

Floristic Quality Assessment and Monitoring of Brown Bridge Quiet Area Wetlands



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Cover photos by Phyllis J. Higman, 2012- 2013. Clockwise from left to right: Brown Bridge Pond, Brown Bridge Dam, The Boardman River Coursing through the Brown Bridge Quiet Area after Dam Removal, and Newly Exposed Bottomlands at Brown Bridge Quiet Area after Dam Removal.

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Introduction

The Brown Bridge dam was constructed on the Boardman River in 1921 for producing hydropower, creating the 191 acre Brown Bridge pond, approximately 12 miles southeast of Traverse City (Figures 1 and 2). In 2004, it was determined that it was no longer economically feasible to use the dam for hydropower, and it was decommissioned in 2006. Subsequently, the aging structure became a safety hazard, requiring several water drawdowns and spurring consideration of alternatives for the dam, including removal and restoration of the original cold water river.

Environmental studies were undertaken to assess potential impacts from dam removal, including consequences for existing wetlands in

the immediate vicinity of the dam and reservoir (A-D, Figure 3), and the likelihood of the spread of invasive plants. These studies concluded that wetlands A and B would be largely sustained by groundwater discharge, while 60% of wetland C and all of wetland D would be converted to non-wetland (USFWS 2011). This would result in an anticipated loss of 61.1 acres of wetland to be offset by the expected development of 74 acres of wetland on newly exposed bottomlands after the drawdown of the reservoir. These newly exposed soils, however, would be extremely vulnerable to invasion by non-native plants, including at least 12 highly invasive species that pose a significant threat to the restoration (USFWS 2011, Christensen and Beachy 2012).



Figure 1. Brown Bridge Dam.



Figure 2. Brown Bridge Pond.

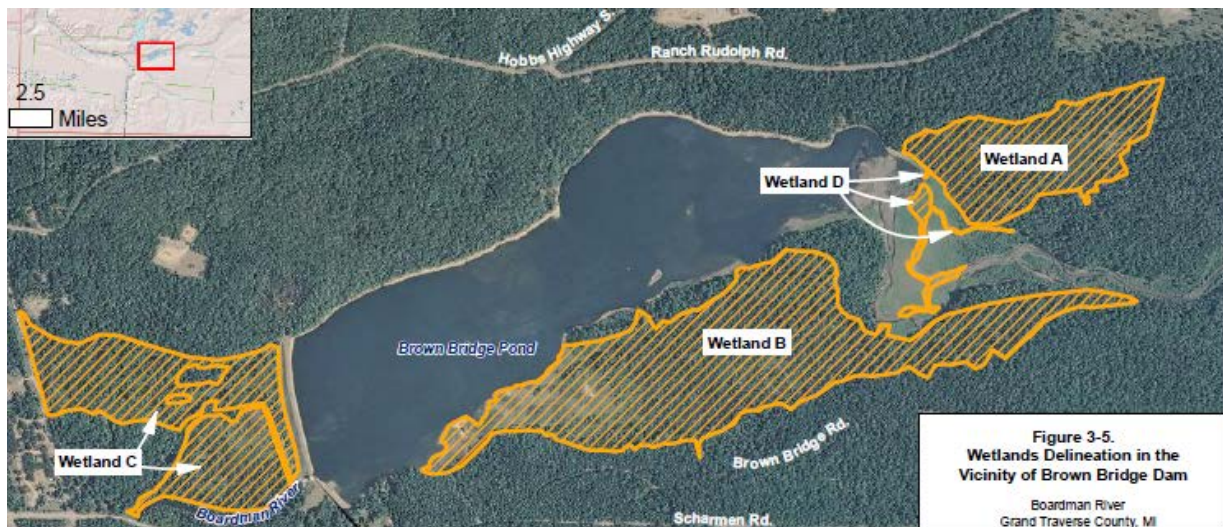


Figure 3. Brown Bridge wetlands documented in the draft Environmental Impact Statement (USFWS 2011).

The bottomlands have been a hotspot for invasive species establishment during the previous partial drawdowns. Twenty-six species were documented in Brown Bridge Quiet Area prior to dam removal (Table 1). Twelve of these are among the top twenty invasive plants for the region—those that land managers believe pose the biggest threat to high quality natural areas (Appendix A). Of highest concern were the sizeable infestations of reed canary grass, non-native phragmites, narrow-leaved cat-tail and Canada thistle found in the immediate vicinity of the reservoir. All four of these are particularly aggressive colonizers.

The commitment to minimize the spread of existing infestations and prevent new species from establishing in the restoration is strong. The creation of the regional Invasive Species

Network (ISN), led by the Grand Traverse Conservation District, resulted in comprehensive invasive plant surveys of the Brown Bridge Quiet Area. Infestations of all detected species were mapped and an invasive species management plan was developed (Christensen and Beachy 2012). Implementation of the plan was initiated prior to dam removal, including treatments for bull thistle, Canada thistle, reed canary grass and non-native phragmites. Follow-up treatments for these and several other species were implemented immediately after dam removal, according to a carefully planned schedule, and using best known treatment techniques for each targeted species.

The conservation community is poised to continue to detect and treat new or spreading infestations as the restoration progresses.

Table 1. Invasive plants documented at Brown Bridge by the GRCD prior to dam removal.

Common Name	Scientific Name	Common Name	Scientific Name
autumn olive*	<i>Elaeagnus umbellata</i>	leafy spurge	<i>Euphorbia esula</i>
black locust	<i>Robinia pseudoacacia</i>	lily-of-the-valley	<i>Convallaria majalis</i>
bladder campion	<i>Silene vulgaris (cucubalis)</i>	motherwort	<i>Leonurus cardiaca</i>
bull thistle	<i>Cirsium vulgare</i>	narrow-leaved cat-tail	<i>Typha angustifolia</i>
Canada thistle	<i>Cirsium arvense</i>	periwinkle (myrtle)	<i>Vinca minor</i>
common mullein	<i>Verbascum thapsis</i>	phragmites (non-native)	<i>Phragmites australis**</i>
common St. john's-wort	<i>Hypericum perforatum</i>	purple loosestrife	<i>Lythrum salicaria</i>
crown vetch	<i>Coronilla varia</i>	reed canary grass	<i>Phalaris arundinacea</i>
European swamp thistle	<i>Cirsium palustre</i>	spotted knapweed	<i>Centaurea maculosa</i>
forget-me-not	<i>Myosotis sylvatica</i>	sweet woodruff	<i>Galium odoratum</i>
garlic mustard	<i>Alliaria petiolata</i>	white sweet clover	<i>Melilotus alba</i>
honeysuckles (nonnative)	<i>Lonicera spp.</i>	wild parsnip	<i>Pastinaca sativa</i>
hybrid cat-tail	<i>Typha Xglauca</i>	yellow sweet clover	<i>Melilotus officinalis</i>

*bolded species are among the top twenty invasive species for the region ** subsp. australis

The partial drawdowns prior to the dam removal resulted in an explosion of native species on the exposed bottomlands as well. This, in conjunction with the proactive invasive species planning, created a sense of excitement about how the newly exposed lands would evolve over time, ultimately leading to the conceptualization of the current project. This study was undertaken to establish baseline vegetation data for the wetlands prior to dam removal (Figure 3) and baseline vegetation data on the newly exposed bottomlands immediately following dam removal.

These data will provide a benchmark for comparison to future years as the restoration progresses. Repeated monitoring will provide an opportunity to detect changes in floristic composition and quality, predicted losses in wetland C below the dam, and the arrival of new invasive species of concern or expansion of known infestations, so they can be treated quickly and efficiently. It will also provide data to add to the growing body of ecological work relating to dam removals across the country.

Methods

Floristic Assessment

Plant inventories were conducted by meander surveys throughout wetlands A-D and newly exposed bottomlands (Figure 3), in August 2012, May 2013, July 2013 and September 2013. Surveyors meandered the sites, deliberately exploring the diversity and extent of microhabitats to maximize the number of species observed. Species were recorded separately for open wetlands and forested wetlands (including shrub thicket). Species that could not be determined in the field were collected and keyed out later or identified with the help of other botanical experts. The documented species were entered into the

Floristic Quality Assessment for Michigan (Herman et al. 2001) and the mean coefficient of conservatism (C), floristic quality index (FQI) and coefficient of wetness (W) were calculated with and without non-native species for forested wetlands, open wetlands and forested and open wetlands combined.

Nomenclature for the FQA follows Herman et al. (2001), however, because of significant, recent changes in taxonomy, a summary of updated nomenclature is provided in Appendix B (Voss and Reznicek 2012) for ease of comparison. An update of the FQA program is in progress, but is not yet complete.

Point-line Intercept Sampling

Five sample areas were identified in the riparian area south of the river, representing different segments of the river and significant features of the restoration: 1) west floodplain--newly exposed bottomland just above the dam, 2) previously exposed floodplain--from the

previous partial drawdowns, 3) mid-floodplain--newly exposed bottomland, 4) a small fen--previously exposed by the partial drawdowns, and 5) east floodplain--newly exposed bottomland at the eastern extreme of the Brown Bridge Pond (Figure 4).

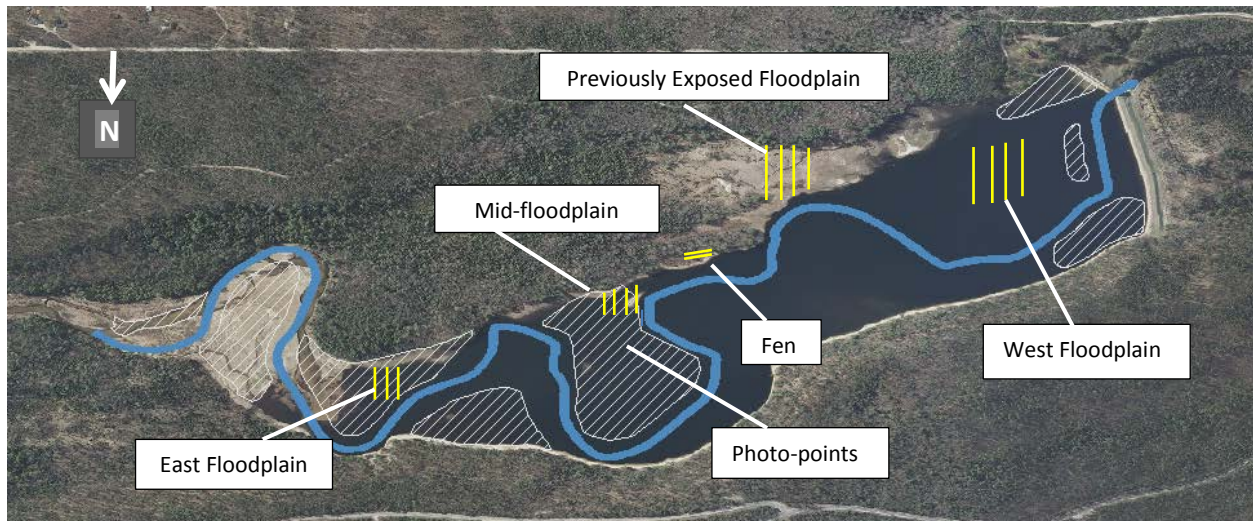


Figure 4. Location of transects used to determine relative cover of plant species.

Macroplots were defined in each sample area and transect lines were placed systematically from a random starting point along the south baseline of each, running northward (Figure 4). Point intercept samples were taken every three feet along each transect by recording every species that intercepted the

transect line. The number of hits was tallied for each species and their relative percent cover calculated within each sample area. The number and length of transects varied by sample area according to the size and variation of each zone, ease of sampling and available sample time. Start and end points of each transect were

marked by wooden garden stakes and reference photos were taken for relocating transects in future years (Appendix C). GPS points were also captured for each start and end point and will be provided to the GTCD as a separate shape file. Detailed accounts of this sample method can be found in (Elzinga et al. 2001).

Sampling was limited in the mid-floodplain zone due to time constraints. As an alternative, landscape reference photos were captured from east to west (Appendix C). These photos and those captured for start and end-points of the transect lines can be used for qualitative assessment of vegetation change over time.

Results

Floristic Quality Assessment

One hundred and ninety-three species were documented in the forested component of the Brown Bridge wetlands (Table 2, and Appendix D). Seventeen species were non-native (adventive), four of which are in the region's top twenty invasive plants, posing the greatest risk to high quality natural areas. The mean C for native species alone was 4.4 and dropped to 4.1 when native and non-native species were combined. The native FQI was 58.3 and declined to 56.1 with non-native species combined. The native mean W was -2.2 (FACW-) and changed only slightly to -2 (FACW-) when combined with non-native species.

A total of 188 species were documented in the open wetlands surrounding the restored river channel, including previously exposed and newly exposed bottomlands (Table 2, Figure 4, and Appendix C). Fifty-seven were non-native, with nine of these among the top twenty. The native mean C was 3.6 and dropped a full point to 2.6 when combined with non-native species. The native FQI was 42.2 and declined

considerably to 36 when combined with non-native species. The native mean W was -3.1 (FACW-), and changed to -1.7 (FACW) when calculated for native and non-native species together.

Overall, 219 native species and 58 non-native species were documented in all of the targeted wetlands combined (Table 2, Figures 2, 3, and Appendix C). Table 3 lists all the non-native species documented during the wetland surveys, ten of which are in the top twenty invasive plants of highest regional concern. The overall mean native C was 4.2, falling to 3.3 when calculated together with non-native species. The native FQI for all wetlands combined was 62 and 55.5 with non-native species included. The native mean W was -2.4 (FACW-), dropping to -1.6 (FACW-) when non-native species were combined.

Table 2 summarizes these data and data from earlier surveys of the area conducted by Reese in 1992 (last column). Full species lists and FQA data from the current study are provided in Appendix D,

Table 2. Comparison of Floristic Quality Data from 1992 to 2013.

	Forested Wetlands	Open Wetlands	All Wetlands	All Wetlands*
Floristic Quality Data	2013	2013	2013	1992
Native Species	176	131	219	153
Adventive Species	17	57	58	9
Total Species	193	188	277	163
Native Mean C	4.4	3.6	4.2	4.6
Mean C w/ adventives	4.1	2.6	3.4	4.4
Native FQI	58.3	42.2	62.7	57.5
FQI w/ adventives	56.1	36	56.2	56.1
Native Mean W	-2.2	-3.1	-2.4	-2.2
Mean W w/ adventives	-2	-1.7	-1.6	-2.1
Average W	FACW-	FACW	FACW	FACW-

Table 3. All non-native species documented in the Brown Bridge Wetlands during 2012-2013.

Scientific Name	Common Name	Scientific Name	Common Name
<i>Abutilon theophrasti</i>	velvetleaf	<i>Melilotus officinalis</i>	yellow sweet clover
<i>Agrostis gigantea</i>	redtop	<i>Myosotis scorpioides</i>	forget me not
<i>Avena sativa</i>	oats	<i>Nasturtium officinale</i>	watercress
<i>Barbarea vulgaris</i>	yellow rocket	<i>Pastinaca sativa</i>	wild parsnip
<i>Berteroa incana</i>	hoary alyssum	<i>Phleum pratense</i>	timothy
<i>Brassica rapa</i>	field mustard	<i>Phragmites australis</i>**	phragmites
<i>Brassica kaber</i>	wild mustard	<i>Plantago lanceolata</i>	English plantain
<i>Cerastium fontanum</i>	mouse ear chickweed	<i>Plantago major</i>	common plantain
<i>Cirsium arvense</i>*	Canada thistle	<i>Poa compressa</i>	Canada bluegrass
<i>Cirsium vulgare</i>	bull thistle	<i>Poa pratensis</i>	Kentucky bluegrass
<i>Coronilla varia</i>	crown vetch	<i>Polygonum aviculare</i>	knotweed
<i>Crepis tectorum</i>	hawk's beard	<i>Polygonum convolvulus</i>	false buckwheat
<i>Daucus carota</i>	queen Anne's lace	<i>Polygonum persicaria</i>	lady's thumb
<i>Echinochloa crusgalli</i>	barnyard grass	<i>Prunella vulgaris</i>	lawn prunella
<i>Elaeagnus umbellata</i>	autumn olive	<i>Phalaris arundinacea</i>	reed canary grass
<i>Epilobium hirsutum</i>	great hairy willow herb	<i>Rumex crispus</i>	curly dock
<i>Epilobium parviflorum</i>	willow herb	<i>Rumex obtusifolius</i>	bitter dock
<i>Epipactis helleborine</i>	helleborine	<i>Saponaria officinalis</i>	bouncing bet
<i>Festuca arundinacea</i>	tall fescue	<i>Silene vulgaris</i>	bladder campion
<i>Galium odoratum</i>	sweet woodruff	<i>Sisymbrium irio</i>	London rocket
<i>Hieracium aurantiacum</i>	orange hawkweed	<i>Solanum dulcamara</i>	bittersweet nightshade
<i>Hieracium piloselloides</i>	glaucous king devil	<i>Sonchus asper</i>	prickly sow thistle
<i>Hypericum perforatum</i> *	common St. John's wort	<i>Taraxacum officinale</i>	common dandelion
<i>Hypochaeris radicata</i>	spotted cat's ear	<i>Tragopogon dubius</i>	goat's beard
<i>Lactuca serriola</i>	prickly lettuce	<i>Trifolium repens</i>	white clover
<i>Linaria vulgaris</i>	butter and eggs	<i>Typha angustifolia</i>	narrow leaved cattail
<i>Lolium perenne</i>	perennial rye grass	<i>Typha Xglauca</i>	hybrid cattail
<i>Lonicera tatarica</i>	tatarian honeysuckle	<i>Verbascum Thapsus</i>	common mullein
<i>Melilotus alba</i>	white sweet clover	<i>Veronica officinalis</i>	common speedwell

*bolded species are among the top twenty invasive species for the region ** subsp. australis

Point-line Intercept Sampling

Seventy-nine vascular plant species were documented during the point-line intercept sampling, including 63 native and 16 non-native species. Six other categories were also tallied including bare ground, moss, open water, stump, and zebra mussel shell (Appendix D). Table 5 shows the relative cover for all species that reached 1% cover or higher within any sample area. Within each sample area, only a few species had high cover values (>10%). In the east floodplain, witch grass, cut grass, and nodding bur marigold dominated. Cut grass and water horehound were most abundant in the mid-floodplain. Twig-rush, satin grass, tall

goldenrod and moss had the highest cover in the fen. Cut grass and a non-native willow-herb were most abundant in the previously exposed floodplain. Trembling aspen and cut grass, dominated in the west floodplain.

Only cut grass had greater than 10% cover in more than one sample area (15%, 36%, 20% and 19%), resulting in the highest combined cover value overall. Cut grass, however, was completely absent from the fen. Twig-rush was restricted the fen, dominating there at 52%—the highest cover value of any species in any sample area.

Of the 16 non-native species tallied in the sample areas, only five had cover values greater than 1%. Two of these, reed canary grass and narrow-leaved cat-tail, are in the top twenty invasive species of regional concern. They occurred in only two sample areas along a single

transect each, with fairly modest cover values of 7% and 8%. Fifty-five additional native and non-native species (Appendix D) were tallied at least once during sampling, but at very low values (0% to <1%) in all sample areas and thus are not shown in Table 5.

