnikinnick. Infrequent. Dry, south-facing slopes. 364.
Chimaphila umbellata (L.) Bart. prince's pine. Frequent. Upland forests.
Hypopitys monotropa Crantz. pinesap. Rare. Upland forests.
Ledum glandulosum Nutt. Labrador-tea. Rare. Wet meadows associated with *Sphagnum* spp.; upper portion of Sun Creek.
Pyrola asarifolia Michx. pink wintergreen. Rare. Moist forests; Onion Park area. 362; Layser 3287.
Pyrola chlorantha Sw. green wintergreen. Occasional. Upland forests.
Pyrola minor L. lesser wintergreen. Rare. Forests. 133, 400 (MONT).
Pyrola secunda L. one-sided wintergreen. Occasional. Upland forests.
Vaccinium caespitosum Michx. dwarf huckleberry. Infrequent. Forests. Layser 3299.
Vaccinium globulare Rydb. globe huckleberry. Frequent. Moist forests; plants are diminutive in stature throughout TCEF. 242, 283, 368.
Vaccinium myrtillos L. dwarf billberry. Abundant. Upland forests.
Vaccinium scoparium Leiberg. grouse whortleberry. Abundant. Upland forests.

Fabaceae

Astragalus alpinus L. alpine milkvetch. Occasional. Forest openings and rocky areas. 39, 240 (MONT), 421, 425 (MONT).

Astragalus bourgovii Gray. Bourgeau's milkvetch. Occasional. Meadows; gullies and along tree lines; Spring Park area. TCEF 005 (MONT).

Hedysarum occidentale Greene. western hedysarum. Rare. Lower portion of Tenderfoot Creek. 252, 369.

Lupinus argenteus Pursh. silvery lupine. Abundant. Forests.

**Medicago lupulina* L. black medic. Rare. Roadsides. JLB 8.

**Melilotus officinalis* (L.) Pallas. common yellow sweet-clover. Rare. Disturbed site near flume in gravel. JLB 20.

Oxytropis cusickii Greenm. Rare. Open ridgetop above gravelpit. 276.

**Trifolium hybridum* L. alsike clover. Occasional. Roadsides. JLB 24.

Trifolium longipes Nutt. long-stalked clover. Occasional. Moist meadows and forest openings. 233.

**Trifolium pratense* L. red clover. Infrequent. Roadsides. JLB 22.

**Trifolium repens* L. white clover. Rare. Meadows and roadsides.

Gentianaceae

Frasera speciosa Dougl. giant fraseria. Rare. Dry Park.
Gentiana affinis Griseb. pleated gentian. Rare. Moist meadows. 128; Layser 3324.

Geraniaceae

Geranium bicknellii Britt. Bicknell's geranium. Rare. Dry meadows; Sun Creek and Onion Park. TCEF 003 (MONT).
Geranium richardsonii Fisch. & Trautv. white geranium. Frequent. Moist to wet meadows and streamsides. 95, 261 (MONT).
Geranium viscosissimum F. & M. sticky geranium. Occasional. Meadows.

Grossulariaceae

Ribes lacustre (Pers.) Poir. black gooseberry. Occasional. Forests, rocky slopes and open areas along streams.
Ribes viscosissimum Pursh. sticky currant. Occasional. Rocky slopes and open areas along road paralleling Tenderfoot Creek. 262.

Hydrophyllaceae

Phacelia hastata Dougl. silverleaf phacelia. Rare. Steep, south slope near bottom of drainage. 340.
Phacelia sericea (Grah.) Gray. silky phacelia. Rare. Scree slope approx. ¼ mile SE of Dry Park and N of Road 839. 333 (MRC, Dupl. MONT).

Lamiaceae

Prunella vulgaris L. self-heal. Rare. Meadows and forest edges; west edge of Onion Park. 117.

