

THE VASCULAR PLANTS OF FALL CREEK GORGE NATURE PRESERVE, WARREN COUNTY, INDIANA

Gayle S. Tonkovich and Malcolm L. Sargent¹
Department of Plant Biology
University of Illinois
Urbana, Illinois 61801

ABSTRACT: Fall Creek Gorge Nature Preserve, Warren County, Indiana, sustains a wide variety of plant taxa within its diverse habitats. During the floristic survey reported here, 351 species of vascular plants were collected and identified. Of these species, 167 are reported for the first time from the Fall Creek Gorge area, 122 are reported for the first time from Warren County, and 4 are considered as rare or endangered in Indiana. No taxa new to the State were discovered.

INTRODUCTION

Fall Creek Gorge Nature Preserve (40° x 20° N, 87° x 19° W) is located in Liberty Township (Secs. 21 and 22, T22N, R8W, Williamsport Quadrangle), Warren County, Indiana, and lies approximately 5 miles north/northwest of the county seat, Williamsport. Owned by the Indiana Chapter of The Nature Conservancy (TNC) since 1973, the Preserve was expanded from its original 37 acres to its present size (149 acres) by purchases made in 1989 (Chris Maron, Director of Science & Stewardship, Indiana Chapter, TNC, pers. comm.). This expansion increased the diversity of habitats, and thus presumably the flora, within the Preserve's boundaries.

Two surveys of the Fall Creek Gorge vascular flora (grasses and sedges not included) were done prior to expansion of the Preserve in 1989 (Grossnickle, 1977; Kvaalen, 1983). Neither study yielded a published species catalogue, but an abstract was published by Grossnickle and Jackson (1977). The survey done by Dennis Grossnickle, then a student at Indiana State University working with Dr. Marion Jackson, included selective collecting of specimens which are now located in the Indiana State University herbarium. Ruth Kvaalen (1983), then associated with Purdue University, made a visual survey of the flora, but no specimens were collected. Both Dr. Jackson and Ruth Kvaalen have graciously provided us with copies of their respective unpublished surveys which are now also available from the Indiana Chapter of TNC, the Division of Nature Preserves (Indiana Department of Natural Resources), the Friesner Herbarium of Butler University, and the second author of this study. A list of species found in their surveys, but not seen in ours, is found in Appendix I.

The purpose of this investigation was to produce a catalogue of the vascular flora of the Preserve in order to provide: 1) information useful for the ongoing management practices of TNC at the Preserve; and 2) a data base against which to monitor continuing floristic changes which might result from succession on the abandoned farm fields, a lack of fire, increasing pollution, and the invasion of alien species.

PHYSICAL SETTING

Fall Creek Gorge Nature Preserve lies in the Entrenched Valley Section of the Central Till Plain Natural Region in west-central Indiana (Homoya, *et al.*, 1985). The bedrock

¹ Author to whom reprint requests should be addressed.

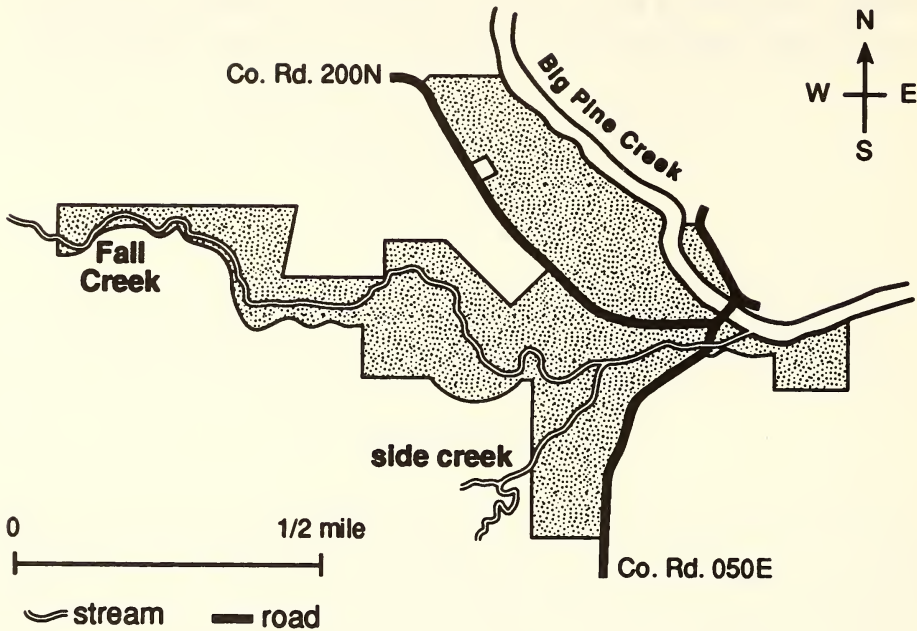


Figure 1. Map of Fall Creek Gorge Nature Preserve based on the topographic map of Williamsport Quadrangle. Original at a scale of 1:24000. Total land area of the Preserve, shown shaded, is 149 acres. Streams included within the Preserve are Fall Creek, the side creek, and Big Pine Creek.

of the area within and surrounding the Preserve has been dated to the Pottsville Epoch in the Lower Pennsylvanian. The rocks are from the Mansfield Formation, which includes mostly sandstone, shale, and some lenticular coal beds with associated underclay (Wayne, *et al.*, 1966). The coal beds are mostly Minshall Coal which has, in the past, been mined from areas adjacent to but not within the Preserve (Hutchison, 1961). The upland areas of the Preserve not exposed to alluvial erosion by the various creeks are mainly unconsolidated Quaternary age till deposits from the Wisconsin Glaciation (Wayne, *et al.*, 1966). There are several large granitic boulders scattered throughout the upland areas which we believe are evidence of these glacial till deposits.

Major landmarks of the Preserve are related to the streams which flow within its boundaries: Big Pine Creek, Fall Creek, and its tributary, the "side creek" (Figure 1). The most notable physical features of the Preserve are found along Fall Creek. About 0.2 miles upstream from its junction with Big Pine Creek, Fall Creek flows through a canyon-like gorge where the sandstone streambed has been carved into potholes by stream erosion. The Preserve is thus known locally as "the potholes." Some of the potholes reach a diameter of 6.1 meters (Lindsey, *et al.*, 1969) and depths of 2.4-3.7 meters (C. Maron, pers. comm.). Smaller diameter (1-1.2 m) and shallower (15-30 cm) potholes also occur in the side creek which joins Fall Creek just east of the main potholes. The other major landmark of the Preserve, a scenic waterfall where Fall Creek drops over a broad, 1.5 meter ledge, is located west of the potholes and gorge, just upstream from a horseshoe bend in the creek (Lindsey, *et al.*, 1969).

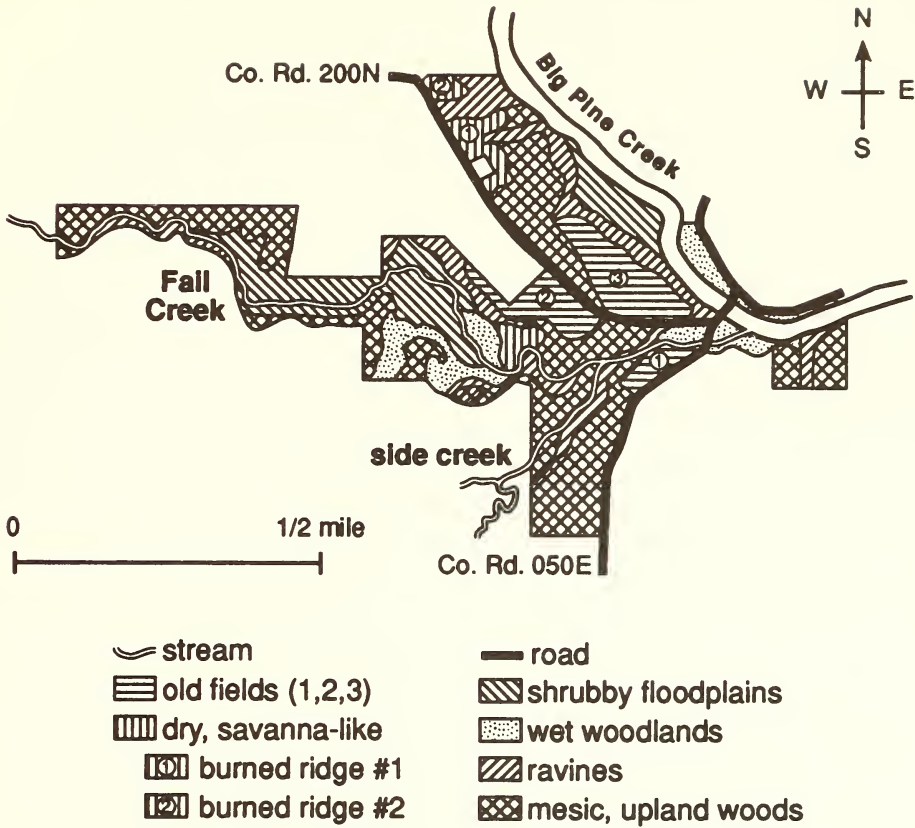


Figure 2. Map of Fall Creek Gorge Nature Preserve modeled after Figure 1. The map displays the general locations of six of the Preserve's eight habitats. The roadside and streamside habitats are not depicted due to their intricate overlap with the roads and streams.

