

WETLAND, RIPARIAN, AND TERRESTRIAL RESOURCES SURVEY



RIVER FALLS HYDROELECTRIC PROJECT FERC No. 10489

SUBMITTED BY:

**CITY OF RIVER FALLS MUNICIPAL UTILITIES
222 LEWIS STREET
RIVER FALLS, WI 54022**

PREPARED BY:

**TRC
150 NORTH PATRICK BOULEVARD
BROOKFIELD, WI 53045**

JANUARY 2020, REVISED FEBRUARY 2020



CITY OF RIVER FALLS MUNICIPAL UTILITIES
RIVER FALLS HYDROELECTRIC PROJECT
FERC NO. 10489

WETLAND, RIPARIAN, AND TERRESTRIAL RESOURCES SURVEY

TABLE OF CONTENTS

1.0	INTRODUCTION	1
2.0	METHODS	1
3.0	RESULTS	3
3.1	Aerial Photo-interpretation.....	3
3.2	Powell Falls Field Assessment.....	3
3.2.1	Vegetation Cover Types	4
3.2.2	Rare, Threatened and Endangered Species.....	7
3.2.3	Invasive Species	7
3.3	Junction Falls Field Assessment	8
3.3.1	Vegetation Cover Types	8
3.3.2	Rare, Threatened and Endangered Species.....	10
3.3.3	Invasive Species	10
4.0	CONCLUSIONS.....	11
5.0	REFERENCES	11
APPENDIX A Figures		
APPENDIX B Cover Type Species Lists Table		
APPENDIX C Representative Cover Type Photographs		
APPENDIX D Wisconsin NR 40 List of Invasive Botanical Species		

LIST OF ACRONYMS

Commission	Federal Energy Regulatory Commission
dbh	diameter at breast height
ERR	Endangered Resources Review
FERC	Federal Energy Regulatory Commission
ILP	Integrated Licensing Process
IPaC	Information for Planning and Consultation
Licensee	River Falls Municipal Utilities
Project	River Falls Hydroelectric Project (FERC No. 10489)
PSP	Proposed Study Plan
RFMU	River Falls Municipal Utilities
RSP	Revised Study Plan
RTE	rare, threatened, and endangered
SPD	Study Plan Determination
USFWS	U.S. Fish and Wildlife Service
Wisconsin DNR	Wisconsin Department of Natural Resources

1.0 INTRODUCTION

River Falls Municipal Utilities (Licensee or RFMU) is the Licensee of the River Falls Hydroelectric Project (FERC No. 10489) (Project), located along the Kinnickinnic River in the City of River Falls, in Pierce County, Wisconsin. The Project is licensed by the Federal Energy Regulatory Commission (FERC or Commission) as a two-development project. The two developments include the Junction Falls Development and the Powell Falls Development. The Licensee is using the FERC's Integrated Licensing Process (ILP) to relicense the Junction Falls Development and decommission and remove the Powell Falls Development.

The Licensee included a Wetland, Riparian, and Terrestrial Resources Survey in its Proposed Study Plan (PSP) dated February 11, 2019 and Revised Study Plan (RSP) dated June 11, 2019. The FERC issued a revised process plan and schedule on July 20, 2019 and its Study Plan Determination (SPD) on July 11, 2019, which included the Wetland, Riparian, and Terrestrial Resources Survey.

On behalf of the Licensee, TRC Environmental Corporation (TRC) conducted the Wetland, Riparian, and Terrestrial Resources Survey of the Project (Figure 1, Appendix A). The Study Areas include the Powell Falls Project Boundary and Junction Falls Project Boundary (Project Boundaries).

The purpose of this study was to conduct reconnaissance level surveys to document wetland, riparian, and terrestrial resources in the Project Boundaries. The study was conducted to map the major vegetation cover types, document common wildlife species within each cover type, map invasive botanical species, evaluate mature hardwood trees for potential northern long-eared bat habitat, and evaluate rare, threatened and endangered species habitat within the Project Boundaries to support the relicensing of the Junction Falls development and decommissioning of Powell Falls development. Our study is presented here in terms of methodology, results, and conclusions.

2.0 METHODS

The wetland, riparian, and terrestrial resources survey was conducted in three phases. Phase 1 utilized aerial photo-interpretation to determine the boundaries of major vegetation cover types within each Study Area. The vegetation cover types were categorized based on the distinction between forested (woody) and herbaceous cover types; which were then mapped as wetland versus non-wetland where discernable through aerial photo-interpretation.

Phase 2, the field assessment, was conducted September 5 and 6, 2019 by TRC scientists Laura Giese, PhD and Amanda Larsen. The field assessment traversed the area within the Project Boundaries to confirm and further refine the vegetation cover types. Within each cover type,

documentation included botanical species composition, including the dominant and more prominent associated species in each stratum (tree, shrub and herbaceous layers).

Observations of wildlife species, included direct sightings, signs (tracks, scat), and calls. All observations of wildlife were noted for each vegetation cover type.

Rare, threatened and endangered species particular to the Project were identified through a U.S. Fish and Wildlife Service (USFWS) Information for Planning and Consultation (IPaC) search and Wisconsin Department of Natural Resources (Wisconsin DNR) Endangered Resources Review (ERR). The site specific USFWS IPaC search listed two terrestrial species: northern long-eared bat (*Myotis septentrionalis*) and prairie bush-clover (*Lespedeza leptostachya*). The results of the Wisconsin DNR ERR contain data that are considered sensitive and are not subject to Wisconsin's Open Records Law (per s. 23.27, Wis. Stats.). Due to the confidential nature of the results, the details of the report are not provided in this public filing. In summary, the Wisconsin DNR ERR listed one (1) plant species with required actions, 14 species or communities with recommended actions, and four (4) communities with no recommended actions. During the field assessment suitable habitat for potential rare, threatened, and endangered (RTE) species was evaluated and meander surveys conducted within their associated habitats to document the presence/absence of that species, or any signs of that species.

Northern long-eared bats hibernate in caves and mines during the winter and in summer roost singly or in colonies in cavities, underneath bark, crevices, or hollows of both live and dead trees (typically ≥ 3 inches diameter at breast height [dbh]) (USFWS 2014, USFWS 2019). This opportunistic bat selects roosts, using tree species based on presence of cavities or crevices or presence of peeling bark. Northern long-eared bats emerge at dusk to forage in upland and lowland woodlots and tree-lined corridors, feeding on insects, which they catch while in flight using echolocation. This species also feeds by gleaning insects from vegetation and water surfaces.

Suitable summer habitat for northern long-eared bats consists of a wide variety of forested/wooded habitats where they roost, forage, and travel and may also include some adjacent and interspersed non-forested habitats such as emergent wetlands and adjacent edges of agricultural fields, old fields and pastures. This includes forests and woodlots containing potential roosts (i.e., live trees and/or snags ≥ 3 inches dbh that have exfoliating bark, cracks, crevices, and/or cavities), as well as linear features such as fencerows, riparian forests, and other wooded corridors. These wooded areas may be dense or loose aggregates of trees with variable amounts of canopy closure. Northern long-eared bats typically occupy their summer habitat from mid-May through mid-August each year and the species may arrive or leave some time before or after this period.

A meander survey was conducted for mature hardwood trees with exfoliating bark that may be used as summer habitat for northern long-eared bats. If suitable roost habitat was found data were collected on species composition, general abundance, and size within the woodlands.

The Wisconsin NR 40 list of invasive botanical species (Appendix D) was used to determine which species to consider invasive. The locations of invasive botanical species were mapped via GPS either as a point or polygon noting general abundance.

Phase 3 included the development of this summary report.

3.0 RESULTS

3.1 Aerial Photo-interpretation

A review of Google Earth aerial imagery identified several major vegetation cover types based on landscape position, color and texture. Major vegetation cover types within the Powell Falls Study Area included mature hardwood woodlands, emergent wetlands, and fields. Within the Junction Falls Study Area, mature hardwood woodlands are the primary major vegetation cover type.

3.2 Powell Falls Field Assessment

The Powell Falls Study Area, which includes Lake Louise, is mostly undeveloped with natural plant communities. Relatively steep slopes border the southern three-quarters of the lake and terrestrial cover types are more prominent within this area. Terrain is more level within the northern portion of the Study Area where wetland cover types are prominent.

Photo-interpretation followed by field verification identified eight vegetation cover types; three wetland cover types and five terrestrial cover types (Appendix A, Figure 1). Each vegetation cover type is described further below, and a list of botanical species is included in Table 1 (Appendix B). Representative photos of the cover types are included in Appendix C. Observed wildlife and mapped invasive species are included for each cover type below.

Within Lake Louise itself wildlife observations included otters, great blue heron, green heron, and Canada geese. Numerous ducks were observed including wood ducks and mallards.

Rare, threatened and endangered species habitat was evaluated within the cover types and is discussed separately below.