Onagraceae

Epilobium anagallidifolium Lam. alpine willow-herb. Infrequent. Wet meadows and streamsides. 112, 308 (MRC, Dupl. MONT); Layser 3321, 3332.
Epilobium angustifolium L. fireweed. Occasional. Roadsides and open forests.
Epilobium ciliatum Raf. common willow-herb. Frequent. Streamsides and wet meadows. 41; Layser 3322, 3327.

Epilobium paniculatum Nutt. ex T. & G. tall annual willow-herb. Rare. Steep, south slope near bottom of drainage. 339.

Plantaginaceae

Plantago major L. common plantain. Infrequent. Roadsides. JLB 18.

Polemoniaceae

Collomia linearis Nutt. narrow-leaf collomia. Occasional. Dry meadows and rocky slopes.

Phlox kelseyi Britt. var. *missoulensis* (Wherry) Cronq. Missoula phlox. Rare. Open ridgetop above gravel-pit. 280; *Hitchcock & Muhlick 12311* (RM) (Hitchcock and Cronquist 1973).

Polemonium pulcherrimum Hook. skunk-leaved polemonium. Infrequent. Dry, open areas. 88.

Polygonaceae

Eriogonum flavum Nutt. yellow buckwheat. Rare. Scree slope approx. $\frac{3}{4}$ mile SE of Dry Park and Nof Road 839. 328 (MONT).

Eriogonum umbellatum Torr. sulfur buckwheat. Rare. Open ridgetop above gravel-pit. 298.

Polygonum bistortoides Pursh. American bistort. Frequent. Wet meadows. 108, 225 (MONT).

**Polygonum convolvulus* L. black bindweed. Rare. Roadsides. JLB 11.

Polygonum douglasii Greene. Douglas's knotweed. Infrequent. Meadows and dry, open areas. 103, 302 (MONT); *Layser 3325*.

**Rumex acetosella* L. sheep sorrel. Infrequent. Roadsides. JLB 19.

Rumex paucifolius Nutt. mountain sorrel. Infrequent. Meadows; Onion Park. 317; *Layser 3285*; *Clark 37*.

Portulacaceae

Claytonia lanceolata Pursh. western springbeauty. Frequent. Forests at higher elevations. 94.

Primulaceae

Androsace septentrionalis L. northern androsace. Infrequent. Barren areas along streams and in meadows. 101.

Dodecatheon pulchellum (Raf.) Merrill. few-flowered shooting star. Frequent. Meadows. 84, 105, 226 (MONT), 274.

Ranunculaceae

Actaea rubra (Ait.) Willd. baneberry. Rare. Shaded streambanks. 273.

Delphinium bicolor Nutt. low larkspur. Rare. Meadows; Onion Park.

Ranunculus eschscholtzii Schlecht. subalpine buttercup. Rare. Rivulets in wet meadows; Onion Park. 236.

Ranunculus inamoenus Greene. unlovely buttercup. Infrequent. Streamsides and wet meadows. 96, 418.

Ranunculus uncinatus D. Don ex G. Don. little buttercup. Infrequent. Streamsides and wet meadows. 97.

Thalictrum occidentale Gray. western meadowrue. Frequent. Moist forests. 232.

Trollius laxus Salisb. American globeflower. Abundant. Openings of moist forests and wet meadows. 237.

Rosaceae

Amelanchier alnifolia Nutt. serviceberry. Rare. Lower portion of drainage. 249.

Fragaria virginiana Duchesne. blueleaf strawberry. Frequent. Forest openings, meadows and roadsides. 265.

Geum macrophyllum Willd. large-leaved avens. Infrequent. Moist to wet meadows.

Geum rivale L. water avens. Rare. Moist to wet meadows; Onion Park. TCEF 007 (MONT).

Geum triflorum Pursh. prairie smoke. Infrequent. Drier meadows; Onion and Dry Parks. 279.

Potentilla diversifolia Lehm. diverse-leaved cinquefoil. Frequent. Meadows, moist forests and streamsides. 231.

Potentilla glandulosa Lindl. sticky cinquefoil. Occasional. Rocky slopes along lower portion of Tenderfoot Creek. 63, 269.