Table 4. Relative cover of species with 1% or higher cover in any sample area.

Species		East	Mid	Fen	Prev exposed	West
<i>AMARANTHUS ALBA</i>	tumbleweed	0%	1%	0%	0%	4%
<i>Bidens cernuus</i>	nodding bur marigold	11%	2%	0%	2%	9%
<i>Carex sp 1 (Site 2)</i>	sedge	0%	0%	2%	2%	4%
<i>Carex vulpinoidea</i>	fox-tail sedge	0%	4%	0%	5%	1%
<i>Cladium mariscoides</i>	twig-rush	0%	0%	52%	0%	0%
<i>EPILOBIUM PARVIFLORUM</i>	great hairy willow herb	0%	3%	0%	20%	1%
<i>Epilobium coloratum</i>	cinnamon willow herb	0%	4%	0%	1%	0%
<i>Erectites hieraciifolia</i>	pilewort	1%	7%	0%	2%	0%
<i>Eupatorium perfoliatum</i>	Joe-pye weed	0%	4%	0%	2%	0%
<i>Juncus dudleyi</i>	Dudley's rush	0%	1%	0%	0%	1%
<i>Juncus effusus</i>	soft stemmed rush	1%	1%	0%	1%	1%
<i>Leersia oryzoides</i>	cut grass	15%	36%	0%	27%	19%
<i>Lycopus americana</i>	common water horehound	1%	11%	0%	2%	0%
<i>Muhlenbergia mexicana</i>	leafy satin grass	2%	8%	20%	7%	0%
<i>Panicum capillare</i>	witch grass	27%	1%	0%	1%	1%
<i>PHALARIS ARUNDINACEA</i>	reed canary grass	6%	0%	0%	0%	0%
<i>Polygonum hydropiper</i>	water pepper	1%	0%	0%	2%	0%
<i>Polygonum lapathifolium</i>	nodding smartweed	9%	0%	0%	1%	1%
<i>POLYGONUM PERSICARIA</i>	lady's thumb	7%	0%	0%	0%	1%
<i>Populus tremuloides seedling</i>	trembling aspen	1%	1%	0%	3%	29%
<i>Rorippa palustris</i>	yellow cress	0%	2%	0%	0%	1%
<i>Salix eriocephala</i>	willow	0%	0%	2%	2%	3%
<i>Solidago altissima</i>	tall goldenrod	0%	2%	13%	5%	0%
<i>TYPHA ANGUSTIFOLIA</i>	narrow leaved cat-tail	0%	0%	0%	8%	2%
<i>Verbena hastata</i>	blue vervain	7%	8%	0%	0%	0%
Bare Ground	---	9%	1%	2%	2%	6%
Moss	---	0%	0%	11%	3%	0%
Stump	---	0%	0%	0%	1%	2%

Discussion

Floristic Quality Assessment

Forested Wetlands

The Brown Bridge forested wetlands harbor a high diversity of native species accounting for 91% of the total species documented and approximately 10% of Michigan's entire native flora. Thirteen species have a C value greater than or equal to eight, compared to the overall average of 6.5 for Michigan's native flora

(Herman et al. 1991). C values are a measure of a plant's fidelity to very specific natural habitat (conservatism), ranging from zero to ten, with high values indicating greater fidelity to natural habitat and low values indicate more general habitat requirements. The high native FQI for the forested wetlands (58.3) reflects both the species richness and number of conservative

species present. FQI's greater than 35 are generally believed to be of statewide significance (Herman et al. 1991). The total FQI, with non-native species included, is slightly lower at 56.1, but still higher than the benchmark of 35.

The native FQI for the forested wetlands differs by less than a point from that calculated in 1992 by Reese (Table 3) and the total FQIs are exactly the same, indicating that these wetlands remain relatively intact and diverse natural communities. While 23 additional species were documented in the current study, this is off-set by the number of additional non-native species that were also observed. The higher number of species documented in 2013 likely reflects the greater survey effort afforded by this project; in spring, summer and fall.

Reese documented only nine non-native species in 1992, including three invasive plants

of regional concern: reed canary grass, narrow-leaved cat-tail and hybrid cat-tail (Table 5). Three new invaders of regional significance were found in 2013, including European swamp thistle (*Cirsium palustre*), bull thistle (*Cirsium vulgare*) and non-native phragmites (*Phragmites australis* subsp. *australis*). Thus, although floristic quality remains high in wetlands overall, the threat of invasive species has increased substantially.

Surveys focused only on the wetlands and did not capture several upland species, such as spotted knapweed, common St. John's-wort, and leafy spurge. These species are present in the area (Christensen and Beachy 2012) and pose an additional threat, since changes in wetland acreage are expected. This is particularly significant for wetlands downstream of the dam (Figure 3), should the predicted 60% loss of wetlands (USFWS 2011) actually occur.

Table 5. Non-native species documented at Brown Bridge in 1992.

Common Name	Scientific Name	Common Name	Scientific Name
<i>Brassica kaber</i>	charlock	<i>Solanum dulcamara</i>	climbing nightshade
<i>Nasturtium officinale</i>	water-cress	<i>Taraxacum officinale</i>	Common dandelion
<i>Phleum pretense</i>	timothy	<i>Typha angustifolia</i>	narrow-leaved cat-tail
<i>Phalaris arundinacea</i>*	reed canary grass	<i>Typha Xglauca</i>	hybrid cat-tail
<i>Plantago major</i>	common plantain		

*bolded species are among the top twenty species for the region

The native mean coefficient of wetness (W) in the forested wetlands was -2.2 (FACW-), not differing substantially when non-native species are included (-2 (FACW-). These values are essentially equivalent to the values of -2.2 and -2.1 that were calculated by Reese in 1992. One of the goals of this study was to determine if predicted loss of wetlands downstream of the old dam actually occurs and whether it could be detected by recalculating mean W over time. Since the predicted wetland loss was high (60%), it is likely that the range of wetland species closer to obligate (OBL) wetland species

will decrease, resulting in a higher mean—a decrease in wetness—over time. Changes will also be observed qualitatively by surveyors, if such a significant loss occurs. It would be useful to acquire new aerial imagery in future years, which can be used to approximate and compare wetland boundaries as well. The most accurate assessment of change in wetland status, however, will be by conducting an on-ground delineation of wetland boundaries using a GPS, in conjunction with repeated Floristic Quality Assessments to detect changes in composition and physiognomy (growth forms).

Open wetlands

Native diversity was lower in the open wetlands, comprising 70% of the total species documented and approximately 7% of the entire Michigan flora. The number of non-native species was much higher at 57 species compared

to 17 in the forested wetlands, including four additional invasive species among the top twenty species of regional concern. This is reflected in the lower native and total mean C values of 3.6 and 2.6, and the much lower mean

and total FQI values of 42.5 and 36. This is not surprising since colonization by opportunistic species, including invasive species, is more common in open wetlands. These are generalist species that have correspondingly lower C values that drive down the total mean C and thus, the total FQI.

While these lower numbers do reflect real differences in the floristic composition of forested and open wetlands, the FQIs are not truly directly comparable. They represent different suites of ecosystems comprised of different suites and numbers of representative species, and therefore have different baseline FQIs. Direct comparisons are better made between similar systems, such as open wetlands pre and post-dam removal or forested wetlands, pre and post dam removal.

The open wetland native FQI of 42.5 is also higher than the benchmark of 35 for natural areas of statewide significance, reflecting the diversity and presence of conservative species at the site. Seven species have a C value of eight or higher, five of which are ranked with the highest possible C value of 10, indicating strict fidelity to natural habitat. Among the latter are a sedge (*Carex sterilis*), twig rush (*Cladium mariscoides*), and Kalm's lobelia (*Lobelia kalmia*), all of which are calciphiles, typical of fens and calcareous shores. These were

Combined wetlands

A total of 219 native plants were documented in all the sampled wetlands combined, representing 79% of the total species documented and 12% of the overall native Michigan flora. The mean native and total C were higher than either forested or open wetlands alone, as were the mean and total FQI. The native FQI of 62 reflects the combined total of 27 species with C-values greater than or equal to eight, and the total FQI reflects the combined total of 58 non-native species, including 11 which are among the top twenty of regional concern. While it is interesting to consider these values, particularly the very high native FQI, they too, are not directly comparable to either

documented in the fen sample area adjacent to the original Brown Bridge Pond as well in a sizeable opening within poor conifer swamp, south of the removed dam. Further exploration of these areas and particular attention to their fate post-restoration is warranted.

In addition to the four invasive plants noted above, all of the invasive species of high concern in the forested wetlands were also observed in the open wetlands. They were, however, better established and more abundant in the open wetlands prior to dam removal (Christensen and Beachy 2012), posing an even more immediate threat. Due to the aggressive and exemplary implementation of the invasive species plan, pre and post-dam removal, these invasive species have been markedly reduced. Maintaining this proactive effort will be critical in the coming years.

Several additional invasive species of high concern were documented that are not on the top twenty list. These include common St. John's-wort and sweet white and yellow clover. These aggressive species have high ecological impacts where they become established, and are already on the radar screen of the ISN. These and nearby infestations of spotted knapweed and leafy spurge will need to be addressed. Particular attention should be paid to areas directly downstream where wetlands may decrease.

the forested or open wetlands values alone because they represent different systems with different suites of representative species.

The earlier comparison of the forested wetland FQI to Reese's work in 1992 is, for the most part justifiable, because Brown Bridge pond was not drawn down and the extensive open wetlands on recently exposed bottomlands were absent at that time. His study included several pockets of emergent marsh and wet meadow; however, the vast majority of species encountered in these open wetlands occur in the forested wetlands as well. Thus, Reese was essentially sampling the same forested wetland ecosystems as are there today.

Point-line Intercept Sampling

The sampling data does not yet reveal any clear patterns, with the exception of several dominants emerging in each sample area along with a high diversity of additional species that are widely, but sparsely distributed (e.g., not clumped). There was also a general abundance of cut grass which is characteristic of early successional riparian zones (Auble et al. 2007, Orr and Koennig 2006, Orr and Stanley 2006, Shafroth et al. 2002). Other dominants largely differed for each sample area, indicating local patchiness.

Only twig rush and reed canary grass were found in only one sample area. It was not surprising that the twig rush (C=10) was restricted to the fen. However, the detection of reed canary grass in only one sample area was

surprising considering its abundance prior to dam-removal. The lack of detection of any other invasive species of regional concern, with the exception of narrow-leaved cat-tail, was also surprising. This may, in part, be a reflection of the sample areas chosen, but it also reflects the amount and type of sculpting required to create the restoration and the aggressive invasive species management that has occurred.

These initial data provide a benchmark for comparison to future years. Repeated monitoring will provide an opportunity to detect changes in vegetation over time and patterns will likely emerge. Qualitative changes will be apparent visually, while statistical comparisons and their power can be determined for quantitative assessments that are made.

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Appendix A

Grand Traverse Conservation District's Regional Invasive Species Network Top Twenty Least Wanted

TOP 20 LEAST WANTED

SHRUBS:

1. common buckthorn (*Rhamnus cathartica*)
glossy buckthorn (*Frangula alnus*)
2. honeysuckle(s)
(*Lonicera* spp.)*can also be a vine
3. Japanese barberry
(*Berberis thunbergii*)
4. multiflora rose
(*Rosa multiflora*)
5. Russian olive (*Elaeagnus angustifolia*)
autumn olive (*Elaeagnus umbellata*)



buckthorns



honeysuckles



autumn olive



J. barberry



Russian olive



multiflora rose

WOODY VINE:

6. oriental bittersweet
(*Celastrus orbiculatus*)



oriental bittersweet



lyme grass

ISN partners determined the Top 20 Least Wanted for northwestern lower Michigan based on their collective experience managing some of the region's most valued natural areas. The Top 20 represent the greatest invasive plant threats to the region, the management of which helps preserve the region's natural heritage for future generations to enjoy. Invasive species which did not make the Top 20 list should still be considered threatening; be a part of ISN's early detection efforts by reporting ALL sightings to <http://www.mtmiin.msu.edu/report>.

To learn more about ISN, the Top 20, and how you can get involved, visit <http://www.NatureisCalling.org>.

HERBACEOUS PLANTS:

7. baby's breath (*Gypsophila paniculata*)
8. bull thistle (*Cirsium vulgare*)
9. Canada thistle (*Cirsium arvense*)
10. dame's rocket
(*Hesperis matronalis*)
11. European swamp thistle
(*Cirsium palustre*)
12. garlic mustard
(*Alliaria petiolata*)
13. Japanese knotweed (*Polygonum cuspidatum*)
giant knotweed (*P. sachalinense*)
14. leafy spurge (*Euphorbia esula*)
15. lyme grass (*Leymus arenarius*)
16. narrow-leaved cattail (*Typha angustifolia*)
17. phragmites (*Phragmites australis*)
18. purple loosestrife (*Lythrum salicaria*)
19. reed canary grass (*Phalaris arundinacea*)
20. wild parsnip (*Pastinaca sativa*)



baby's breath



thistles



dama's rocket



knotweed



leafy spurge



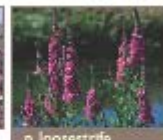
garlic mustard



narrow-leaved cattail



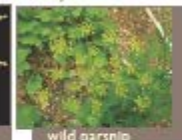
phragmites



p. loosestrife



reed canary grass



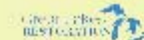
wild parsnip

Grand Traverse Regional Invasive Species Network



MAJOR PARTNERS:

Northwest Michigan CWMA



Appendix B
Recent Taxonomic Changes

Genera in *Michigan Flora* whose family assignments here changed

Genus	Family	New Family
Acer	Aceraceae	Sapindaceae
Acorus	Araceae	Acoraceae
Adlumia	Fumariaceae	Papaveraceae
Aesculus	Hippocastanaceae	Sapindaceae
Agalinis (incl. Tomanthera)	Scrophulariaceae	Orobanchaceae
Aletris	Liliaceae	Melanthiaceae
Allium	Liliaceae	Alliaceae
Anagallis	Primulaceae	Myrsinaceae
Anticlea (see Zigadenus)	Liliaceae	Melanthiaceae
Antirrhinum	Scrophulariaceae	Plantaginaceae
Arceuthobium	Viscaceae	Santalaceae
Asclepias	Asclepiadaceae	Apocynaceae
Asparagus	Liliaceae	Asparagaceae
Atriplex	Chenopodiaceae	Amaranthaceae
Aureolaria	Scrophulariaceae	Orobanchaceae
Besseyia	Scrophulariaceae	Plantaginaceae
Beta	Chenopodiaceae	Amaranthaceae
Brasenia	Nymphaeaceae	Cabombaceae
Buchnera	Scrophulariaceae	Orobanchaceae
Buddleja	Buddlejaceae	Scrophulariaceae
Cabomba	Nymphaeaceae	Cabombaceae
Callitriche	Callitrichaceae	Plantaginaceae
Camassia	Liliaceae	Hyacinthaceae
Castilleja	Scrophulariaceae	Orobanchaceae
Celtis	Ulmaceae	Cannabaceae
Chaenorrhinum	Scrophulariaceae	Plantaginaceae
Chamaelirium	Liliaceae	Melanthiaceae
Chelone	Scrophulariaceae	Plantaginaceae
Chenopodium	Chenopodiaceae	Amaranthaceae
Chimaphila	Pyrolaceae	Ericaceae
Claytonia	Portulacaceae	Montiaceae
Cleome	Capparaceae	Cleomaceae
Clintonia	Liliaceae	Convallariaceae
Collinsia	Scrophulariaceae	Plantaginaceae
Convallaria	Liliaceae	Convallariaceae
Corispermum	Chenopodiaceae	Amaranthaceae
Corydalis	Fumariaceae	Papaveraceae
Cuscuta	Cuscutaceae	Convolvulaceae
Cycloloma	Chenopodiaceae	Amaranthaceae

Cymbalaria	Scrophulariaceae	Plantaginaceae
Dasistoma	Scrophulariaceae	Orobanchaceae
Dicentra	Fumariaceae	Papaveraceae
Diervilla	Caprifoliaceae	Diervillaceae
Digitalis	Scrophulariaceae	Plantaginaceae
Disporum (see Prosartes)	Liliaceae	Convallariaceae
Dysphania (Chenopodium)	Chenopodiaceae	Amaranthaceae
Ellisia	Hydrophyllaceae	Boraginaceae
Empetrum	Empetraceae	Ericaceae
Euphrasia	Scrophulariaceae	Orobanchaceae
Fumaria	Fumariaceae	Papaveraceae
Gratiola	Scrophulariaceae	Plantaginaceae
Hemerocallis	Liliaceae	Hemerocallidaceae
Hippuris	Hippuridaceae	Plantaginaceae
Hydrocotyle	Apiaceae	Araliaceae
Hydrophyllum	Hydrophyllaceae	Boraginaceae
Hypericum	Clusiaceae	Hypericaceae
Hypoxis	Amaryllidaceae	Hypoxidaceae
Kickxia	Scrophulariaceae	Plantaginaceae
Kochia	Chenopodiaceae	Amaranthaceae
Kolkwitzia	Caprifoliaceae	Linnaeaceae
Lemna	Lemnaceae	Araceae
Leucospora	Scrophulariaceae	Plantaginaceae
Linaria	Scrophulariaceae	Plantaginaceae
Lindernia	Scrophulariaceae	Linderniaceae
Linnaea	Caprifoliaceae	Linnaeaceae
Lysimachia	Primulaceae	Myrsinaceae
Maianthemum (incl. Smilacina)	Liliaceae	Convallariaceae

New Species added to the website March 2013 (24 total)

Acalypha ostryifolia	Eriochloa contracta	Molinia caerulea
Agastache rugosa	Euphorbia serpens	Napaea dioica
Anemone blanda	Exochorda racemosa	Nicotiana alata
Aralia spinosa	Geranium sibiricum	Pinus rigida
Aronia arbutifolia	Hibiscus syriacus	Spiraea nipponica
Arthraxon hispidus	Hydrocotyle ranunculoides	Spiraea prunifolia
Chenopodium polyspermum	Iris ×vinicolor	Tripidium ravennae
Cyperus iria	Magnolia acuminata	Viburnum sieboldii