3.2.1 Vegetation Cover Types

3.2.1.1 Wetlands

3.2.1.1.1 Fresh (wet) Meadow

Fresh (wet) meadows are dominated by grasses and forbs and may represent younger communities that indicate recent disturbances by drainage, siltation, cultivation, pasturing, peat fires and/or temporary flooding (Eggers and Reed, 2015). Fresh (wet) meadow comprises approximately 1.4 acres along the south side of the Kinnickinnic River in the northern portion of the Powell Falls Study Area. This area likely floods as evidenced by scour and drainage patterns creating a dynamic and resilient ecosystem. Within the fresh (wet) meadow there is a diverse mix of botanical species with no prominent species other than invasive reed canary grass (*Phalaris arundinacea*), which comprises approximately 80 percent of the mapped area.

In addition to the reed canary grass, invasive botanical species included hybrid cattail (*Typha x glauca*) at 10 percent coverage, and purple loosestrife (*Lythrum salicaria*) at one percent coverage.

Wildlife observed included birds, turtles, and mammals: gold finch, least bittern, belted kingfisher, red-eared slider, and a meadow vole. White-tail deer tracks were also observed.

3.2.1.1.2 Shallow Marsh

Shallow marshes are characterized by emergent aquatic plants growing in permanent to seasonal, shallow water (Egger and Reed, 2015). Emergent aquatic plants typically become established and spread when water levels are low or when the marsh substrate is exposed, and then persist when water levels rise. Shallow marsh is located within several places including along the eastern part of Lake Louise and within the backwater areas of the northwestern portion of the Study Area. Soils are saturated to the surface and unconsolidated. This vegetation cover type comprises approximately 4.96 acres in the Powell Falls Study Area. The botanical species composition is very diverse with no dominant species other than hybrid cattail within 30 percent of the mapped area.

In addition to the hybrid cattail, invasive botanical species included common reed (*Phragmites australis*) at five (5) percent, reed canary grass at two (2) percent coverage, and purple loosestrife at one (1) percent coverage.

Wildlife observed included birds and amphibians: great blue heron, blue jays, Canada geese, and a frog too quick to be identified.

3.2.1.1.3 *Bottomland Hardwood Woodlands*

Bottomland hardwood forests are found along rivers and streams, generally in broad floodplains with at least occasional flooding beyond the stream channel confines. Bottomland hardwood woodlands comprise approximately 2.07 acres primarily located in the northeast portion of the Powell Falls Study Area with a small section in the northwest; both within backwater landscape positions. Botanical species composition is not very diverse. Silver maple (*Acer saccharinum*), and black walnut (*Juglans nigra*) are prominent overstory species, and wood nettle (*Laportea canadensis*) is the dominant forb species.

Invasive species included common buckthorn (*Rhamnus cathartica*) at 20 percent and reed canary grass at two percent.

Wildlife observed included birds, mammals, and invertebrates: pileated woodpecker, red squirrel, and a swallowtail butterfly.

3.2.1.2 *Terrestrial*

3.2.1.2.1 *Old Field*

The old field cover type includes agricultural fields that have been left fallow and other areas in early succession. The old field vegetation cover type is approximately 0.91 acres and located within a powerline right-of-way along a hillside in the eastern portion of the Powell Falls Study Area. It is comprised of ruderal botanical species with crown vetch (*Securigera varia*) and reedtop (*Agrostis gigantea*) as the dominant species.

No invasive botanical species or wildlife were observed.

3.2.1.2.2 *Young Upland Woodlands*

Young upland woodlands border the northern portion of the Powell Falls Study Area. This cover type includes deciduous tree species which have not reached a mature height or dbh and nor are they capable of reproducing. In this area, elevations are slightly higher before they drop behind a slight berm. The western portions are dominated by common buckthorn and American basswood (*Tilia americana*). Common buckthorn comprises approximately 50 percent. Black walnut is prominent on the eastern portion. This vegetation cover type is approximately 1.95 acres in the Powell Falls Study Area.

Other than common buckthorn, a small amount of reed canary grass (five (5) percent) was observed.

Wildlife signs include white-tail deer and raccoon tracks.

3.2.1.2.3 Riparian Woodlands

Riparian woodlands are adjacent to streams and rivers. The close proximity to the stream and potential for flooding influences the species composition, which includes those suitable for frequent disturbance. This cover type is located south of the Powell Falls dam on the west side of the Kinnickinnic River, comprises approximately 0.25 acres in the Powell Falls Study Area, and appears to be regularly flooded. Species composition, different than the bottomland hardwood woodlands, was also not very diverse. American basswood was the dominant overstory species, prickly ash (*Zanthoxylum americanum*) the dominant shrub species, and common scouring rush (*Equisetum hyemale*) the dominant ground cover species.

No invasive botanical species or wildlife were observed.

3.2.1.2.4 Mature Woodlands

Mature woodlands are comprised of deciduous tree species that have reached a height and maturity level for reproduction. The mature woodland cover type comprises approximately 4.63 acres in the Powell Falls Study Area and is located along the steep hillside in the eastern portion of the Study Area. Sugar maple (*Acer saccharum*) and basswood are prominent overstory species, American current (*Ribes cynosbati*) is prevalent in the shrub strata, and wild ginger (*Asarum canadense*) is common in the ground strata.

Other than common buckthorn at two (2) percent, no other invasive botanical species were observed.

Wildlife observed included red and gray squirrels. White-tail deer tracks were also observed

3.2.1.2.5 Oak Savanna

The oak-dominated savanna community has less than 50 percent tree canopy coverage and more than one tree per acre. Historically, oak savannas were very abundant in Wisconsin and occurred on wet-mesic to dry sites. Oak Savanna comprises approximately 0.38 acres along a steep hillside southwest of the Powell Falls dam. The botanical species composition was very diverse. Bur oak (*Quercus macrocarpa*) was the prominent overstory species. There was not a dominant understory or ground strata species.

Other than common buckthorn at 15 percent, no other invasive botanical species were observed.

Wildlife observed included a chipmunk.

3.2.2 *Rare, Threatened and Endangered Species*

During the field assessment suitable habitat for potential RTE species was evaluated and meander surveys conducted within their associated habitats to document the presence/absence of that species, or any signs of that species. The Powell Falls Project Boundary was examined for prairie bush clover, northern long-eared bats, and state listed botanical species.

Habitat for the federally-threatened plant species prairie bush-clover includes tallgrass prairie with mesic, moderately damp to dry prairie soils. It differs from round-headed bush-clover (*Lespedeza capitata*) by having open, branching flower heads and widely spaced leaves compared to tight flower heads and larger, wider leaves. Suitable habitat for this species was identified in the Oak Savanna cover type. Therefore, this area was extensively searched for presence of the plant. No individuals of the prairie bush-clover were found.

Northern long-eared bats hibernate in caves and mines during the winter and roost in live or dead trees with cavities or crevices during the summer. Suitable roost trees include live trees and/or snags ≥ 3 inches dbh that have exfoliating bark, cracks, crevices, and/or cavities. Mature trees were present within the Powell Falls Study Area; however, the trees were in good health with no noticeable crevices or exfoliating bark to provide suitable summer roosting habitat for the northern long-eared bat.

No suitable habitat was present within the Powell Falls Project Boundary for any of the other state-listed plant species or communities. Nor were any high-quality habitats observed.

3.2.3 *Invasive Species*

Invasive species were more prominent in the wetland cover types (Appendix A, Figure 2), with the addition of the young upland woodland cover type. Several areas of hybrid cattail were mapped (2.36 acres), as well as reed canary grass (1.53 acres), and common reed (0.15 acres). Common buckthorn was prevalent in the young upland woodland (1.31 acres).

Purple loosestrife was observed scattered in small patches within the fresh (wet) meadow and shallow marsh plant communities, which includes approximately 2.08 acres. It comprised approximately one percent of the area in each cover type. It is likely that the dense vegetative cover in these plant communities is maintaining the low levels of this species.

3.3 Junction Falls Field Assessment

The Junction Falls Study Area is more developed with trails, benches, and picnic areas along the west side. The east side primarily has steep, wooded slopes adjacent to commercial development. There are two somewhat larger woodlands where terrain is more level and subject to frequent flooding. One is in the northwest portion and the other on the northside of Lake George.

Photo-interpretation followed by field verification identified six vegetation cover types; two wetland cover types and four terrestrial cover types (Appendix A, Figure 1). Each vegetation cover type is described further below, and a list of botanical species is included in Table 1 (Appendix B). Representative photos of the cover types are included in Appendix C. Observed wildlife and mapped invasive species are included for each cover type below.

Within Lake George itself wildlife observations included teal, mallards, Canada geese, white egrets, and a belted kingfisher.

Rare, threatened and endangered species habitat was evaluated within the cover types and discussed separately below.

3.3.1 *Vegetation Cover Types*

3.3.1.1 *Wetlands*

3.3.1.1.1 *Shallow Marsh*

Shallow marshes are characterized by emergent aquatic plants growing in permanent to seasonal, shallow water (Egger and Reed, 2015). Emergent aquatic plants typically become established and spread when water levels are low or when the marsh substrate is exposed, and then persist when water levels rise. There is a small area of shallow marsh (approximately 0.15 acres) within a backwater location along the west side of the Kinnickinnic River in the Junction Falls Study Area. Narrowleaf cattail (*Typha angustifolia*) is the prominent species.

