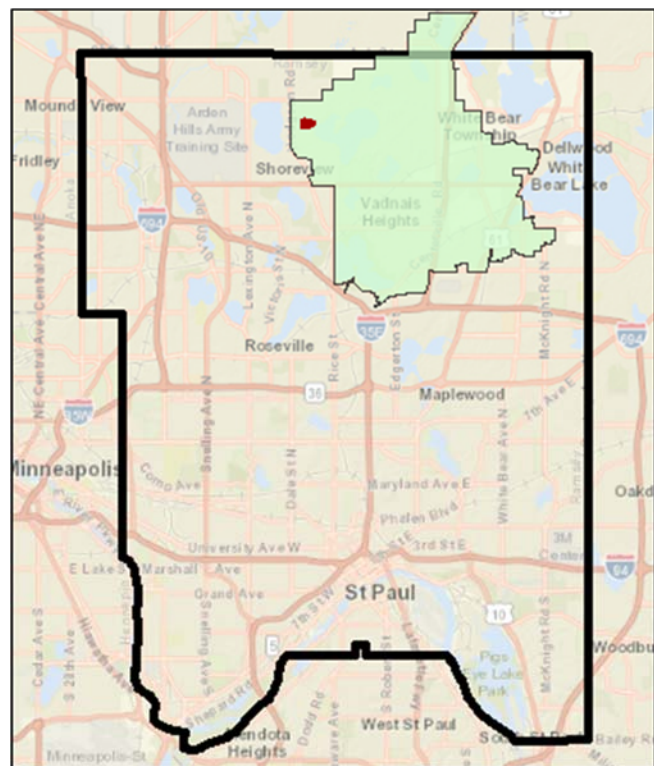


# Charley Lake



## Shore Vegetation Survey 8/10/17

This document details the methods and findings for vegetation data collected from an assessment of the shore vegetation on Charley Lake.



Data collected and prepared by **Ramsey  
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Location of Charley Lake (red) in Ramsey County within VLAWMO borders

# Charley Lake Shore Vegetation Survey

August 10, 2017

## Methods:

The plant sampling technique used for this survey was the Relevé method, which applied plot-based sampling as the collection method to describe and characterize the shore vegetation surrounding Charley Lake. The precise methodology was adapted from the current practices and procedures for collecting vegetation plot data, by the Minnesota Department of Natural Resources County Biological Survey and Natural Heritage Program.

Three preliminary sample locations were identified based on the major vegetative patterns and site conditions through off-site analysis. Relevé sampling plots were then field-verified and subjectively placed to best represent uniformity in vegetation composition and structure. Once the location of each sampling plot was finalized, the shape and orientation of the plot (equal to 100 square meters) was determined for greatest accuracy in species documentation and coverage. Relevé shape was also altered comparative to site conditions, such as slope or impacts by the built-environment. Layout of the sampling plots were then flagged, and GPS coordinates were taken for each corner [Figure 1].

## Vegetation Data:

Each relevé resulted in a complete list and percent areal cover of the species present [Appendix A]. Furthermore, a species' status as native, non-native and invasive was recorded on the field data forms. Status for native origin to Minnesota, was determined according to Cholewa, A.F. 2011. *Annotated Checklist of the Flora of Minnesota*. Invasive species status was based on ranking from the Minnesota Invasive Species Advisory Council (MISAC) and NatureServe's impact rankings. In addition, the wetland indicator status for each species was listed to assist with further characterization of the plant community types sampled. Wetland indicator status was assigned per the Army Corp of Engineers (USACE) 2016 Northcentral and Northeast Regional Wetland Plant List. All plant species within the designated plot boundary or limits, were inventoried to the full binomial name of the species. All survey data was recorded in the field, apart from correction for any species that were collected for identification.

The procedure for recording plant data was to divide the vegetation into four general layers: T= Tree, S= Sapling/Shrub, H= Herbaceous, and V= Woody Vines – based on functional life-form and vertical stratification of the plant species present. A cover-abundance class value was then visually estimated and given for each plant identified within the respective stratum and relevé area. The scalar value for cover-abundance class assigned in the field was the Modified Daubenmire Vegetation Cover Scale (Daubenmire 1959, 1968) from Mueller Dombois and Ellenberg (1974) [Table 1]. All estimates were reported as absolute cover (not relative cover), and species percent covers may total over 100% when added-up due to overlap. Non-native or invasive species occurring in the relevé areas were also recorded with their respective strata and cover class value [Appendix A].