PLANT COMMUNITIES

Fall Creek Gorge's location within the Entrenched Valley Section of Indiana's Central Till Plain Natural Region is important because it is within this region that some plants from all directions reach their State distribution limits (Deam, 1940; Homoya, *et al.*, 1985). Characteristic of the Entrenched Valley Section, the Preserve combines specialized cliff and ravine communities with flat land formerly covered by beech-maple-oak forests (Homoya, *et al.*, 1985). Due to the agricultural value of the flat land, almost all of the woodlands there have been cleared for cultivation. Fortunately, the Preserve contains both relatively undisturbed, old-growth beech-maple and oak-hickory forests, and some large tracts of abandoned agricultural land. Because it includes both uncultivated and previously cultivated land, the Preserve is a valuable area in which to study the regional flora.

The vegetation found within the Preserve is varied due to the range of habitats. In an attempt to simplify the presentation of results, descriptive names have been assigned to each of the eight environments identified and six of these have been coded in Figure 2. These general habitats include roadsides, old fields, dry, savanna-like areas, stream-sides, shrubby floodplains, wet woodlands, ravines, and mesic, upland woods.

The "roadsides" (not coded in Fig. 2) generally support weedy species that are commonly characterized as invasive. Examples include *Daucus carota* L., *Pastinaca sativa* L., *Cichorium intybus* L., *Leucanthemum vulgare* Lam., *Medicago lupulina* L., *M. sativa* L., and *Morus alba* L.

The "old fields" of the Preserve illustrate three different stages of secondary succession. These abandoned agricultural fields are numbered according to their successional age (Figure 2). Cultivation of field #1 ceased over 20 years ago, while fields #2 and #3 were last farmed about 1987 (C. Maron, pers. comm.). Some characteristic species of the old fields include *Asclepias syriaca* L., *Ambrosia artemisiifolia* L., *A. trifida* L., *Cirsium discolor* (Muhl.) Spreng., *Pycnanthemum pilosum* Nutt., *Rosa carolina* L., and *R. setigera* Michx.

The "dry, savanna-like areas" consist mainly of an oak overstory (usually *Quercus velutina* Lam.) and a somewhat drought-resistant undergrowth of herbs such as *Potentilla simplex* Michx., *Verbena stricta* Vent., and *Lechea villosa* Ell. In the NE¹/₄ of the NE¹/₄ of Section 21 are two ridges that TNC burned in the fall of 1990 to eliminate invasive species and to keep the area more savanna-like in character (C. Maron, pers. comm.). The larger, more southern ridge (#1) has *Rubus* in abundance, while the ridge to the north (#2), being more shaded, has considerable *Toxicodendron radicans* (L.) Kuntze at its edges. The discovery of *Spiranthes cernua* (L.) L.C. Rich. on the larger ridge indicates a positive effect of the burnings, since it thrives in dry, open areas.

In contrast to the above habitats which have been subjected to considerable disturbance, the following five habitats are more interior and thus sheltered from large-scale human disturbance. The habitats directly adjacent to and including the stream banks are classified as "streamsides." Typical species include *Equisetum hyemale* L. var. *affine* (Engelm.) A.A. Eaton, *Selaginella apoda* (L.) Fern., *Lycopus americanus* Muhl., *L. rubellus* Moench, *Mimulus alatus* Ait., and *M. ringens* L. The streamside habitats are not coded in Figure 2 due to their overlap with the streams.

Two different habitats occur in the flat lowlands near the creeks, the "shrubby floodplains" and the "wet woodlands." Both are floodplain areas, but the composition of the vegetation is quite distinct. The "wet woodlands" support well-spaced, large trees like *Maclura pomifera* (Raf.) Schneider, *Platanus occidentalis* L., *Juglans nigra* L., *Acer negundo* L., *Aesculus glabra* Willd., and *Ptelea trifoliata* L. The resulting open ground surface supports a lush undergrowth including *Viola pratincola* Greene, *Erigenia bulbosa* (Michx.) Nutt., and *Polemonium reptans* L. In contrast, the "shrubby floodplains" contain smaller trees, such as *Staphylea trifolia* L., and bushy herbs like *Scutellaria lateriflora* L., *Laportea canadensis* (L.) Wedd., and *Phytolacca americana* L.

The final two habitats represent the most pristine areas within the Preserve. The "ravine" classification refers to the slopes and steeply-angled sandstone walls which support, in general, smaller trees and shrubby vegetation: e.g., *Amelanchier arborea* (Michx. f.) Fern., *Ostrya virginiana* (P. Mill.) K. Koch, and *Viburnum acerifolium* L. However, the herbaceous undergrowth is quite lush and specific in a few moist and shady areas: e.g., near the Fall Creek waterfall and above the potholes. Two species found only in these locally cool microenvironments are *Mitchella repens* L. and *Adiantum pedatum* L.

The last classification is "mesic, upland woods." These regions are situated on rich soil and support a typical midwestern woodland flora. Common species include *Acer saccharum* Marsh., *Quercus alba* L., *Q. muhlenbergii* Engelm., *Q. rubra* L., *Fagus grandifolia* Ehrh., *Carya glabra* (P. Mill) Sweet, *C. ovata* (P. Mill) K. Koch, *Smilacina racemosa* (L.) Desf., *Trillium nivale* Riddell, *T. recurvatum* Beck, *Claytonia virginica* L., and *Arisaema tryphyllum* (L.) Schott.

METHODS

The sampling technique for this survey was a full-area census. A collection permit was provided by the Indiana Chapter of TNC. Specimens were collected on 25 of 27 visits over thirteen months from April, 1991 through May, 1992. No collections were made during the winter months of November through February. Collections from the survey were deposited at the Friesner Herbarium of Butler University (BUT), Indianapolis, Indiana, and duplicates in the herbarium of the University of Illinois (ILL), Urbana, Illinois. The nomenclature used follows that of Mohlenbrock (1986) except where noted. The collection numbers are those of the primary author.

RESULTS AND DISCUSSION

In total, 12 ferns and fern allies, 2 gymnosperms, and 337 angiosperms were identified in the Fall Creek Gorge flora. Of the 351 taxa found, 167 are reported for the first time from Fall Creek Gorge (designated in the checklist by an asterisk, *), and 122 are new to Warren County (designated by a double asterisk, **) as compared to the list compiled by Crovello, *et al.* (1983). Those species which are not native to the midwest (Mohlenbrock, 1986) have "alien" in parentheses after the collection number. In addition to the collected species which appear in the checklist, a few species observed at the Preserve were inadvertently or purposely (due to small population sizes) not collected (Appendix II). Those species, which were reported in the previous studies at Fall Creek Gorge by Dennis Grossnickle and Dr. Marion Jackson, or Ruth Kvaalen, but were not found in this survey, are listed in Appendix I.

The checklist which follows will hopefully be useful as a basis for documenting changes in the flora of the Fall Creek Gorge area. Trends can be observed by monitoring the distribution and relative abundance of various species. For example, observations of changes in the number of alien species in proportion to the native ones could lead The Nature Conservancy (TNC) to adjust its management practices for the Preserve if it wishes to keep the flora more "native" in character. Likewise, the decision to burn, or not burn, the "dry, savanna-like areas" could be aided by monitoring species composition in those areas. Monitoring the species composition of the three "old fields" would allow estimation of the relative rates of secondary succession, as well as allow predictions about their return to a natural state or to an altered state dominated by alien species.

In this study, 55 non-native species were found at the Preserve. It is our conclusion that the native flora is still dominant since only 16% of the 351 species identified were aliens and since a high proportion of the alien species are found primarily in highly disturbed areas, e.g., the "roadsides". One notable alien invasive species, *Elaeagnus umbellata* Thunb., was observed adjacent to the burned ridges. To our knowledge, this is the first report of this problem species in the Preserve, and it may be early enough to prevent its spread if acted upon quickly.

As the search for rare and endangered species continues, this survey may help identify potential (or current) habitat sites where such species may be found. Currently there are four species at Fall Creek Gorge which are considered to be rare or endangered. *Diervilla lonicera* P. Mill., *Catalpa speciosa* (Warder) Engelm., and *Selaginella apoda* (L.) Fern. are considered rare, while *Aster furcatus* Burgess is listed as endangered and under federal review in *Indiana's Rare Plants and Animals: A Checklist of Endangered and Threatened Species* (Indiana DNR, 1990).

Additional studies might relate changes in species composition to environmental factors such as air quality or fluctuating nitrate concentration in the creeks due to upstream farming. Monitoring the species at Fall Creek Gorge could help to establish trends within the plant communities due to such environmental influences. Future surveys of the flora could also permit analysis of these trends for use in subsequent management decisions.

CHECKLIST OF VASCULAR PLANTS
IN FALL CREEK GORGE NATURE PRESERVE,
ARRANGED ALPHABETICALLY BY FAMILY¹

DIVISION PTERIDOPHYTA (Fern & Fern Allies)

Adiantaceae – Maidenhair Family

Adiantum pedatum L.

Maidenhair fern; locally common in moist ravine southeast of Fall Creek waterfall; 136.