Additions and Name Changes to *Michigan Flora*, Volumes 1-3

- Acalypha gracilens — add
Acer campestre — add
Acer ginnala — add
Acer nigrum — add (split from *A. saccharum*)
Acinos arvensis — *Clinopodium acinos*
Aconitum napellus — add
Acorus americanus — add (split from *A. calamus*)
Aegilops cylindrica — add
Agropyron cristatum — add
Agropyron dasystachyum — *Elymus lanceolatus*
Agropyron repens — *Elymus repens*
Agropyron smithii — *Pascopyrum smithii*
Agropyron spicatum — *Pseudoroegneria spicata*
Agropyron trachycaulum — *Elymus trachycaulus*
Agrostis scabra — add (split from *A. hyemalis*)
Agrostis tenuis — *Agrostis capillaris*
Aira caryophyllea — add
Alisma plantago-aquatica — delete (split into *A. subcordatum* & *A. triviale*)
Alisma subcordatum — add (split from *A. plantago-aquatica*)
Alisma triviale — add (split from *A. plantago-aquatica*)
Allium burdickii — add (split from *A. tricoccum*)
Allium tuberosum — add
Alnus crispa — *Alnus viridis*
Alnus rugosa — *Alnus incana*
Alopecurus geniculatus — add
Alopecurus myosuroides — add
Alyssum saxatile — *Aurinia saxatilis*
Amaranthus gracilis — *Amaranthus viridis*
Ampelopsis aconitifolia — add
Ampelopsis brevipedunculata — add
Andropogon scoparius — *Schizachyrium scoparium*
Anemonella thalictroides — *Thalictrum thalictroides*
Anthemis tinctoria — *Cota tinctoria*
Apera interrupta — add
Apera spica-venti — add
Arabis canadensis — *Boechera canadensis*
Arabis divaricarpa — *Boechera grahamii*
Arabis drummondii — *Boechera stricta*
Arabis glabra — *Turritis glabra*
Arabis hirsuta — *Arabis pycnocarpa*
Arabis holboellii — *Boechera retrofracta*
Arabis laevigata — *Boechera laevigata*
Arabis lyrata — *Arabidopsis lyrata*
Arabis missouriensis — *Boechera missouriensis*
Arabis perstellata — *Boechera dentata*
Aralia elata — add
Arenaria lateriflora — *Moehringia lateriflora*
Arenaria macrophylla — *Moehringia macrophylla*
Arenaria stricta — *Minuartia michauxii*
Aristolochia macrophylla — *Isotrema macrophyllum*
Aristolochia serpentaria — *Endodeca serpentaria*
Armoracia aquatica — *Rorippa aquatica*
Arnica lonchophylla — add
Aster borealis — *Symphyotrichum boreale*
Aster brachyactis — *Symphyotrichum ciliatum*
Aster ciliolatus — *Symphyotrichum ciliolatum*
Aster cordifolius — *Symphyotrichum cordifolium*
Aster dumosus — *Symphyotrichum dumosum*
Aster ericoides — *Symphyotrichum ericoides*
Aster furcatus — *Eurybia furcata*
Aster laevis — *Symphyotrichum laeve*
Aster lanceolatus — *Symphyotrichum lanceolatum*
Aster lateriflorus — *Symphyotrichum lateriflorum*
Aster longifolius — *Symphyotrichum robynsianum*
Aster macrophyllus — *Eurybia macrophylla*
Aster modestus — *Canadanthus modestus*
Aster nemoralis — *Oclemena nemoralis*
Aster novae-angliae — *Symphyotrichum novae-angliae*
Aster ontarionis — *Symphyotrichum ontarionis*
Aster oolentangiensis — *Symphyotrichum oolentangiense*
Aster paternus — *Sericocarpus asteroides*
Aster pilosus — *Symphyotrichum pilosum*
Aster praealtus — *Symphyotrichum praealtum*
Aster puniceus — *Symphyotrichum puniceum*
Aster sagittifolius — *Symphyotrichum urophyllum*
Aster sericeus — *Symphyotrichum sericeum*
Aster shortii — *Symphyotrichum shortii*
Aster solidagineus — *Sericocarpus linifolius*
Aster subulatus — *Symphyotrichum subulatum*
Aster umbellatus — *Doellingeria umbellata*

Atriplex prostrata — add (split from *A. patula*)
Barbarea stricta — add
Belamcanda chinensis — *Iris domestica*
Berberis repens — add
Betula murrayana — add
Betula populifolia — add
Bidens coronatus — *Bidens trichosperma*
Bouteloua gracilis — add
Brachyelytrum aristosum — add (split from *B. erectum*)
Brachypodium sylvaticum — add
Brassica alba — *Sinapis alba*
Brassica kaber — *Sinapis arvensis*
Bromus molliformis — delete (lump with *B. hordeaceus*)
Bromus mollis — *Bromus hordeaceus*
Bromus nottowayanus — add (split from *B. pubescens*)
Buchloe dactyloides — add
Cacalia atriplicifolia — *Arnoglossum atriplicifolium*
Cacalia plantaginea — *Arnoglossum plantagineum*
Calamagrostis inexpansa — delete (lump with *C. stricta*)
Calamagrostis lacustris — delete (lump with *C. stricta*)
Calamintha arkansana — *Clinopodium arkansanum*
Callitriche terrestris — add
Callitriche verna — *Callitriche palustris*
Caltha natans — add
Calylophus serrulatus — *Oenothera serrulata*
Calystegia hederacea — *Calystegia pubescens*
Calystegia macounii — add
Calystegia silvatica — add
Campanula americana — *Campanulastrum americanum*
Campanula latifolia — add
Cardaria draba — *Lepidium draba*
Cardaria pubescens — *Lepidium appelianum*
Carduus crispus — add
Carex acutiformis — add
Carex aenea — *Carex foenea*
Carex angustior — *Carex echinata*
Carex artitecta — *Carex albicans*
Carex assiniboinensis — add
Carex billingsii — add (split from *C. trisperma*)
Carex bushii — add
Carex cephalantha — *Carex echinata*
Carex conjuncta — add
Carex convoluta — *Carex rosea*
Carex duriuscula — add
Carex echinodes — add (split from *C. tenera*)
Carex emmonsii — *Carex albicans*
Carex foenea — *Carex siccata*
Carex grisea — add (split from *C. amphibola*)
Carex heleonastes — add
Carex howei — delete (lump with *C. atlantica*)
Carex inops — add (split from *C. pennsylvanica*)
Carex lanuginosa — *Carex pellita*
Carex meadii — add (split from *C. tetanica*)
Carex muricata — add
Carex novae-angliae — add
Carex paupercula — *Carex magellanica*
Carex rosea — *Carex radiata*
Carex rugosperma — *Carex tonsa*
Carex sylvatica — add
Carex texensis — add
Carex tinctoria — add
Carex utriculata — add (split from *C. rostrata*)
Carex viridistellata — add (split from *C. cryptolepis*)
Carex wiegandii — add
Carthamus tinctorius — add
Cassia chamaecrista — *Chamaecrista fasciculata*
Cassia hebecarpa — *Senna hebecarpa*
Cassia nictitans — *Chamaecrista nictitans*
Cassia tora — *Senna tora*
Castanea mollissima — add
Caulophyllum giganteum — add (split from *C. thalictroides*)
Centaurea maculosa — *Centaurea stoebe*
Centaurea repens — *Rhaponticum repens*
Cerastium brachypodium — add (split from *C. nutans*)
Cerastium pumilum — add
Cerastium velutinum — add (split from *C. arvense*)
Chaenomeles speciosa — add
Chenopodium ambrosioides — *Dysphania ambrosioides*
Chenopodium aristatum — *Dysphania aristata*
Chenopodium berlandieri — add (split from *C. album*)
Chenopodium botrys — *Dysphania botrys*
Chenopodium hybridum — *Chenopodium simplex*
Chenopodium subglabrum — *Chenopodium pratericola*
Chorispora tenella — add

Chrysanthemum ×*superbum* — *Leucanthemum* ×*superbum*
Chrysanthemum balsamita — *Tanacetum balsamita*
Chrysanthemum leucanthemum — *Leucanthemum vulgare*
Chrysanthemum parthenium — *Tanacetum parthenium*
Chrysanthemum serotinum — *Leucanthemella serotina*
Chrysopsis camporum — *Heterotheca camporum*
Chrysopsis villosa — *Heterotheca villosa*
Cimicifuga racemosa — *Actaea racemosa*
Circaea lutetiana — *Circaea canadensis*
Claytonia sibirica — add
Clematis terniflora — add
Cleome hassleriana — *Tarenaya hassleriana*
Cleome serrulata — *Peritoma serrulata*
Coelorachis cylindrica — add
Coincya monensis — add
Consolida ambigua — *Consolida ajacis*
Corispermum americanum — add (split from *C. hyssopifolium*)
Corispermum orientale — *Corispermum villosum*
Corispermum pallasii — add (split from *C. hyssopifolium*)
Cornus stolonifera — *Cornus sericea*
Coronilla varia — *Securigera varia*
Corydalis sempervirens — *Capnoides sempervirens*
Corydalis solida — add
Corynephorus canescens — add
Cotinus coggygria — add
Cotoneaster adpressus — add
Cotoneaster divaricatus — add
Crataegus apiomorpha — *Crataegus fluviatilis*
Crataegus basilica — *Crataegus schuettei*
Crataegus beata — delete (lump with *C. populnea*)
Crataegus brumalis — delete (lump with *C. macrosperma*)
Crataegus compta — delete (lump with *C. populnea*)
Crataegus dilatata — *Crataegus coccinioides*
Crataegus disperma — delete
Crataegus filipes — delete (lump with *C. jesupii*)
Crataegus foetida — delete (lump with *C. intricata*)
Crataegus fontanesiana — delete (lump with *C. crus-galli*)
Crataegus gravis — delete (lump with *C. populnea*)
Crataegus hillii — *Crataegus magniflora*
Crataegus immanis — *Crataegus compacta*
Crataegus iracunda — delete (lump with *C. populnea*)
Crataegus leiophylla — delete (lump with *C. pruinosa*)
Crataegus levis — delete (lump with *C. populnea*)
Crataegus merita — delete (lump with *C. macrosperma*)
Crataegus nitidula — delete (lump with *C. punctata*)
Crataegus pedicellata — *Crataegus coccinea*
Crataegus pinguis — delete (lump with *C. brainerdii*)
Crataegus pringlei — *Crataegus coccinea*
Crataegus pringlei — delete (lump with *C. coccinea*)
Crataegus rugosa — delete (lump with *C. pruinosa*)
Cyperus aristatus — *Cyperus squarrosus*
Cyperus filiculmis — *Cyperus lupulinus*
Cyperus fuscus — add
Cyperus rivularis — *Cyperus bipartitus*
Cypripedium calceolus — *Cypripedium parviflorum*
Danthonia compressa — add
Daphne mezereum — add
Dentaria diphylla — *Cardamine diphylla*
Dentaria laciniata — *Cardamine concatenata*
Dentaria maxima — *Cardamine maxima*
Deschampsia flexuosa — *Avenella flexuosa*
Desmanthus illinoensis — add
Desmodium glabellum — add (split from *D. paniculatum*)
Desmodium glutinosum — *Hylodesmum glutinosum*
Desmodium nudiflorum — *Hylodesmum nudiflorum*
Desmodium perplexum — add (split from *D. paniculatum*)
Deutzia scabra — add
Diarrhena americana — *Diarrhena obovata*
Dichantheium polyanthes — add
Disporum hookeri — *Prosartes hookeri*
Disporum maculatum — *Prosartes maculata*
Dodecatheon meadia — *Primula meadia*

Draba glabella — add
Duchesnea indica — *Potentilla indica*
Dysphania pumilio — add
Echinochloa esculenta — add (split from *E. crusgalli*)
Eleocharis atropurpurea — add
Eleocharis caribaea — *Eleocharis geniculata*
Eleocharis microcarpa — add
Eleocharis nitida — add
Eleocharis olivacea — *Eleocharis flavescens*
Eleocharis pauciflora — *Eleocharis quinqueflora*
Eleocharis smallii — *Eleocharis palustris*
Eleutherococcus sieboldianus — add
Elymus arenarius — *Leymus arenarius*
Elymus macgregorii — add (split from *E. virginicus*)
Elymus mollis — *Leymus mollis*
Epilobium angustifolium — *Chamerion angustifolium*
Epilobium brachycarpum — add
Eragrostis curvula — add
Eragrostis poaeoides — *Eragrostis minor*
Eragrostis tephrosanthes — delete (lump with *E. pectinacea*)
Eragrostis trichodes — add
Eriocaulon septangulare — *Eriocaulon aquaticum*
Eriophorum spissum — *Eriophorum vaginatum*
Erophila verna — *Draba verna*
Euonymus hamiltoniana — add
Eupatorium coelestinum — *Conoclinium coelestinum*
Eupatorium fistulosum — *Eutrochium fistulosum*
Eupatorium maculatum — *Eutrochium maculatum*
Eupatorium purpureum — *Eutrochium purpureum*
Eupatorium rugosum — *Ageratina altissima*
Euphorbia davidii — add (split from *E. dentata*)
Euphorbia esula — *Euphorbia virgata*
Euphorbia obtusata — *Euphorbia spathulata*
Euphorbia prostrata — add
Euthamia remota — *Euthamia caroliniana*
Fatoua villosa — add
Festuca arundinacea — *Schedonorus arundinaceus*
Festuca obtusa — *Festuca subverticillata*
Festuca octoflora — *Vulpia octoflora*
Festuca ovina — *Festuca trachyphylla*
Festuca pratensis — *Schedonorus pratensis*
Festuca scabrella — *Festuca altaica*
Festuca tenuifolia — *Festuca filiformis*
Ficus carica — add
Filago arvensis — *Logfia arvensis*
Filipendula ulmaria — add
Filipendula vulgaris — add
Forsythia ×intermedia — add
Frangula purshiana — add
Froelichia floridana — add
Froelichia gracilis — add
Fuirena squarrosa — *Fuirena pumila*
Galanthus nivalis — add
Galega officinalis — add
Galium mollugo — *Galium album*
Gaura biennis — *Oenothera gaura*
Gaura coccinea — *Oenothera suffrutescens*
Gaura longiflora — *Oenothera filiformis*
Gentianopsis procera — *Gentianopsis virgata*
Geranium aequale — add (split from *G. molle*)
Glyceria melicaria — add
Gnaphalium helleri — *Pseudognaphalium micradenium*
Gnaphalium macounii — *Pseudognaphalium macounii*
Gnaphalium obtusifolium — *Pseudognaphalium obtusifolium*
Gnaphalium purpureum — *Gamochaeta purpurea*
Gnaphalium sylvaticum — *Omalotheca sylvatica*
Habenaria blephariglottis — *Platanthera blephariglottis*
Habenaria ciliaris — *Platanthera ciliaris*
Habenaria clavellata — *Platanthera clavellata*
Habenaria dilatata — *Platanthera dilatata*
Habenaria flava — *Platanthera flava*
Habenaria hookeri — *Platanthera hookeri*
Habenaria hyperborea — delete (split into *Platanthera aquilonis* and *P. huronensis*)
Habenaria lacera — *Platanthera lacera*
Habenaria leucophaea — *Platanthera leucophaea*
Habenaria obtusata — *Platanthera obtusata*
Habenaria orbiculata — *Platanthera orbiculata*
Habenaria psycodes — *Platanthera psycodes*
Habenaria unalascensis — *Platanthera unalascensis*
Habenaria viridis — *Coeloglossum viride*
Haplopappus ciliatus — *Grindelia ciliata*
Hedyotis nigricans — *Stenaria nigricans*
Heleochloa schoenoides — *Crypsis schoenoides*

Helianthemum bicknellii — *Crocianthemum bicknellii*
Helianthemum canadense — *Crocianthemum canadense*
Hemicarpha micrantha — *Lipocarpha micrantha*
Heracleum mantegazzianum — add
Heracleum sphondylium — add
Hierochloë odorata — *Hierochloë hirta*
Holcus mollis — add
Hosta ventricosa — add
Hydrocharis morsus-ranae — add
Hylotelephium erythrostictum — add
Hymenoxys herbacea — *Tetranneuris herbacea*
Hypericum adpressum — add
Hystrix patula — *Elymus hystrix*
Iberis sempervirens — add
Ilex opaca — add
Iris sibirica — add
Isopyrum biternatum — *Enemion biternatum*
Isotrema tomentosum — add
Iva xanthiifolia — *Cyclachaena xanthiifolia*
Juncus alpinus — *Juncus alpinoarticulatus*
Juncus antheratus — add (split from *J. tenuis*)
Juncus compressus — add
Juncus ensifolius — add
Kalopanax septemlobus — add
Kerria japonica — add
Kochia scoparia — *Bassia scoparia*
Kuhnia eupatorioides — *Brickellia eupatorioides*
Lactuca muralis — *Mycelis muralis*
Lactuca pulchella — *Mulgedium pulchellum*
Lamiastrum galeobdolon — add
Lamprocapnos spectabilis — add
Lechea villosa — *Lechea mucronata*
Ledum groenlandicum — *Rhododendron groenlandicum*
Lemna turionifera — add (split from *L. minor*)
Leontodon autumnalis — *Scorzoneroides autumnalis*
Leontodon taraxacoides — *Leontodon saxatilis*
Leptochloa fascicularis — *Leptochloa fusca*
Leptoloma cognatum — *Digitaria cognata*
Lespedeza bicolor — add
Lespedeza intermedia — *Lespedeza violacea*
Lespedeza stipulacea — *Kummerowia stipulacea*
Lespedeza thunbergii — add
Lespedeza violacea — *Lespedeza frutescens*
Leymus racemosus — add
Lilium martagon — add
Limonium platyphyllum — add
Linaria canadensis — *Nuttallanthus canadensis*
Listera auriculata — *Neottia auriculata*
Listera convallarioides — *Neottia convallarioides*
Listera cordata — *Neottia cordata*
Lithospermum arvense — *Buglossoides arvensis*
Luzula pallidula — add
Lychnis chalcedonica — *Silene chalcedonica*
Lychnis coronaria — *Silene coronaria*
Lycopersicon esculentum — *Solanum lycopersicum*
Mahonia aquifolium — *Berberis aquifolium*
Malus baccata — add
Malus prunifolia — add
Malus sieboldii — add
Malva crispa — *Malva verticillata*
Malva rotundifolia — *Malva pusilla*
Matricaria perforata — *Tripleurospermum inodorum*
Matricaria recutita — *Matricaria chamomilla*
Mazus reptans — *Mazus miquelii*
Megalodonta beckii — *Bidens beckii*
Mentha ×gracilis — add (given fuller treatment)
Mentha arvensis — *Mentha canadensis*
Minuartia dawsonensis — add (split from *Arenaria stricta*)
Mirabilis hirsuta — delete (lump with *M. albida*)
Miscanthus sacchariflorus — add
Miscanthus sinensis — add
Monarda clinopodia — add (split from *M. fistulosa*)
Monotropa hypopithys — *Hypopitys monotropa*
Muhlenbergia asperifolia — add
Muscari atlanticum — *Muscari neglectum*
Myosurus minimus — add
Myrica pensylvanica — add
Myriophyllum exalbescens — *Myriophyllum sibiricum*
Myrrhis odorata — add
Narcissus poeticus — add
Narcissus pseudonarcissus — add
Nasturtium microphyllum — add (split from *N. officinale*)
Nemophanthus mucronatus — *Ilex mucronata*
Nuphar pumila — *Nuphar microphylla*
Nymphaea tetragona — *Nymphaea leibergii*
Odontites vulgaris — *Odontites vernus*
Onosmodium molle — *Lithospermum molle*
Orchis rotundifolia — *Amerorchis rotundifolia*
Orchis spectabilis — *Galearis spectabilis*

