FLORA OF AMNICON FALLS STATE PARK, DOUGLAS COUNTY, WISCONSIN

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ABSTRACT

The vascular plants and plant communities observed from 2006 to 2008 at Amnicon Falls State Park, located in Douglas County, 24 kilometers east of the city of Superior and eight kilometers south of Lake Superior in northwestern Wisconsin are presented. The most commonly encountered plant communities were the spruce/fir boreal forest and the aspen/birch forest. The vascular plant list included 400 taxa from 79 families. There were 19 ferns and fern allies, seven gymnosperms, and 374 angiosperms. Fifteen county records were discovered in the course of the survey, as well as the observation and confirmation of one species listed as threatened and seven species listed as special concern in the State. These data are presented to document floral composition, and to provide a base for future research activities within the park and region.

KEYWORDS: Amnicon Falls State Park, Douglas County flora of Wisconsin, boreal forest, northern Wisconsin plant communities

INTRODUCTION

The area of study was Amnicon Falls State Park (AFSP) of the Wisconsin Department of Natural Resources’ State Park System. The park is approximately 338 hectares in size, and located in Douglas County, 24 kilometers east of the city of Superior and approximately eight kilometers from the shores of Lake Superior in northwestern Wisconsin. The main feature of the Park is the series of waterfalls where the Amnicon River crosses the Superior escarpment (Figure 1).

The Park is primarily forested and dominated by boreal forest, northern pine forests, and an aging forest of aspen and birch. The other less dominant communities included: alder thickets, sedge meadows, cliffs, small streams, the fluvial zone, and black ash swamps. Of particular interest was the boreal forest. This plant community was very restricted in Wisconsin prior to European settlement, covering approximately 1.9% of the land area (Curtis 1959). Curtis noted that one of the best developments of this forest type was found along the shore of Lake Superior, which included the area of AFSP.

Examination of the early land survey records confirms the findings of Curtis. Stuntz’s (1852–1854) general description of the township noted, “the timber in the township is small spruce, tamarac, birch, fir, and cedar” (assumed to be Picea glauca, Larix laricina, Betula papyrifera, Abies balsamea, and Thuja...
occidentalis, respectively). A closer inspection of the section line notes of the areas immediately surrounding AFSP, revealed a number of species associated with the boreal forest, and confirms the small timber reference of the township general description. Some of the trees observed included white birch (Betula papyrifera), with diameters 15cm–30cm; tamarack (Larix laricina), with diameters 22cm–25cm; spruce (Picea glauca), with diameters 18cm–30cm; white pine (Pinus strobus), with diameters: 20cm–71cm; and aspen (Populus spp.), with diameters 20cm–36cm. The topography was noted as gently rolling with undergrowth typically of hazel (Corylus spp.), alder (Alnus spp.), fir (Abies balsamea) and maple (Acer spp.) (Stuntz 1852–1854).

The climate of the region is continental; however, influences from Lake Superior provide an oceanic-like microclimate to those areas adjacent to the lake. Lake Superior, with an average annual temperature of 4°C, moderates the climate, making winters warmer and summers cooler (Minnesota Sea Grant 2008). Based on weather data from Superior, the mean annual precipitation is 78.2 cm with July having the greatest precipitation (10.8 cm). Mean annual temperature is 4.9° C with the hottest month being July (average 19.2° C) and the coldest being January (average –11.1° C). The growing season (frost free) ranges from 109 to 189 days with an average of 143 days per year (Midwestern Regional Climate Center 2007).

Development within the Park is fairly limited, and consists of a contact station, campground, picnic area and 2.9 kilometers of trails (WIDNR 2006a).
One of the larger disturbed areas, and home to several large populations of invasive plants, is the approximately 100 meter-wide cut that bisects the park to accommodate the Lakehead pipeline. This pipeline traverses east to west 1.6 kilometers through the Park. The north half is dominated by the aspen and birch forest and the southern half is dominated by boreal and pine forests. Two-thirds of the Park’s acreage continues to recover from farming and logging disturbances from early in the twentieth century (W. Eldred, personal communication).

Geology

Approximately one billion years of geologic activity are evident at AFSP. The activity included: volcanic eruptions, the advance of great oceans, the formation of sandstone, earthquakes and glaciation (Green et al. 1977). One billion years ago, a mid continent rift started to form on the North American continent. Lava spread across the region, and as it cooled basalt formed. This rock was observed in the upper falls of the park. Five-hundred million years ago, an ancient ocean covered the basalt (Minnesota Sea Grant 2008). Streams carried sand to this ocean, and over time these sands were compressed into sandstone as they accumulated on top of the basalt (the horizontal layers of this sandstone remain visible along the riverbank near the lower falls of the park) (Figure 2). Over time, the basalt underwent tremendous fracturing and movement. The conclusion was the formation of the Douglas Fault, which extends from just east of Ashland, Wisconsin to the Twin Cities region of Minnesota. If the up thrusting had not occurred, the basalt that is visible today would be several thousand feet below the sandstone. Evidence of the fault can be observed at the present day location of the Upper Falls, Snake Pit Falls, and the Now and Then Falls of AFSP (Dott and Attig 2004).

Finally, the area underwent a series of glaciations, with the last event ending about 10,000 years ago. The glacial melt water scour ed the basalt bedrock and caused the sloughing of the sandstone cliffs in the park. Glacial deposits of lacustrine red clays that formed the old lake plain of Glacial Lake Duluth were left behind (LaBerge 1994). These soils were finely textured, resulting in very poor drainage. The surface clay deposits effectively prevented ground water from reaching the surface as springs, and consequently created artesian well conditions (Douglas County Land Conservation Committee 2005).

Land History

The cultural history of the park is a critical component in understanding the plant communities observed today. The Amnicon Falls area had a rich cultural history and a diversity of uses by native peoples and European settlers. Native peoples traveled to this area as early as 9,000 years ago—a thousand years after the last ice sheets melted from the shores of Glacial Lake Duluth (WIDNR 2006a). While Native Americans (Ojibwa) were in the area, there is evidence that they sought out some of the copper resources located in the park. The first Europeans were also drawn to the area in the 1850s for the same cop-
FIGURE 2. Sandstone is exposed in a bend of the Amnicon River, on the north side of the park. The cracks in the exposed rock provide habitat for a number of species. (Photo by Derek Anderson.)
per resources. Though some people had moderate success, the majority failed. Evidence of their pits is still observed today along the nature trail in the park. A second effort of mining occurred on the downside of the Superior escarpment, in the sandstone areas of the park. Brownstone quarries were opened up and a staging area was created around 1850 and used through the 1870s. Today, this area remains an open field.

In 1866, James Bardon purchased 64.75 hectares from the Chicago, St. Paul, Minneapolis and Omaha Railroad Company. Logging activities commenced soon after and the Amnicon River was used as a sluiceway to transport the logs to the lake, which were later floated to Duluth and Superior to build these new cities. The area was logged over by the 1920’s and portions were farmland as late as the 1950’s (W. Eldred, personal communication). In 1932, Douglas County purchased 24.28 hectares and the Bardon family donated 26.30 hectares and the place became known as Bardon Park. Between 1932 and 1961, the park was alternately managed by the Town of Amnicon and Douglas County. Finally, in 1961, the park was transferred to the state and named Amnicon Falls State Park. In 1967, the campground was developed in an area mixed with boreal and pine forest elements.

The current project was undertaken to provide baseline data on the flora of this park and region, as these data are lacking in northwestern Wisconsin in general.

METHODS

The park was visited throughout the growing seasons of 2006, 2007 and 2008. Over 1100 voucher specimens were collected, identified, and deposited in the John W. Thomson Herbarium of the University of Wisconsin – Superior, Superior, Wisconsin (SUWS). For general plant identification, the Spring Flora of Wisconsin (Fassett 1978), the Grasses of Wisconsin (Fassett 1951), the Manual of Vascular Plants of Northeastern United States and Adjacent Canada (Gleason and Cronquist 1998), the Illustrated Companion to Gleason and Cronquist’s Manual (Holmgren 1998), the Aquatic and Wetland Plants of Northeastern North America (Crow and Hellquist 2000), the Trees and Shrubs of the Upper Midwest (Rosendahl 1955), and the Michigan Flora (Voss 1972, 1985, 1996) were extensively used. Nomenclature follows the published volumes of the Flora of North America (1993+) and then Wetter et al. (2001).