The invasive narrowleaf cattail covers approximately 10 percent and reed canary grass covers approximately one (1) percent of the shallow marsh area.

No wildlife was observed.

3.3.1.1.2 *Bottomland Hardwood Woodlands*

Bottomland hardwood forests are found along rivers and streams, generally in broad floodplains with at least occasional flooding beyond the stream channel confines. The bottomland hardwood cover type was along the fringe of Lake George and the Kinnickinnic River, as well as in two broad floodplain areas. This cover type comprises

approximately 3.92 acres of the Junction Falls Study Area. Silver maple is the prominent overstory species, and wood nettle, jewelweed and pale touch-me-not (*Impatiens capensis* and *Impatiens pallida*) are abundant in the herbaceous strata.

Mapped invasive species consisted of common buckthorn at approximately five percent and Tatarian honeysuckle (*Lonicera tatarica*) at one percent. Garlic mustard (*Alliaria petiolata*) and moneywort (*Lysimachia nummularia*) were present at less than one percent coverage. Siberian elm (*Ulmus pumila*) and black locust (*Robinia pseudoaccacia*) bordered the River.

Wildlife observed included red and gray squirrels, and mallards.

An area (0.24 acres) of young bottomland hardwood woodlands interspersed with fresh (wet) meadow is located immediately below the Junction Falls dam. This plant community is influenced by the flow over the dam due to water spray from the dam and turbulent waters.

3.3.1.2 Terrestrial

3.3.1.2.1 Meadow

The meadow cover type is generally composed of grasses and flowering forbs without the encroachment of woody species. There is a small area (0.09 acres) of meadow in the northern portion of the Junction Falls Study Area adjacent to the River. Prominent species included Canada goldenrod (*Solidago canadensis*), ground ivy (*Glechoma hederacea*), giant ragweed (*Ambrosia trifida*), and daisy fleabane (*Erigeron annuus*).

Invasive species wild parsnip (*Pastinaca sativa*) and dames rocket (*Hesperis matronalis*) were present at five (5) percent each.

No wildlife was observed.

3.3.1.2.2 Young Upland Woodland

This cover type includes deciduous tree species that have not reached a mature height or dbh and nor are they capable of reproducing. A section of young upland woodland (0.10 acres) is adjacent to Lake George in the southern portion of the Study Area. Basswood was the prominent overstory species with a mix of forbs in the herb layer. A paved trail with maintained edges passes through this cover type.

No invasive botanical species were identified in this area.

Wildlife observed included a red squirrel.

3.3.1.2.3 Upland Shrub

The upland shrub cover type has a preponderance of shrub or small tree species interspersed with forbs. South of the bridge between W. Cascade Avenue and S. Winter Street, and on the steep, west bank below the Junction Falls powerhouse there is a small area of an upland shrub cover type (approximately 0.53 acres). It is also composed of ruderal species with smooth sumac (*Rhus glabra*), and box elder (*Acer negundo*) prominent in the shrub layer, and Canada goldenrod prominent in the forb layer.

One invasive species, common buckthorn at one (1) percent, was noted. No wildlife was observed.

3.3.1.2.4 Mature Woodland

Mature woodlands include deciduous tree species that have reached a height and maturity level for reproduction. Mature woodland encompasses approximately 2.52 acres along the western side of Lake George and the Kinnickinnic River in the Junction Falls Study Area. Paved trails, picnic areas and sitting benches are located within this cover type. Prominent overstory species include black walnut, red oak (*Quercus rubra*), and basswood. A variety of species comprised the ground strata but none were dominant. A paved trail with maintained edges passes through this cover type. There are scattered mown areas with picnic tables and sitting benches.

One invasive species, burning bush (*Euonymus alata*) was located within this cover type.

Wildlife observed included a cedar waxwing, chipmunks, and red squirrels.

3.3.2 Rare, Threatened and Endangered Species

Northern long-eared bats hibernate in caves and mines during the winter and roost in live or dead trees with cavities or crevices during the summer. Suitable roost trees include live trees and/or snags ≥ 3 inches dbh that have exfoliating bark, cracks, crevices, and/or cavities. Mature trees were present within the Study Area; however, the trees were in good health with no noticeable crevices or exfoliating bark to provide suitable summer roosting habitat for the northern long-eared bat.

No suitable habitat was present for the other federal- or state-listed plant species. Nor were any high-quality habitats observed.

3.3.3 Invasive Species

Invasive species were scattered throughout the Study Area (Appendix A, Figure 2), generally in small quantities. Mapped invasive botanical species included burning bush (0.04 acres), dame's rocket (0.18 acres), wild parsnip (0.09 acres), Tatarian honeysuckle (0.10 acres), moneywort

(0.08 acres), common buckthorn (0.27 acres), garlic mustard (0.21 acres), black locust (0.16 acres), and Siberian elm (0.14 acres).

4.0 CONCLUSIONS

A Wetland, Riparian, and Terrestrial Resources Survey was conducted in the Powell Falls Project Boundary and Junction Falls Project Boundary. Within the Powell Falls Project Boundary, habitat types include fresh (wet) meadow, shallow marsh, bottomland hardwood woodland, riparian woodland, old field, young upland woodland, mature woodland, and oak savanna. Within the Junction Falls Project Boundary, habitat types include shallow marsh, bottomland hardwood woodland, meadow, young upland woodland, upland shrub, and mature woodland. Invasive species observed included burning bush, dame's rocket, wild parsnip, Tatarian honeysuckle, moneywort, purple loosestrife reed canary grass, common reed, common buckthorn, garlic mustard, black locust, cattail, and Siberian elm. Wildlife observed was typical of urbanized areas in northwest Wisconsin. While appropriate habitat for prairie bush-clover is present in the Oak Savanna habitat, no rare species were observed. Mature trees present within the Study Area were in good health with no noticeable crevices or exfoliating bark to provide suitable summer roosting habitat for the northern long-eared bat.

5.0 REFERENCES

- Eggers, Steve D. and Donald M. Reed. 2015. Wetland Plants and Plant Communities of Minnesota and Wisconsin. Version 3.2. U.S. Army Corps of Engineers, St. Paul District.
- The Prairie Enthusiasts St Croix Valley Chapter. 2018. Management Plan for Foster Cemetery Oak Savanna, Pierce County, WI prepared by Brook Dreshek. 23 pgs.
- The Prairie Enthusiasts and the Foster Conservation Area Executive Summary, 2018. 3 pgs.
- US Fish and Wildlife Service (USFWS). Northern Long-Eared Bat (*Myotis septentrionalis*). USFWS Fact Sheet
<https://www.fws.gov/midwest/endangered/mammals/nleb/nlebFactSheet.html>
- US Fish and Wildlife Service (USFWS). 2014. Northern Long-Eared Bat Interim Conference and Planning Guidance. USFWS Regions 2, 3, 4, 5, and 6. January 6, 2014. Available online: <http://www.fws.gov/northeast/virginiafield/pdf/NLEBinterimGuidance6Jan2014.pdf>
- Wisconsin Department of Natural Resources, 2016. Surface Water Data Viewer:
<http://dnrmaps.wi.gov/sl/?Viewer=SWDV>.
- Wisconsin State Herbarium. Flora of Wisconsin. <http://wisflora.herbarium.wisc.edu/>