Cover Class	Cover Class Range	Midpoint
7	>95 – 100%	97.5%
6	>75 – 95%	85%
5	>50 – 75%	62.5%
4	>25 – 50%	37.5%
3	>5 – 25%	15%
2	>1 – 5%	3%
1	>0 – 1%	0.5%

Table 1. Cover Classes, cover class ranges, and percent cover midpoints. Modified Daubenmire Vegetation Cover Scale (Daubenmire 1959, 1968) from Mueller Dombois and Ellenberg (1974).

## Results:

### *Relevé Survey Area 1.0:*

The plant sampling plot selected for this survey area was located nearest the northwest corner of the lake [Figure 1], and consistent with the plant community surrounding predominantly the northern and western shoreline. The sample plot was constructed with the dimension of 5-meters x 20-meters. The configuration of the plot was arranged to reflect its transitional location between aquatic communities and upland, as well as document the gentle sloping nature or gradual change in elevation across the plant community.

The plant community sampled was observed to be dominant to an approximate elevation of 894.00 feet and has a south and eastern sun exposure with nearly 100-percent vegetative cover. The plant community was comprised of perennial forb, grass and sedge mixtures growing on saturated soils, consistent with inland fresh meadow and shallow marsh species [Figure 2]. Conditions indicating short periods of inundation or standing water were also observed. Invading shrubs and smaller trees were present as scattered individuals, becoming denser with encroachment nearing upland conditions or where disturbances are present. The plant community remained consistent in diversity and native perennial plant cover in all areas which it occurred surrounding Charley Lake.

Lake Sedge (*Carex lacustris*) is dominant while Canada Blue-joint Grass (*Calamagrostis canadensis*) is sub-dominant. Non-dominant species include Northern Marsh Fern (*Thelypteris palustris*), River Bulrush (*Scirpus fluviatilis*), Green Bulrush (*Scirpus atrovirens*), Narrow-leaved Cattail (*Typha angustifolia*), Softstem Bulrush (*Schoenoplectus tabernaemontani*), Purple Loosestrife (*Lythrum salicaria*), Giant Bur Reed (*Sparganium eurycarpum*), Reed Canary Grass (*Phalaris arundinacea*), Caterpillar Sedge (*Carex comosa*), Sweet flag (*Acorus americanus*), American Common Reed (*Phragmites australis* subsp. *Americanus*), Bulblet-Bearing Water Hemlock (*Cicuta bulbifera*), Porcupine Sedge (*Carex hystericina*), Jewelweed (*Impatiens capensis*), Rice Cut Grass (*Leersia oryzoides*), Monkey Flower (*Mimulus ringens*) Fowl Bluegrass (*Poa palustris*), Wild Mint (*Mentha arvensis*), Linear-Leaf Willow Herb (*Epilobium leptophyllum*) Swamp Milkweed (*Asclepias incarnata*), Joe Pye Weed (*Eupatorium maculatum*), Stiff Marsh Bedstraw (*Galium tinctorium*), Red-stemmed Aster (*Symphotrichum puniceum*), Broadleaf Arrowhead (*Sagittaria latifolia*), Great Water Dock (*Rumex britannica*), Arrowleaf Tearthumb (*Persicaria sagittata*), Water Horsetail (*Equisetum fluviatile*), Common Boneset (*Eupatorium perfoliatum*), Blue Flag Iris (*Iris versicolor*) and Sensitive fern (*Onoclea sensibilis*). Small, dispersed individuals of Speckled Alder (*Alnus incana*), Beaked Willow (*Salix bebbiana*), Slender Willow (*Salix petiolaris*), Glossy Buckthorn (*Frangula alnus*), and Red-osier Dogwood (*Cornus sericea*) are present.

### *Relevé Survey Area 2.0:*

The plant sampling plot selected for this survey area was located nearest the northeast corner of the lake [Figure 1], and consistent with the vegetative structure and composition immediately on the northeastern shoreline, where the proximity of the road is closest. The sample plot was constructed with the dimension of 5-meters x 20-meters. The configuration of the plot was arranged to document the abrupt change in elevation from surface water to upland, and to reflect the thin-band of shore vegetation as result from the existing road.