Aspleniaceae – Spleenwort Family

Asplenium platyneuron (L.) Oakes ex D.C. Eaton

Ebony spleenwort; common in wet areas along Fall Creek; 119.

Cystopteris bulbifera (L.) Bernh.

Bladder fern; locally common along sandstone cliff overhang southeast of Fall Creek waterfall; 165.

Cystopteris fragilis L.

Fragile fern; common throughout mesic, upland woods; 365 (nomenclature according to Gleason and Cronquist, 1991).

Dryopteris marginalis (L.) Gray

Marginal shield fern or marginal wood fern; common in rocky wooded areas along creeks; 97.

Polystichum acrostichoides (Michx.) Schott

Christmas fern; common throughout wooded areas; 124.

Woodsia obtusa (Spreng.) Torr.

Common woodsia; occasional on rock surfaces overlooking Big Pine Creek and under cliff overhang by Fall Creek waterfall; 125, 164.

Equisetaceae – Horsetail Family

*, ** *Equisetum hyemale* L. var. *affine* (Engelm.) A.A. Eaton

¹ * = New to the Fall Creek Gorge Nature Preserve.

** = New to Warren County.

Scouring rush; locally common along streamside at Fall Creek and the side creek junction, and locally abundant farther east along the south bank of Fall Creek; 200.

*, ** *Equisetum pratense* Ehrh.

Meadow horsetail; common on rocky bank southeast of Fall Creek waterfall; 118.

Ophioglossaceae – Adder’s-tongue Family

Botrychium virginianum (L.) Sw.

Rattlesnake fern; occasional in mesic, upland woods; 166.

Polypodiaceae – Fern Family

Polypodium virginianum L.

Common polypody; common along rock faces and ledges throughout; 117.

Selaginellaceae – Spikemoss Family

*, ** *Selaginella apoda* (L.) Fern.

Small spikemoss; locally common on muddy sandstone areas along Fall Creek SE of waterfall; 162.

DIVISION SPERMATOPHYTA

SUBDIVISION GYMNOSPERMAE (Conifers)

Cupressaceae – Cypress Family

** *Juniperus virginiana* L.

Red cedar; occasional along roadsides and northeast of parking lot; 10.

Pinaceae – Pine Family

Pinus strobus L.

White pine; occasional by parking lot and locally common on bluff at horseshoe bend of Fall Creek; 11.

SUBDIVISION ANGIOSPERMAE (Flowering Plants)

Acanthaceae – Acanthus Family

* *Justicia americana* (L.) Vahl

Water willow; rare, isolated patch near rocks on north bank of Big Pine Creek northwest of bridge and sandy area; 236.

*, ** *Ruellia humilis* Nutt.

Wild petunia; occasional in old field #2; 130.

Aceraceae – Maple Family

Acer negundo L.

Box elder; occasional in wet woodlands; 251.

Acer saccharum Marsh.

Sugar maple; common throughout; 153.

Agavaceae – Agave Family

** *Yucca filamentosa* L.

Yucca; occasional, along road by burned ridges and another clump along main trail from parking lot; 336 (alien; nomenclature according to Gleason and Cronquist, 1991).

Amaranthaceae – Amaranth Family

* *Amaranthus rudis* Sauer

Water hemp; occasional along Big Pine Creek streamside southeast of burned ridges; 316, 317.

* *Amaranthus* sp.

Amaranth; occasional on sandbar in Big Pine Creek adjacent to where Fall Creek joins; 287.

Anacardiaceae – Sumac Family

Rhus glabra L.

Smooth sumac; occasional along northern boundary of old field #2; 61.

** *Toxicodendron radicans* (L.) Kuntze

Poison ivy; common throughout border areas; 231.

Annonaceae – Custard Apple Family

Asimina triloba (L.) Dunal

Pawpaw; occasional in mesic, upland woods; 303.

Apiaceae – Carrot Family

Chaerophyllum procumbens (L.) Crantz

Wild chervil; common in wet woodland area between Fall Creek and Big Pine Creek east of Twin Bridges; 379.

Cryptotaenia canadensis (L.) DC.

Honewort; common in mesic, upland woods and wet woodland area southwest of Fall Creek waterfall; 85.

Daucus carota L.

Wild carrot or Queen-Anne's-lace; abundant along roadsides; 115 (alien).

* *Erigenia bulbosa* (Michx.) Nutt.

Harbinger-of-spring; common in mesic, upland woods; 353.

* *Heracleum lanatum* Michx.

Cow parsnip; locally abundant in wet woodland area between Fall Creek and Big Pine Creek east of Twin Bridges; 38.

Osmorhiza longistylis (Torr.) DC.

Anise-root; scattered occasionally in mesic, upland woods; 33.

Osmorhiza longistylis (Torr.) DC. var. *villicaulis* Fern.

Sweet cicely; scattered in mesic, upland woods; 34.

** *Pastinaca sativa* L.

Parsnip; common in old fields and along roadsides; 83 (alien).

Sanicula gregaria Bickn.

Common snakeroot; abundant throughout; 120.

*, ** *Taenidia integerrima* (L.) Drude

Yellow pimpernel; occasional along shaded roadside of Co. Rd. 200 N; 76.

Apocynaceae – Dogbane Family

*, ** *Apocynum cannabinum* L.

Indian hemp; locally abundant in old field #2; 135.

Araceae – Arum Family

Arisaema tryphyllum (L.) Schott

Jack-in-the-pulpit; common in rich woods between Big Pine Creek and the burned ridges; 42.

Araliaceae – Aralia Family

Aralia nudicaulis L.

Wild sarsaparilla; locally occasional along cliff edge over potholes; 368.

Aristolochiaceae – Birthwort Family

Asarum canadense L.

Wild ginger; common in mesic, upland woods and locally abundant in wet woodlands area between Copeland Hill and Fall Creek; 30.

Asclepiadaceae – Milkweed Family

- ** *Asclepias incarnata* L.
Swamp milkweed; locally occasional along north bank of Big Pine Creek northwest of bridge; 217
- Asclepias syriaca* L.
Common milkweed; common in old field #2; 131.
- Asclepias verticillata* L.
Horsetail milkweed; occasional in old field #1; 324.

Asteraceae – Aster Family

- Achillea millefolium* L.
Common yarrow or milfoil; common in old fields; 64 (alien).
- * *Ambrosia artemisiifolia* L.
Common ragweed; common along roadsides and in old fields; 241.
- Ambrosia trifida* L.
Giant ragweed; common along roadsides and in old fields; 240.
- Antennaria plantaginifolia* (L.) Richards.
Pussytoes; occasional throughout; 296, 377.
- ** *Arctium minus* Bernh.
Common burdock; occasional along roadside by Twin Bridges; 250 (alien).
- *, ** *Artemisia annua* L.
Annual wormwood; rare, Big Pine Creek streamside southeast of burned ridges; 318 (alien).
- [nomenclature for *Aster* follows Jones, 1989]
- Aster cordifolius* L.
Heart-leaved or blue wood aster; occasional in old field #3; 309.
- *, ** *Aster drummondii* Lindley in Hooker
Drummond's aster; occasional at wood edge by parking lot and also a few plants in old field #3; 304, 307.
- Aster furcatus* Burgess in Britton & Brown
Forked aster; locally common on south stream bank at Fall Creek and the side creek junction; 276.

Aster lateriflorus (L.) Britton

Starved or calico aster; common along Fall Creek streamsides; 294, 326, 344.

Aster novae-angliae L.

New England aster; occasional in old field #1; 325.

Aster pilosus Willd.

Hairy aster; common in old fields and along roadsides; 305, 306, 331.

Aster shortii Lindley in Hooker

Short's aster; occasional in old field #3; 308.

*, ** *Aster urophyllus* Lindley in DC.

Aster; occasional along main trail between parking lot and Fall Creek; 279.

Bidens cernua L.

Nodding bur marigold, sticktight; occasional along streamside south of Fall Creek waterfall; 292.

*, ** *Bidens connata* Muhl.

Swamp beggar-ticks; common along Big Pine Creek streamside south-east of burned ridges; 314.

Bidens frondosa L.

Common beggar-ticks, sticktight; locally common along roadside of Co. Rd. 050 E just south of parking lot; 223.

*, ** *Carduus nutans* L.

Musk or nodding thistle; common along roadsides and in old field #1; 82 (alien).

*, ** *Cichorium intybus* L.

Chicory; common along roadsides; 147 (alien).

* *Cirsium altissimum* (L.) Spreng.

Tall thistle; occasional along roadsides by parking lot; 242.

* *Cirsium discolor* (Muhl.) Spreng.

Field thistle; common in old field #1; 220.

*, ** *Conyza canadensis* (L.) Cronq.

Horseweed; locally common along roadside at intersection of Co. Rds. 050 E and 200 N; 216.