APPENDIX A
Figures



LEGEND

-  APPROXIMATE JUNCTION FALLS PROJECT BOUNDARY
-  APPROXIMATE POWELL FALLS PROJECT BOUNDARY

NOTES

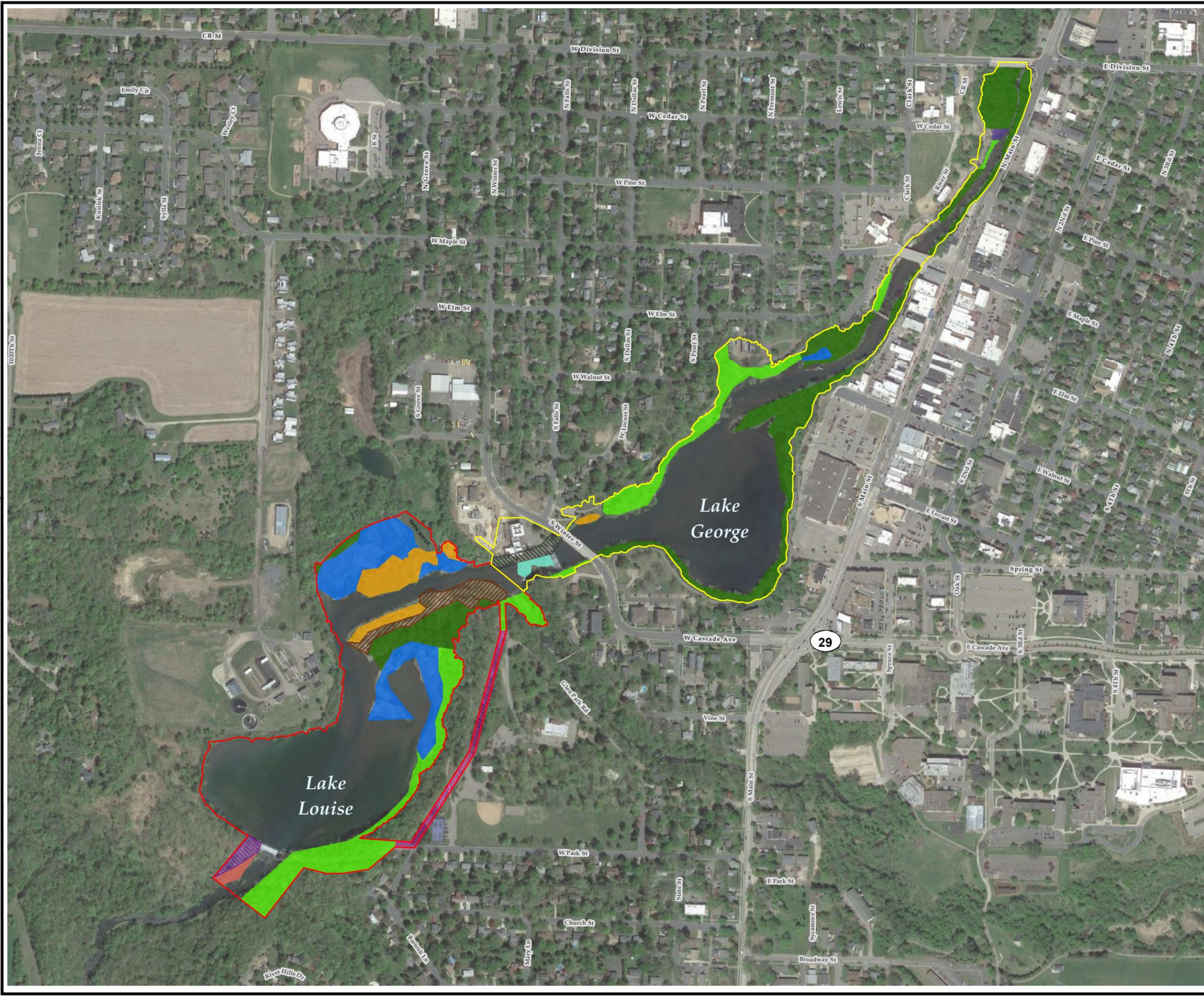
1. BASE MAP IMAGERY FROM GOOGLE EARTH PRO., (5/14/2018).



1" = 500'
 1:6,000



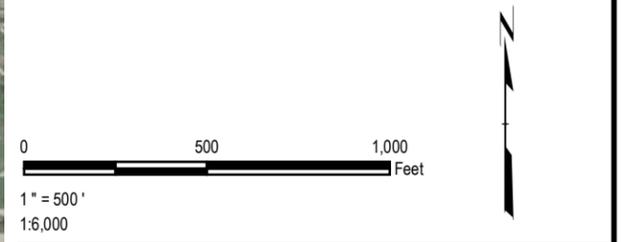
PROJECT:		RIVER FALLS HYDROELECTRIC PROJECT CITY OF RIVER FALLS, WISCONSIN	
TITLE:		RIVER FALLS PROJECT BOUNDARY MAP	
DRAWN BY:	A. ADAIR	PROJ. NO.:	350165.0001
CHECKED BY:	L. GIESE	FIGURE 1	
APPROVED BY:	L. BROTKOWSKI		
DATE:	JANUARY 2020		
		708 Heartland Trail, Suite 3000 Madison, WI 53717 Phone: 608.826.3600 www.trcsolutions.com	
FILE NO.:	350165_001_PB.mxd		



LEGEND

- MATURE WOODLAND
- OAK SAVANNA
- RIPARIAN WOODLAND
- BOTTOMLAND HARDWOOD WOODLAND
- YOUNG UPLAND WOODLAND
- YOUNG BOTTOMLAND HARDWOOD/FRESH (WET) MEADOW
- FRESH (WET) MEADOW
- SHALLOW MARSH
- UPLAND SHRUB
- MEADOW
- OLD FIELD
- APPROXIMATE JUNCTION FALLS PROJECT BOUNDARY
- APPROXIMATE POWELL FALLS PROJECT BOUNDARY

- NOTES**
1. BASE MAP IMAGERY FROM GOOGLE EARTH PRO., (5/14/2018).
 2. OPEN WATER & DEVELOPED AREAS NOT INCLUDED.



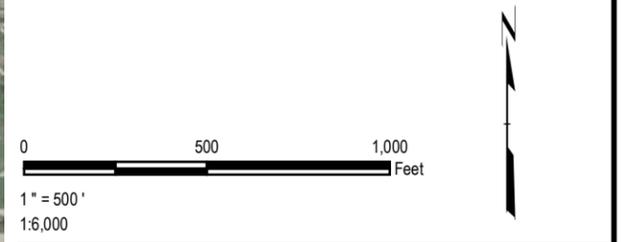
PROJECT:		RIVER FALLS HYDROELECTRIC PROJECT CITY OF RIVER FALLS, WISCONSIN	
TITLE:		VEGETATION COVER TYPES IN THE PROJECT BOUNDARIES	
DRAWN BY:	A. ADAIR	PROJ. NO.:	350165.0001
CHECKED BY:	L. GIESE	FIGURE 2	
APPROVED BY:	L. BROTKOWSKI		
DATE:	FEBRUARY 2020		
		708 Heartland Trail, Suite 3000 Madison, WI 53717 Phone: 608.826.3600 www.trcsolutions.com	
FILE NO.:	350165_002_VEG.mxd		



LEGEND

- 1: *Euonymus alata* (BURNING BUSH)
- 2: *Hesperis matronalis* (DAMES ROCKET)
- 3: *Hesperis matronalis* (DAMES ROCKET) AND *Pastinaca sativa* (WILD PARSNIP)
- 4: *Lonicera tatarica* (TATARIAN HONEYSUCKLE)
- 5: *Lysimachia nummularia* (MONEYWORT)
- 6: *Phalaris arundinacea* (REED CANARY GRASS) AND *Lythrum salicaria* (PURPLE LOOSESTRIFE)
- 7: *Phragmites australis* (COMMON REED)
- 8: *Rhamnus cathartica* (COMMON BUCKTHORN)
- 9: *Rhamnus cathartica* (COMMON BUCKTHORN) AND *Alliaria petiolata* (GARLIC MUSTARD)
- 10: *Robinia pseudoacacia* (BLACK LOCUST)
- 11: *Typha x glauca* (CATTAIL)
- 12: *Ulmus pumila* (SIBERIAN ELM)
- 13: *Ulmus pumila* (SIBERIAN ELM) AND *Lonicera tatarica* (TATARIAN HONEYSUCKLE)
- 14: *Lythrum salicaria* (PURPLE LOOSESTRIFE)
- APPROXIMATE JUNCTION FALLS PROJECT BOUNDARY
- APPROXIMATE POWELL FALLS PROJECT BOUNDARY

- ### NOTES
- BASE MAP IMAGERY FROM GOOGLE EARTH PRO., (5/14/2018).
 - PREDOMINANT INVASIVE SPECIES ARE DEPICTED ON THE MAP. PERCENT COVER OF SCATTERED INVASIVE SPECIES IS DESCRIBED IN THE TEXT UNDER EACH PLANT COMMUNITY.



PROJECT:		RIVER FALLS HYDROELECTRIC PROJECT CITY OF RIVER FALLS, WISCONSIN	
TITLE:		INVASIVE SPECIES IN THE PROJECT BOUNDARIES	
DRAWN BY:	A. ADAIR	PROJ. NO.:	350165.0001
CHECKED BY:	L. GIESE	FIGURE 3	
APPROVED BY:	L. BROTKOWSKI		
DATE:	FEBRUARY 2020		
		708 Heartland Trail, Suite 3000 Madison, WI 53717 Phone: 608.826.3600 www.trcsolutions.com	
FILE NO.:	350165_003_INV.mxd		