Eighteen randomly placed plots were marked in the dominant forest plant communities to capture the basic composition of each major plant community within the park. Dimensions of each plot were 20 meters by 50 meters in size and contained nested plots, arranged in the style of the Whittaker Plant Diversity Sampling Method (Shmida 1984; Barbour et al. 1987). Meander searches were used to search smaller, more unique plant communities and microhabitats such as the cliff faces, rock outcrops, fluvial habitats and the black ash swamps (Goff and Glenn 1982).

A database query of Wisconsin herbaria was used to identify additional plants that have been collected from AFSP (Robert W. Freckmann Herbarium 2008; Wisconsin State Herbarium 2008). The majority of species were collected in the heavily visited area of the park, while only a few were collected from the north end of the park.

RESULTS

A total of 400 vascular plant taxa representing 223 genera and 79 families were documented from the 338-ha park (Appendix I) between 2006 and 2008.
The fern and fern allies were represented by 19 taxa. Gymnosperms were represented by seven taxa. Of the remaining angiosperms, 100 were monocots, and 274 were dicots. The predominant plant families observed were Asteraceae with 49 taxa, Cyperaceae with 35 taxa, Poaceae with 29 taxa, and Rosaceae with 28 taxa. One rare species listed as Threatened and seven species listed as Special Concern by the Wisconsin Department of Natural Resources, Bureau of Endangered Resources (WIDNR 2006b) were also observed (Table 1). There were a total of 51 introduced species documented, some of which are ecologically invasive.

The introduced species represented approximately 13% of the flora. Introduced plants were concentrated in those areas along the pipeline, the riverbed and banks (especially north of the pipeline crossing), and the northern third of the park that was once farmed, which contained a small amount of common buckthorn (*Rhamnus cathartica*). The sedge meadow area supported a diversity of plants despite the general dominance of reed canary grass (*Phalaris arundinacea*) throughout a large portion of the area and a small 25 square meter area of purple loosestrife (*Lythrum salicaria*). Several non-native species, many of the Fabaceae family, were found adjacent to County Highway U, which represents the eastern boundary of the park. Currently, many of these species are confined to the roadside right-of-way. The interior portions of the park had the best representation of native flora, and typically were devoid of human activity.

The survey of AFSP also resulted in the discovery of 15 species yet to be reported from Douglas County. *Scirpus georgianus*, one of the new county records, had only been cited a few times in the state of Wisconsin (R. Freckmann, personal communication). See Table 2 for the complete list of species newly reported in Douglas County. Another result of the survey was the discovery of 15 taxa that had not been collected in Douglas County in more than 30 years. Of particular interest was *Carex merritt-ferndii* as this species had not been collected in the county since 1897. There were also several taxa that had not been collected since the 1940s, and these include: *Artemisia serrata*, *Bidens vulgata*, *Corydalis aurea*, and *Hypericum pyramidatum*. See Table 3.
for the complete list of species not collected in more than 30 years, until this study.

The database survey resulted in a number of specimens that were collected from AFSP in the past. Prominent collectors included Rudy G. Koch and John W. Thomson Jr. The majority of the specimens collected by these individuals are housed at the University of Wisconsin–Superior [SUWS], the University of Wisconsin–Madison [WIS], the University of Wisconsin–La Crosse [UWLC], and/or the Milwaukee Public Museum [MIL] herbaria. There were a total of ten taxa that had previously been collected at the park that were not found during the 2006–2008 survey (Table 4). Some of these species may have disappeared from the park, but a more likely explanation is that these were missed during the survey.

### TABLE 2. New Douglas County Records

<table>
<thead>
<tr>
<th>Species</th>
<th>No. of Known Occurrences</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carex ormostachya</td>
<td>1</td>
</tr>
<tr>
<td>Carex radiata</td>
<td>1</td>
</tr>
<tr>
<td>Convallaria majalis</td>
<td>1</td>
</tr>
<tr>
<td>Geum macrophyllum</td>
<td>2</td>
</tr>
<tr>
<td>Helianthus hirsutus</td>
<td>1</td>
</tr>
<tr>
<td>Hydrocotyle americana</td>
<td>3</td>
</tr>
<tr>
<td>Pedicularis lanceolata</td>
<td>1</td>
</tr>
<tr>
<td>Polygonatum biflorum</td>
<td>Numerous</td>
</tr>
<tr>
<td>Quercus × bebbiana</td>
<td>1</td>
</tr>
<tr>
<td>Ranunculus sceleratus</td>
<td>Numerous</td>
</tr>
<tr>
<td>Ribes lacustre</td>
<td>10</td>
</tr>
<tr>
<td>Sanicula canadensis</td>
<td>Numerous</td>
</tr>
<tr>
<td>Scirpus georgianus</td>
<td>1</td>
</tr>
<tr>
<td>Smilax ecirrata</td>
<td>Numerous</td>
</tr>
<tr>
<td>Symphyotrichum lanceolatum var. interior</td>
<td>1</td>
</tr>
</tbody>
</table>

### TABLE 3. Plants not collected from Douglas County in more than 30 years, until this survey.

<table>
<thead>
<tr>
<th>Species</th>
<th>No. of Occurrences</th>
<th>Year Last Collected</th>
</tr>
</thead>
<tbody>
<tr>
<td>Artemisia serrata</td>
<td>1</td>
<td>1940</td>
</tr>
<tr>
<td>Bidens vulgata</td>
<td>1</td>
<td>1943</td>
</tr>
<tr>
<td>Carex bebbii</td>
<td>1</td>
<td>1973</td>
</tr>
<tr>
<td>Carex castanea</td>
<td>1</td>
<td>1979</td>
</tr>
<tr>
<td>Carex debilis var. rudgei</td>
<td>1</td>
<td>1969</td>
</tr>
<tr>
<td>Carex merritt-fernaldii</td>
<td>1</td>
<td>1897</td>
</tr>
<tr>
<td>Comarum palustre</td>
<td>1</td>
<td>1979</td>
</tr>
<tr>
<td>Corydalis aurea</td>
<td>1</td>
<td>1942</td>
</tr>
<tr>
<td>Festuca trachyphylla</td>
<td>1</td>
<td>1979</td>
</tr>
<tr>
<td>Hypericum pyramidatum</td>
<td>1</td>
<td>1943</td>
</tr>
<tr>
<td>Maianthemum trifolium</td>
<td>1</td>
<td>1976</td>
</tr>
<tr>
<td>Oenothera villosa</td>
<td>1</td>
<td>1966</td>
</tr>
<tr>
<td>Parthenocissus quinquefolia</td>
<td>1</td>
<td>1973</td>
</tr>
<tr>
<td>Salix × rubens</td>
<td>1</td>
<td>1960</td>
</tr>
<tr>
<td>Woodsia ilvensis</td>
<td>Numerous</td>
<td>1975</td>
</tr>
</tbody>
</table>
Plant Communities

The two most common plant communities encountered within the park were a young, even-aged aspen/birch forest and white spruce/balsam fir mixed-aged boreal forest.

Aspen/Birch Forest

The aspen/birch forest was dominated by quaking aspen (*Populus tremuloides*) with typical diameters at breast height (dbh) of 25 to 30 cm (Figure 3). White birch (*Betula papyrifera*) was seldom observed. The typical dbh of the white birch that were measured were 30 to 40 cm. There was very little regeneration of the white birch. However, down and decaying birch was commonplace on the forest floor. In the subcanopy, balsam fir (*Abies balsamea*) was the only tree that rose higher than six meters in height. It was sporadically distributed. The shrub layer contained young white spruce (*Picea glauca*). This species was more common, but less than three meters tall. There were numerous deciduous shrubs present, and the most common species were: arrowwood (*Viburnum rafinesquianum*), nannyberry (*Viburnum lentago*), serviceberries (*Amelanchier spp.*) and hawthorn (*Crataegus sp.*). The ground flora was quite diverse and represented by the following species: *Anemone quinquefolia*, *Aralia nudicaulis*, *Athyrium filix-femina*, *Cornus canadensis*, *Eurybia macrophylla*, *Geum aleppicum*, *Lathyrus ochroleucus*, *Luzula acuminata*, *Maianthemum canadense*, *Maianthemum racemosum*, *Oryzopsis asperifolia*, *Rubus pubescens*, *Uvularia grandiflora*, and *Vicia americana*.