The plant community sampled was characterized by upland dry-mesic site conditions, and has a continuous ground-cover, with an emerging shrub-layer and a sparse canopy of deciduous trees [Figure 3]. The vegetative structure and composition was observed to be dominant and persist most consistently along the northeast shoreline. Along this area of the shoreline, conditions of naturally occurring steep slopes with south- and southwest-facing aspects, abruptly transition into lake-edge. Due to the existing conditions, the structure and composition of the vegetation is comprised largely of both annual and perennial forb, grass and woody deciduous upland species. However, there is a narrow fringe of emergent and transitional species growing immediately at the water's edge. In addition, a significant amount of reoccurring disturbance was observed in the sample area. This is a result from the overlap of road right-of-way and localized erosion caused from drainage off the road. There is a dominance of invasive and native perennials tolerant of disturbed areas, and that disperse quickly or have aggressive tendencies which coincides with this disturbance.

Smooth Brome (*Bromus inermis*) is dominant while Birds-foot Trefoil (*Lotus corniculatus*), Rabbit-foot Clover (*Trifolium arvense*), Red-osier dogwood (*Cornus sericea*), Staghorn Sumac (*Rhus typhina*), and Sandbar Willow (*Salix interior*) were sub-dominant species. Non-dominant species include Smooth Wild Rose (*Rosa blanda*), Common Yarrow (*Achillea millefolium*), Virginia Creeper (*Parthenocissus quinquefolia*) Common Ragweed (*Ambrosia artemisiifolia*), Big Bluestem (*Andropogon gerardii*), Indian Hemp (*Apocynum cannabinum*), Common Burdock (*Arctium minus*), Common Milkweed (*Asclepias syriaca*), Lake Sedge (*Carex lacustris*), Orchard Grass (*Dactylis glomerata*), Smooth Crabgrass (*Digitaria ischaemum*), Butter and Eggs (*Linaria vulgaris*), Purple Loosestrife (*Lythrum salicaria*), Yellow Sweet Clover (*Melilotus officianlis*), Sensitive Fern (*Onoclea sensibilis*), Pennsylvania Smartweed (*Persicaria pennsylvanica*), Reed Canary Grass (*Phalaris arundinacea*), Timothy (*Phleum pratense*), American Common Reed (*Phragmites australis subsp. americanus*), Common Plantain (*Plantago major*), Kentucky Bluegrass (*Poa pratense*), White Champion (*Silene latifolia*), Canada Goldenrod (*Solidago canadensis*), Hairy Goldenrod (*Solidago hispida*), Stiff Goldenrod (*Solidago rigida*), Smooth Blue Aster (*Symphotrichum laeve*) and Blue Vervain (*Verbena hastata*). A sparse upper-layer or canopy include American Elm (*Ulmus Americana*), Green Ash (*Fraxinus pennsylvanica*), Northern Red Oak (*Quercus rubra*) and Riverbank Grape (*Vitis riparia*).

#### Relevé Survey Area 3.0:

The plant sampling plot selected for this survey area was located nearest the southeastern corner of the lake [Figure 1], and consistent with the vegetative structure and composition surrounding predominantly the southern shoreline. The sample plot was constructed with the dimension of 5-meters x 20-meters. The configuration of the plot was arranged to document the landscape setting and conditions which varied slightly between naturally occurring steeper slopes to moderate slopes with north- and northwest-facing aspects.

The plant community sampled is characterized by upland dry-mesic site conditions. The vegetative structure and composition consisted of a ground-layer and shrub-layer that is patchy to interrupted, along with an understory and canopy that is interrupted to continuous. Furthermore, the plant community is comprised of both annual and perennial forb and grass species, as well as woody deciduous shrub and tree species [Figure 4].

The ground-layer and shrub-layer cover was observed to be patchy to interrupted, and includes Woodland Sedge (*Carex blanda*), Penn Sedge (*Carex pennsylvanica*) Awl-fruited Sedge (*Carex stipata*), Smooth Brome (*Bromus inermis*), Large-leaved Aster (*Eurybia macrophylla*), Virginia Stickseed (*Hackelia virginiana*), Jewelweed (*Impatiens capensis*), False Solomon's Seal (*Maianthemum racemosum*), Smooth Solomon's Seal (*Polygonatum biflorum*), Canada Goldenrod (*Solidago canadensis*), Western Poison Ivy (*Toxicodendron rydbergii*), Hedge Bindweed (*Calystegia sepium*), Spotted Knapweed (*Centaurea stoebe*), Enchanter's Nightshade (*Circaea lutetiana*), Virginia Creeper (*Parthenocissus quinquefolia*), Kentucky Bluegrass (*Poa pratensis*), Reed Canary Grass (*Phalaris arundinacea*), Clearweed (*Pilea pumila*), Riverbank Grape (*Vitis riparia*), Timothy (*Phleum pratense*), Grey Dogwood (*Cornus racemosa*), Tartarian Honeysuckle (*Lonicera tatarica*), Prickly Gooseberry (*Ribes cynosbati*), Common Buckthorn (*Rhamnus cathartica*) and Red Raspberry (*Rubus idaeus*). There was a significant amount of Bur Oak (*Quercus macrocarpa*) and Northern Red Oak (*Quercus rubra*) seedlings present within the ground-layer.