APPENDIX B
Cover Type Species Lists Table

Scientific Name	Common Name	Conservation Status*	Form	Powell Falls / Lake Louise								Junction Falls / Lake George					
				Wet Meadow	Shallow Marsh	Bottomland Hardwoods	Riparian Woodlands	Old Field	Young Upland Woodlands	Mature Woodlands	Oak Savanna	Shallow Marsh	Bottomland Hardwoods	Meadow	Young Upland Woodlands	Upland Shrub	Mature Woodlands
<i>Acer negundo</i>	Ash-leaved maple	Native	T					X		X			X			X	
<i>Acer platanoides</i>	Norway maple	Introduced	T														X
<i>Acer saccharinum</i>	Silver maple	Native	T			X						X	X				X
<i>Acer saccharum</i>	Sugar maple	Native	T							X							
<i>Aesculus glabra</i>	Ohio buckeye	Introduced	T														X
<i>Betula nigra</i>	River birch	Native	T														X
<i>Carpinus caroliniana</i>	American hornbeam	Native	T							X							
<i>Catalpa speciosa</i>	Northern catalpa	Introduced	T										X				
<i>Celtis occidentalis</i>	Northern hackberry	Native	T														X
<i>Fraxinus nigra</i>	Black ash	Native	T			X				X			X				
<i>Fraxinus pennsylvanica</i>	Green ash	Native	T										X		X	X	X
<i>Juglans nigra</i>	Black walnut	Native	T			X		X	X	X			X				X
<i>Juniperus virginiana</i>	Eastern red-cedar	Native	T														X
<i>Malus sp.</i>	Apple	Introduced	T														X
<i>Ostrya virginiana</i>	Eastern hop-hornbeam	Native	T				X			X							
<i>Picea sp.</i>	Spruce	Introduced	T														X
<i>Pinus resinosa</i>	Red pine	Native	T														X
<i>Populus deltoides</i>	Eastern cottonwood	Native	T	X		X							X				
<i>Prunus serotina</i>	Wild black cherry	Native	T					X		X							
<i>Quercus alba</i>	White oak	Native	T							X		X					
<i>Quercus macrocarpa</i>	Bur oak	Native	T			X			X	X	X						X
<i>Quercus rubra</i>	Red oak	Native	T							X							X
<i>Robinia pseudoacacia</i>	Black locust	Invasive	T														X
<i>Salix nigra</i>	Black willow	Native	T			X	X										
<i>Tilia americana</i>	American basswood	Native	T				X		X	X	X		X		X		X
<i>Ulmus americana</i>	American elm	Native	T			X				X			X			X	X
<i>Ulmus pumila</i>	Siberian elm	Invasive	T														X
<i>Ulmus rubra</i>	Red elm	Native	T					X		X							
<i>Cornus alba</i>	Red osier dogwood	Native	S	X	X												X
<i>Cornus racemosa</i>	Gray dogwood	Native	S							X							
<i>Lonicera tatarica</i>	Tartarian honeysuckle	Invasive	S					X	X				X				
<i>Physocarpus opulifolius</i>	Atlantic nine-bark	Native	S							X							
<i>Rhamnus cathartica</i>	Common buckthorn	Invasive	S			X			X	X	X		X			X	X
<i>Rhus glabra</i>	Smooth sumac	Native	S													X	X
<i>Rhus typhina</i>	Staghorn sumac	Native	S					X									X
<i>Ribes americanum</i>	American black currant	Native	S		X												
<i>Ribes cynosbati</i>	Dogberry	Native	S				X			X							X
<i>Rosa carolina</i>	Carolina rose	Native	S								X						
<i>Rubus idaeus</i>	American red raspberry	Native	S							X	X			X			X
<i>Salix discolor</i>	Pussy willow	Native	S		X												
<i>Salix interior</i>	Sandbar willow	Native	S	X													
<i>Sambucus nigra</i>	American elder	Native	S		X	X				X			X	X			
<i>Taxus canadensis</i>	American yew	Native	S							X							
<i>Viburnum dentatum</i>	Southern arrow-wood	Native	S							X							
<i>Viburnum opulus</i>	Cranberry viburnum	Native	S			X											
<i>Zanthoxylum americanum</i>	Common prickly-ash	Native	S				X		X	X							X
<i>Agastache foeniculum</i>	Blue giant hyssop	Native	H								X						
<i>Ageratina altissima</i>	White snakeroot	Native	H														
<i>Agrimonia gryposepala</i>	Common agrimony	Native	H											X			

Scientific Name	Common Name	Conservation Status*	Form	Powell Falls / Lake Louise								Junction Falls / Lake George					
				Wet Meadow	Shallow Marsh	Bottomland Hardwoods	Riparian Woodlands	Old Field	Young Upland Woodlands	Mature Woodlands	Oak Savanna	Shallow Marsh	Bottomland Hardwoods	Meadow	Young Upland Woodlands	Upland Shrub	Mature Woodlands
<i>Ambrosia artemisiifolia</i>	Annual bur-sage	Native	H					X									
<i>Ambrosia trifida</i>	Giant ragweed	Native	H	X										X		X	
<i>Amorpha canescens</i>	Lead-plant	Native	H								X						
<i>Amphicarpaea bracteata</i>	American hog-peanut	Native	H	X			X		X		X			X			
<i>Apocynum cannabinum</i>	Hemp-dogbane	Native	H					X									
<i>Aralia nudicaulis</i>	Wild sarsaparilla	Native	H							X							
<i>Arctium minus</i>	Common burdock	Introduced	H				X							X		X	
<i>Arisaema triphyllum</i>	Indian turnip	Native	H							X			X				
<i>Asarum canadense</i>	Canadian wild-ginger	Native	H							X							
<i>Asclepias syriaca</i>	Common milkweed	Native	H	X				X									
<i>Astragalus canadensis</i>	Canadian milk-vetch	Native	H								X						
<i>Berteroa incana</i>	Hoary false madwort	Introduced	H					X									
<i>Bidens cernua</i>	Nodding beggar-ticks	Native	H	X	X							X	X				
<i>Caltha palustris</i>	Cowslip	Native	H		X												
<i>Calystegia sepium</i>	Hedge bindweed	Native	H					X									
<i>Campanula rapunculoides</i>	Creeping bellflower	Invasive	H				X									X	
<i>Campanula rotundifolia</i>	Bluebell	Native	H														
<i>Carex lacustris</i>	Common lake sedge	Native	H	X	X												
<i>Carex sp.</i>	Sedge	Native	H								X						
<i>Carex vulpinoidea</i>	Brown fox sedge	Native	H	X													
<i>Caulophyllum thalictroides</i>	Blue cohosh	Native	H							X							
<i>Chelone glabra</i>	Turtlehead	Native	H		X												
<i>Cicuta bulbifera</i>	Bulbet water-hemlock	Native	H		X												
<i>Circaea canadensis</i>	Broad-leaf enchanter's-nightshade	Native	H						X	X							
<i>Cirsium vulgare</i>	Bull thistle	Introduced	H					X							X		
<i>Daucus carota</i>	Queen Anne's-lace	Introduced	H											X			
<i>Desmodium canadense</i>	Canadian tick-trefoil	Native	H								X						
<i>Desmodium glutinosum</i>	Cluster-leaf tick-trefoil	Native	H								X						
<i>Echinocystis lobata</i>	Balsam-apple	Native	H	X										X		X	
<i>Eleocharis palustris</i>	Common spike-rush	Native	H	X													
<i>Epilobium coloratum</i>	Cinnamon willow-herb	Native	H	X	X												
<i>Equisetum hyemale</i>	Common scouring rush	Native	H				X										
<i>Erigeron annuus</i>	Annual fleabane	Native	H					X						X			
<i>Eupatorium perfoliatum</i>	Boneset	Native	H		X												
<i>Eupatorium rugosum</i>	White snakeroot	Native	H				X	X	X		X		X	X	X	X	
<i>Euphorbia corollata</i>	Flowering spurge	Native	H								X						
<i>Eutrochium maculatum</i>	Spotted Joe-Pye weed	Native	H	X	X						X		X				
<i>Filipendula rubra</i>	Queen-of-the-prairie	Native	H	X													
<i>Galium palustre</i>	Common marsh bedstraw	Native	H		X												
<i>Geum canadense</i>	White avens	Native	H					X			X						
<i>Glechoma hederacea</i>	Creeping-Charlie	Introduced	H			X	X	X					X	X			
<i>Helianthus giganteus</i>	Giant sunflower	Native	H	X												X	
<i>Hemerocallis fulva</i>	Orange daylily	Introduced	H										X				
<i>Hesperis matronalis</i>	Dame's rocket	Invasive	H														
<i>Hydrophyllum virginianum</i>	John's-cabbage	Native	H							X							
<i>Impatiens capensis</i>	Orange jewelweed	Native	H	X	X	X		X	X	X		X	X	X		X	
<i>Impatiens pallida</i>	Pale touch-me-not	Native	H			X							X			X	
<i>Iris versicolor</i>	Blue flag	Native	H		X							X					
<i>Laportea canadensis</i>	Canadian wood-nettle	Native	H		X	X			X				X				