Spruce/Fir Boreal Forest

The mixed aged boreal forest was dominated by balsam fir (*Abies balsamea*) and white spruce (*Picea glauca*). There were a few large (66–81 cm dbh) white pine (*Pinus strobus*) scattered throughout the forest as well. Quaking aspen and white birch were still present, but were part of the subcanopy layer. White cedar (*Thuja occidentalis*) was found along the cool moist valley.

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**TABLE 4.** Taxa and associated information from plants collected at Amnicon Falls State Park, but not observed during the 2006–2008 survey. Herbarium codes: Milwaukee Public Museum [MIL]; University of Wisconsin–Superior [SUWS]; University of Wisconsin–Stevens Point [UWSP]; University of Wisconsin–Madison [WIS].

<table>
<thead>
<tr>
<th>Species</th>
<th>Collector</th>
<th>Collection No.</th>
<th>Herbarium</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Agrostis perennans var. perennans</em></td>
<td>Koch, R. G.</td>
<td>6364</td>
<td>SUWS</td>
<td>1969</td>
</tr>
<tr>
<td><em>Antennaria plantaginifolia</em></td>
<td>Koch, R. G.</td>
<td>6663</td>
<td>SUWS</td>
<td>1970</td>
</tr>
<tr>
<td><em>Astragalus canadensis var. canadensis</em></td>
<td>Thomson, J. W., Jr. s.n.</td>
<td>SUWS, WIS</td>
<td>1942</td>
<td></td>
</tr>
<tr>
<td><em>Botrychium virginianum</em></td>
<td>Somerville, M. F.</td>
<td>80, 81</td>
<td>WIS</td>
<td>1924</td>
</tr>
<tr>
<td><em>Cystopteris bulbifera</em></td>
<td>Somerville, M. F.</td>
<td>104</td>
<td>MIL</td>
<td>1923</td>
</tr>
<tr>
<td><em>Mitella nuda</em></td>
<td>Koch, R. G.</td>
<td>5693</td>
<td>UWSP</td>
<td>1969</td>
</tr>
<tr>
<td><em>Selaginella rupestris</em></td>
<td>Conklin, G. H.</td>
<td>338</td>
<td>WIS</td>
<td>1932</td>
</tr>
<tr>
<td><em>Spiranthes lacera var. lacera</em></td>
<td>Thomson, J. W., Jr. s.n.</td>
<td>WIS</td>
<td>1942</td>
<td></td>
</tr>
<tr>
<td><em>Stellaria longifolia</em></td>
<td>Koch, R. G.</td>
<td>7450</td>
<td>WIS</td>
<td>1972</td>
</tr>
<tr>
<td><em>Taxus canadensis</em></td>
<td>Thomson, J. W., Jr. s.n.</td>
<td>SUWS, WIS</td>
<td>1942</td>
<td></td>
</tr>
</tbody>
</table>
Floors rising up to the ridge tops. There was little to no evidence of any cedar regeneration. In the shrub layer, the species were similar to those of the aspen/birch forest, with thimbleberry (*Rubus parviflorus*) and round-leaved dogwood (*Cornus rugosa*) playing a more significant role. The ground layer vegetation (Figure 4) changed as the canopy became more coniferous and supported uncommon, but not rare, plants including: *Aralia racemosa, Clintonia borealis, Linnaea borealis, Lonicera canadensis, Pyrola elliptica, Sanguinaria canadensis, Shepherdia canadensis*, and *Trientalis borealis*.

**Northern Pine Forest (Xeric)**

There were only two areas in the park considered northern pine forest (xeric). One was an obvious red pine plantation and the other was a mixture of secondary succession pines (*Pinus resinosa and P. strobus*) that began regenerating near the turn of the 20th century (W. Eldred, personal communication). This latter area represented the heart of Amnicon Falls State Park (Figure 5). It was found on a dome of bedrock that was an island within the river. The falls were also the most dramatic in this area. Though the island was small (less than 2 ha), it had numerous trails from heavy visitation. The dominant canopy trees on the island were an equal mix of red pine and white pine, while red pine dominates the less traveled plantation. The subcanopy, shrub, and ground cover layers were poorly represented in these two pine forests. Species found...
FIGURE 4. Twinflower (*Linnaea borealis*) was commonly observed in the ground vegetation layer of the spruce/fir forests of the park. Other commonly encountered species in this layer were blue-bead lily (*Clintonia borealis*), starflower (*Trientalis borealis*), and shinleaves (*Pyrola spp.*). (Photo by Derek Anderson.)

FIGURE 5. The pine forest located in the ‘heart’ of the park was dominated by a mix of even-aged red and white pines (*Pinus resinosa* and *P. strobus*). This area of the park received the bulk of visitor use. The underlying bedrock was close to the surface as seen at the bottom of the photograph. (Photo by Derek Anderson.)
in this community included: Anaphalis margaritacea, Anemone quinquefolia, Corylus cornuta, Diervilla lonicera, Eurybia macrophylla, and Pteridium aquilinum.

**Sedge Meadow**

A 30-ha sedge meadow occurred at the base of two small ravines, where small streams drain the meadow through a series of small ponds eventually to the Amnicon River. This area appeared to have been flooded by beavers in the past, as several standing snags were observed in the sedge meadow as well. This area was primarily herbaceous, with floating aquatic, submerged, and emergent vegetation (Figure 6). The area was dominated by Phalaris arundinacea and Calamagrostis canadensis, with Alisma, Carex, Persicaria, Ranunculus, Schoenoplectus and Scirpus well represented. Some of the more interesting plants found in this area were: Ranunculus sceleratus, Asclepias incarnata, Eutrochium maculatum, Schoenoplectus pungens and Scirpus georgianus.

**Black Ash Swamps**

There are three black ash swamps primarily in the northern half of the park. The canopy is dominated by Fraxinus nigra, though Fraxinus pennsylvanica is also present. The soils are often saturated and pools of water collect during periods of high moisture. Plants that grow in this area must be able to tolerate

FIGURE 6. Celery leaf buttercup (*Ranunculus sceleratus*) was a Douglas County record found at Amnicon Falls State Park. It was commonly observed in the pools and streams that were found in the sedge-meadow area. (Photo by Derek Anderson.)
some periods of total inundation. Many of the trees had formed small buttresses, similar to some southern swamp species. There were no conifers present in the swamp, while seedlings of *Ulmus americana* were found in two of the three swamps. One additional tree of interest found on a narrow upland within one of the swamps was an 18 meter tall hybrid oak, *Quercus x bebiana*. This cross of *Quercus macrocarpa* and *Q. alba* was an interesting observation. While *Q. macrocarpa* has been observed in several areas of Douglas County, *Q. alba* has rarely been documented. The subcanopy and shrub layer was sporadic with clumps of *Alnus incana* and *Salix spp*. The area was predominately herbaceous in nature and consisted of many graminoid species dominated by *Carex* (12 species recorded). Other common and rare plants in this zone were *Campanula aparinoides*, *Hydrocotyle americana*, the three forms of *Ranunculus hispidus*, *Ranunculus recurvatus*, *Saxifraga pensylvanica* (Figure 7), and two orchid species – *Cypripedium parviflorum* var. *makasin* and *Platanthera psycodes*, the former being a species of Special Concern.