Potentilla gracilis Dougl. soft cinquefoil. Occasional. meadows and forest openings. 119.

Prunus pensylvanica L. f. pin cherry. Rare. Steep, south slope near bottom of drainage. 343.

Prunus virginiana L. common chokecherry. Rare. Steep, south slope near bottom of drainage. 342.

Rosa acicularis Lindl. prickly rose. Infrequent. Lower portion of Tenderfoot Creek. 86, 254, 347 (MONT).

Rubus idaeus L. red raspberry. Occasional. Scree slopes and rocky areas; Quartzite Ridge.

Rubus parviflorus Nutt. thimbleberry. Rare. Passionate Creek. 402.

Sibbaldia procumbens L. creeping sibbaldia. Infrequent. Roadsides and other exposed areas. 50.

Sorbus scopulina Greene. Cascade mountain ash. Rare. Upland forests; one individual found on north slope. 59.

Spiraea betulifolia Pall. shiny-leaf spirea. Frequent. Upland forests.

Rubiaceae

Galium boreale L. northern bedstraw. Occasional. Meadows and partially shaded streambanks. 24.

Galium triflorum Michx. sweet-scented bedstraw. Rare. Moist areas in lower portion of drainage. 359 (MONT).

Salicaceae

Populus balsamifera L. spp. *trichocarpa* (Torr. & Gray, ex Hook.) Brayshaw. black cottonwood. Rare. One individual found along lower portion of Tenderfoot Creek. 215.

Populus tremuloides Michx. quaking aspen. Infrequent. Lower portion of drainage on rocky slopes. 338.

Salix barclayi Anderss. Barclay's willow. Frequent. Streamsides and wet meadows along rivulets. 89, 113; *Layser 3283*, 3315.

Salix bebbiana Sarg. Bebb willow. Rare. Lower portion of drainage. 255 (MRC, Dupl. MONT), 256.

Salix boothii Dorn. Booth's willow. Occasional. Lower portion of drainage along Tenderfoot Creek. 243, 257, 376, 379 (MRC, Dupl. MONT).

Salix drummondiana Barratt. Drummond willow. Frequent. Streamsides and wet meadows along rivulets. 30, 377 (MONT); *Layser 3303*, 3320.

Salix geyeriana Anderss. Geyer's willow. Infrequent. Lower portion of drainage along Tenderfoot Creek. 388.

Salix lasiandra Benth. Pacific willow. Rare. Lower portion of drainage along Tenderfoot Creek. 404.

Salix melanopsis Nutt. dusky willow. Lower portion of drainage along Tenderfoot Creek. 389, 390.

Salix scouleriana Barratt. Scouler willow. Occasional. Lower portion of drainage along Tenderfoot Creek and in forest openings. 378 (MONT), 387 (MRC, Dupl. MONT).

Saxifragaceae

Heuchera cylindrica Dougl. ex Hook. roundleaf alum-root. Occasional. Dry, rocky slopes. 346.
Lithophragma glabrum Nutt. bulbiferous fringe-cup. Occasional. Wet meadows and streamsides. 107.
Mitella pentandra Hook. alpine mitrewort. Occasional. Shaded streambanks. 130, 270 (MONT).
Mitella trifida Grah. Threeparted mitrewort. Rare. Moist forests. 424.
Parnassia fimbriata Koenig. fringed grass of parnassus. Occasional. Streambanks and wet meadows. 25.
Saxifraga occidentalis Wats. western saxifrage. Infrequent. Meadows; Onion Park. 100.
Saxifraga odontoloma Piper. brook saxifrage. Occasional. Shaded streambanks.
Saxifraga oregana Howell. Oregon saxifrage. Occasional. Moist meadows. 230.