Scientific Name	Common Name	Conservation Status*	Form	Powell Falls / Lake Louise								Junction Falls / Lake George					
				Wet Meadow	Shallow Marsh	Bottomland Hardwoods	Riparian Woodlands	Old Field	Young Upland Woodlands	Mature Woodlands	Oak Savanna	Shallow Marsh	Bottomland Hardwoods	Meadow	Young Upland Woodlands	Upland Shrub	Mature Woodlands
<i>Leersia oryzoides</i>	Rice cut grass	Native	H														
<i>Leonurus cardiaca</i>	Lion's tail	Introduced	H														X
<i>Liatris aspera</i>	Lacerating blazing-star	Native	H								X						
<i>Lycopus americanus</i>	American water-horehound	Native	H										X				
<i>Lysimachia nummularia</i>	Moneywort	Invasive	H			X			X				X				
<i>Lythrum salicaria</i>	Purple loosestrife	Invasive	H	X	X												
<i>Maianthemum canadense</i>	Canada bead-ruby	Native	H														X
<i>Maianthemum racemosum</i>	False Solomon's-seal	Native	H								X						X
<i>Maianthemum stellatum</i>	Little false Solomon's-seal	Native	H														X
<i>Melilotus alba</i>	White sweet clover	Introduced	H	X				X					X				
<i>Menispermum canadense</i>	Canadian moonseed	Native	H				X				X						
<i>Mentha arvensis</i>	Field mint	Native	H		X												
<i>Monarda fistulosa</i>	Bee balm	Native	H														X
<i>Monarda punctata</i>	Dotted horsemint	Native	H								X						
<i>Nepeta cataria</i>	Catnip	Introduced	H					X									
<i>Oenothera biennis</i>	Bastard evening-primrose	Native	H					X								X	
<i>Osmorhiza claytonii</i>	Bland sweet cicely	Native	H				X			X			X				
<i>Oxypolis rigidior</i>	Common water-dropwort	Native	H			X											
<i>Pastinaca sativa</i>	Wild parsnip	Invasive	H											X			
<i>Penstemon digitalis</i>	False foxglove	Introduced	H								X						
<i>Penthorum sedoides</i>	Ditch stonecrop	Native	H	X													
<i>Persicaria hydropiper</i>	Marsh-pepper smartweed	Introduced	H										X				
<i>Persicaria maculosa</i>	Heart's-ease	Introduced	H	X					X			X	X				
<i>Persicaria pensylvanica</i>	Pennsylvania knotweed	Native	H	X										X			
<i>Persicaria sagittata</i>	Arrow vine	Native	H		X												
<i>Phryma leptostachya</i>	American lop-seed	Native	H							X	X						X
<i>Pilea pumila</i>	Canadian clearweed	Native	H		X					X		X	X				
<i>Polygonatum biflorum</i>	Giant Solomon's-seal	Native	H														
<i>Polygonum lapathifolium</i>	Curly-top knotweed	Native	H	X													
<i>Polygonum sagittatum</i>	Arrow-leaved tearthumb	Native	H	X													
<i>Potentilla arguta</i>	Prairie cinquefoil	Native	H								X						
<i>Prunella vulgaris</i>	Heal-all	Native	H					X									
<i>Ratibida pinnata</i>	Globular coneflower	Native	H								X						
<i>Ribes cynosbati</i>	Dogberry	Native	H						X								
<i>Rudbeckia laciniata</i>	Cut-leaved coneflower	Native	H								X			X			
<i>Rudbeckia triloba</i>	Brown-eyed Susan	Native	H								X						
<i>Rumex verticillatus</i>	Swamp dock	Native	H		X												
<i>Sagittaria latifolia</i>	Broad-leaf arrow-head	Native	H		X												
<i>Sanguinaria canadensis</i>	Bloodroot	Native	H								X						
<i>Sanicula marilandica</i>	Black snakeroot	Native	H								X						
<i>Schoenoplectus tabernaemontani</i>	Great bulrush	Native	H	X													
<i>Scirpus atrovirens</i>	Black bulrush	Native	H	X													
<i>Scirpus cyperinus</i>	Wool-grass	Native	H		X												
<i>Securigera varia</i>	Crown-vetch	Introduced	H					X									
<i>Silene latifolia</i>	Bladder campion	Introduced	H					X					X				
<i>Silphium integrifolium</i>	Prairie rosinweed	Native	H											X			
<i>Silphium perfoliatum</i>	Cup-plant	Native	H	X													X
<i>Solanum dulcamara</i>	Bittersweet nightshade	Introduced	H	X													
<i>Solidago canadensis</i>	Canadian goldenrod	Native	H					X	X		X			X		X	

APPENDIX C
Representative Cover Type Photographs

Site Photographs — Powell Falls

Project Name		Site Location	Project No.
River Falls Hydroelectric Project		River Falls, WI	350165 (FERC No. 10489)
Photo No.	Date		
1	9/5/19		
Description			
Representative photo of Lake Louise.			

Photo No.	Date		
2	9/5/19		
Description			
Representative photo of fresh (wet) meadow and young upland woodlands south of the Junction Falls Dam.			

Site Photographs — Powell Falls

Project Name River Falls Hydroelectric Project		Site Location River Falls, WI	Project No. 350165 (FERC No. 10489)
Photo No. 3	Date 9/5/19		
Description Representative photo of the bottomland hardwood woodland cover type along Lake Louise.			

Photo No. 4	Date 9/5/19	
Description View of the bottomland hardwood woodland cover type along Lake Louise.		

Site Photographs — Powell Falls

Project Name		Site Location	Project No.
River Falls Hydroelectric Project		River Falls, WI	350165 (FERC No. 10489)
Photo No.	Date		
5	9/5/19		
Description			
<p>Representative photo of the oak savanna cover type on the hillside south of the Powell Falls Dam.</p>			

Photo No.	Date		
6	9/5/19		
Description			
<p>View of the herbaceous cover within the oak savanna cover type.</p>			

Site Photographs — Powell Falls

Project Name River Falls Hydroelectric Project		Site Location River Falls, WI	Project No. 350165 (FERC No. 10489)
Photo No. 7	Date 9/5/19		
Description Photo of the mature woods on the south side of Lake Louise.			

Photo No. 8	Date 9/5/19	
Description Photo of the mature woods on the south side of Lake Louise.		

Site Photographs — Powell Falls

Project Name		Site Location	Project No.
River Falls Hydroelectric Project		River Falls, WI	350165 (FERC No. 10489)
Photo No.	Date		
9	9/5/19		
Description			
<p>Photo of the riparian woodland adjacent to the Kinnickinnic River below the Powell Falls Dam.</p>			

Photo No.	Date		
10	9/5/19		
Description			
<p>Photo of the riparian woodland adjacent to the Kinnickinnic River below the Powell Falls Dam.</p>			

Site Photographs — Powell Falls

Project Name		Site Location	Project No.
River Falls Hydroelectric Project		River Falls, WI	350165 (FERC No. 10489)
Photo No.	Date		
11	9/5/19		
Description			
<p>Photo of the young upland woodland cover type on the north side of Lake Louise where black walnut was dominant.</p>			

Photo No.	Date	
12	9/5/19	
Description		
<p>Photo of the young upland woods habitat on the north side of Lake Louise where common buckthorn was dominant.</p>		

Site Photographs — Powell Falls

Project Name River Falls Hydroelectric Project		Site Location River Falls, WI	Project No. 350165 (FERC No. 10489)
Photo No. 13	Date 9/5/19		
Description Photo of the old field cover type located below the utility corridor. Facing southwest			

Photo No. 14	Date 9/5/19		
Description Photo of the old field cover type below the utility corridor. Facing northeast.			

Site Photographs — Powell Falls

Project Name River Falls Hydroelectric Project		Site Location River Falls, WI	Project No. 350165 (FERC No. 10489)
Photo No. 15	Date 9/5/19		
Description Representative photo of the vegetative cover within the shallow marsh cover type located on the north side of Lake Louise.			

Photo No. 16	Date 9/5/19	
Description Representative photo of the vegetative cover within the shallow marsh cover type located on the north side of Lake Louise.		

Site Photographs — Powell Falls

Project Name		Site Location	Project No.
River Falls Hydroelectric Project		River Falls, WI	350165 (FERC No. 10489)
Photo No.	Date		
17	9/5/19		
Description Representative photo of the vegetative cover within the shallow marsh cover type located on the north side of Lake Louise.			

Photo No.	Date		
18	9/5/19		
Description Photo of the shallow marsh cover type located on the north side of Lake Louise. A couple sprigs of purple loosestrife are present.			

Site Photographs — Powell Falls

Project Name River Falls Hydroelectric Project		Site Location River Falls, WI	Project No. 350165 (FERC No. 10489)
Photo No. 19	Date 9/5/19		
Description Representative photo of the vegetative cover within the shallow marsh cover type located on the north side of Lake Louise.			

Photo No. 20	Date 9/5/19	
Description Representative photo of the vegetative cover within the fresh (wet) meadow cover type located on the north side of Lake Louise.		

Site Photographs — Powell Falls

Project Name River Falls Hydroelectric Project		Site Location River Falls, WI	Project No. 350165 (FERC No. 10489)
Photo No. 21	Date 9/5/19		
Description Representative photo of the vegetative cover within the fresh (wet) meadow cover type located on the north side of Lake Louise.			

Photo No. 22	Date 9/5/19		
Description Representative photo of the vegetative cover within the fresh (wet) meadow cover type located on the north side of Lake Louise.			

Site Photographs—Lake George

Project Name River Falls Hydroelectric Project		Site Location River Falls, WI	Project No. 350165 (FERC No. 10489)
Photo No. 1	Date 9/6/19		
Description Photo of the pathway through the mature woods on the North side of Lake George.			

Photo No. 2	Date 9/6/19	
Description Photo of the mature woods on the North side of Lake George.		

Site Photographs—Lake George

Project Name River Falls Hydroelectric Project		Site Location River Falls, WI	Project No. 350165 (FERC No. 10489)
Photo No. 3	Date 9/6/19		
Description Representative photo of the bottomland hardwood habitat on the northeast side of Lake George.			

Photo No. 4	Date 9/6/19	
Description Photo of the bottomland hardwood woodland habitat on the northwest side of Lake George.		