**Fluvial Zone**

For the purposes of discussion, the riverbed, its banks, and the river’s few islands were included in this zone. This area also contained most of the cliff ferns, which will be discussed in the next section. Of all of the habitats in the park (outside of the sedge meadow) this area received the greatest fluctuation in water levels and flow, as well as the largest amount of direct sunlight. Emergent vegetation and annuals were growing directly in the riverbed. These in-
included: *Alisma trivale, Antennaria neglecta, Barbarea vulgaris, Calla palustris, Caltha palustris, Cirsium arvense, Eleocharis ovata, Gnaphalium uliginosum, Hypericum perforatum, Mimulus ringens, Mollugo verticillata, Oenothera biennis, and Tanacetum vulgare.* Species present on the riverbanks were: *Angelica atropurpurea, Cicuta maculata, Helianthus giganteus, Heracleum lanatum, Sonchus arvensis, Stachys palustris, Symphyotrichum lanceolatum,* and *Symphyotrichum lateriflorum.*

**Cliffs**

The cliff habitats were primarily located at the north end of the park at the Upper and Lower falls area, as well as the Now and Then Falls. Several smaller side ravines also provided additional areas of this community type (Figure 8). It was in these areas that *Cystopteris laurentiana* and *Dryopteris fragrans,* two species of Special Concern, were re-discovered for the first time since 1975. Other fern species found in these cliff environments were: *Athyrium filix-femina, Cystopteris fragilis, Dryopteris carthusiana, Gymnocarpium dryopteris, Polypodium virginianum,* and *Woodsia ilvensis.*

**Alder Thicket**

The last major plant community surveyed was an alder thicket. This community was predominantly found in the southwest corner of the park as well as
in pockets throughout the even-aged aspen/birch forest at the south end. Both of these areas were surveyed and species common to wetlands were observed. These included: *Alnus incana*, *Calamagrostis canadensis*, *Carex lacustris*, *Caltha palustris*, and *Impatiens capensis*.

**DISCUSSION**

The flora of Amnicon Falls State Park represents a secondary succession of undisturbed forest in northwestern Wisconsin that has now persisted for more than 70 years. There is a mosaic of ridge tops, bottom lowlands, sedge meadows and cliff habitats found within the park.

The northern portion of the park is heavily browsed by deer with strong evidence of extensive deer yards being present. Rooney et al. (2004) noted that native plant populations are adversely affected in protected lands free from deer hunting. This may help explain why there was no evidence of forest regeneration of species described by Curtis (1959) as associates found in the boreal forest such as white cedar. Subcanopy and ground cover species have also been significantly impoverished in northern plant communities of Wisconsin over the past 50 years in areas of high deer populations (Rooney et al. 2004).

Whittelsey (1852), an early explorer, noted that American yew (*Taxus canadensis*) blanketed the ground and was a continued annoyance of the traveler. This plant was observed and collected by John W. Thomson in 1942 from an unspecified location within the park (specimen located at the University of Wisconsin – Superior Herbarium). However, yew was not located during this study, possibly because of the high deer population. This observation has also been made in other parts of Wisconsin as well. Additional authors, such as Stearns (1951) and Alverson et al. (1988) concluded that the lack of yew in forests they were working in was caused by heavy pressures from winter deer populations. Locally, at Pattison State Park (20 km to the southwest) yew is only observed in the most precarious locations of the Black River gorge.

Along with changes to the native plant populations caused by deer, introduced and invasive plants (mostly from Eurasia) have increasingly become a problem throughout Wisconsin. Introduced plants made up 13% of the overall flora found at AFSP. The areas that had the least amount of disturbance also had the lowest incidence of introduced species. The highest concentrations of introduced species were located adjacent to the county road surrounding the park and the pipeline that bisects the park. Personnel at the park have indicated that they would like to see this right-of-way narrowed in future years, which could reduce the amount of introduced and invasive plant seed. Another area with a much lower concentration of introduced species was found in the early succession aspen/birch forest. This area, at the northern end of the park, was farmland prior to the 1960s and several pioneer invasive species (*Trifolium spp.*, *Poa spp.*, and *Agrostis sp.*) occurred in this region. As the forest community matures and moves to a later sere, these pioneer species should continue to decline.
One of the exciting results of the survey work conducted at the park was the observation of 15 new county records, two of which were species of Special Concern (*Geum macrophyllum* and *Scirpus georgianus*). In addition, the project recorded another 15 species that have not been documented in the county in more than 30 years. These findings demonstrate the need for floristic surveys and the gap that exists in species distribution within Wisconsin. Of these 30 species, only *Polygonatum biflorum*, *Ranunculus sceleratus*, *Sanicula canadensis*, and *Smilax ecirrhata* had multiple populations within the park. For many species, these observations represent range extensions within Wisconsin. Two of the taxa (*Pedicularis lanceolata* and *Quercus × bebbiana*) were observed well beyond their documented range within the state.

As a result of the flora and plant communities documented at Amnicon Falls State Park, numerous possibilities for future research exist. These opportunities include: 1) invasive plant population monitoring (including the threats to native populations), 2) effects of global climate change on forests of northern Wisconsin, 3) impacts of forest activities on native plant populations in the park, 4) impacts of the deer population on the forest understory 5) on-going monitoring of the narrow, but extensive black ash swamps at the northern end of the park (including impacts from the invasive emerald ash borer, currently not present, but a future threat), and 6) to serve as a comparison for future floristic research within the park and surrounding area.

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APPENDIX I: AMNICON FALLS STATE PARK FLORA LIST

The following list is organized alphabetically by family, genus, and then species in each major group of plants. All collections are made by Hlina and Anderson and are deposited at the John W. Thomson Herbarium at the University of Wisconsin – Superior, Superior, Wisconsin (SUWS). Each species is followed by a common name and collection numbers. Introduced species are indicated with an asterisk. Nomenclature follows the published volumes of the Flora of North America (1993+). When the Flora of North America was not available, Wetter et al. (2001) was used for nomenclature.

PTERIDOPHYTES

**Dennstaedtiaceae** (Bracken Family)

*Pteridium aquilinum* (L.) Kuhn. var. *latiusculum* (Desv.) Underw. ex A. Heller, bracken fern (86, 88)

**Dryopteridaceae** (Wood Fern Family)

*Athyrium filix-femina* (L.) Roth ex. Mert. var. *angustum* (Willd.) G. Lawson, lady fern (50, 179, 197, 234)
*Cystopteris fragilis* (L.) Bernh., brittle bladder fern (59, 676, 715, 829)
*C. laurentiana* (Weath.) Blasdell, Laurentian bladder fern (69, 713, 827, 922, 1125)
*Dryopteris carthusiana* (Vill.) H. P. Fuchs., spinulose wood fern (49, 820, 920, 921)
*D. cristata* (L.) A. Gray, crested shield fern (205, 300, 301, 773)
*D. fragrans* (L.) Schott, fragrant fern (44)
*Gymnocarpium dryopteris* (L.) Newman, oak fern (87, 89, 461)
*Matteuccia struthiopteris* (L.) Todaro var. *pensylvanica* (Willd.) C. V. Morton, ostrich fern (648, 668)
*Onoclea sensibilis* L., sensitive fern (90, 107, 172, 441)
*Woodsia ilvensis* (L.) R. Br., rusty cliff fern (45, 169, 599, 1003)

**Equisetaceae** (Horsetail Family)

*Equisetum arvense* L., common horsetail (378, 379, 561, 639)
*E. fluviatile* L., river horsetail (536)
*E. sylvaticum* L., wood horsetail (108, 603)

**Lycopodiaceae** (Club-moss Family)

*Huperzia lucidula* (Michx.) Trevis., shining club-moss (799)

**Osmundaceae** (Royal Fern Family)

*Osmunda cinnamomea* L., cinnamon fern (1122, 1127)
*O. claytoniana* L., interrupted fern (85, 118, 222, 923)

**Polypodiaceae** (Polypody Family)

*Polypodium virginianum* L., common polypody fern (407, 543)

**Thelypteridaceae** (Marsh Fern Family)

*Phegopteris connectilis* (Michx.) Watt, narrow beech fern (150, 255, 443, 447)
GYMNOSPERMS

CUPRESSACEAE (Cypress Family)