- * *Eclipta prostrata* (L.) L.
Yerba de tajo; occasional on sandbar in Big Pine Creek adjacent to where Fall Creek joins; 284.
- ** *Erigeron annuus* (L.) Pers.
Daisy fleabane, white top; occasional along roadside of Co. Rd. 200 N; 323.
- Erigeron philadelphicus* L.
Marsh fleabane; common along streamsides; 44.
- *, ** *Erigeron strigosus* Muhl.
Daisy fleabane; abundant on burned ridge #1, common throughout; 89.
- Eupatorium perfoliatum* L.
Common boneset; occasional along streamsides of Fall Creek; 215.
- Eupatorium purpureum* L.
Purple, green-stemmed, or sweet joe-pye-weed; occasional along roadside by Twin Bridges and along Copeland Hill; 180.
- Eupatorium rugosum* Houtt.
White snakeroot; occasional in mesic, upland woods, and also a few plants by Fall Creek waterfall; 224, 255.
- *, ** *Eupatorium serotinum* Michx.
Late boneset; occasional on N sandy bank of Big Pine Creek northwest of bridge; 233.
- * *Gnaphalium obtusifolium* L.
Sweet everlasting; occasional in field area approximately 1/3 mile northwest of Fall Creek waterfall; 270.
- * *Helenium autumnale* L.
Autumn sneezeweed; occasional along Big Pine Creek streamside southeast of burned ridges; 319.
- * *Helianthus decapetalus* L.
Pale, or thin-leaved sunflower; occasional along streamsides in sandy soil; 188, 348.
- ** *Helianthus divaricatus* L.
Woodland sunflower; occasional throughout wooded areas and on burned ridge #1; 160, 225.
- *, ** *Helianthus giganteus* L.
Tall sunflower; rare, Big Pine Creek streamside southeast of burned ridges; 321.

- * *Helianthus strumosus* L.
Pale-leaved sunflower; occasional in woods and alongside Co. Rd. 050 E; 239.
- * *Helianthus tuberosus* L.
Jerusalem artichoke; occasional along Fall Creek by bridge; 281.
- *, ** *Heliopsis helianthoides* (L.) Sweet
False sunflower; rare, on wet sandy area southeast of Fall Creek waterfall; 256.
- Krigia biflora* (Walt.) Blake
False dandelion, two-flowered cynthia; common in mesic, upland woods; 47.
- Lactuca canadensis* L.
Wild lettuce; occasional in old field #2; 133.
- Lactuca floridana* (L.) Gaertner
Woodland lettuce; occasional along roadside of Co. Rd. 050 E just south of parking lot; 221.
- * *Leucanthemum vulgare* Lam.
Ox-eye daisy; occasional along roadsides; 113 (alien).
- * *Polymnia canadensis* L.
Leafcup; locally common in wet woodland area north of Fall Creek just west of bridge; 185.
- * *Prenanthes altissima* L.
Tall white lettuce; rare, few plants by Fall Creek waterfall; 290.
- * *Rudbeckia hirta* L.
Black-eyed susan; locally common in savanna-like area north of Fall Creek waterfall; 137.
- * *Rudbeckia laciniata* L.
Goldenglow; rare, single patch on south bank of Big Pine Creek west of bridge; 218.
- Rudbeckia triloba* L.
Brown-eyed susan; common along roadside by Twin Bridges; 177.
- Senecio aureus* L. var. *gracilis* (Pursh) Hooker
Golden ragwort; common along streamsides; 25.
- *, ** *Senecio glabellus* Poir.
Butterweed; occasional along Fall Creek streamside east of bridge; 378.

- ** *Senecio obovatus* Muhl.
Round-leaved groundsel; occasional in mesic, upland woods; 19.
- Silphium perfoliatum* L.
Cup-plant; occasional along Fall Creek west of bridge; 206.
- Solidago caesia* L.
Woodland or blue-stemmed goldenrod; occasional in wooded areas; 299.
- Solidago flexicaulis* L.
Broadleaf goldenrod; occasional on burned ridge #2; 335.
- Solidago gigantea* Ait. var. *serotina* (Ait.) Cronq.
Late goldenrod; occasional along roadsides and in old fields; 249.
- *, ** *Solidago juncea* Ait.
Early goldenrod; locally abundant on burned ridge #1; 196.
- * *Solidago nemoralis* Ait.
Field goldenrod; occasional on burned ridges and also along Fall Creek
- Solidago ulmifolia* Muhl.
Elm-leaved goldenrod; common in mesic, upland woods; 243.
- ** *Taraxacum officinale* Weber
Common dandelion; common especially along trails and roadsides; 37 (alien).
- *, ** *Tragopogon pratensis* L.
Common goat's-beard; rare, roadside by bridge over Fall Creek; 346.
- Verbesina alternifolia* (L.) Britton
Yellow ironweed; common in wet woodland area north of Big Pine Creek and northwest of bridge; 228.
- * *Vernonia fasciculata* Michx.
Common ironweed; rare, in wet woodland area northwest of Fall Creek waterfall; 266.
- * *Vernonia gigantea* (Walt.) Trel. ex Branner & Coville
Tall ironweed; locally common in old field #2; 193.
- * *Xanthium strumarium* L. var. *canadense* (P. Mill.) Torr. & Gray
Common cocklebur; occasional on north sandy bank of Big Pine Creek northwest of bridge; 232.

Balsaminaceae – Jewel-weed Family

** *Impatiens capensis* Meerb.

Spotted touch-me-not; common along Fall Creek; 199.

* *Impatiens pallida* Nutt.

Pale touch-me-not; rare, on south bank of "island-sandbar" north of Fall Creek, west of bridge; 189.

Berberidaceae – Barberry Family

Caulophyllum thalictroides (L.) Michx.

Blue cohosh; rare, found in mesic, upland woods west of Co. Rd. 050 E; 361.

*, ** *Jeffersonia diphylla* (L.) Pers.

Twinleaf; rare, found locally in mesic, upland woods along ridge west of Co. Rd. 050 E; 355.

Podophyllum peltatum L.

May apple; abundant in mesic, upland woods; 48.

Betulaceae – Birch Family

Carpinus caroliniana Walt.

Blue beech, musclewood; common throughout wooded areas; 271, 334.

Corylus americana Walt.

American hazelnut; occasional, in ravine between the burned ridges, and one tree by parking lot; 338.

Ostrya virginiana (P. Mill.) K. Koch

Hop hornbeam; occasional throughout wooded areas; 254.

Bignoniaceae – Bignonia Family

** *Catalpa speciosa* (Warder) Engelm.

Catalpa; rare, on point of "island-sandbar" north of Fall Creek, west of bridge; 187.

Boraginaceae – Borage Family

*, ** *Hackelia virginiana* (L.) I.M. Johnston

Stickseed; occasional, on rocks by bridge over Fall Creek, and on "island-bar" north of Fall Creek, west of bridge; 183.

* *Myosotis verna* Nutt.

Scorpion grass, spring forget-me-not; common on burned ridge #1; 373.

Brassicaceae – Mustard Family

- * *Arabis hirsuta* (L.) Scop. var. *adpressipilis* (M. Hopkins) Rollins
Rock cress; scattered on rock at Fall Creek and the side creek intersection; 27.
- Arabis laevigata* (Muhl.) Poir.
Smooth rock cress; occasionally scattered in mesic, upland woods; 362.
- *, ** *Brassica nigra* (L.) W.D.J. Koch
Black mustard; common along roadside north of Big Pine Creek; 158 (alien).
- *, ** *Brassica rapa* L.
Field mustard; occasional in old field #2; 75 (alien).
- * *Capsella bursa-pastoris* (L.) Medic.
Shepherd's-purse; occasional along roadsides; 374 (alien).
- ** *Cardamine douglassii* (Torr.) Britton
Purple cress; locally common in wet woodland area west of Fall Creek waterfall; 5.
- Cardamine pensylvanica* Muhl.
Bitter cress; occasional along the side creek; 357.
- Dentaria laciniata* Muhl.
Cut-leaved toothwort or pepperroot; common in mesic, upland woods; 2.
- * *Nasturtium officinale* R. Br.
Water cress; occasional along streamsides; 340.

Caesalpiniaceae – Caesalpinia Family

- Cercis canadensis* L.
Redbud; occasional in mesic, upland woods and roadsides; 22.
- ** *Gleditsia triacanthos* L.
Honey locust; common throughout, especially near boundaries between old fields and rich woods; 59.

Campanulaceae – Bellflower Family

- Campanula americana* L.
American bellflower; common throughout mesic, upland woods and wet woodlands; 174.

- ** *Lobelia inflata* L.
Indian tobacco; occasional in old field #2 and also by Fall Creek waterfall; 194.
- Lobelia siphilitica* L.
Blue cardinal-flower; common along streamsides; 275, 298 (white form).
- * *Triodanis perfoliata* (L.) Nieuwl.
Venus' looking-glass; occasional in old field #2; 62.

Caprifoliaceae – Honeysuckle Family

- ** *Diervilla lonicera* P. Mill.
Bush honeysuckle; rare, found on point of cliff edge over potholes; 369.
- Lonicera dioica* L.
Red honeysuckle; occasional along ridge top just west of Co. Rd. 050 E near old house foundation; 364.
- Sambucus canadensis* L.
Elderberry; occasional under sandstone overhang east of Fall Creek waterfall; 201.
- *, ** *Symphoricarpos orbiculatus* Moench
Coralberry; locally common at base of hill north of savanna-like area north of Fall Creek waterfall; 350.
- Viburnum acerifolium* L.
Maple-leaved arrowwood; common on bluffs of mesic, upland woods; 46.
- Viburnum prunifolium* L.
Black haw or nannyberry; occasional on point between Co. Rd. 200 N and Big Pine Creek; 246.