Scrophulariaceae

Besseyia wyomingensis (A. Nels.) Rydb. Wyoming besseyia. Rare. Open ridgetop above gravel-pit. 282.
Castilleja cusickii Greenm. Cusick's paintbrush. Infrequent. Dry meadows; Dry Park and Onion Park. 29, 131; Layser 3298.
Castilleja miniata Dougl. scarlet paintbrush. Occasional. Meadows and streambanks.
Collinsia parviflora Lindl. blue-eyed mary. Infrequent. Vernally moist slopes and meadows.
Mimulus guttatus DC. yellow monkey-flower. Rare. Streambanks.
Mimulus lewisii Pursh. Lewis' monkey-flower. Infrequent. Streambanks and partially shaded edges of wet meadows; primarily around Sun Creek.
Pedicularis bracteosa Benth. bracted lousewort. Infrequent. Upper elevation forests and wet meadows.
Pedicularis contorta Benth. white coiled-beak lousewort. Rare. Upper elevation forests.
Pedicularis groenlandica Retz. pink elephant's head. Infrequent. Wet meadows. 326.
Pedicularis parryi Gray. Parry's lousewort. Rare. Open ridgetop above gravel-pit. 281.
Pedicularis racemosa Dougl. sickletop lousewort. Infrequent. Forests.
Penstemon attenuatus Dougl. var. *pseudoprocerus* (Rydb.) Cronq. small penstemon. Rare. Open slopes. 295, 399. (Hitchcock and Cronquist 1973).
Penstemon procerus Dougl. ex Grah. small-flowered penstemon. Rare. Open slopes and meadows. 140.
Veronica americana Schwein. American speedwell. Rare. Standing or flowing water; Sun Creek area. 36.
Veronica serpyllifolia L. var. *humifusa* (Dickson) Vahl. thyme-leaved speedwell. Rare. Vernally inundated depressions in meadows; one collection from small meadow east of Spring Park. 126. (Hitchcock and Cronquist 1973).
Veronica wormskjoldii Roem. & Schult. alpine speedwell. Infrequent. Moist meadows.

Urticaceae

Urtica dioica L. stinging nettle. Rare. Open areas along streams; Stringer Creek.

Valerianaceae

Valeriana dioica L. northern valerian. Infrequent. Meadows. 111, 224 (MONT).
Valeriana sitchensis Bong. Sitka valerian. Frequent. Moist forests and meadows.

Violaceae

Viola macloskeyi Lloyd. small white violet. Rare. Streambanks and wet meadows. 98.
Viola nuttallii Pursh. Nuttall's violet. Rare. Streambanks and wet meadows. 99.
Viola orbiculata Geyer ex Holz. round-leaved violet. Abundant. Forests.

Class Liliopsida

Cyperaceae

Carex atrata L. blackened sedge. Infrequent. Wet meadows. 135.
Carex canescens L. gray sedge. Rare. Wet meadows. 46.
Carex concinnoides Mack. northwest sedge. Infrequent. Dry forests.
Carex disperma Dewey. soft-leaved sedge. Rare. Shaded streambanks and moist, forest edges. 125.
Carex foenea Willd. dryspike sedge. Uncommon. Moist openings; lower portion of drainage. 374.
Carex geyeri Boott. elk sedge. Abundant. Upland forests. 228.
Carex hoodii Boott. Hood's sedge. Occasional. Moist openings; lower portion of drainage. 375.
Carex lenticularis Michx. lakeshore sedge. Infrequent. Moist openings; lower portion of drainage. 73, 373.
Carex microptera Mack. small-winged sedge. Frequent. Meadows. 23, 80, 85, 136, 318 (MONT), 320 (MONT).
Carex muricata L. muricate sedge. Infrequent. Wet meadows. 77.
Carex norvegica Retz. Scandinavian sedge. Rare. Wet meadows; Onion Park. Layser 3319.
Carex phaeocephala Piper. dunhead sedge. Rare. SE of Dry Park just below scree slope. 330.
Carex raynoldsii Dewey. Raynold's sedge. Occasional. Moist to wet meadows. 120, 300 (MRC & Dupl. MONT), 312 (MONT).
Carex rossii Boott. Ross' sedge. Infrequent. Forest openings. 258 (MRC, Dupl. MONT), 332 (MONT).
Carex scirpoidea Michx. var. *pseudoscirpoidea* (Rydb.) Cronq. single-spice sedge. Rare. Rocky slopes and meadows. 110, 304. (Hitchcock and Cronquist 1973).
Carex scopulorum Holm var. *prionophylla* (Holm) Standley. saw-leaved sedge. Infrequent. Wet meadows; Onion Park. 239, 372 (MRC, Dupl. MONT); Layser 3290, 3310, 3311, 3340.
Carex utriculata Boott. beaked sedge. Occasional. Permanently saturated meadows and low gradient streams. Layser 3291, 3309, 3335, 3336, 3339. Incorrectly called *Carex rostrata* by Dorn (1984) and many other authors (Reznicek 1997).
Eriophorum chamissonis C. A. Mey. Chamisso's cotton-grass. Infrequent. Wet meadows, usually associated with *Sphagnum* spp.; Onion Park and Sun Creek areas. 4; Layser 3295, 3305, 3338.
Eriophorum polystachion L. many-spiked cotton-grass. Rare. Wet meadows; Onion Park. 115.