Site Photographs—Lake George

Project Name		Site Location	Project No.
River Falls Hydroelectric Project		River Falls, WI	350165 (FERC No. 10489)
Photo No.	Date		
5	9/6/19		
Description			
<p>Photo of the bottomland hardwood woodland cover type in the northwest portion of the Junction Falls Project Boundary.</p>			

Photo No.	Date		
6	9/6/19		
Description			
<p>Representative view of the bottomland hardwood woodland cover type on the northeast side of Lake George.</p>			

Site Photographs—Lake George

Project Name River Falls Hydroelectric Project		Site Location River Falls, WI	Project No. 350165 (FERC No. 10489)
Photo No. 7	Date 9/6/19		
Description Representative photo of the riparian and mature woods surrounding Lake George.			

Photo No. 8	Date 9/6/19	
Description Representative photo of the riparian and mature woods surrounding Lake George.		

Site Photographs—Lake George

Project Name		Site Location	Project No.
River Falls Hydroelectric Project		River Falls, WI	350165 (FERC No. 10489)
Photo No.	Date		
9	9/6/19		
Description			
<p>Representative photo of the meadow cover type in the northwest portion of the Junction Falls Project Boundary.</p>			

Photo No.	Date	
10	9/6/19	
Description		
<p>Photo of the shallow marsh cover type on the north side of Lake George.</p>		

Site Photographs—Lake George

Project Name River Falls Hydroelectric Project		Site Location River Falls, WI	Project No. 350165 (FERC No. 10489)
Photo No. 11	Date 9/6/19		
Description Photo of the young upland hardwoods on the southwest side of Lake George.			

Photo No. 12	Date 9/6/19	
Description Photo of the young bottomland hardwood/fresh wet meadow located immediately below the Junction Falls dam. Right side of photo.		

Site Photographs—Lake George

Project Name River Falls Hydroelectric Project		Site Location River Falls, WI	Project No. 350165 (FERC No. 10489)
Photo No. 13	Date 9/6/19		
Description Photo of the upland shrub cover type on the hillside located on the southwest side. Left side of the photo.			

APPENDIX D
Wisconsin NR 40 List of Invasive Botanical Species

WISCONSIN CH. NR 40

INVASIVE SPECIES LIST – PLANTS ONLY

EFFECTIVE LISTING DATES: September 1, 2009^A; June 1, 2011^B; and May 1, 2015^C

PROHIBITED CATEGORY:

1. *Achyranthes japonica* (Japanese chaff flower)^C
2. *Akebia quinata* (Fiveleaf akebia or Chocolate vine)^C
3. *Ampelopsis brevipedunculata* (Porcelain berry)^A including the variegated cultivar
4. *Arundo donax* (Giant reed)^C
5. *Azolla pinnata* (Mosquito fern)^C
6. *Berberis vulgaris* (Common barberry)^C
7. *Cabomba caroliniana* (Fanwort, Carolina fanwort)^A
8. *Cardamine impatiens* (Narrow leaf bittercress)^C
9. *Celastrus loeseneri* (Asian loeseneri bittersweet)^C
10. *Centaurea diffusa* (Diffuse knapweed)^C
11. *Centaurea repens* (Russian knapweed)^C
12. *Centaurea solstitialis* (Yellow star thistle)^A
13. *Crassula helmsii* (Australian swamp crop or New Zealand pygmyweed)^A
14. *Cytisus scoparius* (Scotch broom)^A
15. *Digitalis lanata* (Grecian foxglove)^C
16. *Dioscorea batatas* or *Dioscorea polystachya* (Chinese yam)^C
17. *Dioscorea oppositifolia* (Indian yam)^A
18. *Egeria densa* (Brazilian waterweed or wide-leaf anacharis)^A
19. *Eichhornia azurea* (Anchored water hyacinth)^C
20. *Eichhornia crassipes* (Water hyacinth, floating)^C
21. *Fallopia sachalinensis* or *Polygonum sachalinense* (Giant knotweed)^A
22. *Fallopia x bohemicum* or *F. x bohémica* or *Polygonum x bohémicum* (Bohemian knotweed)^C
23. *Glossostigma cleistanthum* (Mudmat)^C
24. *Heracleum mantegazzianum* (Giant hogweed)^A
25. *Hydrilla verticillata* (Hydrilla)^A
26. *Hydrocharis morsus-ranae* (European frogbit)^A
27. *Hydrocotyle ranunculoides* (Floating marsh pennywort)^C
28. *Hygrophila polysperma* (Indian Swampweed)^C
29. *Impatiens glandulifera* (Policeman's helmet)^C
30. *Ipomoea aquatica* (Water spinach, swamp morning-glory)^C
31. *Lagarosiphon major* (Oxygen-weed, African elodea or African waterweed)^A
32. *Lepidium latifolium* (Perennial or broadleaved pepperweed)^A
33. *Lespedeza cuneata* or *Lespedeza sericea* (Sericea or Chinese lespedeza)^A
34. *Limnophila sessiliflora* (Asian marshweed)^C
35. *Lonicera japonica* (Japanese honeysuckle)^A
36. *Lythrum virgatum* (Wanded loosestrife)^C
37. *Microstegium vimineum* (Japanese stilt grass)^A
38. *Myriophyllum aquaticum* (Parrot feather)^A
39. *Najas minor* (Brittle naiad, or lesser, bushy, slender, spiny or minor naiad or waternymph)^A
40. *Nelumbo nucifera* (Sacred Lotus)^C
41. *Nymphoides peltata* (Yellow floating heart)^A
42. *Oenanthe javanica* (Java waterdropwort or Vietnamese parsley)^C
43. *Oplismenus hirtellus* ssp. *undulatifolius* (Wavy leaf basket grass)^C
44. *Ottelia alismoides* (Ducklettuce)^C
45. *Paulownia tomentosa* (Princess tree)^A
46. *Petasites hybridus* (Butterfly dock)^C
47. *Phellodendron amurense* (Amur Cork Tree)^C except male cultivars and seedling rootstock
48. *Pistia stratiotes* (Water lettuce)^C
49. *Polygonum perfoliatum* or *Persicaria perfoliata* (Mile-a-minute vine)^A
50. *Pueraria montana* or *P. lobata* (Kudzu)^A
51. *Quercus acutissima* (Sawtooth oak)^A
52. *Ranunculus ficaria* (Lesser celandine)^C
53. *Rubus armeniacus* (Himalayan blackberry)^C
54. *Rubus phoenicolasius* (Wineberry or wine raspberry)^A
55. *Sagittaria sagittifolia* (Hawaii arrowhead)^C
56. *Salvinia herzogii* (Giant Salvinia)^C
57. *Salvinia molesta* (Giant salvinia)^C
58. *Sorghum halepense* (Johnsongrass)^C
59. *Stratiotes aloides* (Water Soldiers)^C
60. *Taeniatherum caput-medusae* (Medusahead)^C
61. *Torilis arvensis* (Spreading hedgeparsley)^A
62. *Trapa natans* (Water chestnut)^A
63. *Tussilago farfara* (Colt's foot)^C
64. *Typha domingensis* (Southern cattail)^C
65. *Typha laxmannii* (Graceful cattail)^C
66. *Vincetoxicum rossicum* or *Cynanchum rossicum* (Pale or European swallow-wort)^A
67. *Wisteria floribunda* (Japanese wisteria)^C
68. *Wisteria sinensis* (Chinese wisteria)^C

PROHIBITED/RESTRICTED CATEGORY (restricted in the counties listed; prohibited elsewhere):

1. *Anthriscus sylvestris* (Wild chervil)^A - Adams, Barron, Chippewa, Crawford, Columbia, Dane, Dodge, Dunn, Fond du Lac, Grant, Green, Green Lake, Iowa, Jefferson, Juneau, Kenosha, Lacrosse, Lafayette, Marquette, Milwaukee, Monroe, Ozaukee, Polk, Racine, Richland, Rock, Sauk, Sheboygan, Taylor, Vernon, Walworth, Waukesha, and Washington counties
2. *Bunias orientalis* (Hill mustard)^A - Dane, Grant, Green, Iowa, Lafayette, and Rock counties
3. *Cirsium palustre* (European marsh thistle)^A - Ashland, Bayfield, Chippewa, Clark, Door, Florence, Forest, Iron, Langlade, Lincoln, Marathon, Marinette, Menominee, Oconto, Oneida, Price, Rusk, Sawyer, Shawano, Taylor and Vilas counties
4. *Conium maculatum* (Poison hemlock)^A - Buffalo, Crawford, Dane, Grant, Green, Iowa, Jefferson, Kenosha, La Crosse, Lafayette, Milwaukee, Monroe, Ozaukee, Racine, Richland, Rock, Sauk, Sheboygan, Trempealeau, Vernon, Walworth, and Waukesha counties; prohibited elsewhere
5. *Epilobium hirsutum* (Hairy willow herb)^A - Brown, Calumet, Door, Kenosha, Kewaunee, and Manitowoc counties
6. *Glyceria maxima* (Tall or reed mannagrass)^A - Brown, Calumet, Columbia, Dane, Dodge, Door, Fond du Lac, Green, Jefferson, Kenosha, Kewaunee, Manitowoc, Milwaukee, Outagamie, Ozaukee, Racine, Rock, Sheboygan, Walworth, Washington, Waukesha and Winnebago counties
7. *Humulus japonicus* (Japanese hops)^A - Buffalo, Crawford, Dane, Grant, Green, Iowa, Jackson, La Crosse, Lafayette, Monroe, Pepin, Richland, Sauk, Trempealeau, and Vernon counties; prohibited elsewhere
8. *Leymus arenarius* or *Elymus arenarius* (Lyme grass or sand ryegrass)^A - Door, Kenosha, Kewaunee, Manitowoc, Milwaukee, Ozaukee, Racine, and Sheboygan counties