Caryophyllaceae – Pink Family

- ** *Dianthus armeria* L.
Deftford pink; common in old field #2; 63 (alien).
- *, ** *Saponaria officinalis* L.
Bouncing bet; common along roadside north of Big Pine Creek; 156 (alien).
- ** *Silene virginica* L.
Firepink; occasional along Copeland Hill, and in rich woods between old field #2 and Fall Creek; 57.

- ** *Stellaria media* (L.) Vill.
Common chickweed; occasional, growing in mats along streamside of Fall Creek by waterfall; 257 (alien).
- *, ** *Stellaria pubera* Michx.
Great chickweed; locally abundant along Big Pine Creek streamside near wet woodland areas; 100 (alien).

Celastraceae – Bittersweet Family

- Celastrus scandens* L.
Bittersweet; rare, between burned ridges; 337.

Chenopodiaceae – Goosefoot Family

- *, ** *Chenopodium ambrosioides* L.
Mexican tea; occasional along Fall Creek just east of bridge; 345 (alien).
- *, ** *Chenopodium berlandieri* Moq. var. *zschackei* (J. Murr.) J. Murr.
Pitseed; occasional near parking lot along Co. Rd. 050 E; 252.
- * *Chenopodium standleyanum* Aellen
Goosefoot; occasional along Co. Rd. 050 E; 238.

Cistaceae – Rockrose Family

- *, ** *Lechea villosa* Ell.
Hairy pinweed; locally common on burned ridge #1; 197.

Commelinaceae – Spiderwort Family

- *, ** *Commelina communis* L.
Common dayflower; occasional on west edge of "island-sandbar" north of Fall Creek, west of bridge; 191 (alien).
- * *Tradescantia subaspera* Ker-Gawl.
Spiderwort; rare, in wet woodland area northwest of Fall Creek waterfall; 264.
- Tradescantia virginiana* L.
Spiderwort; locally abundant along southeast edge of old field #2; 67.

Convolvulaceae – Morning-glory Family

- *, ** *Calystegia sepium* (L.) R. Br. ssp. *americana* (Sims) Brummitt
American bindweed; occasional along roadsides; 92.

- *, ** *Ipomoea hederacea* (L.) Jacq.

Ivy-leaved morning-glory; common at woods and field boundary approximately 1/3 mile northwest of Fall Creek waterfall; 268 (alien).

Cornaceae – Dogwood Family

- *, ** *Cornus drummondii* C.A. Mey.

Rough-leaved dogwood; occasional around parking lot; 84.

Cornus florida L.

Flowering dogwood; common in woods between Big Pine Creek and the burned ridges; 40.

- *, ** *Cornus stolonifera* Michx.

Red osier; occasional in wet woodland area south of Fall Creek and east of bridge; 339.

Crassulaceae – Stonecrop Family

Sedum ternatum Michx.

Three-leaved stonecrop; locally common on cliff face between potholes and horseshoe bend of Fall Creek; 176.

- *, ** *Sedum* sp.

Stonecrop; locally common in area south of entrance trail by patch of *Hemerocallis*; 354.

Cyperaceae – Sedge Family

- * *Carex blanda* Dewey

Sedge; occasional along streamside where Fall Creek and the side creek meet; 24.

- *, ** *Carex frankii* Kunth

Sedge; common along roadside by Twin Bridges; 178.

- * *Carex pensylvanica* Lam.

Spring sedge; occasional/scattered in wet, and mesic, upland woods; 8.

- * *Carex rosea* Willd.

Sedge; abundant in mesic, upland woods; 50, 81.

- *, ** *Cyperus strigosus* L.

Galingale; occasional in field area about 1/3 mile northwest of Fall Creek waterfall; 269.

- * *Scirpus atrovirens* Willd.

Bulrush; locally common along streamside of Fall Creek just east of waterfall; 173.

Dipsacaceae – Teasel Family

*, ** *Dipsacus sylvestrus* Huds.

Common teasel; rare, on rocks by bridge over Fall Creek; 184 (alien).

Elaeagnaceae – Elaeagnus Family

*, ** *Elaeagnus umbellata* Thunb.

Autumn olive; rare, “ditch” near road at southeast edge of burned ridge #1; 333 (alien).

Ericaceae – Heath Family

Gaylussacia baccata (Wang.) K. Koch

Black huckleberry; locally abundant on point of horseshoe-shaped ridge along Fall Creek east of waterfall; 79.

Euphorbiaceae – Spurge Family

* *Acalypha rhomboidea* Raf.

Three-seeded mercury; locally common along Fall Creek just east of waterfall; 289, 291.

Euphorbia corollata L.

Flowering spurge; common throughout, locally abundant on flat savanna-like area north of Fall Creek waterfall; 121.

Fabaceae – Pea Family

*, ** *Amphicarpa bracteata* (L.) Fern.

Hog peanut; occasional on shaded, shaley slope north of Fall Creek waterfall; 260.

* *Lespedeza violacea* (L.) Pers.

Violet bush clover; occasional on shaded, shaley slope north of Fall Creek waterfall; 261.

* *Lespedeza virginica* (L.) Britton

Slender bush clover; occasional along roadside by Co. Rd. 200 N and Twin Bridges; 248.

* *Medicago lupulina* L.

Black medic; common along roadsides and parking lot; 87 (alien).

*, ** *Medicago sativa* L.

Alfalfa; common along roadsides; 114 (alien).

Melilotus alba Medic.

White sweet clover; occasional along roadsides; 159 (alien).

Melilotus officinalis (L.) Pallas

Yellow sweet clover; common along roadsides, old field borders, and on burned ridge #1; 53 (alien).

Psoralea onobrychis Nutt.

French grass; locally abundant along roadside of Co. Rd. 200 N up Copeland Hill; 128.

** *Robinia pseudoacacia* L.

Black locust; common along Fall Creek; 175.

* *Trifolium campestre* Schreb.

Low hop clover; occasional on burned ridge #1; 90 (alien).

*, ** *Trifolium dubium* Sibthorp

Little hop clover; occasionally scattered near *T. pratense* and *T. repens* on burned ridge #1; 56 (alien).

** *Trifolium pratense* L.

Red clover; common on burned ridge #1, along roadsides, and in old fields; 54 (alien).

** *Trifolium repens* L.

White clover; common on burned ridge #1 and in old fields; 55, 65 (alien).

Fagaceae – Beech Family*Fagus grandifolia* Ehrh.

Beech; locally common in mesic, upland woods especially on north-facing slopes along the side creek; 213.

Quercus alba L.

White oak; common throughout; 123.

Quercus imbricaria Michx.

Shingle oak; common throughout drier areas; 110.

* *Quercus macrocarpa* Michx.

Bur oak; occasional in wooded area southeast of ridges; 312.

Quercus muhlenbergii Engelm.

Yellow chestnut oak; common in mesic, upland woods; 342 (nomenclature according to Gleason and Cronquist, 1991).

Quercus rubra L.

Red oak; common throughout; 341.

Quercus velutina Lam.

Black oak; locally common on burned ridges; 330.

Geraniaceae – Geranium Family

*, ** *Geranium carolinianum* L.

Wild cranesbill; occasional in old field #2; 68.

Geranium maculatum L.

Wild geranium; common in mesic, upland woods; 36.

Grossulariaceae – Gooseberry Family

Ribes missouriense Nutt.

Missouri gooseberry; occasional in mesic upland woods; 351.

Hippocastanaceae – Horse-chestnut Family

Aesculus glabra Willd.

Ohio buckeye; common in wet woodland areas along Big Pine Creek especially east of ridges, and also east of Twin Bridges; 98.

Hydrangeaceae – Hydrangea Family

Hydrangea arborescens L.

Wild hydrangea; abundant along rock ledges and wet, rocky stream banks; 96.

Hydrophyllaceae – Waterleaf Family

*, ** *Hydrophyllum virginianum* L.

Virginia waterleaf; common in mesic, upland woods; 31.

Hypericaceae – St. John's-wort Family

** *Hypericum punctatum* Lam.

Spotted St. John's-wort; rare, in old field #3; 151.

Iridaceae – Iris Family

Sisyrinchium angustifolium P. Mill.

Blue-eyed grass; rare, one patch along old trail through mesic, upland woods southwest of parking lot; 49.

Juglandaceae – Walnut Family

Carya glabra (P. Mill.) Sweet

Pignut hickory; common throughout; 112.

Carya ovata (P. Mill.) K. Koch

Shagbark hickory; common throughout; 245.

** *Juglans nigra* L.

Black walnut; occasional on point of wet woodland area between Big Pine Creek and Fall Creek; 101.

Lamiaceae – Mint Family

* *Glechoma hederacea* L. var. *micrantha* Moric.

Ground ivy or gill-over-the-ground; common throughout, especially streamsides, old fields, and roadsides; 23 (alien).

* *Hedeoma pulegioides* (L.) Pers.

American pennyroyal; occasional on burned ridge #1 at northern tip; 329.

** *Lamium purpureum* L.

Purple dead nettle; common in mesic, upland woods and wet woodlands; 352 (alien).