Oryzopsis canadensis — *Piptatherum canadense*
Oryzopsis pungens — *Piptatherum pungens*
Oryzopsis racemosa — *Piptatherum racemosum*
Osmorhiza chilensis — *Osmorhiza berteroi*
Oxalis fontana — *Oxalis stricta*
Oxalis stricta — *Oxalis dillenii*
Pachysandra terminalis — add
Packera glabella — add
Packera insulae-regalis — add (split from
Packera paupercula)
Panicum boreale — *Dichanthelium boreale*
Panicum calliphyllum — delete
Panicum clandestinum — *Dichanthelium*
clandestinum
Panicum columbianum — *Dichanthelium*
columbianum
Panicum commonsianum — *Dichanthelium*
commonsianum
Panicum commutatum — *Dichanthelium*
commutatum
Panicum depauperatum — *Dichanthelium*
depauperatum
Panicum dichotomum — *Dichanthelium*
dichotomum
Panicum gattingeri — add (split from *P.*
philadelphicum)
Panicum implicatum — *Dichanthelium*
implicatum
Panicum latifolium — *Dichanthelium latifolium*
Panicum leibergii — *Dichanthelium leibergii*
Panicum lindheimeri — *Dichanthelium*
lindheimeri
Panicum linearifolium — *Dichanthelium*
linearifolium
Panicum longifolium — add
Panicum meridionale — *Dichanthelium*
meridionale
Panicum microcarpon — *Dichanthelium*
microcarpon
Panicum oligosanthos — *Dichanthelium*
oligosanthos
Panicum perlongum — *Dichanthelium*
perlongum
Panicum praecocius — *Dichanthelium*
praecocius
Panicum sphaerocarpon — *Dichanthelium*
sphaerocarpon
Panicum spretum — *Dichanthelium spretum*
Panicum tuckermanii — add (split from *P.*
philadelphicum)
Panicum xanthophysum — *Dichanthelium*
xanthophysum
Papaver pseudo-orientale — add (split from *P.*
orientale)
Parietaria diffusa — *Parietaria judaica*
Parthenium hispidum — delete (lump with *P.*
integrifolium)
Paspalum ciliatifolium — *Paspalum setaceum*
Paspalum laeve — add
Pennisetum alopecuroides — add
Persicaria robustior — add
Phellodendron amurense — add
Philadelphus ×virginalis — add
Philadelphus coronarius — add
Philadelphus inodorus — add
Philadelphus pubescens — add
Phlox latifolia — add
Physalis pubescens — *Physalis grisea*
Picea abies — add
Pimpinella saxifraga — add
Pinus nigra — add
Pinus ponderosa — add
Pinus sylvestris — add
Plagiobothrys hirtus — *Plagiobothrys figuratus*
Platanthera aquilonis — add (split from
Habenaria hyperborea)
Platanthera huronensis — add (split from
Habenaria hyperborea)
Platanthera macrophylla — add (split from
Habenaria orbiculata)
Poa arida — add
Poa canbyi — *Poa secunda*
Poa interior — add (split from *P. nemoralis*)
Polygonum amphibium — *Persicaria amphibia*
Polygonum arifolium — *Persicaria arifolia*
Polygonum careyi — *Persicaria careyi*
Polygonum cespitosum — *Persicaria longiseta*
Polygonum cilinode — *Fallopia cilinodis*
Polygonum convolvulus — *Fallopia*
convolvulus
Polygonum cuspidatum — *Fallopia japonica*
Polygonum hydropiper — *Persicaria hydropiper*
Polygonum hydropiperoides — *Persicaria*
hydropiperoides
Polygonum lapathifolium — *Persicaria*
lapathifolia
Polygonum orientale — *Persicaria orientalis*
Polygonum pensylvanicum — *Persicaria*
pensylvanica
Polygonum persicaria — *Persicaria maculosa*
Polygonum punctatum — *Persicaria punctata*

Polygonum sachalinense — *Fallopia sachalinensis*
Polygonum sagittatum — *Persicaria sagittata*
Polygonum scandens — *Fallopia scandens*
Polygonum virginianum — *Persicaria virginiana*
Polygonum viviparum — *Bistorta vivipara*
Polymnia uvedalia — *Smallanthus uvedalia*
Porteranthus stipulatus — *Gillenia stipulata*
Porteranthus trifoliatus — *Gillenia trifoliata*
Potamogeton capillaceus — *Potamogeton bicupulatus*
Potamogeton filiformis — *Stuckenia filiformis*
Potamogeton lateralis — delete
Potamogeton pectinatus — *Stuckenia pectinata*
Potamogeton vaginatus — delete (lump with *Stuckenia filiformis*)
Potamogeton vaginatus — *Stuckenia filiformis*
Potentilla arguta — *Drymocallis arguta*
Potentilla bipinnatifida — add
Potentilla canadensis — add (split from *P. simplex*)
Potentilla fruticosa — *Dasiphora fruticosa*
Potentilla intermedia — add (split from *P. inclinata*)
Potentilla palustris — *Comarum palustre*
Potentilla paradoxa — *Potentilla supina*
Potentilla pensylvanica — *Potentilla litoralis*
Potentilla tridentata — *Sibbaldiopsis tridentata*
Potentilla verna — add
Prenanthes crepidinea — add
Proboscidea louisiana — original spelling, not “louisianica”
Prosartes trachycarpa — add
Prunus alleghaniensis — *Prunus umbellata*
Prunus angustifolia — add
Prunus armeniaca — add
Prunus cerasifera — delete
Prunus hortulana — add
Pseudotsuga menziesii — add
Psilocarya scirpoides — *Rhynchospora scirpoides*
Psoralea psoralioides — *Orbexilum pedunculatum*
Puccinellia fernaldii — *Torreyochloa fernaldii*
Puccinellia pallida — *Torreyochloa pallida*
Pueraria montana — add
Pyrola rotundifolia — *Pyrola americana*
Pyrus calleryana — add
Pyrus cordata — add
Quercus coccinea — *Quercus ellipsoidalis*
Quercus prinus — *Quercus montana*
Quercus shumardii — add
Ranunculus cymbalaria — *Halerpestes cymbalaria*
Ranunculus ficaria — *Ficaria verna*
Ranunculus lapponicus — *Coptidium lapponicum*
Ranunculus sardous — add
Ranunculus trichophyllus — add (split from *R. longirostris*)
Rhamnus frangula — *Frangula alnus*
Rheum rhaponticum — *Rheum ×hybridum*
Rhexia mariana — add
Rhinanthus minor — add
Rhodotypos scandens — add
Rhynchospora glomerata — *Rhynchospora recognita*
Rhynchospora nitens — add
Ribes missouriense — add
Rosa canina — add
Rosa eglanteria — *Rosa rubiginosa*
Rosa virginiana — add
Rubus bifrons — add
Rubus caesius — add
Rumex maritimus — *Rumex fueginus*
Rumex occidentalis — add
Ruppia maritima — *Ruppia cirrhosa*
Ruta graveolens — add
Sagittaria cristata — add (split from *S. graminea*)
Salicornia europaea — *Salicornia rubra*
Salix atrocineria — add
Salix matsudana — add
Salsola collina — add
Salsola kali — *Salsola tragus*
Sanguisorba minor — *Poterium sanguisorba*
Sanicula gregaria — *Sanicula odorata*
Saxifraga pensylvanica — *Micranthes pensylvanica*
Saxifraga virginensis — *Micranthes virginensis*
Schedonorus giganteus — add
Schoenoplectus purshianus — add (split from *Scirpus smithii*)
Schrankia nuttallii — *Mimosa quadrivalvis*
Scilla forbesii — add
Scilla luciliae — add
Scilla siberica — add
Scirpus acutus — *Schoenoplectus acutus*
Scirpus americanus — *Schoenoplectus pungens*
Scirpus atrocinctus — add (split from *S. cyperinus*)

Scirpus cespitosus — *Trichophorum cespitosum*
Scirpus clintonii — *Trichophorum clintonii*
Scirpus fluviatilis — *Bolboschoenus fluviatilis*
Scirpus georgianus — add (split from *S. atrovirens*)
Scirpus hallii — *Schoenoplectus hallii*
Scirpus hattorianus — add (split from *S. atrovirens*)
Scirpus heterochaetus — *Schoenoplectus heterochaetus*
Scirpus hudsonianus — *Trichophorum alpinum*
Scirpus olneyi — *Schoenoplectus americanus*
Scirpus paludosus — *Bolboschoenus maritimus*
Scirpus pedicellatus — add (split from *S. cyperinus*)
Scirpus smithii — *Schoenoplectus smithii*
Scirpus subterminalis — *Schoenoplectus subterminalis*
Scirpus torreyi — *Schoenoplectus torreyi*
Scirpus validus — *Schoenoplectus tabernaemontani*
Scleria reticularis — add
Sclerochloa dura — add
Sedum spurium — *Phedimus spurium*
Sedum telephium — *Hylotelephium telephium*
Senecio aureus — *Packera aurea*
Senecio congestus — *Tephrosia palustris*
Senecio indecorus — *Packera indecora*
Senecio obovatus — *Packera obovata*
Senecio pauperculus — *Packera paupercula*
Senecio plattensis — delete (lump with *Packera paupercula*)
Setaria glauca — *Setaria pumila*
Shepherdia argentea — add
Silene armeria — *Atocion armeria*
Silene dioica — add
Silene nivea — add
Silene pratensis — *Silene latifolia*
Sisyrinchium campestre — add
Sisyrinchium farwellii — *Sisyrinchium fuscum*
Sisyrinchium hastile — delete (lump with *S. albidum*)
Smilacina racemosa — *Maianthemum racemosum*
Smilacina stellata — *Maianthemum stellatum*
Smilacina trifolia — *Maianthemum trifolium*
Smilax tamnoides — *Smilax hispida*
Solidago vossii — add (split from *S. houghtonii*)
Sparganium chlorocarpum — *Sparganium emersum*
Sparganium minimum — *Sparganium natans*
Spartina gracilis — add
Spiranthes casei — add (split from *S. cernua*)
Spiranthes magnicamporum — add (split from *S. cernua*)
Spiranthes ochroleuca — add (split from *S. cernua*)
Spiranthes ovalis — add
Spiranthes tuberosa — add
Spiranthes vernalis — delete
Sporobolus asper — *Sporobolus compositus*
Sporobolus clandestinus — add
Sporobolus indicus — add
Stachys arenicola — add (split from *S. palustris*)
Stachys aspera — add (split from *S. tenuifolia*)
Stachys byzantina — add
Stachys hispida — add (split from *S. tenuifolia*)
Stachys pilosa — add (split from *S. palustris*)
Stellaria calycantha — *Stellaria borealis*
Stellaria pallida — add
Stipa avenacea — *Piptochaetium avenaceum*
Stipa comata — *Hesperostipa comata*
Stipa spartea — *Hesperostipa spartea*
Streptopus roseus — *Streptopus lanceolatus*
Symphotrichum drummondii — add
Symphotrichum firmum — add (split from *Aster puniceus*)
Syringa ×henryi — add
Syringa reticulata — add
Tanacetum huronense — *Tanacetum bipinnatum*
Taraxacum palustre — add
Taxodium distichum add
Taxus cuspidata add
Teesdalia nudicaulis — add
Thalictrum pubescens — add
Thaspium barbinode — *Thaspium chapmanii*
Thymus pannonicus — *Thymus albidus*
Tofieldia glutinosa — *Triantha glutinosa*
Tomanthera auriculata — *Agalinis auriculata*
Toxicodendron rydbergii — add (split from *T. radicans*)
Trillium cuneatum — add (split from *Trillium viride*)
Trillium luteum — add (split from *Trillium viride*)
Trillium viride — delete (split into *T. cuneatum* & *T. luteum*)
Trisetum melicoides — *Graphephorum melicoides*

Ulmus glabra — add

Uniola latifolia — Chasmanthium latifolium

Verbena canadensis — Glandularia canadensis

Veronica hederifolia — add

Viburnum trilobum — add (split from V.
opulus)

Vicia lathyroides — add

Vigna unguiculata — add

Vinca major — add

Viola conspersa — Viola labradorica

Viola novae-angliae — add

Viola primulifolia — add

Vulpia myuros — add

Appendix C

Point-line Intercept Transect Photos

Previously Exposed Flood Plain - Start Point - A



north



south



east



west

Previously Exposed Flood Plain - End Point - A



north



south



east



west

Previously Exposed Flood Plain - Start Point - B



north



south



east



west

Previously Exposed Flood Plain - End Point - B



north



south



east



west

Mid-floodplain – Start Point - C



north



south



east



west

Previously exposed floodplain – End Point - C



north



south



east



west

Mid-floodplain – East to West Photos



far east



mid east



mid west



far west

Appendix D
Floristic Quality Data

Brown Bridge Forested Wetlands Floristic Quality Data

Floristic Quality Data	
Native Species	176
Total Species	193
Native Mean C	4.4
Mean C w/ Adventives	4.1
Native FQI	58.3
FQI w/ Adventives	56.1
Native Mean W	-2.2
Mean W w/ Adventives	-2
Average wetness	FACW-

Physiognomy Summary						
	Native	177	93%	Adventive	14	7%
Tree	18	9%		Tree	0	0%
Shrub	16	8%		Shrub	0	0%
W-Vine	3	2%		W-Vine	0	0%
H-Vine	0	0%		H-Vine	0	0%
P-Forb	78	41%		P-Forb	8	4%
B-Forb	2	1%		B-Forb	2	1%
A-Forb	7	4%		A-Forb	1	1%
P-Grass	11	6%		P-Grass	3	2%
A-Grass	0	0%		A-Grass	0	0%
P-Sedge	23	12%		P-Sedge	0	0%
A-Sedge	1	1%		A-Sedge	0	0%
Fern	19	9%		Fern	0	0%

Documented Species:

Acronym	C	Scientific Name	Common name	W	Wetness	Physiognomy
ABIBAL	3	<i>Abies balsamea</i>	balsam fir	-3	FACW	Nt Tree
ACENEG	0	<i>Acer negundo</i>	box elder	-2	FACW-	Nt Tree
ACERUB	1	<i>Acer rubrum</i>	red maple	0	FAC	Nt Tree
ACESAU	5	<i>Acer saccharum</i>	sugar maple	3	FACU	Nt Tree
ACTRUB	7	<i>Actaea rubra</i>	red baneberry	5	UPL	Nt P-Forb
ADIPED	6	<i>Adiantum pedatum</i>	maidenhair fern	1	FAC-	Nt Fern
AGRGRY	2	<i>Agrimonia gryposepala</i>	tall agrimony	2	FACU+	Nt P-Forb
AGRIGIG	0	<i>AGROSTIS GIGANTEA</i>	redtop	0	FAC	Ad P-Grass
ALNRUG	5	<i>Alnus rugosa</i>	tag alder	-5	OBL	Nt Shrub
ANAMAR	3	<i>Anaphalis margaritacea</i>	pearly everlasting	5	UPL	Nt P-Forb
ANEQUI	5	<i>Anemone quinquefolia</i>	wood anemone	0	FAC	Nt P-Forb
ARANUD	5	<i>Aralia nudicaulis</i>	wild sarsaparilla	3	FACU	Nt P-Forb
ARITRI	5	<i>Arisaema triphyllum</i>	Jack in the pulpit	-2	FACW-	Nt P-Forb
ASCINC	6	<i>Asclepias incarnata</i>	swamp milkweed	-5	OBL	Nt P-Forb
ASTLAT	2	<i>Aster lateriflorus</i>	side flowering aster	-2	FACW-	Nt P-Forb
ASTPUN	5	<i>Aster puniceus</i>	swamp aster	-5	OBL	Nt P-Forb
ATHFIL	4	<i>Athyrium filix-femina</i>	lady fern	0	FAC	Nt Fern
BETPAP	2	<i>Betula papyrifera</i>	paper birch	2	FACU+	Nt Tree
BIDCER	3	<i>Bidens cernuus</i>	nodding bur marigold	-5	OBL	Nt A-Forb
BIDFRO	1	<i>Bidens frondosus</i>	common beggar ticks	-3	FACW	Nt A-Forb
BOECYL	5	<i>Boehmeria cylindrica</i>	false nettle	-5	OBL	Nt P-Forb
BRAERE	7	<i>Brachyelytrum erectum</i>	long awned wood grass	5	UPL	Nt P-Grass
BRAKAB	0	<i>BRASSICA KABER</i>	wild mustard	5	UPL	Ad A-Forb
BROCIL	6	<i>Bromus ciliatus</i>	fringed brome	-3	FACW	Nt P-Grass
CALCAN	3	<i>Calamagrostis canadensis</i>	blue joint grass	-5	OBL	Nt P-Grass
CALTPA	6	<i>Caltha palustris</i>	marsh marigold	-5	OBL	Nt P-Forb
CAMAPR	7	<i>Campanula aparinoides</i>	marsh bellflower	-5	OBL	Nt P-Forb
CXBEBB	4	<i>Carex bebbii</i>	sedge	-5	OBL	Nt P-Sedge
CXBROM	6	<i>Carex bromoides</i>	sedge	-4	FACW+	Nt P-Sedge