*Juniperus communis* L. var. *depressa* Pursh, common juniper (152, 163)

*Thuja occidentalis* L., northern white cedar (145, 162)

PINACEAE (Pine Family)

*Abies balsamea* (L.) Mill., balsam fir (92, 93)

*Picea glauca* (Moench) Voss, white spruce (6, 525, 604)

*Pinus banksiana* Lamb., jack pine (642)

*P. resinosa* Aiton, red pine (986)

*P. strobus* L., eastern white pine (551, 552)

DICOTYLEDONS

ACERACEAE (Maple Family)

*Acer negundo* L., box-elder (1129)

*A. rubrum* L. var. *rubrum*, red maple (41, 42, 304, 305)

*A. saccharinum* L., silver maple (559)

*A. saccharum* Marshall var. *saccharum*, sugar maple (10, 787)

*A. spicatum* Lam., mountain maple (215, 483, 533, 712)

ANACARDIACEAE (Cashew, Sumac Family)

*Rhus hirta* (L.) Sudw., staghorn sumac (319, 498, 499)

*Toxicodendron rydbergii* (Small ex Rydb.) Greene, poison ivy (photo)

APIACEAE (Carrot Family)

*Angelica atropurpurea* L., purple-stem angelica (362)

*Cicuta maculata* L., common water-hemlock (160, 486, 756)

*Heracleum lanatum* Michx., American cow-parsnip (photo)

*Hydrocotyle americana* L., marsh pennywort (242, 892, 972)

*Osmorhiza longistylis* (Torr.) DC., smooth sweet cicely (147)

*Sanicula canadensis* L., Canadian black snakeroot (832)

*S. marilandica* L., black snakeroot (455, 702, 709)

*Sium suave* Walter, water parsnip (865, 905, 907)

APOCYNACEAE (Dogbane Family)

*Apocynum androsaemifolium* L., spreading dogbane (76, 193, 253, 426)

AQUIFOLIACEAE (Holly Family)

*Illex verticillata* (L.) A. Gray, common winterberry (189, 422, 591, 740)

ARALIACEAE (Ginseng Family)

*Aralia nudicaulis* L., wild sarsaparilla (74, 75, 123, 649)

*A. racemosa* L., American spikenard (143, 223, 224, 990)

*Panax trifolius* L., dwarf ginseng (1121)

ARISTOLOCHIACEAE (Birthwort Family)

*Asarum canadense* L., wild-ginger (496)

ASCLEPIADACEAE (Milkweed Family)

*Asclepias incarnata* L. ssp. *incarnata*, swamp milkweed (397, 398, 399, 400)

*A. syriaca* L., common milkweed (183)

ASTERACEAE (Aster Family)

*Achillea millefolium* L., yarrow (194, 262, 351, 696)

*Ambrosia artemisiifolia* L., common ragweed (328)

*Anaphalis margaritacea* (L.) Benth. & Hook.f., pearly everlasting (29, 131, 132)

*Antennaria howellii* Greene ssp. *canadensis* (Greene) R. J. Bayer, Howell’s pussy-toes (806)

*A. neglecta* Greene, field pussy-toes (261, 1052)

*Artemisia serra* Nutt., saw-tooth wormwood (368)
Bidens cernua L., nodding beggar-ticks (220, 263, 1055, 1056)
B. discoidea (Torr. & A. Gray) Britton, swamp beggar-ticks (1058, 1066)
B. vulgaris Greene, tall beggar-ticks (1059)
*Cirsium arvense* (L.) Scop., Canada thistle (355, 361, 890)
C. muticum Michx., swamp thistle (588, 745, 903)
Doellingeria umbellata (Mill.) Nees, flat-top aster (236, 334, 494)
Erigeron philadelphicus L., common fleabane (882, 1053)
E. strigosus Müll. ex Willd., daisy fleabane (164, 861, 1054, 1062)
Eurybia macrophylla (L.) Cass., big-leaved aster (30, 31, 989, 993)
Eupatorium perfoliatum L., boneset (860)
Eutrochium maculatum (L.) Lamont, spotted Joe-Pye-weed (175, 353, 489, 677)
*Gnaphalium uliginosum* L., low cudweed (323, 350)
Helianthus giganteus L., giant sunflower (1043, 1044, 1045)
*H. hirsutus* Raf., rough sunflower (1061)
*H. maximilianii* Schrad., Maximilian’s sunflower (1046, 1047)
Heliotropium helianthoides (L.) Sweet, ox-eye (1049)
Hieracium aurantiacum L., devil’s-paintbrush (19, 763)
*H. caespitosum* Dumort., rough hawkweed (732, 825, 1057)
H. umbellatum L., Canada hawkweed (140, 427, 1064, 1065)
Lactuca biennis (Moench) Fern., tall blue lettuce (887, 1048)
*Leucanthemum vulgare* Lam., ox-eye daisy (182, 359)
*M. recutita* L., chamomile (869)
Packerera aurea (L.) A. Löve & D. Löve (797)
Petasites frigidus (L.) Fr. var. *palmatus* (Aiton) Cronquist, Arctic sweet colt’s-foot (264, 477, 678)
P. frigidus (L.) Fr. var. *sagittatus* (Banks ex. Pursh) Chern., arrowhead sweet colt’s foot (1130)
Prenanthes alba L., white-lettuce (22, 137, 448, 1010)
Rudbeckia hirta L. var. *pulcherrima* Farw., black-eyed Susan (352, 497, 500, 873)
Solidago canadensis L., Canada goldenrod (photo)
*Sympyrtium flexicaulis* L., zigzag goldenrod (988)
S. gigantea Aiton, giant goldenrod (128, 321, 1072, 1073)
Sonchus arvensis L. ssp. *arvensis*, field sow-thistle (414, 924)
S. pilosum (Willd.) G. L. Nesom var. *pringlei* (A. Gray) G. L. Nesom, frost aster (249, 1007)
S. puniceum (L.) A. Löve & D. Löve, purple-stemmed aster (1005, 1069, 1074, 1080)
*Tanacetum vulgare* L., common tansy (176, 335, 348, 418)
*Taraxacum officinale* F. H. Wiggers, common dandelion (601)

**BALSAMINACEAE** (Touch-me-not, Jewelweed Family)
*Impatiens capensis* Meerb., orange jewelweed (188, 403, 445)

**BERBERIDACEAE** (Barberry Family)
*Berberis thunbergii* DC, Japanese barberry (243)
*Caulophyllum thalictroides* (L.) Michx., blue cohosh (952)

**BETULACEAE** (Birch Family)
*Alnus incana* (L.) Moench ssp. *rugosa* (Du Roi) R.T.Clausen, speckled alder (97)
*A. viridis* (Vill.) DC. ssp. *crispa* (Aiton) Turrill, green alder (Photo)
Betula alleghaniensis Britton, yellow birch (98)
B. papyrifera Marshall, white birch (99, 248, 331, 695)
Corylus cornuta Marshall ssp. cornuta, beaked hazelnut (100, 101)
Ostrya virginiana (Mill.) K.Koch, ironwood (423, 424, 485, 784)

BORAGINACEAE (Borage Family)
Cynoglossum boreale Fernald., northern wild comfrey (191, 269, 701, 768)
*Myosotis scorpioides L., common forget-me-not (953, 1050)

BRASSICACEAE (Mustard Family)
*Barbarea vulgaris R.Br., yellow-rocket (315, 733)
Cardamine pensylvanica Muhl. ex Willd., Pennsylvania bittercress (609, 638, 757)
Rorippa palustris (L.) Besser., common yellow cress (726, 901)

CALLITRICHACEAE (Water-Starwort Family)
Callitriche palustris L., common water starwort (460)

CAMPANULACEAE (Bellflower, Bluebell Family)
Campanula aparinoides Pursh, marsh bellflower (354, 681)

CANNABACEAE (Hemp Family)
Humulus lupulus L. var. lupuloides E. Small, common hop (210, 475)