The understory and canopy cover was observed to be interrupted to continuous, and dominant species include American Basswood (*Tilia americana*) and Northern Red Oak (*Quercus rubra*). Sub-dominant species include Ironwood (*Ostrya virginiana*), Bur Oak (*Quercus macrocarpa*), Green Ash (*Fraxinus pennsylvanica*), Hackberry (*Celtis occidentalis*), Paper Birch (*Betula papyrifera*) and Eastern Cottonwood (*Populus deltoides*). Other species present were Black Walnut (*Juglans nigra*) and Black Willow (*Salix nigra*).



Appendix A:

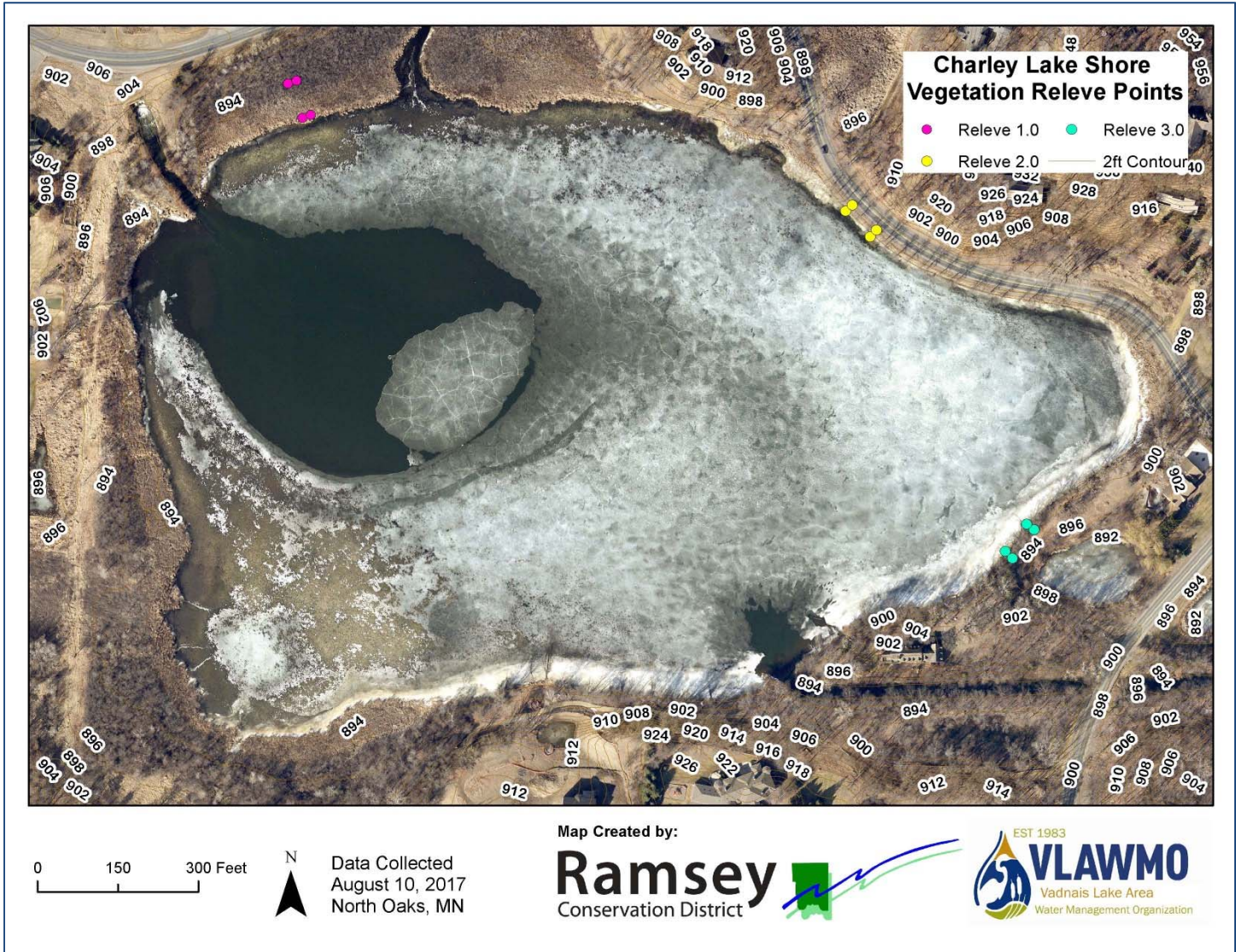


Figure 1. Charley Lake Shore Vegetation Relevé Area survey point locations.