Juncaceae

Juncus balticus Willd. Baltic Rush. Occasional. Wet meadows. 38.

Juncus confusus Cov. Colorado rush. Rare. Wet meadows. 68, 355 (MONT).
Juncus drummondii E. Meyer. Drummond's rush. Infrequent. Wet meadows. 22.
Juncus ensifolius Wikst. dagger-leaf rush. Occasional. Wet meadows and streamsides. 360; *Layser* 3307.
Juncus longistylis Torr. long-styled rush. Rare. Wet meadows; Sun Creek area. 76.
Juncus mertensianus Bong. Merten's rush. Occasional. Wet meadows and streamsides. *Layser* 3306.
Juncus nevadensis Wats. Sierra rush. Infrequent. Wet meadows. 45.
Luzula campestris (L.) DC. field woodrush. Infrequent. Moist meadows. 227 (MONT), 303 (MRC, Dupl. MONT).
Luzula parviflora (Ehrh.) Desv. small-flowered woodrush. Occasional. Shaded streambanks.

Liliaceae

Allium brevistylum Wats. short-styled onion. Occasional. Wet meadows; primarily Onion Park. 61.
Allium cernuum Roth. nodding onion. Rare. Dry, open slopes. 306, 335 (MONT).
Allium geeyeri Wats. Geyer's onion. Infrequent. Wet meadows; Onion Park. 102.
Allium schoenoprasum L. chives. Occasional. Wet meadows; primarily Onion Park.
Camassia quamash (Pursh) Greene. common camas. Frequent. Wet meadows; primarily Onion Park.
Erythronium grandiflorum Pursh. glacier lily. Frequent. Upland, forests. 238.
Fritillaria pudica (Pursh) Spreng. yellow bell. Infrequent. Meadows: along tree lines; Sun Creek and Onion Park. *TCEF* 001 (MONT).
Smilacina stellata (L.) Desf. starry false Solomon's seal. Rare. Shaded streambanks and moist forests. 55.
Streptopus amplexifolius (L.) DC. twisted-stalk. Rare. Shaded streambanks.
Veratrum viride Ait. green false hellebore. Frequent. Moist forest openings and wet meadows.
Zigadenus elegans Pursh. mountain death camas. Infrequent. Wet meadows and moist forest openings.

Orchidaceae

Calypso bulbosa (L.) Oakes. fairy-slipper. Rare. One individual found in moist forested bottom. 268.
Corallorhiza maculata (Raf.) Raf. spotted coral-root. Rare. Moist forests.
Corallorhiza wisteriana Conrad. spring coral-root. Rare. One individual observed in a *Pinus contorta* forest.
Goodyera oblongifolia Raf. rattlesnake plantain. Occasional. Forests. 47, 363 (MONT).
Habenaria dilatata (Pursh) Hook. white bog orchid. Occasional. Wet meadows. 241; *Layser* 3292.
Habenaria saccata Greene. slender bog orchid. Infrequent. Streambanks and wet meadows. *Layser* 3293.
Listera cordata (L.) R. Br. heart-leaf listera. Infrequent. Moist forests. 129, 267 (MONT).
Spiranthes romanzoffiana Cham. hooded ladies-tresses. Rare. Wet meadows; Onion Park. 116.