CAPRIFOLIACEAE (Honeysuckle Family)
Dierama palustre Mill., northern bush-honeysuckle (80, 871)
Linnaea borealis L. ssp. americana (Forbes) Hultén ex R. T. Clausen, twinflower (81, 151, 808)
Lonicera canadensis W.Bartram ex Marshall, American fly honeysuckle (794, 818, 834)
L. dioica L., red honeysuckle (428)
L. hirsuta Eaton, hairy honeysuckle (458, 699)
Sambucus canadensis L. var. canadensis, American elderberry (257, 711)
Viburnum lentago L., nannyberry (3, 23, 314, 982)
V. opulus L. ssp. trilobum (Marshall) R. T. Clausen, American cranberry-bush (24, 129)
V. rafinesquianum Schult., arrow-wood (25, 492, 520)

CARYOPHYLLACEAE (Pink Family)
*Cerastium fontanum Baung. ssp. vulgare (Hartm.) Greuter & Burdet, common chickweed (102, 103)
*Dianthus armeria L., Deptford pink (1107)
*Silene noctiflora L., night flowering catchfly (259)
*Stellaria graminea L., common stitchwort (photo)

CONVOLVULACEAE (Morning-glory Family)
Calystegia sepium (L.) R.Br., hedge bindweed (258)

CORNACEAE (Dogwood Family)
Cornus canadensis L., bunchberry (148, 542, 565, 660)
C. racemosa Lam., gray dogwood (38, 228, 944)
C. rugosa Lam., round-leaved dogwood (5, 256, 318)
C. stolonifera Michx., red osier dogwood (39, 40, 478, 802)

CUCURBITACEAE (Cucumber, Gourd Family)
Echinocystis lobata (Michx.) Torr. & A. Gray, wild cucumber (526, 976)

ELAEAGNACEAE (Oleaster Family)
Shepherdia canadensis (L.) Nutt., russet buffaloberry (82, 124, 522, 833)

ERICACEAE (Heath Family)
Arctostaphylos uva-ursi (L.) Spreng., bearberry (139)
Gaultheria procumbens L., wintergreen (252, 450)
Vaccinium angustifolium Aiton, early low blueberry (104, 452, 456, 547)
V. myrtilloides Michx., Canada blueberry (235)
FABACEAE (Pea Family)

Amphicarpaea bracteata (L.) Fernald, hog-peanut (207, 462)
*Coronilla varia L., crown-vetch (317, 367, 879)
Desmodium canadense (L.) DC., Canada tick-trefoil (329)
Lathyrus ochroleucus Hook., cream pea-vetch (388, 390, 595, 659)
L. venosus Muhl. ex Willd., forest pea (391)
*Lotus corniculata L., bird’s-foot trefoil (157, 381, 464)
*Medicago sativa L., alfalfa (524)
*Melilotus alba Medik., white sweet-clover (165, 878)
*Trifolium arvense L., rabbit-foot clover (966)
*T. aureum Pollich, golden clover (977)
*T. hybridum L., alsike clover (528, 529)
*T. pratense L., red clover (502, 545)
*T. repens L., white clover (178)

Vicia americana Muhl. ex Willd. ssp. americana, American vetch (384, 686, 706, 835)

FAGACEAE (Beech Family)

Quercus ellipsoidalis E. J. Hill, northern pin oak (299, 641, 853)
Q. macrocarpa Michx., bur oak (127, 296, 297)
Q. rubra L., northern red oak (295, 298, 703, 961)
Q. x bebbiana C.K. Schneid., Bebb’s oak (770, 1009, 1041)

FUMARIACEAE (Bleeding-heart, Fumitory Family)

Corydalis aurea Willd. ssp. aurea, goldencorydalis (836)

GENTIANACEAE (Gentian Family)

Halenia deflexa (Sm.) Griseb. ssp. deflexa, American spurred-gentian (109)

GERANIACEAE (Geranium Family)

Geranium bicknellii Britton var. bicknellii, Bicknell’s cranebill (307)
G. maculatum L., wild geranium (1123)

GROSSULARIACEAE (Gooseberry Family)

Ribes americanum Mill., American black currant (582, 708, 744, 848)
R. cynosbati L., eastern prickly gooseberry (153, 640, 738)
R. hirtellum Michx., hairy-stem gooseberry (231, 682, 771)
R. lacustre (Pers.) Poir., bristly black current (934)
R. triste Pall., swamp red currant (429, 870, 927, 1119)

HYPERICACEAE (St. John’s Wort Family)

*Hypericum perforatum L., common St. John’s wort (404, 506, 866)
H. pyramidalatum Aiton., giant St. John’s wort (635, 915)

LAMIACEAE (Mint Family)

*Galeopsis tetrahit L. var. bifida (Boenn.) Lej. & Courtois, hemp-nettle (537)
Lycopus americanus Muhl. ex W.P.C.Barton, American water-horehound (120, 219, 349, 978)
L. uniflorus Michx., northern bugleweed (208)
Mentha arvensis L. var. canadensis (L.) Kuntze, field mint (209, 327, 479, 929)
Prunella vulgaris L. ssp. lanceolata (W. P. C. Barton) Hullén, heal-all (77, 587)
Scutellaria galericulata L., common skullcap (468, 476)
S. lateriflora L., blue skullcap (720, 721)
Stachys palustris L., marsh hedge-nettle (330, 519, 874, 1051)
S. tenifolia Willd. var. tenifolia, narrow-leaved hedge nettle (167)

LYTHRACEAE (Loosestrife Family)

*Lythrum salicaria L., purple loosestrife (564)

MOLLUGINACEAE (Carpetweed Family)

*Mollugo verticillata L., carpetweed (325)

MONOTROPACEAE (Indian-pipe Family)

Monotropa uniflora L., Indian-pipe (photo)
OLEACEAE (Olive Family)

*Fraxinus americana* L., white ash (1120)
*F. nigra* Marshall, black ash (512)
*F. pennsylvanica* Marshall, green ash (78, 332, 600, 739)

ONAGRACEAE (Evening-primrose Family)

*Circaea alpina* L. ssp. *alpina*, alpine enchanter’s-nightshade (168, 366, 449, 906)
*C. lutetiana* L. ssp. *canadensis* (L.) Asch. & Magnus (270, 271, 950)
*Epilobium angustifolium* L. ssp. *circumvagum* Mosquin, fireweed (406)
*E. ciliatum* Raf. ssp. *ciliatum*, American willow herb (454)
*Oenothera biennis* L., common evening-primrose (134, 135, 718, 925)
*O. villosa* Thunb., hairy evening-primrose (211)

OXALIDACEAE (Wood-sorrel Family)

*Oxalis dillenii* Jacq., southern yellow wood-sorrel (240, 260, 567, 958)
*O. stricta* L., tall wood-sorrel (photo)

PAPAVERACEAE (Poppy Family)

*Sanguinaria canadensis* L., bloodroot (159, 689, 843)

PLANTAGINACEAE (Plantain Family)

*Plantago major* L., common plantain (341, 394, 911)

POLYGONACEAE (Smartweed Family)

*Fallopia cilinodis* (Michx.) Holub., black-fringed bindweed (891)
*F. convolvulus* (L.) A. Löve, false buckwheat (photo)
*F. scandens* (L.) Holub., climbing false buckwheat (482)
*Persicaria hydropiper* (L.) Spach, marsh-pepper knotweed (572, 590, 998)
*P. lapathifolia* (L.) Gray, curly-top knotweed (582, 645, 999, 1000)
*P. pensylvanica* (L.) M. Gomez, Pennsylvania knotweed (577, 997, 1002)
*P. punctata* (Elliott) Small, dotted smartweed (439, 573, 727)
*P. sagittata* (L.) H. Gross, arrow-leaved tear-thumb (112, 575, 932, 1001)
*Rumex crispus* L., curly dock (322)
*R. orbiculatus* A. Gray, great water dock (364)

PRIMULACEAE (Primrose Family)

*Lysimachia ciliata* L., fringed loosestrife (130, 365, 405, 598)
*L. terrestris* (L.) Britton, Sterns, & Poggenb., swamp-candles (32, 472, 761, 881)

PYROLACEAE (Shin-leaf Family)