RELEVÉ SURVEY AREA 1.0

PLANT COMMUNITY: Inland Fresh Meadow/Shallow Marsh (Circular 39 Type 2/3) or (Cowardin PEM1B/PEM1C and F)

Scientific Name	Common Name	Indicator	Native	Invasive	Strata	Cover Class	Cover Class Range
<i>Acorus americanus</i>	Sweet Flag	OBL	YES	NO	H	3	> 5 – 25%
<i>Asclepias incarnata</i>	Swamp Milkweed	OBL	YES	NO	H	1	> 0 – 1%
<i>Calamagrostis canadensis</i>	Canada Bluejoint Grass	OBL	YES	NO	H	3	> 5 – 25%
<i>Carex comosa</i>	Caterpillar Sedge	OBL	YES	NO	H	3	> 5 – 25%
<i>Carex hystericina</i>	Porcupine Sedge	OBL	YES	NO	H	2	> 1 – 5%
<i>Carex lacustris</i>	Lake Sedge	OBL	YES	NO	H	4	> 25 – 50%
<i>Cicuta bulbifera</i>	Bulblet-Bearing Water Hemlock	OBL	YES	NO	H	2	> 1 – 5%
<i>Epilobium leptophyllum</i>	Linear-leaf Willow Herb	FACW	YES	NO	H	1	> 0 – 1%
<i>Equisetum fluviatile</i>	Water Horsetail	OBL	YES	NO	H	1	> 0 – 1%
<i>Eupatorium maculatum</i>	Joe Pye Weed	OBL	YES	NO	H	1	> 0 – 1%
<i>Eupatorium perfoliatum</i>	Common Boneset	FACW	YES	NO	H	1	> 0 – 1%
<i>Galium tinctorium</i>	Stiff Marsh Bedstraw	OBL	YES	NO	H	1	> 0 – 1%
<i>Impatiens capensis</i>	Jewelweed	FACW	YES	NO	H	2	> 1 – 5%
<i>Iris versicolor</i>	Blue Flag Iris	OBL	YES	NO	H	1	> 0 – 1%
<i>Leersia oryzoides</i>	Rice Cut Grass	OBL	YES	NO	H	2	> 1 – 5%
<i>Lycopus americanus</i>	American Water Horehound	OBL	YES	NO	H	2	> 1 – 5%
<i>Lythrum salicaria</i>	Purple Loosestrife	OBL	NO	YES	H	3	> 5 – 25%
<i>Mentha arvensis</i>	Wild Mint	FACW	YES	NO	H	1	> 0 – 1%
<i>Mimulus ringens</i>	Monkey Flower	OBL	YES	NO	H	2	> 1 – 5%
<i>Onoclea sensibilis</i>	Sensitive Fern	FACW	YES	NO	H	1	> 0 – 1%
<i>Persicaria lapathifolia</i>	Nodding Smartweed	FACW	YES	NO	H	1	> 0 – 1%