* *Lycopus americanus* Muhl.

Common water horehound; occasional along Big Pine Creek streamside east of burned ridges; 315.

* *Lycopus rubellus* Moench

Stalked water horehound; occasional along Fall Creek north of waterfall; 262.

Monarda fistulosa L.

Wild bergamot; locally common in wet woodland area northwest of Fall Creek waterfall; 142.

Prunella vulgaris L. var. *elongata* Benth.

Self-heal; common along roadside of Co. Rd. 200 N, on burned ridge #1, and also along Fall Creek; 152 (alien).

** *Pycnanthemum incanum* (L.) Michx.

Gray mountain mint; locally common in mesic, upland woods just southwest of entrance trail; 168.

* *Pycnanthemum pilosum* Nutt.

Hairy mountain mint; common in old field #1 and on burned ridge #1; 155.

* *Scutellaria lateriflora* L.

Mad-dog skullcap; occasional in wet woodlands and along streamsides; 203, 272.

- * *Stachys tenuifolia* Willd.
Smooth hedge nettle; occasional along Big Pine Creek streamside east of burned ridges; 322.
- * *Teucrium canadense* L. var. *virginicum* (L.) Eaton
American germander; common in old field #2; 132.

Lauraceae – Laurel Family

- Lindera benzoin* (L.) Blume
Spicebush; occasional in mesic, upland woods; 273.
- Sassafras albidum* (Nutt.) Nees
Sassafras; common throughout, especially savanna-like area north of Fall Creek waterfall; 122.

Lemnaceae – Duckweed Family

- * *Lemna minor* L.
Duckweed; occasional in “stagnant” area at Fall Creek and the side creek junction; 301.

Liliaceae – Lily Family

- ** *Allium canadense* L.
Wild onion; locally abundant in areas around drainage streams in rich woods north of Fall Creek and east of waterfall; 74.
- Erythronium albidum* Nutt.
White dog-tooth violet or white trout lily; a few plants scattered among fallen trees in mesic, upland woods; 20.
- ** *Erythronium americanum* Ker-Gawl.
Yellow dog-tooth violet or yellow trout lily; common in scattered groups in mesic upland woods, especially by old trail stairs to the side creek; 14.
- *, ** *Hypoxis hirsuta* (L.) Coville
Yellow star grass; occasional on burned ridge #1; 41.
- ** *Polygonatum biflorum* (Walt.) Ell.
Small Solomon’s seal; common along cliff overhang on south side of Fall Creek above the potholes; 77.
- *, ** *Polygonatum commutatum* (Schult.) A. Dietr.
Solomon’s seal; scattered along roadside by bridge over Fall Creek; 181.

*, ** *Scilla sibirica* Andr.

Squill; occasional, scattered in wet woodland area southwest of Fall Creek waterfall near "pond"; 6 (alien).

Smilacina racemosa (L.) Desf.

False Solomon's seal; occasional throughout rich woods; 72.

Trillium nivale Riddell

Snow trillium; common in mesic, upland woods; 12.

Trillium recurvatum Beck

Red trillium or wake robin; common in mesic, upland woods; 21.

Uvularia grandiflora Sm.

Yellow bellwort; occasional along trail on moist ravine southeast of Fall Creek waterfall; 366.

Magnoliaceae – Magnolia Family* *Liriodendron tulipifera* L.

Tulip tree; occasional throughout; 108.

Menispermaceae – Moonseed Family** *Menispermum canadense* L.

Moonseed; common in mesic, upland woods and wet woodland area north of Fall Creek and west of bridge; 186.

Moraceae – Mulberry Family* *Humulus lupulus* L. var. *pubescens* E. Small

Hops; occasional along Co. Rd. 200 N, north of Big Pine Creek; 229 (nomenclature according to Gleason and Cronquist, 1991).

** *Maclura pomifera* (Raf.) Schneider

Osage orange; occasional in wet woodland area west of bridge over Fall Creek, and in area north of Fall Creek by bridge; 234 (alien).

*, ** *Morus alba* L.

White mulberry; common along road by Twin Bridges; 182 (alien).

Oleaceae – Olive Family*Fraxinus americana* L.

White ash; common throughout; 69, 109.

Onagraceae – Evening Primrose Family

Circaea lutetiana (L.) Aschers. & Magnus ssp. *canadensis* (L.) Aschers. & Magnus

Enchanter's nightshade; common in wooded area between Big Pine Creek and burned ridges; 126.

* *Oenothera biennis* L.

Evening primrose; occasional along Co. Rd. 200 N just north of bridge over Big Pine Creek; 211.

*, ** *Oenothera fruticosa* L. ssp. *glauca* (Michx.) Straley

Four-angled sundrops; occasional along Co. Rd. 200 N opposite burned ridges; 227.

*, ** *Oenothera pilosella* Raf.

Prairie sundrops; occasional along Co. Rd. 200 N opposite burned ridges; 226.

Orchidaceae – Orchid Family

* *Spiranthes cernua* (L.) L.C. Rich.

Nodding ladies' tresses; rare, on burned ridge #1 at northern tip in shade of oaks; 328.

Oxalidaceae – Wood Sorrel Family

* *Oxalis dillenii* Jacq.

Yellow wood sorrel; common in wet woodlands; 99.

* *Oxalis stricta* L.

Yellow wood sorrel; occasional along roadside of Co. Rd. 200 N; 208.

* *Oxalis violacea* L.

Purple wood sorrel; occasional at east edge of burned ridge #2; 376.

Papaveraceae – Poppy Family

Dicentra canadensis (Goldie) Walp.

Squirrel-corn; rare, found in mesic, upland woods on ridge just west of Co. Rd. 050 E; 363.

** *Dicentra cucullaria* (L.) Bernh.

Dutchman's breeches; sparsely scattered along ridge in wet woodland area west of Fall Creek waterfall; 7.

Sanguinaria canadensis L.

Bloodroot; occasional, interspersed in patches in mesic, upland woods; 3.

Phytolaccaceae – Pokeweed Family

Phytolacca americana L.

Pokeweed; occasional, in disturbed, bramble area at north edge of old field #3, and in shrubby flood plain area along the side creek; 154.

Plantaginaceae – Plantain Family

* *Plantago aristata* Michx.

Bracted plantain; rare, on burned ridge #1; 198.

*, ** *Plantago lanceolata* L.

Buckhorn or English plantain; common along roadsides of Copeland Hill; 91 (alien).

* *Plantago rugelii* Dcne.

Rugel's plantain; occasional along Fall Creek by waterfall; 163.

* *Plantago virginica* L.

Dwarf plantain; common in old fields and along roadsides; 43.

Platanaceae – Plane-tree Family

Platanus occidentalis L.

Sycamore; occasional along stream banks and in wet woodlands; 93.

Poaceae – Grass Family

* *Bromus inermis* Leyss.

Awnless brome grass; common along Co. Rd. 050 E; 102 (alien).

*, ** *Chasmanthium latifolium* (Michx.) Yates

Sea oats; occasional in savanna-like area north of Fall Creek waterfall; 145.

*, ** *Dactylis glomerata* L.

Orchard grass; common along Co. Rd. 050 E; 103 (alien).

*, ** *Dichanthelium acuminatum* (Sw.) Gould & Clark var. *fasciculatum* (Torr.) Freckm.

Panic grass; common in old field #2 in clumps; 66.

* *Dichanthelium clandestinum* (L.) Gould

Broad-leaved panic grass; locally abundant in savanna-like area north of Fall Creek waterfall; 138.

* *Echinochloa crus-galli* (L.) Beauv.

Barnyard grass; occasional along Co. Rd. 050 E: 222, 343 (alien).

- * *Elymus canadensis* L.
Nodding wild rye; occasional on north sandy bank of Big Pine Creek west of bridge; 235.
- * *Elymus hystrix* L.
Bottlebrush grass; occasional near Twin Bridges and in savanna-like area north of Fall Creek waterfall; 116, 141.
- * *Elymus villosus* Muhl.
Slender wild rye; common in savanna-like area north of Fall Creek waterfall; 140.
- * *Elymus virginicus* L.
Virginia wild rye; common along Co. Rd. 050 E; 105.
- *, ** *Festuca pratensis* Huds.
Meadow fescue; locally abundant on wet area where Fall Creek and the side creek meet; 45 (alien).
- *, ** *Phalaris arundinacea* L.
Reed canary grass; common along Co. Rd. 050 E; 104.
- *, ** *Phleum pratense* L.
Timothy; common along Co. Rd. 050 E; 106, 150 (alien).
- Poa pratensis* L.
Kentucky bluegrass; abundant near roadside on burned ridge #1; 52 (alien).
- *, ** *Setaria faberi* Herrm.
Giant foxtail; occasional along roadside by Twin Bridges; 179 (alien).

Polemoniaceae – Phlox Family

- Phlox divaricata* L. ssp. *laphami* (Wood) Wherry
Common phlox ; common in mesic, upland woods; 15.
- * *Phlox paniculata* L.
Garden phlox; common along Fall Creek east of waterfall; 171.
- Polemonium reptans* L.
Jacob's-ladder; occasional in mesic, upland woods and wet woodlands; 13.

Polygalaceae – Milkwort Family

- ** *Polygala senega* L.