*Pyrola asarifolia* Michx. ssp. *asarifolia*, pink shin-leaf (196, 584)
*P. elliptica* Nutt., elliptic shin-leaf (105, 302, 420, 585)
*P. rotundifolia* L. ssp. *americana* (Sweet) R. T. Clausen, round-leaved shin-leaf (786)

RANUNCULACEAE (Buttercup Family)

*Actaea rubra* (Aiton) Willd., red baneberry (444, 463, 544, 650)
*Anemone americana* (DC.) H. Hara, round-lobed hepatica (192, 201, 687)
*A. canadensis* L., Canada anemone (766, 796)
*A. quinquefolia* var. *quinquefolia*, wood anemone (94, 339, 620, 723)
*A. virginiana* L., tall anemone (14, 504, 505, 541)
*Aquilegia canadensis* L., Canadian columbine (251, 576, 693)
*Caltha palustris* L., marsh-marigold (614, 667)
*Clematis occidentalis* (Hornem.) DC. var. *occidentalis*, purple clematis (710, 760)
*C. virginiana* L., virgin’s-bower (518, 862, 991)
*Ranunculus abortivus* L., little-leaf buttercup (652, 838)
*R. hispidus* Michx., bristly buttercup (96, 729, 746)
*R. hispidus* Michx. var. *caricetorum* (Greene) T. Duncan, bristly buttercup (246, 254, 867)
R. hispidus Michx. var. hispidus, bristly buttercup (793)
R. hispidus Michx. var. nitisus (Chapm.) T.Duncan, bristly buttercup (245, 247, 902)
R. pensylvanicus L.f., Pennsylvania buttercup (717, 724, 872)
R. recurvatus Poir. var. recurvatus, hooked buttercup (631, 775, 840, 912)
R. sceleratus L., celery leaf buttercup (672, 839, 955, 956)
Thalictrum dasycarpum Fisch. & Avé-Lall., tall meadow-rue (116, 569, 747)
T. dioicum L., early meadow-rue (440, 728, 762, 868)

Rhamnaceae (Buckthorn Family)
* Rhamnus cathartica L., common buckthorn (842, 962, 964)

Rosaceae (Rose Family)
Agrimonia gryposepala Wallr., common agrimony (33, 200, 336)
Amelanchier arborea (F. Michx.) Fernald., downy juneberry (546, 625, 627)
A. interior Nielsen, inland juneberry (311, 566)
A. laevis Wiegand, Allegheny serviceberry (190, 626)
A. sanguinea (Pursh) DC. var. sanguinea, New England serviceberry (125, 312, 503, 562)
A. spicata (Lam.) K. Koch, dwarf serviceberry (1117)
Conium palustre L., marsh cinquefoil (216)
Crataegus chrysocarpa Ashe, fireberry hawthorn (510)
C. succulenta Schrad. ex Link, fleshy hawthorn (568)
C. sp., hawthorn (737, 783)
Fragaria vesca L. ssp. americana (Porter) Staudt, woodland strawberry (523)
F. virginiana Duchesne, wild strawberry (26, 480)
Geum aleppicum Jacq., yellow avens (126, 181, 313, 643)
G. canadense Jacq., white avens (909, 960)
G. macrophyllum Willd., big leaved avens (309, 606)
Potentilla norvegica L., Norwegian cinquefoil (27, 769)
Prunus americana Marshall, American plum (623, 624)
P. pensylvanica L., pin cherry (628, 629, 674, 675)
P. virginiana L., var. virginiana, chokecherry (226, 227)
Rosa acicularis Lindl. ssp. sayi (Schwein.) W. H. Lewis, bristly rose (1, 457, 644, 807)
R. blandula Aiton, smooth rose (459, 916)
Rubus allegheniensis Porter ex L. H. Bailey, common blackberry (34, 340, 511)
R. idaeus L. var. strigosus (Michx.) Maxim., red raspberry (35, 119, 303)
R. parviflorus Nutt., thimbleberry (36, 337, 466)
R. pubescens Raf., dwarf red raspberry (37, 539, 984)
*Sorbus aucuparia L., Eurasian mountain ash (241)
Spiraea alba Du Roi var. alba, white meadowsweet (144, 431, 917)
Waldsteinia fragarioides (Michx.) Tratt. ssp. fragarioides, barren strawberry (613, 662)

Rubiacaeae (Bedstraw, Madder Family)
Galium asprellum Michx., rough bedstraw (748, 940, 980, 981)
G. labradoricum (Wiegand) Wiegand, Labrador marsh bedstraw (508)
G. tinctorum L., southern three-lobed bedstraw (507)
G. trifidum L. ssp. trifidum, northern three-lobed bedstraw (719)
G. triflorum Michx., fragrant bedstraw (122, 571, 694, 876)
Mitchella repens L., partridgeberry (402)

Salicaceae (Willow Family)
Populus balsamifera L. ssp. balsamifera, balsam poplar (408, 684)
P. grandidentata Michx., big-tooth aspen (432, 819)
P. tremuloides Michx., quaking aspen (4)
Salix bebbiana Sarg., beaked willow (622)
S. discolor Muhl., pussy willow (632, 809, 810, 1016)
S. eriocephala Michx., diamond willow (1026, 1027)
S. exigua Nutt. ssp. interior (Rowlee) Cronquist, sandbar willow (177, 1029, 1030, 1040)
S. humilis Marshall, upland willow (1033, 1034, 1035, 1036)
S. lucida Muhl. ssp. lucida, shining willow (631, 736, 1025)
S. petiolaris Sm., meadow willow (1012, 1013, 1015, 1031)
* S. x rubens Schrank (pro sp.), hybrid crack willow (415, 530, 531)

SAXIFRAGACEAE (Saxifrage Family)
Penthorum sedoides L., ditch stonecrop (250, 889, 970, 969)
Saxifraga pensylvanica L., eastern swamp saxifrage (474, 679)

SCROPHULARIACEAE (Figwort, Snapdragon Family)
Chelone glabra L., turtlehead (photo)
Melampyrum lineare Desr., narrow-leaved cow-wheat (185)
Mimulus ringens L. var. ringens, monkey-flower (142, 434, 983)
Pedicularis lanceolata Michx., swamp betony (106, 824)
Scrophularia lanceolata Pursh, American figwort (237, 238, 239)
* Verbasca thapsus L., common mullein (324)
* Veronica serpyllifolia L., thyme-leaved speedwell (734, 735)

SOLANACEAE (Nightshade Family)
Solanum dulcamara L., bittersweet nightshade (141, 515)

TILIACEAE (Linden Family)
Tilia americana L. var. americana, American basswood (436)

ULMACEAE (Elm Family)
Ulmus americana L., American elm (749, 785)

URTICACEAE (Nettle Family)
Laportea canadensis (L.) Wedd., Canadian wood-nettle (photo)
Pilea pumila (L.) A.Gray, Canadian clearweed (1126)
Urtica dioica L. ssp. gracilis (Aiton) Selander, stinging nettle (1124)

VALERIANACEAE (Valerian Family)
* Valeriana officinalis L., garden valerian (9, 28, 173, 481)

VERBENACEAE (Vervain Family)
Verbena hastata L., blue vervain (154, 435)

VIOLACEAE (Violet Family)
Viola cucullata Aiton, blue marsh violet (553, 579, 581)
V. labradorica Schrank, dog violet (7, 554, 612, 653)
V. novae-angliae House, New England blue violet (822)
V. pubescens Aiton, downy yellow violet (12, 333, 570, 656)
V. sororia Willd., door-yard violet (580, 605, 670, 963)

VITACEAE (Grape Family)
Parthenocissus quinquefolia (L.) Planch., Virginia creeper (437, 722)
P. vitacea (Knerr) Hitchc., grape woodbine (204)

MONOCOTYLEDONS

ALISMATACEAE (Water-plantain Family)
Alisma subcordatum Raf., common water plantain (113, 908)
A. triviale Pursh, northern water plantain (17, 202, 596)
Saussurira latifolia Willd., broad-leaved arrowhead (221, 634, 904)