Poaceae

Agrostis exarata Trin. spike bentgrass. Infrequent. Moist meadows. 37, 48 (MRC, Dupl. MONT); *Layser* 3304, 3334.

Agrostis idahoensis Nash. Idaho bentgrass. Rare. Moist meadows. 57; *Layser* 3312.
Agrostis scabra Willd. tickle grass. Frequent. Meadows, roadsides and rocky slopes. 12; *Layser* 3286.
Alopecurus alpinus Smith. alpine foxtail. Infrequent. Wet meadows; Onion Park. 114, 235 (MONT).
Bromus carinatus Hook. & Arn. California brome. Frequent. Meadows and moist, forest openings. 17; *Layser* 3313, 3318, 3328.
Bromus ciliatus L. fringed brome. Infrequent. Moist, shaded to partially shaded forests. 14.
**Bromus inermis* Leys. smooth brome. Occasional. Meadows and roadsides.
Calamagrostis canadensis (Michx.) Beauv. bluejoint reedgrass. Abundant. Moist forests and wet meadows. 371; *Layser* 3294, 3314.
Calamagrostis purpurascens R. Br. purple reedgrass. Infrequent. Dry, rocky slopes. 324.
Calamagrostis rubescens Buckl. pinegrass. Occasional. Upland forests, usually on drier slopes. 408.
Cinna latifolia (Trevir.) Griseb. woodreed. Infrequent. Streambanks; lower portion of drainage. 396.
**Dactylis glomerata* L. orchard-grass. Occasional. Roadsides, meadows and forest openings.
Danthonia intermedia Vasey. timber oatgrass. Frequent. Meadows and dry, rocky slopes. 11, 322 (MONT).
Deschampsia cespitosa (L.) Beauv. tufted hairgrass. Abundant. Moist to wet meadows. 60, 121, 139, 248 (MONT).
Deschampsia elongata (Hook.) Munro. slender hairgrass. Rare. Roadsides, along Road 586. 407.
Elymus elymoides (Raf.) Swezey. bottlebrush squirrel-tail. Rare. SE of Dry Park just below scree slope. 334 (MRC, Dupl. MONT).
Elymus glaucus Buckl. blue wildrye. Frequent. Moist forests, wet meadows and streambanks. 32.
Elymus spicatus (Pursh) Gould. bluebunch wheatgrass. Rare. Steep, south slope near bottom of drainage. 353.
Elymus trachycaulus (Link) Gould ex Shinners. slender wheatgrass. Occasional. Moist to dry meadows. 13; *Layser* 3329.
Festuca idahoensis Elmer. Idaho fescue. Infrequent. Dry meadows; Dry Park and Onion Park. 10, 325 (MONT).
***Festuca rubra* L. red fescue. Rare. Moist, open areas. 354.
Festuca scabrella Torr. rough fescue. Infrequent. Dry meadows; Dry Park. 9.
Glyceria elata (Nash ex Rydb.) Jones. tall managrass. Infrequent. Tenderfoot Creek. 356 (MRC, Dupl. MONT), 397 (MONT).
Koeleria macrantha (Ledeb.) Schultes. prairie junegrass. Rare. Open ridgetop above gravel pit. 311.
Melica spectabilis Scribn. showy oniongrass. Frequent. Meadows and streambanks. 33.
Phleum alpinum L. alpine timothy. Frequent. Meadows and moist, forest openings.
**Phleum pratense* L. timothy. Infrequent. Meadows and roadsides.
Poa alpina L. alpine bluegrass. Occasional. Meadows and forest openings. 69, 123, 142.
Poa cusickii Vasey. Cusick's bluegrass. Infrequent. Meadows; Onion Park. 134.
Poa interior Rydb. inland bluegrass. Infrequent. Open area along Tenderfoot Creek. 331 (MONT), 370.
Poa leptocoma Trin. bog bluegrass. Infrequent. Wet meadows; Onion Park. 259; *Layser* 3331.