CXBRUN	5	Carex brunnescens	sedge	-3	FACW	Nt P-Sedge
CXCOMO	5	Carex comosa	sedge	-5	OBL	Nt P-Sedge
CXDISP	10	Carex disperma	sedge	-5	OBL	Nt P-Sedge
CXFLAV	4	Carex flava	sedge	-5	OBL	Nt P-Sedge
CXGRAA	4	Carex gracillima	sedge	3	FACU	Nt P-Sedge
CXHYST	2	Carex hystericina	sedge	-5	OBL	Nt P-Sedge
CXINTE	3	Carex interior	sedge	-5	OBL	Nt P-Sedge
CXINTU	3	Carex intumescens	sedge	-4	FACW+	Nt P-Sedge
CXLACU	6	Carex lacustris	sedge	-5	OBL	Nt P-Sedge
CXLEPA	5	Carex leptalea	sedge	-5	OBL	Nt P-Sedge
CXPEDU	5	Carex pedunculata	sedge	5	UPL	Nt P-Sedge
CXPSEU	5	Carex pseudo-cyperus	sedge	-5	OBL	Nt P-Sedge
CXRETS	3	Carex retrorsa	sedge	-5	OBL	Nt P-Sedge
CXSTIP	1	Carex stipata	sedge	-5	OBL	Nt P-Sedge
CXSTRI	4	Carex stricta	sedge	-5	OBL	Nt P-Sedge
CXTRIS	9	Carex trisperma	sedge	-5	OBL	Nt P-Sedge
CARCAO	6	Carpinus caroliniana	blue beech	0	FAC	Nt Tree
CHEGLB	7	Chelone glabra	turtlehead	-5	OBL	Nt P-Forb
CINLAT	5	Cinna latifolia	wood reedgrass	-4	FACW+	Nt P-Grass
CIRLUT	2	Circaea lutetiana	enchanter's nightshade	3	FACU	Nt P-Forb
CIRMUT	6	Cirsium muticum	swamp thistle	-5	OBL	Nt B-Forb
CIRPAL	0	CIRSIUM PALUSTRE	marsh thistle	-4	FACW+	Ad B-Forb
CIRVUL	0	CIRSIUM VULGARE	bull thistle	4	FACU-	Ad B-Forb
CLEVIR	4	Clematis virginiana	virgin's bower	0	FAC	Nt W-Vine
CLIBOR	5	Clintonia borealis	bluebead lily; corn lily	-1	FAC+	Nt P-Forb
COPTRI	5	Coptis trifolia	goldthread	-3	FACW	Nt P-Forb
			alternate leaved			
CORALT	5	Cornus alternifolia	dogwood	5	UPL	Nt Tree
CORCAA	6	Cornus canadensis	bunchberry	0	FAC	Nt Shrub
CORSTO	2	Cornus stolonifera	red osier dogwood	-3	FACW	Nt Shrub
CYPRIV	3	Cyperus rivularis	brook nut sedge	-4	FACW+	Nt A-Sedge
CYSBUL	5	Cystopteris bulbifera	bulblet fern	-2	FACW-	Nt Fern
DROROT	6	Drosera rotundifolia	round leaved sundew	-5	OBL	Nt P-Forb
DRYCAR	5	Dryopteris carthusiana	spinulose woodfern	-2	FACW-	Nt Fern
DRYCRI	6	Dryopteris cristata	crested shield fern	-5	OBL	Nt Fern
DRYINT	5	Dryopteris intermedia	evergreen woodfern	0	FAC	Nt Fern
ELEELL	6	Eleocharis elliptica	golden seeded spike rush	-3	FACW	Nt P-Sedge
ELEERY	4	Eleocharis erythropoda	spike rush	-5	OBL	Nt P-Sedge
ELOCAN	1	Elodea canadensis	common waterweed	-5	OBL	Nt P-Forb
ELYVIR	4	Elymus virginicus	Virginia wild rye	-2	FACW-	Nt P-Grass
EPICIL	3	Epilobium ciliatum	willow herb	3	FACU	Nt P-Forb
EPICOL	3	Epilobium coloratum	cinnamon willow herb	-5	OBL	Nt P-Forb
EPILEP	6	Epilobium leptophyllum	fen willow herb	-5	OBL	Nt P-Forb
EPIPAR	0	EPILOBIUM PARVIFLORUM	willow herb	3	FACU	Ad P-Forb
EPIHEL	0	EPIPACTIS HELLEBORINE	helleborine	5	UPL	Ad P-Forb
EQUARV	0	Equisetum arvense	common horsetail	0	FAC	Nt Fern Ally
EQUFLU	7	Equisetum fluviatile	water horsetail	-5	OBL	Nt Fern Ally
EQUSYL	5	Equisetum sylvaticum	woodland horsetail	-3	FACW	Nt Fern Ally
ERIANN	0	Erigeron annuus	annual fleabane	1	FAC-	Nt B-Forb
EUPMAM	4	Eupatorium maculatum	joe pye weed	-5	OBL	Nt P-Forb

EUPPER	4	Eupatorium perfoliatum	common boneset	-4	FACW+	Nt P-Forb
FRANIG	6	Fraxinus nigra	black ash	-4	FACW+	Nt Tree
FRAPEN	2	Fraxinus pennsylvanica	red ash	-3	FACW	Nt Tree
GALTIN	5	Galium tinctorium	stiff bedstraw	-5	OBL	Nt P-Forb
GALTRR	4	Galium triflorum	fragrant bedstraw	2	FACU+	Nt P-Forb
GAUHS	8	Gaultheria hispidula	creeping snowberry	-3	FACW	Nt Shrub
GEURIV	7	Geum rivale	purple avens	-5	OBL	Nt P-Forb
GLYSTR	4	Glyceria striata	fowl manna grass	-5	OBL	Nt P-Grass
GYMDRY	5	Gymnocarpium dryopteris	oak fern	0	FAC	Nt Fern
			larger Canada st. john's			
HYPMAJ	4	Hypericum majus	wort	-3	FACW	Nt P-Forb
IMPCAP	2	Impatiens capensis	spotted touch me not	-3	FACW	Nt A-Forb
JUNBRE	8	Juncus brevicaudatus	rush	-5	OBL	Nt P-Forb
JUNDUD	1	Juncus dudleyi	Dudley's rush	0	FAC	Nt P-Forb
LARLAR	5	Larix laricina	tamarack	-3	FACW	Nt Tree
LEEORY	3	Leersia oryzoides	cut grass	-5	OBL	Nt P-Grass
LINBOR	6	Linnaea borealis	twinflower	0	FAC	Nt P-Forb
LIPOE	5	Liparis loeselii	Loesel's twayblade	-4	FACW+	Nt P-Forb
LOBKAL	10	Lobelia kalmii	bog lobelia	-5	OBL	Nt P-Forb
LONDIO	5	Lonicera dioica	red honeysuckle	3	FACU	Nt W-Vine
LYCANN	5	Lycopodium annotinum	stiff clubmoss	0	FAC	Nt Fern Ally
LYCOBS	5	Lycopodium obscurum	ground pine	3	FACU	Nt Fern Ally
			common water			
LYCAME	2	Lycopus americanus	horehound	-5	OBL	Nt P-Forb
LYCUNI	2	Lycopus uniflorus	northern bugle weed	-5	OBL	Nt P-Forb
LYSTER	6	Lysimachia terrestris	swamp candles	-5	OBL	Nt P-Forb
MAICAC	4	Maianthemum canadense	Canada mayflower	0	FAC	Nt P-Forb
MATSTR	3	Matteuccia struthiopteris	ostrich fern	-3	FACW	Nt Fern
MEDVIR	10	Medeola virginiana	Indian cucumber root	5	UPL	Nt P-Forb
MENARV	3	Mentha arvensis	wild mint	-3	FACW	Nt P-Forb
MIMRIN	5	Mimulus ringens	monkey flower	-5	OBL	Nt P-Forb
MITDIP	8	Mitella diphylla	bishop's cap	2	FACU+	Nt P-Forb
MITNUD	8	Mitella nuda	naked miterwort	-3	FACW	Nt P-Forb
MONOUN	5	Monotropa uniflora	Indian pipe	3	FACU	Nt P-Forb
MUHMEX	3	Muhlenbergia mexicana	leafy satin grass	-3	FACW	Nt P-Grass
MYRGAL	6	Myrica gale	sweet gale	-5	OBL	Nt Shrub
NASOFF	0	NASTURTIIUM OFFICINALE	watercress	-5	OBL	Ad P-Grass
ONOSEN	2	Onoclea sensibilis	sensitive fern	-3	FACW	Nt Fern
ORTSEC	7	Orthilia secunda	one sided pyrola	-1	FAC+	Nt P-Forb
OSMCIN	5	Osmunda cinnamomea	cinnamon fern	-3	FACW	Nt Fern
OSMCLN	6	Osmunda claytoniana	interrupted fern	-1	FAC+	Nt Fern
OSMREG	5	Osmunda regalis	royal fern	-5	OBL	Nt Fern
PARGLA	8	Parnassia glauca	grass of parnassus	-5	OBL	Nt P-Forb
PARINS	4	Parthenocissus inserta	thicket creeper	3	FACU	Nt W-Vine
PHAARU	0	PHALARIS ARUNDINACEA	reed canary grass	-4	FACW+	Nt P-Grass
PHLPRA	0	PHLEUM PRATENSE	timothy	3	FACU	Ad P-Grass
PHRAUS	0	PHRAGMITES AUSTRALIS*	Phragmites	-4	FACW+	Nt P-Grass
PHYOPU	4	Physocarpus opulifolius	ninebark	-2	FACW-	Nt Shrub
PICMAR	6	Picea mariana	black spruce	-3	FACW	Nt Tree
PILFON	5	Pilea fontana	bog clearweed	-3	FACW	Nt A-Forb
PINSTR	3	Pinus strobus	white pine	3	FACU	Nt Tree

PLAMAJ	0	PLANTAGO MAJOR	common plantain	-1	FAC+	Ad P-Forb
PLAHYP	5	Platanthera hyperborea	tall northern bog orchid	-4	FACW+	Nt P-Forb
POAPAS	3	Poa palustris	fowl meadow grass	-4	FACW+	Nt P-Grass
POLPAU	7	Polygala paucifolia	gay wings	3	FACU	Nt P-Forb
POPBAL	2	Populus balsamifera	balsam poplar	-3	FACW	Nt Tree
POPTRE	1	Populus tremuloides	quaking aspen	0	FAC	Nt Tree
PREALB	5	Prenanthes alba	white lettuce	3	FACU	Nt P-Forb
PRUVUL	0	PRUNELLA VULGARIS	lawn prunella	0	FAC	Nt P-Forb
PRUSER	2	Prunus serotina	wild black cherry	3	FACU	Nt Tree
PRUVIR	2	Prunus virginiana	choke cherry	1	FAC-	Nt Shrub
PTEAQU	0	Pteridium aquilinum	bracken fern	3	FACU	Nt Fern
RANABO	0	Ranunculus abortivus	small flowered buttercup	-2	FACW-	Nt A-Forb
RANHIS	5	Ranunculus hispidus	swamp buttercup	0	FAC	Nt P-Forb
RANREC	5	Ranunculus recurvatus	hooked crowfoot	-3	FACW	Nt A-Forb
RHAALN	8	Rhamnus alnifolia	alder leaved buckthorn	-5	OBL	Nt Shrub
RIBAME	6	Ribes americanum	wild black currant	-3	FACW	Nt Shrub
RUBPUB	4	Rubus pubescens	dwarf raspberry	-4	FACW+	Nt P-Forb
RUBSTR	2	Rubus strigosus	wild red raspberry	-2	FACW-	Nt Shrub
RUMVER	7	Rumex verticillatus	water dock	-5	OBL	Nt P-Forb
SAGLAT	1	Sagittaria latifolia	common arrowhead	-5	OBL	Nt P-Forb
SALERI	2	Salix eriocephala	willow	-3	FACW	Nt Shrub
SALLUC	3	Salix lucida	shining willow	-4	FACW+	Nt Shrub
SAMCAN	3	Sambucus canadensis	elderberry	-2	FACW-	Nt Shrub
SANMAR	4	Sanicula marilandica	black snakeroot	3	FACU	Nt P-Forb
SCHACU	5	Schoenoplectus acutus	hardstem bulrush	-5	OBL	Nt P-Sedge
SCIATR	3	Scirpus atrovirens	bulrush	-5	OBL	Nt P-Sedge
SCICYP	5	Scirpus cyperinus	wool grass	-5	OBL	Nt P-Sedge
SCUGAL	5	Scutellaria galericulata	common skullcap	-5	OBL	Nt P-Forb
SCULAT	5	Scutellaria lateriflora	mad dog skullcap	-5	OBL	Nt P-Forb
SENAUR	5	Senecio aureus	golden ragwort	-3	FACW	Nt P-Forb
SIUSUA	5	Sium suave	water parsnip	-5	OBL	Nt P-Forb
SOLDUL	0	SOLANUM DULCAMARA	bittersweet nightshade	0	FAC	Ad P-Forb
SOLALT	1	Solidago altissima	tall goldenrod	3	FACU	Nt P-Forb
SOLCAN	1	Solidago canadensis	Canada goldenrod	3	FACU	Nt P-Forb
SOLGIG	3	Solidago gigantea	late goldenrod	-3	FACW	Nt P-Forb
SOLPAT	6	Solidago patula	swamp goldenrod	-5	OBL	Nt P-Forb
SOLRUG	3	Solidago rugosa	rough goldenrod	-1	FAC+	Nt P-Forb
SOLULI	4	Solidago uliginosa	bog goldenrod	-5	OBL	Nt P-Forb
SPACHL	6	Sparganium chlorocarpum	green fruited bur reed	-5	OBL	Nt P-Forb
SPHINT	4	Sphenopholis intermedia	slender wedgegrass	0	FAC	Nt P-Grass
SPIPOL	6	Spirodela polyrhiza	great duckweed	-5	OBL	Nt A-Forb
STELOF	5	Stellaria longifolia	long leaved chickweed	-4	FACW+	Nt P-Forb
SYMFOE	6	Symplocarpus foetidus	skunk cabbage	-5	OBL	Nt P-Forb
TAROFF	0	TARAXACUM OFFICINALE	common dandelion	3	FACU	Ad P-Forb
TAXCAN	5	Taxus canadensis	Canadian yew	3	FACU	Nt Shrub
THADIO	6	Thalictrum dioicum	early meadow rue	2	FACU+	Nt P-Forb
THEPAL	2	Thelypteris palustris	marsh fern	-4	FACW+	Nt Fern
THUOCC	4	Thuja occidentalis	arbor vitae	-3	FACW	Nt Tree
TIACOR	9	Tiarella cordifolia	foamflower	1	FAC-	Nt P-Forb
TRIBOR	5	Trientalis borealis	starflower	-1	FAC+	Nt P-Forb

TSUCAN	5	Tsuga canadensis	hemlock	3	FACU	Nt Tree
TYPANG	0	TYPHA ANGUSTIFOLIA	narrow leaved cattail	-5	OBL	Ad P-Forb
TYPLAT	1	Typha latifolia	broad leaved cattail	-5	OBL	Nt P-Forb
TYPGLA	0	TYPHA XGLAUCA	hybrid cattail	-5	OBL	Ad P-Forb
ULMRUB	2	Ulmus rubra	slippery elm	0	FAC	Nt Tree
URTDIO	1	Urtica dioica	nettle	-1	FAC+	Nt P-Forb
UTRVUL	6	Utricularia vulgaris	great bladderwort	-5	OBL	Nt P-Forb
VACANG	4	Vaccinium angustifolium	blueberry	3	FACU	Nt Shrub
VACMYR	4	Vaccinium myrtilloides	Canada blueberry	-2	FACW-	Nt Shrub
VALAME	7	Vallisneria americana	eel grass	-5	OBL	Nt P-Forb
VERHAS	4	Verbena hastata	blue vervain	-4	FACW+	Nt P-Forb
		Veronica beccabunga var.				
VERBEB	10	americana	American brooklime	-5	OBL	Ad P-Forb
VEROFF	0	VERONICA OFFICINALIS	common speedwell	5	UPL	Ad P-Forb
VIOBLA	5	Viola blanda	sweet white violet	-2	FACW-	Nt P-Forb
VIOCUC	5	Viola cucullata	marsh violet	-5	OBL	Nt P-Forb
VIOSTR	5	Viola striata	cream violet	-3	FACW	Nt P-Forb

**subsp. australis*

Brown Bridge Open Wetland Floristic Quality Data

Floristic Quality Data	
Native Species	131
Total Species	188
Native Mean C	3.6
Mean C w/ Adventives	2.6
Native FQI	42.2
FQI w/ Adventives	36
Native Mean W	-3.1
Mean W w/ Adventives	-1.7
Average Wetness	FACW

Physiognomy Summary					
Native			Adventive		
	134	71%		54	29%
Tree	6	3%	Tree	0	0%
Shrub	11	6%	Shrub	1	1%
W-Vine	0	0%	W-Vine	0	0%
H-Vine	0	0%	H-Vine	0	0%
P-Forb	56	30%	P-Forb	23	12%
B-Forb	2	1%	B-Forb	9	5%
A-Forb	18	10%	A-Forb	12	6%
P-Grass	13	7%	P-Grass	7	4%
A-Grass	1	1%	A-Grass	2	1%
P-Sedge	22	12%	P-Sedge	0	0%
A-Sedge	2	1%	A-Sedge	0	0%
Fern	3	2%	Fern	0	0%

Documented Species:

Acronym	C	Scientific Name	Common name	W	Wetness	Physiognomy
ABUTHE	0	ABUTILON THEOPHRASTI	velvetleaf	4	FACU-	Ad A-Forb
ACENEG	0	Acer negundo	box elder	-2	FACW-	Nt Tree
ACERUB	1	Acer rubrum	red maple	0	FAC	Nt Tree
AGAPUR	7	Agalinis purpurea	purple gerardia	-3	FACW	Nt A-Forb
AGRIGIG	0	AGROSTIS GIGANTEA	redtop	0	FAC	Ad P-Grass
AGRHYE	4	Agrostis hyemalis	ticklegrass	1	FAC-	Nt P-Grass
ALNRUG	5	Alnus rugosa	tag alder	-5	OBL	Nt Shrub
AMAALB	0	Amaranthus albus	tumbleweed	3	FACU	Nt A-Forb
AMBART	0	Ambrosia artemisiifolia	common ragweed	3	FACU	Nt A-Forb
ANAMAR	3	Anaphalis margaritacea	pearly everlasting	5	UPL	Nt P-Forb
ANECAN	4	Anemone canadensis	Canada anemone	-3	FACW	Nt P-Forb
ASCINC	6	Asclepias incarnata	swamp milkweed	-5	OBL	Nt P-Forb
ASCSYR	1	Asclepias syriaca	common milkweed	5	UPL	Nt P-Forb
ASTLAN	2	Aster lanceolatus	eastern lined aster	-3	FACW	Nt P-Forb
ASTPUN	5	Aster puniceus	swamp aster	-5	OBL	Nt P-Forb
AVESAT	0	AVENA SATIVA	oats	5	UPL	Ad A-Grass
BARVUL	0	BARBAREA VULGARIS	yellow rocket	0	FAC	Ad B-Forb
BERINC	0	BERTEROA INCANA	hoary alyssum	5	UPL	Ad A-Forb
BIDCER	3	Bidens cernuus	nodding bur marigold	-5	OBL	Nt A-Forb
BIDFRO	1	Bidens frondosus	common beggar ticks	-3	FACW	Nt A-Forb
BRAERE	7	Brachyelytrum erectum	long awned wood grass	5	UPL	Nt P-Grass
BRAKAB	0	BRASSICA KABER	wild mustard	5	UPL	Ad A-Forb
BRARAP	0	BRASSICA RAPA	field mustard	5	UPL	Ad A-Forb
BROCIL	6	Bromus ciliatus	fringed brome	-3	FACW	Nt P-Grass
CALCAN	3	Calamagrostis canadensis	blue joint grass	-5	OBL	Nt P-Grass
CAMAPR	7	Campanula aparinoides	marsh bellflower	-5	OBL	Nt P-Forb
CXBEBB	4	Carex bebbii	sedge	-5	OBL	Nt P-Sedge
CXCOMO	5	Carex comosa	sedge	-5	OBL	Nt P-Sedge