Seneca snakeroot; occasional in savanna-like area north of Fall Creek waterfall; 146.

Polygonaceae – Buckwheat Family

- *, ** *Polygonum aviculare* L.
Knotweed; common in parking lot; 278 (alien).
- *, ** *Polygonum cristatum* Engelm. & Gray
Crested bindweed; rare, in wet woodland area northwest of Fall Creek waterfall; 265.
- *, * *Polygonum hydropiper* L.
Smartweed; common on “island-sandbar” north of Fall Creek, west of bridge; 192 (alien).
- *, ** *Polygonum lapathifolium* L.
Pale smartweed; common on “island-sandbar” north of Fall Creek, west of bridge; 205.
- * *Polygonum pensylvanicum* L.
Common smartweed; occasional in old field #2, and common on “island-sandbar” north of Fall Creek, west of bridge; 209, 283.
- Polygonum persicaria* L.
Lady’s thumb; occasional along roadsides; 302 (alien).
- *, ** *Polygonum punctatum* Ell.
Smartweed; locally common on rocky bank of Fall Creek by waterfall; 295.
- * *Polygonum scandens* L.
False buckwheat; common on “island-sandbar” north of Fall Creek, west of bridge; 280.
- Polygonum virginianum* L.
Virginia knotweed or jumpseed; occasional along wooded roadsides; 237.
- * *Rumex acetosella* L.
Sour dock; occasional on burned ridge #1; 372 (alien).
- *, ** *Rumex obtusifolius* L.
Bitter dock; occasional along roadsides of Copeland Hill; 253 (alien).

Portulacaceae – Purslane Family

- Claytonia virginica* L.
Spring beauty; abundant and widespread in mesic, upland woods; 1, 28.

Primulaceae – Primrose Family*Dodecatheon meadia* L.

Shooting-star; common, always associated with *Quercus alba*, locally abundant north of Fall Creek in woods south of old field #2; 39.

** *Lysimachia nummularia* L.

Moneywort; common in shaded area at southeast edge of old field #2; 70 (alien).

*, ** *Samolus valerandii* L.

Brookweed; occasional on sandbar in Big Pine Creek adjacent to where Fall Creek joins; 285.

Ranunculaceae – Buttercup Family** *Actaea pachypoda* Ell.

Doll's-eyes; occasional in mesic, upland woods; 167.

Anemone virginiana L.

Tall anemone; locally common at north edge of old field #1; 111.

Aquilegia canadensis L.

Columbine; locally common along Fall Creek on rocks; 26.

Hepatica nobilis P. Mill. var. *acuta* (Pursh) Steyermark

Sharp-lobed liverleaf; occasional in cool, shaded areas of mesic woods; 9.

Isopyrum biternatum (Raf.) Torr. & Gray

False rue anemone; occasional, scattered in mesic, upland woods; 4.

Ranunculus abortivus L.

Small-flowered crowfoot; occasional throughout; 370.

Ranunculus hispidus Michx.

Bristly buttercup; occasionally scattered along old trail to the side creek in mesic, upland woods; 18.

* *Ranunculus recurvatus* Poir.

Buttercup; occasional along the side creek by *R. septentrionalis*; 359.

* *Ranunculus septentrionalis* Poir.

Swamp buttercup; occasional along bank of the side creek; 358.

Thalictrum dioicum L.

Early meadow rue; occasional in mesic, upland woods; 356.

Rosaceae – Rose Family

*, ** *Agrimonia parviflora* Ait.

Swamp agrimony; locally abundant along old road through savanna-like area north of Fall Creek waterfall; 139.

Agrimonia pubescens Wallr.

Soft agrimony; occasional by entrance trail from parking lot; 277.

** *Amelanchier arborea* (Michx. f.) Fern.

Shadbush; occasional on sandstone slopes along creeks; 247.

*, ** *Crataegus crus-galli* L.

Cock-spur thorn; occasional at north end of savanna-like area north of Fall Creek waterfall; 263.

* *Crataegus* sp.

Hawthorn; occasional in savanna-like area north of Fall Creek waterfall; 349.

* *Fragaria* sp.

Strawberry; occasional at woods and field boundary approximately 1/3 mile northwest of Fall Creek waterfall; 267.

Geum canadense Jacq.

White avens; occasional in mesic, upland woods; 144.

*, ** *Potentilla recta* L.

Sulfur cinquefoil; locally common on burned ridge #1; 88 (alien).

Potentilla simplex Michx.

Common cinquefoil; common on burned ridge #1; 51.

Prunus serotina Ehrh.

Wild black cherry; occasional on slopes and in mesic, upland woods; 29.

Rosa carolina L.

Pasture rose; occasional at north edge of old field #2; 60.

** *Rosa multiflora* Thunb.

Multiflora rose; common in old fields #1 and #2; 58 (alien).

*, ** *Rosa setigera* Michx.

Prairie rose; common in old field #1; 107.

* *Rubus occidentalis* L.

Black raspberry; occasional throughout, especially along boundaries between woods and parking lot, old fields, and roadsides; 86.

- *, ** *Rubus roribaccus* (Bailey) Rydb.
Velvet-leaved dewberry; common on burned ridge #1; 207.

Rubiaceae – Madder Family

Cephalanthus occidentalis L.
Buttonbush; occasional just east of the potholes on Fall Creek; 300.

Galium aparine L.
Goosegrass; common in mesic, upland woods and abundant in old field #2; 35.

- *, ** *Galium asprellum* Michx.
Rough bedstraw; abundant throughout; 80.

- * *Galium pilosum* Ait.
Hairy bedstraw; occasional in woods north of burned ridge #1; 371.

Mitchella repens L.
Partridge-berry; one large, isolated population along cliff overhang on south side of Fall Creek above the potholes, also occasional along cool ravine south of waterfall; 78.

Rutaceae – Rue Family

- * *Ptelea trifoliata* L.
Wafer ash; occasional along stream banks and in wet woodlands; 94.

- ** *Zanthoxylum americanum* P. Mill.
Prickly ash; locally common in wet woodland area north of Fall Creek and west of bridge; 347.

Salicaceae – Willow Family

- ** *Populus deltoides* Bartr. ex Marsh.
Common cottonwood; common along Fall Creek southeast of waterfall; 170.

- *, ** *Salix exigua* Nutt.
Sandbar willow; locally common on west edge of “island-sandbar” north of Fall Creek, west of bridge; 190.

Saxifragaceae – Saxifrage Family

Heuchera americana L. var. *hirsuticaulis* (Wheelock) Rosend.
Tall alumroot; occasional along cliff-faces and along trail above potholes; 367.

Mitella diphylla L.

Bishop's-cap; occasional in mesic woods along the side creek; 360.

* *Penthorum sedoides* L.

Ditch stoncrop; common along streamside of Fall Creek southeast of waterfall; 172.

Scrophulariaceae – Figwort Family*, ** *Agalinis skinneriana* (Wood) Britton

Pale false foxglove; locally common in shaded area at eastern edge of burned ridge #1; 288.

Aureolaria flava (L.) Farw.

Smooth false foxglove; occasional on rocky areas along trail by Fall Creek and the side creek junction; 274.

* *Leucospora multifida* (Michx.) Nutt.

Occasional on sandbar in Big Pine Creek adjacent to where Fall Creek joins; 286.

* *Lindernia dubia* (L.) Pennell var. *anagallidea* (Michx.) Cooperrider

Slender false pimpernel; occasional along north stream bank of Big Pine Creek just east of bridge, 214.

Mimulus alatus Ait.

Winged monkey-flower; common on streamside of Fall Creek east of waterfall; 202.

* *Mimulus ringens* L.

Monkey-flower; common along Fall Creek; 161.

Pedicularis canadensis L.

Lousewort; locally abundant in rich woods north of Fall Creek and east of waterfall; 73.

Scrophularia marilandica L.

Late figwort; occasional along rocky bank of Fall Creek southeast of waterfall; 204.

* *Verbascum blattaria* L.

Moth mullein; rare, a few plants in old field #2; 134 (alien).

*, ** *Verbascum thapsus* L.

Woolly mullein; common in old fields, especially old field #3; 149 (alien).

* *Veronica arvensis* L.

Corn speedwell; occasional on burned ridge #1; 375 (alien).

Smilacaceae – Smilax Family

*, ** *Smilax pulverulenta* Michx.

Carrion flower; occasional in mesic, upland woods; 169.

** *Smilax hispida* Muhl.

Bristly catbrier; occasional throughout drier wooded areas; 212.

Solanaceae – Nightshade Family

*, ** *Physalis heterophylla* Nees

Ground cherry; locally common in old field #2; 195.

*, ** *Solanum carolinense* L.

Horse-nettle; common in old field #2; 129.

Solanum ptycanthum Dunal

Black nightshade; occasional on "island-sandbar" north of Fall Creek, west of bridge; 282.

Staphyleaceae – Bladdernut Family

Staphylea trifolia L.

Bladdernut; occasional in wet woodland area south of Big Pine Creek and northwest of old field #3; 310.

Tiliaceae – Basswood Family

Tilia americana L.

Basswood; occasional along stream banks and in wet woodlands; 259.

Ulmaceae – Elm Family

Celtis occidentalis L.