<i>Persicaria pennsylvanica</i>	Pennsylvania Smartweed	FACW	YES	NO	H	2	> 1 – 5%
<i>Persicaria sagittata</i>	Arrowleaf Tearthumb	OBL	YES	NO	H	1	> 0 – 1%
<i>Phalaris arundinacea</i>	Reed Canary Grass	FACW	NO	YES	H	3	> 5 – 25%
<i>Phragmites australis subsp. americanus</i>	American Common Reed	FACW	YES	NO	H	2	> 1 – 5%
<i>Pilea pumila</i>	Clearweed	FACW	YES	NO	H	2	> 1 – 5%
<i>Poa palustris</i>	Fowl Bluegrass	FACW	YES	NO	H	1	> 0 – 1%
<i>Rumex britannica</i>	Great Water Dock	OBL	YES	NO	H	1	> 0 – 1%
<i>Sagittaria latifolia</i>	Broadleaf Arrowhead	OBL	YES	NO	H	2	> 1 – 5%
<i>Schoenoplectus tabernaemontani</i>	Softstem Bulrush	OBL	YES	NO	H	2	> 1 – 5%
<i>Scirpus atrovirens</i>	Green Bulrush	OBL	YES	NO	H	2	> 1 – 5%
<i>Scirpus fluviatilis</i>	River Bulrush	OBL	YES	NO	H	2	> 1 – 5%
<i>Sparganium eurycarpum</i>	Giant Bur Reed	OBL	YES	NO	H	3	> 5 – 25%
<i>Symphotrichum puniceum</i>	Red-stemmed Aster	OBL	YES	NO	H	1	> 0 – 1%
<i>Thelypteris palustris</i>	Northern Marsh Fern	FACW	YES	NO	H	2	> 1 – 5%
<i>Typha angustifolia</i>	Narrow-leaved Cattail	OBL	NO	YES	H	3	> 5 – 25%
<i>Urtica dioica</i>	Stinging Nettle	FAC	YES	NO	H	1	> 0 – 1%
<i>Alnus incana</i>	Speckled Alder	FACW	YES	NO	S	3	> 5 – 25%
<i>Baptisia australis</i>	False Indigo	FACW	YES	NO	S	1	> 0 – 1%
<i>Cornus sericea</i>	Red-osier Dogwood	FACW	YES	NO	S	3	> 5 – 25%
<i>Frangula alnus</i>	Glossy Buckthorn	FAC	NO	YES	S	3	> 5 – 25%
<i>Salix bebbiana</i>	Beaked Willow	FACW	YES	NO	S	3	> 5 – 25%
<i>Salix petiolaris</i>	Slender Willow	FACW	YES	NO	S	3	> 5 – 25%
<i>Ulmus americana</i>	American Elm	FACW	YES	NO	S	1	> 0 – 1%
<i>Vitis riparia</i>	Riverbank Grape	FAC	YES	NO	V	1	> 0 – 1%