CXFLAV	4	Carex flava	sedge	-5	OBL	Nt P-Sedge
CXHYST	2	Carex hystericina	sedge	-5	OBL	Nt P-Sedge
CXINTE	3	Carex interior	sedge	-5	OBL	Nt P-Sedge
CXPSEU	5	Carex pseudo-cyperus	sedge	-5	OBL	Nt P-Sedge
CXRETS	3	Carex retrorsa	sedge	-5	OBL	Nt P-Sedge
CXSCOP	4	Carex scoparia	sedge	-3	FACW	Nt P-Sedge
CXSTER	10	Carex sterilis	sedge	-5	OBL	Nt P-Sedge
CXSTIP	1	Carex stipata	sedge	-5	OBL	Nt P-Sedge
CXSTRI	4	Carex stricta	sedge	-5	OBL	Nt P-Sedge
CXVIRI	4	Carex viridula	sedge	-5	OBL	Nt P-Sedge
CXVULP	1	Carex vulpinoidea	sedge	-5	OBL	Nt P-Sedge
CERFON	0	CERASTIUM FONTANUM	mouse ear chickweed	3	FACU	Ad P-Forb
CHEGLB	7	Chelone glabra	turtlehead	-5	OBL	Nt P-Forb
CHEALB	0	CHENOPODIUM ALBUM	lamb's quarters	1	FAC-	Ad A-Forb
CICBUL	5	Cicuta bulbifera	water hemlock	-5	OBL	Nt P-Forb
CICMAC	4	Cicuta maculata	water hemlock	-5	OBL	Nt B-Forb
CINLAT	5	Cinna latifolia	wood reedgrass	-4	FACW+	Nt P-Grass
CIRARV	0	CIRSIUM ARVENSE	Canadian thistle	3	FACU	Ad P-Forb
CIRVUL	0	CIRSIUM VULGARE	bull thistle	4	FACU-	Ad B-Forb
CLAMAR	10	Cladium mariscoides	twig rush	-5	OBL	Nt P-Sedge
CONCAN	0	Conyza canadensis	horseweed	1	FAC-	Nt A-Forb
CORSTO	2	Cornus stolonifera	red osier dogwood	-3	FACW	Nt Shrub
CORVAR	0	CORONILLA VARIA	crown vetch	5	UPL	Ad P-Forb
CRETEC	0	CREPIS TECTORUM	hawk's beard	5	UPL	Ad A-Forb
CYPRIV	3	Cyperus rivularis	brook nut sedge	-4	FACW+	Nt A-Sedge
CYPSTR	3	Cyperus strigosus	long scaled nut sedge	-3	FACW	Nt P-Sedge
DAUCAR	0	DAUCUS CAROTA	queen anne's lace	5	UPL	Ad B-Forb
ECHCRU	0	ECHINOCHLOA CRUSGALLI	barnyard grass	-3	FACW	Ad A-Grass
ELAUMB	0	ELAEAGNUS UMBELLATA	autumn olive	3	FACU	Ad Shrub
ELEELL	6	Eleocharis elliptica	golden seeded spike rush	-3	FACW	Nt P-Sedge
ELEERY	4	Eleocharis erythropoda	spike rush	-5	OBL	Nt P-Sedge
ELEINT	7	Eleocharis intermedia	spike rush	-3	FACW	Nt A-Sedge
EPICIL	3	Epilobium ciliatum	willow herb	3	FACU	Nt P-Forb
EPICOL	3	Epilobium coloratum	cinnamon willow herb	-5	OBL	Nt P-Forb
EPIHIR	0	EPILOBIUM HIRSUTUM	great hairy willow herb	-4	FACW+	Ad P-Forb
EPILEP	6	Epilobium leptophyllum	fen willow herb	-5	OBL	Nt P-Forb
EPIPAR	0	EPILOBIUM PARVIFLORUM	willow herb	3	FACU	Ad P-Forb
EQUARV	0	Equisetum arvense	common horsetail	0	FAC	Nt Fern Ally
EQUFLU	7	Equisetum fluviatile	water horsetail	-5	OBL	Nt Fern Ally
EREHIE	2	Erechtites hieracifolia	fireweed	3	FACU	Nt A-Forb
ERISTR	4	Erigeron strigosus	daisy fleabane	1	FAC-	Nt P-Forb
EUPMAM	4	Eupatorium maculatum	Joe pye weed	-5	OBL	Nt P-Forb
EUPPER	4	Eupatorium perfoliatum	common boneset	-4	FACW+	Nt P-Forb
EUTGRA	3	Euthamia graminifolia	grass leaved goldenrod	-2	FACW-	Nt P-Forb
FESARU	0	FESTUCA ARUNDINACEA	tall fescue	2	FACU+	Ad P-Grass
FRAVIR	2	Fragaria virginiana	wild strawberry	1	FAC-	Nt P-Forb
GALASP	5	Galium asprellum	rough bedstraw	-5	OBL	Nt P-Forb
GALODO	0	GALIUM ODORATUM	sweet woodruff	5	UPL	Ad P-Forb
GALTIN	5	Galium tinctorium	stiff bedstraw	-5	OBL	Nt P-Forb
GALTRD	6	Galium trifidum	small bedstraw	-4	FACW+	Nt P-Forb

GENPRO	8	Gentianopsis procera	small fringed gentian	-5	OBL	Nt A-Forb
GLYSTR	4	Glyceria striata	fowl manna grass	-5	OBL	Nt P-Grass
		HIERACIUM				
HIEAUR	0	AURANTIACUM	orange hawkweed	5	UPL	Ad P-Forb
		HIERACIUM				
HIEPIS	0	PILOSELLOIDES	glaucous king devil	5	UPL	Ad P-Forb
HYPPER	0	HYPERICUM PERFORATUM	common St. John's wort	5	UPL	Ad P-Forb
HYPRAD	0	HYPOCHAERIS RADICATA	spotted cat's ear	5	UPL	Ad P-Forb
IMPCAP	2	Impatiens capensis	spotted touch me not	-3	FACW	Nt A-Forb
IRIVER	5	Iris versicolor	wild blue flag	-5	OBL	Nt P-Forb
JUNBRP	7	Juncus brachycephalus	rush	-5	OBL	Nt P-Forb
JUNBRE	8	Juncus brevicaudatus	rush	-5	OBL	Nt P-Forb
JUNDUD	1	Juncus dudleyi	Dudley's rush	0	FAC	Nt P-Forb
JUNEFF	3	Juncus effusus	soft stemmed rush	-5	OBL	Nt P-Forb
JUNNOD	5	Juncus nodosus	joint rush	-5	OBL	Nt P-Forb
JUNPEL	8	Juncus pelocarpus	brown fruited rush	-5	OBL	Nt P-Forb
LACSER	0	LACTUCA SERRIOLA	prickly lettuce	0	FAC	Ad B-Forb
LEEORY	3	Leersia oryzoides	cut grass	-5	OBL	Nt P-Grass
LEMMIN	5	Lemna minor	small duckweed	-5	OBL	Nt A-Forb
LINVUL	0	LINARIA VULGARIS	butter and eggs	5	UPL	Ad P-Forb
LIPOE	5	Liparis loeselii	Loesel's twayblade	-4	FACW+	Nt P-Forb
LOBCAR	7	Lobelia cardinalis	cardinal flower	-5	OBL	Nt P-Forb
LOBKAL	10	Lobelia kalmii	bog lobelia	-5	OBL	Nt P-Forb
LOLPER	0	LOLIUM PERENNE	perennial rye grass	3	FACU	Ad P-Grass
LUDPAL	4	Ludwigia palustris	water purslane	-5	OBL	Nt P-Forb
LYCAME	2	Lycopus americanus	common water horehound	-5	OBL	Nt P-Forb
LYCUNI	2	Lycopus uniflorus	northern bugle weed	-5	OBL	Nt P-Forb
LYTSAL	0	LYTHRUM SALICARIA	purple loosestrife	-5	OBL	Ad P-Forb
MEDLUP	0	MEDICAGO LUPULINA	black medick	1	FAC-	Ad A-Forb
MELALB	0	MELILOTUS ALBA	white sweet clover	3	FACU	Ad B-Forb
MELLOF	0	MELILOTUS OFFICINALIS	yellow sweet clover	3	FACU	Ad B-Forb
MENARV	3	Mentha arvensis	wild mint	-3	FACW	Nt P-Forb
MIMRIN	5	Mimulus ringens	monkey flower	-5	OBL	Nt P-Forb
MUHMEX	3	Muhlenbergia mexicana	leafy satin grass	-3	FACW	Nt P-Grass
MYOSCO	0	MYOSOTIS SCORPIOIDES	forget me not	-5	OBL	Ad P-Forb
NASOFF	0	NASTURTIUM OFFICINALE	watercress	-5	OBL	Ad P-Grass
OENBIE	2	Oenothera biennis	common evening primrose	3	FACU	Nt B-Forb
PANCAP	1	Panicum capillare	witch grass	0	FAC	Nt A-Grass
PARGLA	8	Parnassia glauca	grass of parnassus	-5	OBL	Nt P-Forb
PASSAT	0	PASTINACA SATIVA	wild parsnip	5	UPL	Ad B-Forb
PHAARU	0	PHALARIS ARUNDINACEA	reed canary grass	-4	FACW+	Nt P-Grass
PHLPRA	0	PHLEUM PRATENSE	timothy	3	FACU	Ad P-Grass
PHRAUS	0	PHRAGMITES AUSTRALIS*	phragmites	-4	FACW+	Nt P-Grass
PHYOPU	4	Physocarpus opulifolius	ninebark	-2	FACW-	Nt Shrub
PHYAME	2	Phytolacca americana	pokeweed	1	FAC-	Nt P-Forb
PILFON	5	Pilea fontana	bog clearweed	-3	FACW	Nt A-Forb
PLALAN	0	PLANTAGO LANCEOLATA	english plantain	0	FAC	Ad P-Forb
POACOM	0	POA COMPRESSA	Canada bluegrass	2	FACU+	Ad P-Grass
POAPAS	3	Poa palustris	fowl meadow grass	-4	FACW+	Nt P-Grass
POAPRA	0	POA PRATENSIS	Kentucky bluegrass	1	FAC-	Ad P-Grass
POLAMP	6	Polygonum amphibium	water smartweed	-5	OBL	Nt P-Forb

POLAVI	0	POLYGONUM AVICULARE POLYGONUM	knotweed	1	FAC-	Ad A-Forb
POLCON	0	CONVOLVULUS	false buckwheat	1	FAC-	Ad A-Forb
POLHYR	1	Polygonum hydropiper	water pepper	-5	OBL	Nt A-Forb
POLHYS	5	Polygonum hydropiperoides	water pepper	-5	OBL	Nt P-Forb
POLLAP	0	Polygonum lapathifolium	nodding smartweed	-4	FACW+	Nt A-Forb
POLPEN	0	Polygonum pensylvanicum	bigseed smartweed	-4	FACW+	Nt A-Forb
POLPER	0	POLYGONUM PERSICARIA	lady's thumb	-3	FACW	Ad A-Forb
POLPUN	5	Polygonum punctatum	smartweed	-5	OBL	Nt A-Forb
POLSCA	2	Polygonum scandens	false buckwheat	0	FAC	Nt P-Forb
POPBAL	2	Populus balsamifera	balsam poplar	-3	FACW	Nt Tree
POPTRE	1	Populus tremuloides	quaking aspen	0	FAC	Nt Tree
POTNOR	0	Potentilla norvegica	rough cinquefoil	0	FAC	Nt A-Forb
PRUVUL	0	PRUNELLA VULGARIS	lawn prunella	0	FAC	Nt P-Forb
RANHIS	5	Ranunculus hispidus	swamp buttercup	0	FAC	Nt P-Forb
RANSCE	1	Ranunculus sceleratus	cursed crowfoot	-5	OBL	Nt A-Forb
RHAALN	8	Rhamnus alnifolia	alder leaved buckthorn	-5	OBL	Nt Shrub
RHUTYP	2	Rhus typhina	staghorn sumac	5	UPL	Nt Tree
RORPAL	1	Rorippa palustris	yellow cress	-5	OBL	Nt A-Forb
RUBSTR	2	Rubus strigosus	wild red raspberry	-2	FACW-	Nt Shrub
RUMCRI	0	RUMEX CRISPUS	curly dock	-1	FAC+	Ad P-Forb
RUMOBT	0	RUMEX OBTUSIFOLIUS	bitter dock	-3	FACW	Ad P-Forb
SAGLAT	1	Sagittaria latifolia	common arrowhead	-5	OBL	Nt P-Forb
SALBEB	1	Salix bebbiana	Bebb's willow	-4	FACW+	Nt Shrub
SALDIS	1	Salix discolor	pussy willow	-3	FACW	Nt Shrub
SALERI	2	Salix eriocephala	willow	-3	FACW	Nt Shrub
SALEXI	1	Salix exigua	sandbar willow	-5	OBL	Nt Shrub
SALLUC	3	Salix lucida	shining willow	-4	FACW+	Nt Shrub
SALPET	1	Salix petiolaris	slender willow	-4	FACW+	Nt Shrub
SAPOFF	0	SAPONARIA OFFICINALIS	bouncing bet	3	FACU	Ad P-Forb
SCHACU	5	Schoenoplectus acutus	hardstem bulrush	-5	OBL	Nt P-Sedge
SCHPUN	5	Schoenoplectus pungens Schoenoplectus	three square	-5	OBL	Nt P-Sedge
SCHTAB	4	tabernaemontani	softstem bulrush	-5	OBL	Nt P-Sedge
SCIATR	3	Scirpus atrovirens	bulrush	-5	OBL	Nt P-Sedge
SCICYP	5	Scirpus cyperinus	wool grass	-5	OBL	Nt P-Sedge
SCUGAL	5	Scutellaria galericulata	common skullcap	-5	OBL	Nt P-Forb
SCULAT	5	Scutellaria lateriflora	mad dog skullcap	-5	OBL	Nt P-Forb
SILVUL	0	SILENE VULGARIS	bladder campion	5	UPL	Ad P-Forb
SISIRI	0	SISYMBRIUM IRIO	london rocket	5	UPL	Ad A-Forb
SOLDUL	0	SOLANUM DULCAMARA	bittersweet nightshade	0	FAC	Ad P-Forb
SOLALT	1	Solidago altissima	tall goldenrod	3	FACU	Nt P-Forb
SOLCAN	1	Solidago canadensis	Canada goldenrod	3	FACU	Nt P-Forb
SOLGIG	3	Solidago gigantea	late goldenrod	-3	FACW	Nt P-Forb
SOLRUG	3	Solidago rugosa	rough goldenrod	-1	FAC+	Nt P-Forb
SONASP	0	SONCHUS ASPER	prickly sow thistle	0	FAC	Ad A-Forb
SPACHL	6	Sparganium chlorocarpum	green fruited bur reed	-5	OBL	Nt P-Forb
SPHINT	4	Sphenopholis intermedia	slender wedgrass	0	FAC	Nt P-Grass
SPOCRY	3	Sporobolus cryptandrus	sand dropseed	4	FACU-	Nt P-Grass
TAROFF	0	TARAXACUM OFFICINALE	common dandelion	3	FACU	Ad P-Forb
THEPAL	2	Thelypteris palustris	marsh fern	-4	FACW+	Nt Fern

THUOCC	4	Thuja occidentalis	arbor vitae	-3	FACW	Nt Tree
TRADUB	0	TRAGOPOGON DUBIUS	goat's beard	5	UPL	Ad B-Forb
TRIREP	0	TRIFOLIUM REPENS	white clover	2	FACU+	Ad P-Forb
TYPANG	0	TYPHA ANGUSTIFOLIA	narrow leaved cattail	-5	OBL	Ad P-Forb
TYPLAT	1	Typha latifolia	broad leaved cattail	-5	OBL	Nt P-Forb
TYPGLA	0	TYPHA XGLAUCA	hybrid cattail	-5	OBL	Ad P-Forb
URTDIO	1	Urtica dioica	nettle	-1	FAC+	Nt P-Forb
UTRVUL	6	Utricularia vulgaris	great bladderwort	-5	OBL	Nt P-Forb
VALAME	7	Vallisneria americana	eel grass	-5	OBL	Nt P-Forb
VERTHA	0	VERBASCUM THAPSUS	common mullein	5	UPL	Ad B-Forb
VERHAS	4	Verbena hastata	blue vervain	-4	FACW+	Nt P-Forb
VERBEA	10	Veronica beccabunga var. americana	American brooklime	-5	OBL	Nt P-Forb

**subsp. australis*

Brown Bridge Forested and Open Wetland Floristic Quality Data

Floristic Quality Data	
Native Species	219
Total Species	277
Native Mean C	4.2
Mean C w/ Adventives	3.3
Native FQI	62.0
FQI w/ Adventives	55.5
Native Mean W	-2.4
Mean W w/ Adventives	-1.6
Average Wetness	FACW-

Physiognomy Summary						
	Native	222	80%	Adventive	55	20%
Tree	19	7%		Tree	0	0%
Shrub	22	8%		Shrub	2	1%
W-Vine	3	1%		W-Vine	0	0%
H-Vine	0	0%		H-Vine	0	0%
P-Forb	83	30%		P-Forb	25	9%
B-Forb	4	1%		B-Forb	9	3%
A-Forb	21	8%		A-Forb	11	4%
P-Grass	16	6%		P-Grass	6	2%
A-Grass	1	0%		A-Grass	2	1%
P-Sedge	31	11%		P-Sedge	0	0%
A-Sedge	2	1%		A-Sedge	0	0%
Fern	20	7%		Fern	0	0%

Documented Species:

Acronym	C	Scientific Name	common name	W	Wetness	Physiognomy
ABIBAL	3	Abies balsamea	balsam fir	-3	FACW	Nt Tree
ABUTHE	0	ABUTILON THEOPHRASTI	velvetleaf	4	FACU-	Ad A-Forb
ACENEG	0	Acer negundo	box elder	-2	FACW-	Nt Tree
ACERUB	1	Acer rubrum	red maple	0	FAC	Nt Tree
ACESAU	5	Acer saccharum	sugar maple	3	FACU	Nt Tree
ADIPED	6	Adiantum pedatum	maidenhair fern	1	FAC-	Nt Fern
AGAPUR	7	Agalinis purpurea	purple gerardia	-3	FACW	Nt A-Forb
AGRGRY	2	Agrimonia gryposepala	tall agrimony	2	FACU+	Nt P-Forb
AGRIGG	0	AGROSTIS GIGANTEA	redtop	0	FAC	Ad P-Grass
AGRHYE	4	Agrostis hyemalis	ticklegrass	1	FAC-	Nt P-Grass
ALNRUG	5	Alnus rugosa	tag alder	-5	OBL	Nt Shrub
AMAALB	0	Amaranthus albus	tumbleweed	3	FACU	Nt A-Forb
AMBART	0	Ambrosia artemisiifolia	common ragweed	3	FACU	Nt A-Forb
ANAMAR	3	Anaphalis margaritacea	pearly everlasting	5	UPL	Nt P-Forb
ANEQUI	5	Anemone quinquefolia	wood anemone	0	FAC	Nt P-Forb
ARANUD	5	Aralia nudicaulis	wild sarsaparilla	3	FACU	Nt P-Forb
ARITRI	5	Arisaema triphyllum	Jack in the pulpit	-2	FACW-	Nt P-Forb
ASCINC	6	Asclepias incarnata	swamp milkweed	-5	OBL	Nt P-Forb
ASCSYR	1	Asclepias syriaca	common milkweed	5	UPL	Nt P-Forb
ASTLAN	2	Aster lanceolatus	eastern lined aster	-3	FACW	Nt P-Forb
ASTLAT	2	Aster lateriflorus	side flowering aster	-2	FACW-	Nt P-Forb
ASTPUN	5	Aster puniceus	swamp aster	-5	OBL	Nt P-Forb
ATHFIL	4	Athyrium filix-femina	lady fern	0	FAC	Nt Fern
AVESAT	0	AVENA SATIVA	oats	5	UPL	Ad A-Grass
BARVUL	0	BARBAREA VULGARIS	yellow rocket	0	FAC	Ad B-Forb
BERINC	0	BERTEROA INCANA	hoary alyssum	5	UPL	Ad A-Forb
BETPAP	2	Betula papyrifera	paper birch	2	FACU+	Nt Tree
BIDCER	3	Bidens cernuus	nodding bur marigold	-5	OBL	Nt A-Forb