9. *Linaria dalmatica* (Dalmatian toadflax)^C - Juneau and Bayfield counties
10. *Lonicera maackii* (Amur honeysuckle)^A - Adams, Brown, Buffalo, Calumet, Columbia, Crawford, Dane, Dodge, Fond du Lac, Grant, Green, Green Lake, Iowa, Jefferson, Juneau, Kenosha, Kewaunee, La Crosse, Lafayette, Manitowoc, Marquette, Milwaukee, Monroe, Outagamie, Ozaukee, Racine, Richland, Rock, Sauk, Sheboygan, Vernon, Walworth, Washington, Waukesha, Waupaca, Waushara and Winnebago counties
11. *Phragmites australis* non-native ecotype (Phragmites or Common reed non-native ecotype)^A - Brown, Calumet, Columbia, Dane, Dodge, Door, Florence, Fond du Lac, Forest, Green Lake, Jefferson, Kenosha, Kewaunee, Langlade, Manitowoc, Marathon, Marinette, Marquette, Menominee, Milwaukee, Oconto, Outagamie, Ozaukee, Portage, Racine, Rock, Shawano, Sheboygan, Walworth, Washington, Waukesha, Waupaca, Waushara, and Winnebago counties
12. *Solidago sempervirens* (Seaside goldenrod)^C - Kenosha, Milwaukee and Racine counties
13. *Torilis japonica* (Japanese hedgeparsley or erect hedgeparsley)^A - Adams, Brown, Calumet, Columbia, Crawford, Dane, Dodge, Door, Fond du Lac, Grant, Green, Green Lake, Iowa, Jefferson, Juneau, Kenosha, Kewaunee, La Crosse, Lafayette, Langlade, Manitowoc, Marathon, Marinette, Marquette, Menominee, Milwaukee, Monroe, Oconto, Outagamie, Ozaukee, Portage, Racine, Richland, Rock, Sauk, Shawano, Sheboygan, Vernon, Walworth, Washington, Waukesha, Waupaca, Waushara, and Winnebago counties
14. *Vincetoxicum nigrum* or *Cynanchum louiseae* (Black or Louise's swallow-wort)^A - Columbia, Crawford, Dane, Grant, Green, Iowa, Jefferson, Juneau, Kenosha, La Crosse, Lafayette, Milwaukee, Monroe, Racine, Richland, Rock, Sauk, Vernon, Walworth and Waukesha counties

RESTRICTED CATEGORY:

1. *Acer tataricum* subsp. *ginnala* (Amur maple)^C *except all cultivars
2. *Aegopodium podagraria* (Bishop's goutweed)^C
3. *Ailanthus altissima* (Tree of heaven)^A
4. *Alliaria petiolata* (Garlic mustard)^A
5. *Alnus glutinosa* (Black alder)^C *except all cultivars and hybrids
6. *Artemisia absinthium* (Wormwood)^C
7. *Berberis thunbergii* (Japanese barberry)^C *This restriction only applies to the parent type, the variety *atropurpurea*, the hybrid of *B. thunbergii* x *B. Koreana*, and the following cultivars. *Berberis thunbergii* cultivars: Sparkle, 'Anderson' Lustre Green™, Erecta, 'Bailgreen' Jade Carousel®, Angel Wings, Painter's Palette, Inermis ('Thornless'), Pow Wow, Golden Ring, Kelleris, Kobold, 'JN Variegated' Stardust™ and Antares. Variety *atropurpurea* cultivars: Marshall Upright ('Erecta'), Crimson Velvet, 'Bailtwo' Burgundy Carousel®, Red Rocket, 'Monomb' Cherry Bomb™, 'Bailone' Ruby Carousel®, JN Redleaf, Rose Glow and Silver Mile. Hybrid of *B. thunbergii* x *B. koreana* cultivars: Tara and 'Bailseil' Golden Carousel®
8. *Butomus umbellatus* (Flowering rush)^A
9. *Campanula rapunculoides* (Creeping bellflower)^A
10. *Caragana arborescens* (Siberian peashrub)^C *except the cultivars Lorbergii, Pendula, and Walkerii
11. *Carduus acanthoides* (Plumeless thistle)^A
12. *Carduus nutans* (Musk thistle or Nodding thistle)^A
13. *Celastrus orbiculatus* (Oriental bittersweet)^A
14. *Centaurea biebersteinii*, *Centaurea maculosa* or *Centaurea stoebe* (Spotted knapweed)^A
15. *Centaurea jacea* (Brown knapweed)^C
16. *Centaurea nigra* (Black knapweed)^C
17. *Centaurea nigrescens* (Tyrol knapweed)^C
18. *Chelidonium majus* (Celandine)^A
19. *Cirsium arvense* (Canada thistle)^A
20. *Coronilla varia* (Crown vetch)^C
21. *Cynoglossum officinale* (Hound's tongue)^A
22. *Dipsacus laciniatus* (Cut-leaved teasel)^A
23. *Dipsacus sylvestris* or *Dipsacus fullonum* (Common teasel)^A
24. *Elaeagnus angustifolia* (Russian olive)^A
25. *Elaeagnus umbellata* (Autumn olive)^A
26. *Epipactis helleborine* (Helleborine orchid)^A
27. *Euonymus alatus* (Burning bush)^C *including the cultivar 'Nordine' and excluding all other cultivars
28. *Euphorbia cyparissias* (Cypress spurge)^A
29. *Euphorbia esula* (Leafy spurge)^A
30. *Fallopia japonica* or *Polygonum cuspidatum* (Japanese knotweed)^A
31. *Filipendula ulmaria* (Queen of the meadow)^C
32. *Galeopsis tetrahit* (Hemp nettle, brittlestem hemp nettle)^A
33. *Galium mollugo* (White bedstraw)^C
34. *Hesperis matronalis* (Dame's rocket)^A
35. *Impatiens balfourii* (Balfour's touch-me-not)^C
36. *Iris pseudacorus* (Yellow iris)^C
37. *Knautia arvensis* (Field scabiosa)^C
38. *Lonicera morrowii* (Morrow's honeysuckle)^A
39. *Lonicera tatarica* (Tartarian honeysuckle)^A
40. *Lonicera x bella* (Bell's or showy bush honeysuckle)^A
41. *Lysimachia nummularia* or *L. nummelaria* (Moneywort)^C *except the cultivar Aurea and yellow and gold leaf forms
42. *Lysimachia vulgaris* (Garden yellow loosestrife)^C
43. *Lythrum salicaria* (Purple loosestrife)^A
44. *Morus alba* (White mulberry)^C *except male cultivars
45. *Myosotis scorpioides* (Aquatic forget-me-not)^C
46. *Myosotis sylvatica* or *M. sylvaticum* (Woodland forget-me-not)^C
47. *Mysiophyllum spicatum* (Eurasian watermilfoil)^A
48. *Najas marina* (Spiny naiad)^C
49. *Pastinaca sativa* (Wild parsnip)^A *except for the garden vegetable form
50. *Phalaris arundinacea* var. *picta* (ribbon grass or gardener's garters and other ornamental variegated varieties and cultivars)^C *this restriction does not include the parent type - reed canary grass.
51. *Pimpinella saxifraga* (Scarlet pimpernel or Burnet saxifrage)^C
52. *Populus alba* (White poplar)^C
53. *Potamogeton crispus* (Curly-leaf pondweed)^A
54. *Rhamnus cathartica* (Common buckthorn)^A
55. *Rhamnus frangula* or *Frangula alnus* (Glossy buckthorn)^A *including the Columnaris (tall hedge) cultivar but excluding the cultivars Asplenifolia and Fineline (Ron Williams)
56. *Robinia hispida* (Rose acacia or Bristly locust)^C
57. *Robinia pseudoacacia* (Black locust)^C *except all cultivars
58. *Rosa multiflora* (Multiflora rose)^A
59. *Tanacetum vulgare* (Tansy)^A *except the cultivars Aureum and Crispum
60. *Typha angustifolia* (Narrow-leaf cattail)^A
61. *Typha x glauca* (Hybrid cattail)^A
62. *Ulmus pumila* (Siberian elm)^C *except hybrids and individuals used as rootstock
63. *Valeriana officinalis* (Garden heliotrope or Valerian)^C

Phase-out: Restricted only plants located in Wisconsin prior to their effective listing date may be transported, transferred, and introduced without a permit for a period not to exceed 3 years for herbaceous plants and woody vines, or 5 years for trees and shrubs, from their effective listing date (effective May 1, 2015).