Strata Key: V (Woody Vine), H (Herbaceous Layer), S (Saplings and Shrubs), T (Tree)

Figure 2. Charley Lake shore vegetation Relevé Area 1.0 survey data collection form.

RELEVÉ SURVEY AREA 2.0

PLANT COMMUNITY: Forest-Upland Deciduous (Hardwood) - Southern Dry-Mesic Oak Forest (MHs37)

Scientific Name	Common Name	Indicator	Native	Invasive	Strata	Cover Class	Cover Class Range
<i>Achillea millefolium</i>	Common Yarrow	FACU	YES	NO	H	1	> 0 – 1%
<i>Ambrosia artemisiifolia</i>	Common Ragweed	FACU	YES	NO	H	2	> 1 – 5%
<i>Andropogon gerardii</i>	Big Bluestem	FACU	YES	NO	H	1	> 0 – 1%
<i>Apocynum cannabinum</i>	Indian Hemp	FAC	YES	NO	H	2	> 1 – 5%
<i>Arctium minus</i>	Common Burdock	FACU	NO	YES	H	1	> 0 – 1%
<i>Asclepias syriaca</i>	Common Milkweed	UPL	YES	NO	H	2	> 1 – 5%
<i>Bromus inermis</i>	Smooth Brome	UPL	NO	YES	H	4	> 25 – 50%
<i>Carex Lacustris</i>	Lake Sedge	OBL	YES	NO	H	3	> 5 – 25%
<i>Dactylis glomerata</i>	Orchard Grass	FACU	NO	NO	H	1	> 0 – 1%
<i>Digitaria ischaemum</i>	Smooth Crabgrass	FACU	NO	NO	H	1	> 0 – 1%
<i>Linaria vulgaris</i>	Butter and Eggs	NI	NO	YES	H	3	> 5 – 25%
<i>Lotus corniculatus</i>	Birds-foot Trefoil	FACU	NO	YES	H	3	> 5 – 25%
<i>Lythrum salicaria</i>	Purple Loosestrife	OBL	NO	YES	H	1	> 0 – 1%
<i>Melilotus officianlis</i>	Yellow Sweet Clover	FACU	NO	YES	H	1	> 0 – 1%
<i>Onoclea sensibilis</i>	Sensitive Fern	FACW	YES	NO	H	1	> 0 – 1%
<i>Persicaria pensylvanica</i>	Pennsylvania Smartweed	FACW	YES	NO	H	2	> 1 – 5%
<i>Phalaris arundinacea</i>	Reed Canary Grass	FACW	NO	YES	H	2	> 1 – 5%
<i>Phleum pratense</i>	Timothy	FACU	NO	NO	H	1	> 0 – 1%
<i>Phragmites australis subsp. americanus</i>	American Common Reed	FACW	YES	NO	H	2	> 1 – 5%
<i>Plantago major</i>	Common Plantain	FACU	NO	NO	H	2	> 1 – 5%
<i>Poa pratensis</i>	Kentucky Bluegrass	FACU	NO	YES	H	2	> 1 – 5%
<i>Silene latifolia</i>	White Campion	NI	NO	NO	H	1	> 0 – 1%
<i>Solidago canadensis</i>	Canada Goldenrod	FACU	YES	NO	H	2	> 1 – 5%
<i>Solidago hispida</i>	Hairy Goldenrod	NI	YES	NO	H	1	> 0 – 1%
<i>Solidago rigida</i>	Stiff Goldenrod	FACU	YES	NO	H	1	> 0 – 1%
<i>Sonchus oleraceus</i>	Common Sowthistle	FACU	NO	NO	H	1	> 0 – 1%
<i>Symphotrichum laeve</i>	Smooth Blue Aster	FACU	YES	NO	H	2	> 1 – 5%
<i>Trifolium arvense</i>	Rabbit-foot Clover	NI	NO	NO	H	3	> 5 – 25%
<i>Verbascum thapsus</i>	Common Mullein	UPL	NO	NO	H	1	> 0 – 1%
<i>Verbena hastata</i>	Blue Vervain	FACW	YES	NO	H	1	> 0 – 1%
<i>Cornus sericea</i>	Red-osier Dogwood	FACW	YES	NO	S	3	> 5 – 25%
<i>Rhus typhina</i>	Staghorn Sumac	NI	YES	NO	S	3	> 5 – 25%
<i>Rosa blanda</i>	Smooth Wild Rose	FACU	YES	NO	S	2	> 1 – 5%
<i>Salix interior</i>	Sandbar Willow	FACW	YES	NO	S	3	> 5 – 25%
<i>Ulmus pumila</i>	Siberian Elm	FACU	NO	YES	S	1	> 0 – 1%
<i>Ulmus americana</i>	American Elm	FACW	YES	NO	T	2	> 1 – 5%
<i>Fraxinus pennsylvanica</i>	Green Ash	FACW	YES	NO	T	2	> 1 – 5%
<i>Quercus rubra</i>	Northern Red Oak	FACU	YES	NO	T	1	> 0 – 1%
<i>Parthenocissus quinquefolia</i>	Virginia Creeper	FACU	YES	NO	V	3	> 5 – 25%
<i>Solanum dulcamara</i>	Bittersweet Nightshade	FAC	NO	NO	V	1	> 0 – 1%
<i>Vitis riparia</i>	Riverbank Grape	FAC	YES	NO	V	2	> 1 – 5%

Strata Key: V (Woody Vine), H (Herbaceous Layer), S (Saplings and Shrubs), T (Tree)

Figure 3. Charley Lake shore vegetation Relevé Area 2.0 survey data collection form.

RELEVÉ SURVEY AREA 3.0

PLANT COMMUNITY: Forest-Upland Deciduous (Hardwood) - Southern Mesic Oak-Basswood Forest (MHs38)