BIDFRO	1	Bidens frondosus	common beggar ticks	-3	FACW	Nt A-Forb
BOECYL	5	Boehmeria cylindrica	false nettle	-5	OBL	Nt P-Forb
BRAERE	7	Brachyelytrum erectum	long awned wood grass	5	UPL	Nt P-Grass
BRARAP	0	BRASSICA RAPA	field mustard	5	UPL	Ad A-Forb
BROCIL	6	Bromus ciliatus	fringed brome	-3	FACW	Nt P-Grass
CALCAN	3	Calamagrostis canadensis	blue joint grass	-5	OBL	Nt P-Grass
CALTPA	6	Caltha palustris	marsh marigold	-5	OBL	Nt P-Forb
CAMAPR	7	Campanula aparinoides	marsh bellflower	-5	OBL	Nt P-Forb
CXBEBB	4	Carex bebbii	sedge	-5	OBL	Nt P-Sedge
CXBROM	6	Carex bromoides	sedge	-4	FACW+	Nt P-Sedge
CXBRUN	5	Carex brunnescens	sedge	-3	FACW	Nt P-Sedge
CXCOMO	5	Carex comosa	sedge	-5	OBL	Nt P-Sedge
CXDISP	10	Carex disperma	sedge	-5	OBL	Nt P-Sedge
CXFLAV	4	Carex flava	sedge	-5	OBL	Nt P-Sedge
CXGRAA	4	Carex gracillima	sedge	3	FACU	Nt P-Sedge
CXHYST	2	Carex hystericina	sedge	-5	OBL	Nt P-Sedge
CXINTE	3	Carex interior	sedge	-5	OBL	Nt P-Sedge
CXINTU	3	Carex intumescens	sedge	-4	FACW+	Nt P-Sedge
CXLACU	6	Carex lacustris	sedge	-5	OBL	Nt P-Sedge
CXLEPA	5	Carex leptalea	sedge	-5	OBL	Nt P-Sedge
CXPEDU	5	Carex pedunculata	sedge	5	UPL	Nt P-Sedge
CXPSEU	5	Carex pseudo-cyperus	sedge	-5	OBL	Nt P-Sedge
CXRETS	3	Carex retrorsa	sedge	-5	OBL	Nt P-Sedge
CXSCOP	4	Carex scoparia	sedge	-3	FACW	Nt P-Sedge
CXSTER	10	Carex sterilis	sedge	-5	OBL	Nt P-Sedge
CXSTIP	1	Carex stipata	sedge	-5	OBL	Nt P-Sedge
CXSTRI	4	Carex stricta	sedge	-5	OBL	Nt P-Sedge
CXTRIS	9	Carex trisperma	sedge	-5	OBL	Nt P-Sedge
CXVIRI	4	Carex viridula	sedge	-5	OBL	Nt P-Sedge
CXVULP	1	Carex vulpinoidea	sedge	-5	OBL	Nt P-Sedge
CARCAO	6	Carpinus caroliniana	blue beech	0	FAC	Nt Tree
CERFON	0	CERASTIUM FONTANUM	mouse ear chickweed	3	FACU	Ad P-Forb
CHEGLB	7	Chelone glabra	turtlehead	-5	OBL	Nt P-Forb
CHEALB	0	CHENOPODIUM ALBUM	lamb's quarters	1	FAC-	Ad A-Forb
CICBUL	5	Cicuta bulbifera	water hemlock	-5	OBL	Nt P-Forb
CICMAC	4	Cicuta maculata	water hemlock	-5	OBL	Nt B-Forb
CINLAT	5	Cinna latifolia	wood reedgrass	-4	FACW+	Nt P-Grass
CIRLUT	2	Circaea lutetiana	enchanter's nightshade	3	FACU	Nt P-Forb
CIRARV	0	CIRSIUM ARVENSE	Canadian thistle	3	FACU	Ad P-Forb
CIRMUT	6	Cirsium muticum	swamp thistle	-5	OBL	Nt B-Forb
CIRPAL	0	CIRSIUM PALUSTRE	marsh thistle	-4	FACW+	Ad B-Forb
CIRVUL	0	CIRSIUM VULGARE	bull thistle	4	FACU-	Ad B-Forb
CLAMAR	10	Cladium mariscoides	twig rush	-5	OBL	Nt P-Sedge
CLEVIR	4	Clematis virginiana	virgin's bower	0	FAC	Nt W-Vine
CLIBOR	5	Clintonia borealis	bluebead lily; corn lily	-1	FAC+	Nt P-Forb
CONCAN	0	Conyza canadensis	horseweed	1	FAC-	Nt A-Forb
COPTRI	5	Coptis trifolia	goldthread	-3	FACW	Nt P-Forb
CORALT	5	Cornus alternifolia	alternate leaved dogwood	5	UPL	Nt Tree
CORCAA	6	Cornus canadensis	bunchberry	0	FAC	Nt Shrub
CORSTO	2	Cornus stolonifera	red osier dogwood	-3	FACW	Nt Shrub

CORVAR	0	CORONILLA VARIA	crown vetch	5	UPL	Ad P-Forb
CRETEC	0	CREPIS TECTORUM	hawk's beard	5	UPL	Ad A-Forb
CYPRIV	3	Cyperus rivularis	brook nut sedge	-4	FACW+	Nt A-Sedge
CYPSTR	3	Cyperus strigosus	long scaled nut sedge	-3	FACW	Nt P-Sedge
CYSBUL	5	Cystopteris bulbifera	bulblet fern	-2	FACW-	Nt Fern
DAUCAR	0	DAUCUS CAROTA	queen anne's lace	5	UPL	Ad B-Forb
DRYCAR	5	Dryopteris carthusiana	spinulose woodfern	-2	FACW-	Nt Fern
DRYCRI	6	Dryopteris cristata	crested shield fern	-5	OBL	Nt Fern
DRYINT	5	Dryopteris intermedia	evergreen woodfern	0	FAC	Nt Fern
ECHCRU	0	ECHINOCHLOA CRUSGALLI	barnyard grass	-3	FACW	Ad A-Grass
ECHLOB	2	Echinocystis lobata	wild cucumber	-2	FACW-	Nt A-Forb
ELAUMB	0	ELAEAGNUS UMBELLATA	autumn olive	3	FACU	Ad Shrub
ELEELL	6	Eleocharis elliptica	golden seeded spike rush	-3	FACW	Nt P-Sedge
ELEERY	4	Eleocharis erythropoda	spike rush	-5	OBL	Nt P-Sedge
ELEINT	7	Eleocharis intermedia	spike rush	-3	FACW	Nt A-Sedge
ELYVIR	4	Elymus virginicus	virginia wild rye	-2	FACW-	Nt P-Grass
EPICIL	3	Epilobium ciliatum	willow herb	3	FACU	Nt P-Forb
EPICOL	3	Epilobium coloratum	cinnamon willow herb	-5	OBL	Nt P-Forb
EPIHIR	0	EPILOBIUM HIRSUTUM	great hairy willow herb	-4	FACW+	Ad P-Forb
EPILEP	6	Epilobium leptophyllum	fen willow herb	-5	OBL	Nt P-Forb
EPIPAR	0	EPILOBIUM PARVIFLORUM	willow herb	3	FACU	Ad P-Forb
EPIHEL	0	EPIPACTIS HELLEBORINE	helleborine	5	UPL	Ad P-Forb
EQUARV	0	Equisetum arvense	common horsetail	0	FAC	Nt Fern Ally
EQUFLU	7	Equisetum fluviatile	water horsetail	-5	OBL	Nt Fern Ally
EQUSYL	5	Equisetum sylvaticum	woodland horsetail	-3	FACW	Nt Fern Ally
EREHIE	2	Erechtites hieracifolia	fireweed	3	FACU	Nt A-Forb
ERIANN	0	Erigeron annuus	annual fleabane	1	FAC-	Nt B-Forb
ERISTR	4	Erigeron strigosus	daisy fleabane	1	FAC-	Nt P-Forb
EUPMAM	4	Eupatorium maculatum	Joe pye weed	-5	OBL	Nt P-Forb
EUPPER	4	Eupatorium perfoliatum	common boneset	-4	FACW+	Nt P-Forb
EUTGRA	3	Euthamia graminifolia	grass leaved goldenrod	-2	FACW-	Nt P-Forb
FESARU	0	FESTUCA ARUNDINACEA	tall fescue	2	FACU+	Ad P-Grass
FRAVIR	2	Fragaria virginiana	wild strawberry	1	FAC-	Nt P-Forb
FRANIG	6	Fraxinus nigra	black ash	-4	FACW+	Nt Tree
FRAPEN	2	Fraxinus pennsylvanica	red ash	-3	FACW	Nt Tree
GALASP	5	Galium asprellum	rough bedstraw	-5	OBL	Nt P-Forb
GALTIN	5	Galium tinctorium	stiff bedstraw	-5	OBL	Nt P-Forb
GALTRR	4	Galium triflorum	fragrant bedstraw	2	FACU+	Nt P-Forb
GAUHIS	8	Gaultheria hispidula	creeping snowberry	-3	FACW	Nt Shrub
GENPRO	8	Gentianopsis procera	small fringed gentian	-5	OBL	Nt A-Forb
GEURIV	7	Geum rivale	purple avens	-5	OBL	Nt P-Forb
GLYCAN	8	Glyceria canadensis	rattlesnake grass	-5	OBL	Nt P-Grass
GLYSTR	4	Glyceria striata	fowl manna grass	-5	OBL	Nt P-Grass
GYMDRY	5	Gymnocarpium dryopteris	oak fern	0	FAC	Nt Fern
HIEAUR	0	HIERACIUM AURANTIACUM HIERACIUM	orange hawkweed	5	UPL	Ad P-Forb
HIEPIS	0	PILOSELLOIDES	glaucous king devil	5	UPL	Ad P-Forb
HUPLUC	5	Huperzia lucidula	shining clubmoss	-1	FAC+	Nt Fern Ally
HYPPER	0	HYPERICUM PERFORATUM	common St. John's wort	5	UPL	Ad P-Forb
HYPRAD	0	HYPOCHAERIS RADICATA	spotted cat's ear	5	UPL	Ad P-Forb

IMPCAP	2	<i>Impatiens capensis</i>	spotted touch me not	-3	FACW	Nt A-Forb
IRIVER	5	<i>Iris versicolor</i>	wild blue flag	-5	OBL	Nt P-Forb
JUNBRP	7	<i>Juncus brachycephalus</i>	rush	-5	OBL	Nt P-Forb
JUNBRE	8	<i>Juncus brevicaudatus</i>	rush	-5	OBL	Nt P-Forb
JUNDUD	1	<i>Juncus dudleyi</i>	dudley's rush	0	FAC	Nt P-Forb
JUNEFF	3	<i>Juncus effusus</i>	soft stemmed rush	-5	OBL	Nt P-Forb
JUNNOD	5	<i>Juncus nodosus</i>	joint rush	-5	OBL	Nt P-Forb
JUNPEL	8	<i>Juncus pelocarpus</i>	brown fruited rush	-5	OBL	Nt P-Forb
LACSER	0	LACTUCA SERRIOLA	prickly lettuce	0	FAC	Ad B-Forb
LARLAR	5	<i>Larix laricina</i>	tamarack	-3	FACW	Nt Tree
LEEORY	3	<i>Leersia oryzoides</i>	cut grass	-5	OBL	Nt P-Grass
LEEVIR	5	<i>Leersia virginica</i>	white grass	-3	FACW	Nt P-Grass
LEMMIN	5	<i>Lemna minor</i>	small duckweed	-5	OBL	Nt A-Forb
LINVUL	0	LINARIA VULGARIS	butter and eggs	5	UPL	Ad P-Forb
LINBOR	6	<i>Linnaea borealis</i>	twinflower	0	FAC	Nt P-Forb
LIPLOE	5	<i>Liparis loeselii</i>	Loesel's twayblade	-4	FACW+	Nt P-Forb
LOBCAR	7	<i>Lobelia cardinalis</i>	cardinal flower	-5	OBL	Nt P-Forb
LOBKAL	10	<i>Lobelia kalmii</i>	bog lobelia	-5	OBL	Nt P-Forb
LOLPER	0	LOLIUM PERENNE	perennial rye grass	3	FACU	Ad P-Grass
LONDIO	5	<i>Lonicera dioica</i>	red honeysuckle	3	FACU	Nt W-Vine
			smooth tartarian			
LONTAT	0	LONICERA TATARICA	honeysuckle	3	FACU	Ad Shrub
LUDPAL	4	<i>Ludwigia palustris</i>	water purslane	-5	OBL	Nt P-Forb
LYCANN	5	<i>Lycopodium annotinum</i>	stiff clubmoss	0	FAC	Nt Fern Ally
LYCOBS	5	<i>Lycopodium obscurum</i>	ground pine	3	FACU	Nt Fern Ally
LYCAME	2	<i>Lycopus americanus</i>	common water horehound	-5	OBL	Nt P-Forb
LYCUNI	2	<i>Lycopus uniflorus</i>	northern bugle weed	-5	OBL	Nt P-Forb
LYSTER	6	<i>Lysimachia terrestris</i>	swamp candles	-5	OBL	Nt P-Forb
LYTSAL	0	LYTHRUM SALICARIA	purple loosestrife	-5	OBL	Ad P-Forb
MAICAC	4	<i>Maianthemum canadense</i>	Canada mayflower	0	FAC	Nt P-Forb
MATSTR	3	<i>Matteuccia struthiopteris</i>	ostrich fern	-3	FACW	Nt Fern
MEDLUP	0	MEDICAGO LUPULINA	black medick	1	FAC-	Ad A-Forb
MELALB	0	MELILOTUS ALBA	white sweet clover	3	FACU	Ad B-Forb
MELLOF	0	MELILOTUS OFFICINALIS	yellow sweet clover	3	FACU	Ad B-Forb
MENARV	3	<i>Mentha arvensis</i>	wild mint	-3	FACW	Nt P-Forb
MIMRIN	5	<i>Mimulus ringens</i>	monkey flower	-5	OBL	Nt P-Forb
MITDIP	8	<i>Mitella diphylla</i>	bishop's cap	2	FACU+	Nt P-Forb
MITNUD	8	<i>Mitella nuda</i>	naked miterwort	-3	FACW	Nt P-Forb
MUHMEX	3	<i>Muhlenbergia mexicana</i>	leafy satin grass	-3	FACW	Nt P-Grass
MYOSCO	0	MYOSOTIS SCORPIOIDES	forget me not	-5	OBL	Ad P-Forb
MYRGAL	6	<i>Myrica gale</i>	sweet gale	-5	OBL	Nt Shrub
NASOFF	0	NASTURTIIUM OFFICINALE	watercress	-5	OBL	Ad P-Grass
			common evening			
OENBIE	2	<i>Oenothera biennis</i>	primrose	3	FACU	Nt B-Forb
ONOSEN	2	<i>Onoclea sensibilis</i>	sensitive fern	-3	FACW	Nt Fern
ORTSEC	7	<i>Orthilia secunda</i>	one sided pyrola	-1	FAC+	Nt P-Forb
OSMCIN	5	<i>Osmunda cinnamomea</i>	cinnamon fern	-3	FACW	Nt Fern
OSMCLN	6	<i>Osmunda claytoniana</i>	interrupted fern	-1	FAC+	Nt Fern
OSMREG	5	<i>Osmunda regalis</i>	royal fern	-5	OBL	Nt Fern
PANCAP	1	<i>Panicum capillare</i>	witch grass	0	FAC	Nt A-Grass
PARGLA	8	<i>Parnassia glauca</i>	grass of parnassus	-5	OBL	Nt P-Forb

PARINS	4	Parthenocissus inserta	thicket creeper	3	FACU	Nt W-Vine
PASSAT	0	PASTINACA SATIVA	wild parsnip	5	UPL	Ad B-Forb
PHAARU	0	PHALARIS ARUNDINACEA	reed canary grass	-4	FACW+	Nt P-Grass
PHLPRA	0	PHLEUM PRATENSE	timothy	3	FACU	Ad P-Grass
PHRAUS	0	PHRAGMITES AUSTRALIS*	phragmites	-4	FACW+	Nt P-Grass
PHYOPU	4	Physocarpus opulifolius	ninebark	-2	FACW-	Nt Shrub
PHYAME	2	Phytolacca americana	pokeweed	1	FAC-	Nt P-Forb
PICMAR	6	Picea mariana	black spruce	-3	FACW	Nt Tree
PILFON	5	Pilea fontana	bog clearweed	-3	FACW	Nt A-Forb
PINSTR	3	Pinus strobus	white pine	3	FACU	Nt Tree
PLALAN	0	PLANTAGO LANCEOLATA	English plantain	0	FAC	Ad P-Forb
PLAMAJ	0	PLANTAGO MAJOR	common plantain	-1	FAC+	Ad P-Forb
PLAHYP	5	Platanthera hyperborea	tall northern bog orchid	-4	FACW+	Nt P-Forb
POAPAS	3	Poa palustris	fowl meadow grass	-4	FACW+	Nt P-Grass
POAPRA	0	POA PRATENSIS	Kentucky bluegrass	1	FAC-	Ad P-Grass
POLPAU	7	Polygala paucifolia	gay wings	3	FACU	Nt P-Forb
POLAMP	6	Polygonum amphibium	water smartweed	-5	OBL	Nt P-Forb
POLAVI	0	POLYGONUM AVICULARE POLYGONUM	knotweed	1	FAC-	Ad A-Forb
POLCON	0	CONVOLVULUS	false buckwheat	1	FAC-	Ad A-Forb
POLHYR	1	Polygonum hydropiper	water pepper	-5	OBL	Nt A-Forb
POLHYS	5	Polygonum hydropiperoides	water pepper	-5	OBL	Nt P-Forb
POLLAP	0	Polygonum lapathifolium	nodding smartweed	-4	FACW+	Nt A-Forb
POLPEN	0	Polygonum pensylvanicum	bigseed smartweed	-4	FACW+	Nt A-Forb
POLPER	0	POLYGONUM PERSICARIA	lady's thumb	-3	FACW	Ad A-Forb
POLPUN	5	Polygonum punctatum	smartweed	-5	OBL	Nt A-Forb
POPBAL	2	Populus balsamifera	balsam poplar	-3	FACW	Nt Tree
POPTRE	1	Populus tremuloides	quaking aspen	0	FAC	Nt Tree
POTNOR	0	Potentilla norvegica	rough cinquefoil	0	FAC	Nt A-Forb
PRUVUL	0	PRUNELLA VULGARIS	lawn prunella	0	FAC	Nt P-Forb
PRUSER	2	Prunus serotina	wild black cherry	3	FACU	Nt Tree
PRUVIR	2	Prunus virginiana	choke cherry	1	FAC-	Nt Shrub
PTEAQU	0	Pteridium aquilinum	bracken fern	3	FACU	Nt Fern
PYRELL	6	Pyrola elliptica	large leaved shinleaf	5	UPL	Nt P-Forb
RANHIS	5	Ranunculus hispidus	swamp buttercup	0	FAC	Nt P-Forb
RANREC	5	Ranunculus recurvatus	hooked crowfoot	-3	FACW	Nt A-Forb
RANSCE	1	Ranunculus sceleratus	cursed crowfoot	-5	OBL	Nt A-Forb
RHAALN	8	Rhamnus alnifolia	alder leaved buckthorn	-5	OBL	Nt Shrub
RHUTYP	2	Rhus typhina	staghorn sumac	5	UPL	Nt Tree
RIBAME	6	Ribes americanum	wild black currant	-3	FACW	Nt Shrub
RIBHIR	6	Ribes hirtellum	swamp gooseberry	-3	FACW	Nt Shrub
RIBTRI	6	Ribes triste	swamp red currant	-5	OBL	Nt Shrub
RORPAL	1	Rorippa palustris	yellow cress	-5	OBL	Nt A-Forb
RUBPUB	4	Rubus pubescens	dwarf raspberry	-4	FACW+	Nt P-Forb
RUBSTR	2	Rubus strigosus	wild red raspberry	-2	FACW-	Nt Shrub
RUMCRI	0	RUMEX CRISPUS	curly dock	-1	FAC+	Ad P-Forb
RUMOBT	0	RUMEX OBTUSIFOLIUS	bitter dock	-3	FACW	Ad P-Forb
SAGLAT	1	Sagittaria latifolia	common arrowhead	-5	OBL	Nt P-Forb
SALBEB	1	Salix bebbiana	Bebb's willow	-4	FACW+	Nt Shrub
SALDIS	1	Salix discolor	pussy willow	-3	FACW	Nt Shrub