ARACEAE (Arum Family)
Arisaema triphyllum (L.) Schott. ssp. triphyllum, jack-in-the-pulpit (446, 615)
Calla palustris L., water-arum (469)

CYPERACEAE (Sedge Family)
Carex aquatilis Wahlenb., water sedge (287)
C. arctica Boott ex Hook., drooping wood sedge (800, 812, 813)
C. bebbii (L. H. Bailey) Olney ex Fernald, Bebb’s sedge (897)
C. brunnescens (Pers.) Poir. ssp. sphaerostachya (Tuck.) Kalela, brownish sedge (294)
C. castanea Wahlenb., chestnut sedge (285, 286, 690, 945)
C. crawfordii Fernald, Crawford’s sedge (774, 1114)
C. crinita Lam. var. crinita, fringed sedge (283, 473, 893)
C. debilis Michx. var. rudgei L. H. Bailey, northern weak sedge (282)
C. deflexa Hornem. var. deflexa, northern oak sedge (666)
C. deweyana Schwein. var. deweyana, Dewey’s sedge (610, 754)
C. gracililima Schwein., graceful sedge (281, 292, 755, 795)
C. intumescent Rudge, greater bladder sedge (279, 280, 345)
C. laevisus Willd., common lake sedge (777, 933)
C. merritt-fernaldii Mack., Fernald’s sedge (943)
C. ornostachya Wiegand, necklace-spikesedge (1118)
C. pedunculata Munl. ex Willd., long stalked sedge (611)
C. projecta Mack., loose-headed oval sedge (646, 928, 931, 939, 1115)
C. radiata (Wahlenb.) Schott, eastern star sedge (859)
C. retrorsa Schwein., deflexed bottlebrush sedge (346, 357, 369, 886, 992)
C. stipata Munl. ex Willd. var. stipata, common fox sedge (289, 290, 291, 791, 936)
C. tona (Fernald) E. P. Bicknell, shaved sedge (805)
C. vesicaria L., bluster sedge (374, 772, 930)
C. vulpinoidea Michx., brown fox sedge (514)
Eleocharis obtusa (Willd.) Schult., blunt spike rush (557, 883, 888)
E. ovata (Roth) Roem. & Schult., oval spike rush (344, 558)
E. palustris (L.) Roem. & Schult., common spike rush (556)
Schoenoplectus pungens (Vahl) Palla, chair-maker’s rush (790)
S. tabernaemontani (C. C. Gmel) Palla, great bulrush (380, 789)
Scirpus atroacutus Fernald., black-girdled wool-grass (788)
S. atrovirens Willd., black bulrush (967, 974)
S. cypersinus (L.) Kunth., wool-grass (358, 488)
S. georgianus R. M. Harper, Georgia bulrush (594)
S. hattorianus Makino, early dark green bulrush (633)
S. microcarpus J. Presl & C. Presl, panicked bulrush (121, 375)

IRIDACEAE (Iris Family)
Iris versicolor L., northern blue flag (187, 360, 490)

JUNCACEAE (Rush Family)
Juncus brevicaudatus (Engelm.) Fernald, narrow-panicle rush (1113)
J. effusus L., common rush (376)
J. nodosus L., joint rush (377, 885)
J. vasey Engelm., Vasey’s rush (1128)
Lacana acuminata Raf. var. acuminata, hairy wood rush (616, 654)
L. multilora (Ehrh.) Lej. ssp. multilora, common wood rush (409, 823)

LEMNACEAE (Duckweed Family)
Lemma minor L. common duckweed (212)

LILIACEAE (Lily Family)
*Asparagus officinalis L., asparagus (156, 264)
Clintonia borealis (Aitont) Raf., yellow blue-bead-lily (170, 206, 467)
*Convallaria majalis L. var. majalis, lily-of-the-valley (841)
Erythronium americanum Ker Gawl. ssp. americanum, yellow trout lily (673)
Lilium michiganense Farw., Michigan lily (593, 884, 971)
Maianthemum canadense Desf., wild lily-of-the-valley (15, 199, 213, 538)
M. racemosum (L.) Link ssp. racemosum, false Solomon’s-seal (636)
M. trifolium (L.) Sloboda, false mayflower (198, 680)
Polygonatum biflorum (Walter) Elliott, king Solomon’s-seal (416)
P. pubescens (Willd.) Pursh., downy Solomon’s-seal (110, 421, 602)
Spreitopus lanceolatus (Aitont) Rev., rosy twisted-stalk (661, 664, 831)
Trillium cernuum L., nodding trillium (8, 83, 342, 657)
Uvularia grandiflora Sm., large-flowered bellwort (11, 184, 410, 413)
**U. sessilifolia** L., sessile bellwort (603, 637, 671)

**ORCHIDACEAE** (Orchid Family)

*Cypripedium parviflorum* Salisb. var. *makasin* (Farw.) Sheviak, small yellow lady’s-slipper (photo)

*Platanthera psycodes* (L.) Lindl., lesser purple fringed orchid (465)

**POACEAE** (Grass Family)

*Agrostis gigantea* Roth, redtop (1086)

*Alopecurus aequalis* Sobol., short-awned foxtail (913)

*Brachyelytrum aristosum* (Michx.) Trel., bearded shorthusk (1096)

*B. erectum* (Schreb. ex Spreng.) P. Beauv., long-awned wood grass (1097)

*Bromus ciliatus* L., fringed brome (16, 115, 343, 1101)

*Calamagrostis canadensis* (Michx.) P. Beauv., blue-joint grass (18)

*Dactylis glomerata* L., orchardgrass (826)

*Danthonia spicata* (L.) P. Beauv. ex Roem. & Schult., poverty oat grass (877)

*Dichanthelium acuminatum* (Sw.) Gould & C. A. Clark, hairy panic grass (801)

*Echinochloa muricata* (P. Beauv.) Fernald var. *muricata*, barnyard grass (1102)

*Elymus hystrix* L. var. *hystrix*, bottlebrush grass (412, 470, 894)

*E. virginicus* L. var. *virginicus*, Virginia wild-rye (1094)

*Festuca trachyphylla* (Hack.) Krajina, hard fescue (817)

*Glyceria canadensis* (Michx.) Trin., rattlesnake manna grass (1081)

*G. grandis* S. Watson, American manna grass (910, 1104, 1111)

*G. striata* (Lam.) Hitchc., fowl manna grass (1090, 1105)

*Leersia oryzoides* (L.) Sw., rice cut grass (1001)

*Milius effusum* L., American millet grass (1099)

*Oryzopsis asperifolia* Michx., rough-leaved rice grass (617, 663, 688, 1098)

*O. pungens* (Torr. ex Spreng.) Hitchc., mountain rice grass (804)

*Panicum capillare* L. ssp. *capillare*, common witch grass (1103)

*Phalaris arundinacea* L., reed canary grass (899, 1083, 1087, 1093)

*Phleum pratense* L. ssp. *pratense*, Timothy (419, 764)

*Phragmites australis* (Cav.) Trin. ex Steud., common reed (900, 1088, 1089, 1091)

*Poa annua* L., annual bluegrass (1110)

*P. compressa* L., Canada bluegrass (1109)

*P. palustris* L., marsh bluegrass (880, 1095, 1108, 1112)

*P. pratensis* L., Kentucky bluegrass (8, 106, 161)

*Spartina pectinata* Link., prairie cord grass (1085)

**SMILACACEAE** (Cat-brier Family)

*Smilax ecrirhata* S. Watson, upright carrion flower (438, 548, 776, 863)

*S. tamnoides* L., bristly greenbrier (146, 174)

**SPARGANIACEAE** (Bur-reed Family)

*Sparganium angustifolium* Michx., narrow-leaved bur-reed (1131)

*S. emersum* Rehmann, narrow-leaved bur-reed (1116)

*S. eurycarpum* Englm., giant bur-reed (111)

**TYPOFACIACEAE** (Cat-tail Family)

*Typha angustifolia* L., narrow-leaved cat-tail (842)

*T. latifolia* L., broad-leaved cat-tail (166, 395, 396)