Scientific Name	Common Name	Indicator	Native	Invasive	Strata	Cover Class	Cover Class Range
<i>Anemone virginiana</i>	Tall Thimbleweed	FACU	YES	NO	H	1	> 0 – 1%
<i>Arctium minus</i>	Common Burdock	FACU	NO	YES	H	2	> 1 – 5%
<i>Asclepias incarnata</i>	Swamp Milkweed	OBL	YES	NO	H	1	> 0 – 1%
<i>Bromus inermis</i>	Smooth Brome	UPL	NO	YES	H	3	> 5 – 25%
<i>Calystegia sepium</i>	Hedge Bindweed	FAC	YES	NO	H	2	> 1 – 5%
<i>Carex blanda</i>	Woodland Sedge	FAC	YES	NO	H	1	> 0 – 1%
<i>Carex lacustris</i>	Lake Sedge	OBL	YES	NO	H	1	> 0 – 1%
<i>Carex pensylvanica</i>	Penn Sedge	NI	YES	NO	H	1	> 0 – 1%
<i>Carex stipata</i>	Awl-fruited Sedge	OBL	YES	NO	H	2	> 1 – 5%
<i>Centaurea stoebe</i>	Spotted Knapweed	NI	NO	YES	H	1	> 0 – 1%
<i>Circaea lutetiana</i>	Enchanter's Nightshade	NI	YES	NO	H	2	> 1 – 5%
<i>Conyza canadensis</i>	Canadian Horseweed	NI	YES	NO	H	1	> 0 – 1%
<i>Eurybia macrophylla</i>	Large-leaved Aster	UPL	YES	NO	H	2	> 1 – 5%
<i>Hackelia virginiana</i>	Virginia Stickseed	FACU	YES	NO	H	2	> 1 – 5%
<i>Impatiens capensis</i>	Jewelweed	FACW	YES	NO	H	2	> 1 – 5%
<i>Linaria vulgaris</i>	Butter and Eggs	NI	NO	YES	H	2	> 1 – 5%
<i>Lythrum salicaria</i>	Purple Loosestrife	OBL	NO	YES	H	1	> 0 – 1%
<i>Maianthemum racemosum</i>	False Solomon's Seal	FACU	YES	NO	H	2	> 1 – 5%
<i>Phalaris arundinacea</i>	Reed Canary Grass	FACW	NO	YES	H	2	> 1 – 5%
<i>Phleum pratense</i>	Timothy	FACU	NO	NO	H	1	> 0 – 1%
<i>Pilea pumila</i>	Clearweed	FACW	YES	NO	H	2	> 1 – 5%
<i>Poa pratensis</i>	Kentucky Bluegrass	FACU	NO	YES	H	2	> 1 – 5%
<i>Polygonatum biflorum</i>	Smooth Solomon's Seal	FACU	YES	NO	H	2	> 1 – 5%
<i>Quercus macrocarpa</i>	Bur Oak	FACU	YES	NO	H	2	> 1 – 5%
<i>Quercus rubra</i>	Northern Red Oak	FACU	YES	NO	H	2	> 1 – 5%
<i>Solidago canadensis</i>	Canada Goldenrod	FACU	YES	NO	H	2	> 1 – 5%
<i>Toxicodendron rydbergii</i>	Western Poison Ivy	FAC	YES	NO	H	1	> 0 – 1%
<i>Cornus racemosa</i>	Grey Dogwood	FAC	YES	NO	S	3	> 5 – 25%
<i>Lonicera tatarica</i>	Tartarian Honeysuckle	FACU	NO	YES	S	3	> 5 – 25%
<i>Quercus macrocarpa</i>	Bur Oak	FACU	YES	NO	S	2	> 1 – 5%
<i>Ribes cynosbati</i>	Prickly Gooseberry	FACU	YES	NO	S	2	> 1 – 5%
<i>Rhamnus cathartica</i>	Common Buckthorn	FAC	NO	YES	S	3	> 5 – 25%
<i>Rubus idaeus</i>	Red Raspberry	FACW	YES	NO	S	2	> 1 – 5%
<i>Tilia americana</i>	American Basswood	FACU	YES	NO	T	2	> 1 – 5%
<i>Betula papyrifera</i>	Paper Birch	FACU	YES	NO	T	1	> 0 – 1%
<i>Celtis occidentalis</i>	Hackberry	FAC	YES	NO	T	1	> 0 – 1%
<i>Fraxinus pennsylvanica</i>	Green Ash	FACW	YES	NO	T	2	> 1 – 5%
<i>Juglans nigra</i>	Black Walnut	FACU	YES	NO	T	1	> 0 – 1%
<i>Ostrya virginiana</i>	Ironwood	FACU	YES	NO	T	1	> 0 – 1%
<i>Populus deltoides</i>	Eastern Cottonwood	FAC	YES	NO	T	2	> 1 – 5%
<i>Quercus rubra</i>	Northern Red Oak	FACU	YES	NO	T	2	> 1 – 5%
<i>Salix nigra</i>	Black Willow	OBL	YES	NO	T	1	> 0 – 1%
<i>Tilia americana</i>	American Basswood	FACU	YES	NO	T	3	> 5 – 25%
<i>Parthenocissus quinquefolia</i>	Virginia Creeper	FACU	YES	NO	V	3	> 5 – 25%
<i>Solanum dulcamara</i>	Bittersweet Nightshade	FAC	NO	NO	V	2	> 1 – 5%
<i>Vitis riparia</i>	Riverbank Grape	FAC	YES	NO	V	3	> 5 – 25%

Strata Key: V (Woody Vine), H (Herbaceous Layer), S (Saplings and Shrubs), T (Tree)

Figure 4. Charley Lake shore vegetation Relevé Area 3.0 survey data collection form.