SALERI	2	Salix eriocephala	willow	-3	FACW	Nt Shrub
SALEXI	1	Salix exigua	sandbar willow	-5	OBL	Nt Shrub
SALLUC	3	Salix lucida	shining willow	-4	FACW+	Nt Shrub
SALPET	1	Salix petiolaris	slender willow	-4	FACW+	Nt Shrub
SAMCAN	3	Sambucus canadensis	elderberry	-2	FACW-	Nt Shrub
SAPOFF	0	SAPONARIA OFFICINALIS	bouncing bet	3	FACU	Ad P-Forb
SCHACU	5	Schoenoplectus acutus	hardstem bulrush	-5	OBL	Nt P-Sedge
SCHPUN	5	Schoenoplectus pungens	three square	-5	OBL	Nt P-Sedge
SCHTAB	4	Schoenoplectus tabernaemontani	softstem bulrush	-5	OBL	Nt P-Sedge
SCIATR	3	Scirpus atrovirens	bulrush	-5	OBL	Nt P-Sedge
SCICYP	5	Scirpus cyperinus	wool grass	-5	OBL	Nt P-Sedge
SCUGAL	5	Scutellaria galericulata	common skullcap	-5	OBL	Nt P-Forb
SCULAT	5	Scutellaria lateriflora	mad dog skullcap	-5	OBL	Nt P-Forb
SENAUR	5	Senecio aureus	golden ragwort	-3	FACW	Nt P-Forb
SILVUL	0	SILENE VULGARIS	bladder campion	5	UPL	Ad P-Forb
SISIRI	0	SISYMBRIUM IRIO	London rocket	5	UPL	Ad A-Forb
SIUSUA	5	Sium suave	water parsnip	-5	OBL	Nt P-Forb
SOLDUL	0	SOLANUM DULCAMARA	bittersweet nightshade	0	FAC	Ad P-Forb
SOLALT	1	Solidago altissima	tall goldenrod	3	FACU	Nt P-Forb
SOLCAN	1	Solidago canadensis	Canada goldenrod	3	FACU	Nt P-Forb
SOLGIG	3	Solidago gigantea	late goldenrod	-3	FACW	Nt P-Forb
SOLPAT	6	Solidago patula	swamp goldenrod	-5	OBL	Nt P-Forb
SOLRUG	3	Solidago rugosa	rough goldenrod	-1	FAC+	Nt P-Forb
SOLULI	4	Solidago uliginosa	bog goldenrod	-5	OBL	Nt P-Forb
SONASP	0	SONCHUS ASPER	prickly sow thistle	0	FAC	Ad A-Forb
SPACHL	6	Sparganium chlorocarpum	green fruited bur reed	-5	OBL	Nt P-Forb
SPHINT	4	Sphenopholis intermedia	slender wedgegrass	0	FAC	Nt P-Grass
SPIPOL	6	Spirodela polyrhiza	great duckweed	-5	OBL	Nt A-Forb
SPOCRY	3	Sporobolus cryptandrus	sand dropseed	4	FACU-	Nt P-Grass
SYMFOE	6	Symplocarpus foetidus	skunk cabbage	-5	OBL	Nt P-Forb
TAROFF	0	TARAXACUM OFFICINALE	common dandelion	3	FACU	Ad P-Forb
TAXCAN	5	Taxus canadensis	Canadian yew	3	FACU	Nt Shrub
THADIO	6	Thalictrum dioicum	early meadow rue	2	FACU+	Nt P-Forb
THEPAL	2	Thelypteris palustris	marsh fern	-4	FACW+	Nt Fern
THUOCC	4	Thuja occidentalis	arbor vitae	-3	FACW	Nt Tree
TIACOR	9	Tiarella cordifolia	foamflower	1	FAC-	Nt P-Forb
TRADUB	0	TRAGOPOGON DUBIUS	goat's beard	5	UPL	Ad B-Forb
TRIBOR	5	Trientalis borealis	starflower	-1	FAC+	Nt P-Forb
TRIREF	0	TRIFOLIUM REPENS	white clover	2	FACU+	Ad P-Forb
TSUCAN	5	Tsuga canadensis	hemlock	3	FACU	Nt Tree
TYPANG	0	TYPHA ANGUSTIFOLIA	narrow leaved cattail	-5	OBL	Ad P-Forb
TYPLAT	1	Typha latifolia	broad leaved cattail	-5	OBL	Nt P-Forb
TYPGLA	0	TYPHA XGLAUCA	hybrid cattail	-5	OBL	Ad P-Forb
ULMRUB	2	Ulmus rubra	slippery elm	0	FAC	Nt Tree
URTDIO	1	Urtica dioica	nettle	-1	FAC+	Nt P-Forb
UTRVUL	6	Utricularia vulgaris	great bladderwort	-5	OBL	Nt P-Forb
VACANG	4	Vaccinium angustifolium	blueberry	3	FACU	Nt Shrub
VACMYR	4	Vaccinium myrtilloides	Canada blueberry	-2	FACW-	Nt Shrub
VALAME	7	Vallisneria americana	eel grass	-5	OBL	Nt P-Forb
VERHAS	4	Verbena hastata	blue vervain	-4	FACW+	Nt P-Forb

		Veronica beccabunga var.				
VERBEA	10	americana	American brooklime	-5	OBL	Nt P-Forb
VEROFF	0	VERONICA OFFICINALIS	common speedwell	5	UPL	Ad P-Forb

**subsp. australis*

Appendix E

Point Intercept Transect Sampling Data

Species	Eastern floodplain					Western floodplain						Previously exposed floodplain					
	A	B	C	Tally	% cover	A	B	C	D	Tally	% cover	A	B	C	D	Tally	% cover
AMARANTHUS ALBA				0	0%	7	9	6	4	26	4%					0	0%
Asclepias incarnata			1	1	0%					0	0%			1		1	0%
Asclepias syriaca				0	0%					0	0%					0	0%
Bidens cernuus	3	19	25	47	9%	19	14	9	8	50	9%			1	6	7	2%
Carex stipata				0	0%	1				1	0%					0	0%
Carex sp 1 (Site 1)	7	1		8	2%					0	0%					0	0%
Carex sp 1 (Site 2)				0	0%	5	9	8		22	4%				6	6	2%
Carex sp 2 (Site 1, 2)	3	3		6	1%					0	0%					0	0%
Carex sp 3 (Site 2 (ovales))			1	1	0%				2	2	0%	6				6	2%
Carex sp 1 (Fen)				0	0%					0	0%					0	0%
Carex sp 1 (Site 4)				0	0%					0	0%					0	0%
Carex vulpinoidea				0	0%	4				4	1%	10	2		2	14	4%
CERASTIUM FONTANUM		1		1	0%					0	0%					0	0%
CHENOPODIUM ALBUM				0	0%					0	0%				2	2	1%
Cladium mariscoides				0	0%					0	0%					0	0%
Conyza canadensis	1			1	0%					0	0%	3				3	1%
Cyperus rivularis		1		1	0%					0	0%					0	0%
Eleocharis erythropoda				0	0%					0	0%				6	6	2%
Eleocharis sp.				0	0%					0	0%					0	0%
Eleocharis sp. (Site 1)	2		5	7	1%					0	0%					0	0%
Eleocharis sp. (Site 3-C)				0	0%					0	0%			2		2	1%
EPILOBIUM HIRSUTUM				0	0%					0	0%				1	1	0%
EPILOBIUM PARVIFLORUM				0	0%		2	3	2	7	1%	24	28	16		68	16%
Epilobium ciliatum	1			1	0%					0	0%					0	0%
Epilobium coloratum				0	0%				1	1	0%		2	1		3	1%
Erectites hieraciifolia		3		3	1%					0	0%			3	3	6	2%
Eupatorium maculatum		2	3	5	1%					0	0%		1	1		2	1%
Eupatorium perfoliatum			2	2	0%	1			1	2	0%			3	3	6	2%
Impatiens capensis				0	0%					0	0%	1				1	0%
Juncus dudleyi			1	1	0%	6		4		10	2%					0	0%
Juncus effusus	1		4	5	1%	1		4	4	9	2%	1	2	1		4	1%
Juncus nodosus			2	2	0%				1	1	0%		1			1	0%
Juncus sp 1 (Site 2)				0	0%		1			1	0%					0	0%
Juncus sp 1 (Site 3)				0	0%					0	0%		1			1	0%
Juncus sp 1 (Site 4)				0	0%					0	0%					0	0%

	Eastern floodplain					Western floodplain						Previously exposed floodplain					
Leersia oryzoides	14	9	45	68	13%	41	23	19	27	110	19%	10	21	39	11	81	22%
Ludwigia palustris			1	1	0%					0	0%				3	3	1%
Lycopus americana	1	1	1	3	1%					0	0%	6	1			7	2%
Lycopus uniflorus				0	0%					0	0%			3		3	1%
MEDICAGO LUPULINA	1	3	2	6	1%					0	0%					0	0%
MELILOTIS SP.	2			2	0%	1				1	0%					0	0%
Mentha arvensis				0	0%					0	0%	1				1	0%
Muhlenbergia mexicana	2	5	4	11	2%			2		2	0%	4	8	2	6	20	5%
Panicum capillare	14	78	26	118	23%		2	2	4	8	1%		2		1	3	1%
Panicum sp.	9			9	2%					0	0%					0	0%
Pilea fontana				0	0%					0	0%				1	1	0%
PHALARIS ARUNDINACIA	22	2	5	29	6%			1		1	0%					0	0%
POA COMPRESSA				0	0%					0	0%	2	1		1	4	1%
POLYGONUM CONVULVULUS		1	3	4	1%					0	0%					0	0%
Polygonum hydropiperoides		1	3	4	1%					0	0%	2		5		7	2%
Polygonum lapathifolium	11	24	7	42	8%	1	2		1	4	1%	3	1			4	1%
Polygonum pensylvanicum				0	0%					0	0%	2				2	1%
POLYGONUM PERSICARIA	5	15	9	29	6%			1	2	5	1%		1			1	0%
Populus balsamifera				0	0%					0	0%			1		1	0%
Populus tremuloides seedling	5		1	6	1%	48	52	50	59	209	36%	6	2			8	2%
Potentilla norvegica				0	0%					0	0%	1				1	0%
Ranunculus sceleratus			1	1	0%					0	0%					0	0%
Rhamnus alnifolia				0	0%					0	0%					0	0%
Rorippa palustris			1	1	0%	3	3	1	1	8	1%	1				1	0%
RUMEX OBTUSIFOLIUS		1		1	0%					0	0%					0	0%
Salix erocephala				0	0%	2	2	6	10	20	3%		4	1		5	1%
Salix exigua				0	0%					0	0%	1		2		3	1%
Salix lucida				0	0%					0	0%		1			1	0%
Salix petiolaris				0	0%					0	0%	1			1	2	1%
Salix sp 1 (site 2)				0	0%		1	2		3	1%					0	0%
Salix sp 1 (site 3-B, C, D)				0	0%					0	0%		1	1	1	3	1%
Scirpus atrovirens				0	0%				2	2	0%	1		1		2	1%
Scirpus cyperinus			1	1	0%					0	0%	1			2	3	1%
Solidago altissima				0	0%					0	0%			3	11	14	4%
Solidago rugosa				0	0%					0	0%					0	0%
Sporobolus cryptandrus				0	0%					0	0%		1			1	0%
TRIFOLIUM REPENS	2			2	0%					0	0%					0	0%

	Eastern floodplain					Western floodplain						Previously exposed floodplain					
TYPHA ANGUSTIFOLIA				0	0%	3	7	3	4	17	3%	1		8	14	23	6%
Unknown herb			1	1	0%					0	0%					0	0%
Unknown herb				0	0%	1				1	0%					0	0%
VERBASCUM THAPSIS				0	0%			1		1	0%					0	0%
Verbena hastata	8	17	8	33	6%					0	0%					0	0%
Veronica beccabunga				0	0%					0	0%			1	1	1	0%
Viola sp 1 (Fen)				0	0%					0	0%					0	0%
Bare Ground	22	4	16	42	8%	7	15	13	10	45	8%	3			2	5	1%
Moss				0	0%	1				1	0%	9			1	10	3%
Open water			3	3	1%					0	0%					0	0%
Stump				0	0%	4	4	2	1	11	2%			1	3	4	1%
Zebra mussel shell				0	0%					0	0%		1			1	0%
Total	136	191	182	509	100%	329	132	130	137	728	100%	90	82	96	88	356	100%

Species	Mid-floodplain					Fen			
	A	B	C	Total	% cover	A	B	Total	% cover
AMARANTHUS ALBA	2			2	1%			0	0%
Asclepias incarnata				0	0%			0	0%
Asclepias syriaca				0	0%	1		1	2%
Bidens cernuus		1	2	3	2%			0	0%
Carex stipata				0	0%			0	0%
Carex sp 1 (Site 1)				0	0%			0	0%
Carex sp 1 (Site 2)				0	0%	1		1	2%
Carex sp 2 (Site 1, 2)				0	0%			0	0%
Carex sp 3 (Site 2 (ovales))				0	0%			0	0%
Carex sp 1 (Fen)				0	0%			0	0%
Carex sp 1 (Site 4)	1			1	1%			0	0%
Carex vulpinoidea	6			6	4%			0	0%
CERASTIUM FONTANUM				0	0%			0	0%
CHENOPODIUM ALBUM				0	0%			0	0%
Cladium mariscoides				0	0%	15	14	29	45%
CONYZA CANADENSIS	2	1	1	4	3%	1		1	2%
Cyperus rivularis				0	0%			0	0%
Eleocharis erythropoda				0	0%			0	0%
Eleocharis sp.				0	0%			0	0%
Eleocharis sp. (Site 1)				0	0%			0	0%
Eleocharis sp. (Site 3-C)				0	0%			0	0%
EPILOBIUM HIRSUTUM				0	0%			0	0%
EPILOBIUM PARVIFLORUM	2	1	1	4	3%			0	0%
Epilobium ciliatum				0	0%			0	0%
Epilobium coloratum	3	2	1	6	4%			0	0%
Erectites hieraciifolia	1	2	6	9	6%			0	0%
Eupatorium maculatum				0	0%			0	0%
Eupatorium perfoliatum	2	1	3	6	4%			0	0%
Impatiens capensis				0	0%			0	0%
Juncus dudleyi			2	2	1%			0	0%
Juncus effusus	1	1		2	1%			0	0%
Juncus nodosus				0	0%			0	0%
Juncus sp 1 (Site 2)				0	0%			0	0%
Juncus sp 1 (Site 3)				0	0%			0	0%
Juncus sp 1 (Site 4)			2	2	1%			0	0%

	Mid-floodplain					Fen			
Leersia oryzoides	15	18	16	49	33%			0	0%
Ludwigia palustris				0	0%			0	0%
Lycopus americana	6	4	5	15	10%			0	0%
Lycopus uniflorus				0	0%	1	1	2	3%
MEDICAGO LUPULINA				0	0%			0	0%
MELILOTIS SP.				0	0%			0	0%
Mentha arvensis				0	0%			0	0%
Muhlenbergia mexicana	1	5	5	11	7%		11	11	17%
Panicum capillare		1		1	1%			0	0%
Panicum sp.				0	0%			0	0%
Pilea fontana				0	0%			0	0%
PHALARIS ARUNDINACIA				0	0%			0	0%
POA COMPRESSA				0	0%			0	0%
POLYGONUM CONVULVULUS				0	0%			0	0%
Polygonum hydropiperoides				0	0%			0	0%
Polygonum lapathifolium				0	0%			0	0%
Polygonum pensylvanicum	1			1	1%			0	0%
POLYGONUM PERSICARIA				0	0%			0	0%
Populus balsamifera				0	0%			0	0%
Populus tremuloides seedling	1			1	1%			0	0%
Potentilla norvegica	1	1		2	1%			0	0%
Ranunculus sceleratus				0	0%			0	0%
Rhamnus alnifolia				0	0%		1	1	2%
Rorippa palustris	2		1	3	2%			0	0%
RUMEX OBTUSIFOLIUS				0	0%			0	0%
Salix erocephala				0	0%	1		1	2%
Salix exigua				0	0%			0	0%
Salix lucida				0	0%			0	0%
Salix petiolaris				0	0%		1	1	2%
Salix sp 1 (site 2)				0	0%			0	0%
Salix sp 1 (site 3-B, C, D)				0	0%			0	0%
Scirpus atrovirens	2			2	1%			0	0%
Scirpus cyperinus				0	0%			0	0%
Solidago altissima	1	1	1	3	2%	3	4	7	11%
Solidago rugosa				0	0%		1	1	2%
Sporobolus cryptandrus				0	0%			0	0%
TRIFOLIUM REPENS				0	0%			0	0%

	Mid-floodplain					Fen			
TYPHA ANGUSTIFOLIA				0	0%			0	0%
Unknown herb				0	0%			0	0%
Unknown herb				0	0%			0	0%
VERBASCUM THAPSIS				0	0%			0	0%
Verbena hastata	5	5	1	11	7%			0	0%
Veronica beccabunga				0	0%			0	0%
Viola sp 1 (Fen)				0	0%		1	1	2%
Bare Ground		1	1	2	1%	1		1	2%
Moss				0	0%	5	1	6	9%
Open water				0	0%			0	0%
Stump				0	0%			0	0%
Zebra mussel shell				0	0%			0	0%
Total	55	45	48	148	100%	29	35	64	100%