Poa nervosa (Hook.) Vasey. Wheeler's bluegrass. Infrequent. Meadows and forest openings. 54, 260, 319 (MONT), 323 (MONT).

***Poa palustris* L. fowl bluegrass. Infrequent. Streambanks, lower portion of Tenderfoot Creek. 398 (MONT).

**Poa pratensis* L. Kentucky bluegrass. Infrequent. Roadsides and meadows. 51.

Poa secunda Presl. Sandberg bluegrass. Rare. Open ridgetop above gravelpit. 299.

Puccinellia pauciflora (Presl.) Munz. weak alkali grass. Infrequent. Standing or flowing water. 35.

Stipa nelsonii Scribn. western needlegrass. Infrequent. Meadows and forest openings; Onion Park area. 315 (MRC, Dupl. MONT).

Trisetum spicatum (L.) Richter. downy oatgrass. Frequent. Meadows and dry, rocky slopes. 26.

Trisetum wolfii Vasey. Wolf's trisetum. Occasional. Moist to wet meadows. 34, 49, 82; Layser 3326.

APPENDIX II

NONCONFIRMED TAXA

The following taxa have been reported for TCEF or Onion Park RNA by others but are not included in the main body of the flora since no voucher specimens were collected and some reported taxa are believed to be outside of the boundary of the experimental forest.

Apiaceae

Zizia aptera (Gray) Fern.

Asteraceae

Agoseris heterophylla (Nutt.) Greene

Cirsium scariosum Nutt.

Crepis elegans Hook.

Senecio dimorphophyllus Greene

Senecio pauperculus Michx.

Brassicaceae

Arabidopsis thalina L. Heynh.

Cardamine oligosperma Nutt.

Caprifoliaceae

Symphoricarpos albus (L.) Blake.

Caryophyllaceae

Silene douglasii Hook.

Stellaria crassifolia Ehrh.

Stellaria umbellata Turcz. ex Kar. & Kir.

Chenopodiaceae

Chenopodium album L.

Crassulaceae

Sedum stenopetalum Pursh.

Cyperaceae

Carex aurea Nutt.

Carex pellita Muhl. ex Willd.

Carex praegracilis W. Boott

Eleocharis pauciflora (Lightf.) Link

Elaeagnaceae

Shepherdia canadensis (L.) Nutt.

Equisetaceae

Equisetum palustre L.

Gentianaceae

Gentiana calycosa Griseb.

Liliaceae

Xerophyllum tenax (Pursh) Nutt.

Orchidaceae

Habenaria hyperborea (L.) R. Br.

Habenaria viridis (L.) R. Br.

Poaceae

Bromus vulgaris (Hook.) Shear

Polemoniaceae

Linanthus nuttallii (Gray) Greene ex Milliken

Linanthus septentrionalis Mason

Polygonaceae

Polygonum viviparum L.

Ranunculaceae

Anemone multifida Poir.

Ranunculus macounii Britt.

Salicaceae

Salix farriarum Ball.

Salix lutea Nutt.

Saxifragaceae

Lithophragma parviflora (Hook.) Nutt. ex Torr. & Gray

Mitella breweri Gray.

Scrophulariaceae

Castilleja occidentalis Torr.

Veronica cusickii Gray

Solanaceae

Hyoscyamus niger L.

Appendix III

Synonyms And Excluded Names

Boraginaceae

Mertensia lanceolata (Pursh) DC. Synonymous with

Mertensia viridis (A. Nels.) A. Nels.

Onagraceae

Epilobium halleianum Hausskn. Included under *Epilobium ciliatum* Raf.

Epilobium lactiflorum Hausskn. Included under *Epilobium anagallidifolium* Lam.

Salicaceae

Salix monticola Bebb. Name misapplied: specimens belong to *Salix barclayi* Anders.