Hackberry; occasional in richwoods; 311.

** *Ulmus americana* L.

American elm; rare, along southern stream bank of Big Pine Creek, south of burned ridges; 313.

Ulmus rubra Muhl.

Slippery elm; common in mesic, upland woods and wet areas; 32, 95.

Urticaceae – Nettle Family

Laportea canadensis (L.) Wedd.

Wood nettle; locally abundant in wet woodland area northwest of Fall Creek waterfall; 143.

Pilea pumila (L.) Gray

Clearweed; common along stream bank of Fall Creek by waterfall; 258.

Urtica dioica L.

Stinging nettle; occasional in wet, wooded areas north and south of Big Pine Creek; 230, 320.

Verbenaceae – Vervain Family* *Phyla lanceolata* (Michx.) Greene

Fog-fruit; occasional on Big Pine Creek stream banks by Twin Bridges; 210.

*, ** *Verbena hastata* L.

Blue vervain; occasional in old field #1; 219.

* *Verbena stricta* Vent.

Hoary vervain; locally common on burned ridge #1; 127.

Verbena urticifolia L.

White vervain; common along roadside north of Big Pine Creek; 157.

Violaceae – Violet Family** *Viola pratincola* Greene

Common blue violet; common in mesic, upland woods and wet woodlands; 16.

** *Viola pubescens* Ait. var. *eriocarpa* (Schwein.) Russell

Smooth yellow violet; common in mesic, upland woods, especially between Fall Creek and the side creek; 17.

Viola striata Ait.

Cream violet; occasional in mesic, upland woods; 71.

Vitaceae – Grape Family*Parthenocissus quinquefolia* (L.) Planch.

Virginia creeper; common throughout, especially in wooded areas; 148.

* *Vitis riparia* Michx.

Riverbank grape; occasional at edge of mesic, upland woods by parking lot; 244.

ACKNOWLEDGMENTS

The authors thank Marion Jackson and Ruth Kvaalen for providing copies of their unpublished data. We greatly appreciate the help given by Mike Homoya and Chris Maron in providing background information and materials. Special thanks to Almut Jones, John Ebinger, and Mike Homoya for their assistance with specimen identifications. We also thank Rebecca Dolan, Bill McKnight, Michael Cole, Tom Post, Ken Robertson, and Almut Jones for their advice and encouragement at various stages of this study. This study

was partially supported by grants from the Hughes Undergraduate Research Fellowship Program through the University of Illinois School of Life Sciences.

LITERATURE CITED

- Crovello, T.J., C.A. Keller, and J.T. Kartesz. 1983. The vascular plants of Indiana: A computer based checklist. Univ. Notre Dame Press, Notre Dame, Indiana, 136 pp.
- Deam, C.C. 1940. Flora of Indiana. Dep. Conserv. Div. Forest., Indianapolis, Indiana, 1236 pp.
- Gleason, H.A. and A. Cronquist. 1963. Manual of vascular plants of northeastern United States and adjacent Canada. D. Van Nostrand Company, Inc., Princeton, New Jersey, 810 pp.
- _____ and _____. 1991. Manual of vascular plants of northeastern United States and adjacent Canada, second ed. New York Botanical Garden, New York, 910 pp.
- Grossnickle, D.E. 1977. A botanical inventory of Fall Creek Nature Preserve. Bachelor's Thesis, Indiana State Univ., Terre Haute, Indiana, 13 pp.
- Grossnickle, D.E. and M.T. Jackson. 1977. Vascular plant inventory of Fall Creek Nature Preserve, Warren County, Indiana. Proc. Indiana Acad. Sci. 87: 369.
- Homoya, M.A., D.B. Abrell, J.R. Aldrich, and T.W. Post. 1985. The natural regions of Indiana. Proc. Indiana Acad. Sci. 94: 245-268.
- Hutchison, H.C. 1961. Distribution, structure, and mined areas of coals in Fountain and Warren Counties, and the northernmost part of Vermillion County, Indiana. Preliminary Coal Map No. 9, Indiana Geol. Sur., Bloomington, Indiana.
- Indiana Department of Natural Resources. 1990. Indiana's rare plants and animals: A checklist of endangered and threatened species. Indianapolis, Indiana, 36 pp.
- Jones, A.G. 1989. *Aster* and *Brachyactis* in Illinois. Illinois Natur. Hist. Surv. Bull. 34(2): 139-194.
- Jones, G.N. 1945. Flora of Illinois. Univ. Notre Dame Press, Notre Dame, Indiana, 317 pp.
- Kartesz, J.T. and R. Kartesz. 1980. A synonymized checklist of the vascular flora of the United States, Canada, and Greenland, Volume II. Univ. North Carolina Press, Chapel Hill, North Carolina, 498 pp.
- Kvaalen, R. 1983. Unpublished checklist. 4 pp.
- Lindsey, A.A., D.V. Schmelz, and S.A. Nichols. 1969. Natural areas in Indiana and their preservation. Indiana Natural Areas Survey, Lafayette, Indiana, 594 pp.
- Mohlenbrock, R.H. 1986. Guide to the vascular flora of Illinois: Revised and enlarged edition. Southern Illinois Univ. Press, Carbondale, Illinois, 507 pp.
- Wayne, W.J., G.H. Johnson, and S.J. Keller. 1966. Geologic map of the 1 x 2 Danville Quadrangle, Indiana and Illinois showing bedrock and unconsolidated deposits. Indiana Geol. Surv., Bloomington, Indiana.

APPENDIX I

Taxa reported from previous surveys at Fall Creek Gorge Nature Preserve, but not seen in this survey.

A. Taxa reported by Dennis Grossnickle and Dr. Marion Jackson (1977).

- | | |
|--|--|
| <i>Acer nigrum</i> Michx. | <i>Desmodium nudiflora</i> (L.) DC. |
| <i>Anemonella thalictroides</i> L. | <i>Dryopteris noveboracensis</i> (L.) Gray |
| <i>Aster divaricatus</i> L. | <i>Galium circaezans</i> Michx. |
| <i>Athyrium filix-femina</i> (L.) Roth. | <i>Galium triflorum</i> Michx. |
| <i>Barbarea vulgaris</i> R. Br. | <i>Gerardia tenuifolia</i> Vahl. |
| <i>Barbarea vulgaris</i> R. Br. var. <i>stricta</i> Andrz. | <i>Gerardia virginica</i> (L.) B.S.P. |
| <i>Cacalia atriplicifolia</i> L. | <i>Hieracium scabrum</i> Michx. |
| <i>Cardamine bulbosa</i> (Shreb.) B.S.P. | <i>Hydrophyllum appendiculatum</i> Michx. |
| <i>Carya cordiformis</i> (Wangenh.) K. Koch | <i>Imperatorium ostruthium</i> L. |
| <i>Carya laciniosa</i> (Michx. f.) Loud. | <i>Lepidium campestre</i> (L.) R. Br. |
| <i>Cynoglossum officinale</i> L. | <i>Mentha piperita</i> L. |
| <i>Desmodium glutinosum</i> (Muhl.) Wood | <i>Monotropa uniflora</i> L. |

Nepeta cataria L.
Panax quinquefolium L.
Phaseolus polystachia (L.) B.S.P.
Phryma leptostachya L.
Plantago major L.
Polygonum hydropiperoides Michx.
Ribes cynosbati L.
Ribes hirtellum Michx.
Salix nigra Marsh.
Sanicula canadensis L.
Silene stellata (L.) Ait. f.

Smilax ecirrhata (Engelm.) S. Wats.
Smilax herbacea L.
Solidago macrophylla Pursh.
Stylophorum diphyllum (Michx.) Nutt.
Thlaspi arvense L.
Trillium grandiflorum (Michx.) Salisb.
Uvularia perfoliata L.
Vernonia noveboracensis (L.) Michx.
Woodsia glabella R. Br.
Zizia aurea (L.) W.D.J. Koch

B. Taxa reported by Ruth Kvaalen in 1983 (nomenclature according to G.N. Jones' *Flora of Illinois* (1945)).

Acer saccharum ssp. *nigrum*
Actaea rubra
Allium tricoccum
Aster simplex
Berberis thunbergii
Blephilia hirsuta
Carya cordiformis
Carya ovalis
Corydalis flavula
Euonymus obovata
Galium triflorum
Geum vernum
Gymnocladus dioicus
Leonurus cardiaca
Lepidium campestre
Maianthemum canadense
Malus sp.
Mentha piperita

Narcissus cultivar
Osmorhiza claytonii
Parthenocissus inserta
Penstemon hirsutus
Populus grandidentata
Rhus aromatica
Ribes cynosbati
Rubus allegheniensis
Sanicula canadensis
Sedum spectabile
Smilacina stellata
Smilax rotundifolia
Solidago altissima
Stylophorum diphyllum
Trillium flexipes
Valeriana pauciflora
Wisteria sinensis
Zizia aurea

APPENDIX II

List of taxa observed at Fall Creek Gorge Nature Preserve lacking collected specimens.

Hemerocallis fulva (L.) L., orange day lily.
Mertensia virginica (L.) Pers. ex Link, bluebells.
Orobanche uniflora L., ghost pipe.
Rumex crispus L., curly dock.

