



Environmental Design & Research,
Landscape Architecture, Engineering & Environmental Services, D.P.C.
217 Montgomery Street, Suite 1000, Syracuse, New York 13202
P. 315.471.0688 • F. 315.471.1061 • www.edrdpc.com

memorandum

To: Aron Branam, EDPR Renewables
Christi Calabrese, EDPR Renewables
Hayley Mallen, EDPR Renewables
EDR Project No: 15033

From: Sara Stebbins and Emma Freeland

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Reference: Jericho Rise Wind Farm Rare Plant Survey

Introduction

Section 2.3.1.4 of the Draft Environmental Impact Statement (DEIS) for the Jericho Rise Wind Farm (the Project) committed to completing a rare plant survey for the 32 state-listed and 9 rare but unprotected plant species known to occur in Franklin County. These species were identified based on 2007 New York Natural Heritage Program (NYNHP) data and were listed in Table 2.3-4 of the DEIS. To fulfil the commitment that this survey be completed before the release of the Project's Final Environmental Impact Statement (FEIS), Environmental Design & Research, Landscape Architecture, Engineering & Environmental Services, D.P.C. (EDR) botanists Sara Stebbins and Emma Freeland conducted a rare plant survey in the summer of 2015.

The Project site comprises the 5,895 acres of farmlands and forests where private landowners have agreed to participate and host turbines or other Project components. The Project will consist of up to 37 wind turbines, each with a nameplate capacity of 2.1 megawatts (MW), for a total anticipated nameplate generating capacity of 77.7 MW. However, to allow for flexibility on final site selection, the Applicant is also evaluating and seeking approval for six alternate turbine sites, so this survey addresses a total of 43 turbine sites. This Project also includes one permanent meteorological (met) tower, a system of gravel access roads, electrical collection lines, and a substation site.

The rare plant survey was conducted within or in close proximity to a predetermined buffer around each Project component (i.e., the anticipated limit of disturbance, hereafter referred to as the Survey Area). The Survey Area consists of a 100-foot corridor for proposed access roads, a 75-foot corridor for collection lines, a 250-foot radius around each turbine, and a 100-foot radius around the met tower. The Survey Area also included the proposed substation site and public road intersections identified for temporary expansion in order to accommodate the wide turning radii of turbine delivery vehicles during Project construction.

Methods

EDR began preparation for the survey by reviewing/updating the targeted species list, then researching each species to determine habitat requirements and appropriate survey periods (based on phenology). Site-specific correspondence with NYNHP indicated that there are no known rare or state-listed plant species within the Project site, nor are there any previously-documented significant natural communities. Similarly, site-specific consultation with the U.S. Fish and

Wildlife Service through the Information for Planning and Conservation database indicated that there are no federally-listed threatened, endangered, or candidate plant species within the Project site.

NYNHP updates their data periodically with regard to the distribution of plants, therefore the list of rare and state-listed plant species known to occur in Franklin County was updated using data sources including the NYNHP *New York Rare Plant Status List* (Young, 2010) and the *New York Flora Atlas* (Weldy et al., 2015). This review indicated that there are currently 36 state-listed and 10 rare but unprotected plant species in Franklin County; these 46 species comprise the target species for the rare plant survey. The state status, state rank, and habitat requirements for each of the 46 target species are summarized in Table 1.

Table 1. Rare Plant Species Documented in Franklin County

Scientific Name	Common Name	State Status	State Rank	Habitat
<i>Arethusa bulbosa</i>	dragon's mouth orchid	Threatened	S2	bogs, poor fens
<i>Betula pumila</i>	swamp birch	Threatened	S2	rich fens, acidic bogs
<i>Boechnera stricta</i>	rock cress	Threatened	S2	ledges, bluffs, and forests in dry to mesic soils over rock
<i>Calamagrostis pickeringii</i>	Pickering's reed bentgrass	Rare	S3	bogs, shorelines of rivers and ponds
<i>Calamagrostis stricta ssp. inexpansa</i>	New England northern reedgrass	Threatened	S2	fens, wet meadows, lake and river shores, alpine meadows, cliffs, krummolz
<i>Carex arcta</i>	northern clustered sedge	Endangered	S1	cool seasonally flooded floodplain forests
<i>Carex cryptolepsis</i>	northeastern sedge	Rare	S3	wet acidic soils, pond edges, peaty shores, open wet areas in forest clearings
<i>Carex haydenii</i>	cloud sedge	Endangered	S1	marshes, sedge meadows, stream sides, bogs, poor fens
<i>Carex houghtoniana</i>	Houghton's sedge	Threatened	S2	Lake Ontario dunes, gravel and sand pits, open habitats with dry sandy soils
<i>Carex merritt-fernaldii</i>	Fernald's sedge	Threatened	S2S3	open habitats with sandy or rocky acidic soils, gravel pits, sand mines, dry roadsides
<i>Carex oligosperma</i>	few-seeded sedge	Rare	S3	bogs, poor fens
<i>Carex wiegandii</i>	Wiegand's sedge	Endangered	S1	wet fields, wet pastures, marshes, swamps, edges of streams and ponds, wet ditches
<i>Ceratophyllum echinatum</i>	prickly hornwort	Rare	S3	ponds, lakes, slow-moving streams
<i>Cynoglossum virginianum var. boreale</i>	northern wild comfrey	Endangered	S1S2	upland woods, thickets, openings
<i>Cyperus echinatus</i>	globose flatsedge	Endangered	S1	open disturbed mesic sites, roadsides, serpentine grasslands, meadows, pastures
<i>Diphasiastrum sitchense</i>	Sitka clubmoss	Endangered	S1	alpine meadows, open rocky barrens, conifer woods
<i>Dracocephalum parviflorum</i>	American dragonhead	Endangered	S1	dry soil, sun to partial shade, fields, open woods, waste areas
<i>Dryopteris fragrans</i>	fragrant cliff fern	Endangered	S1	recesses in cool often north-facing cliffs and ledges of calcareous or serpentine rocks
<i>Eleocharis ovata</i>	ovate spikerush	Endangered	S1S2	shallow ponds in swamps, marshy areas on river islands, artificial ponds
<i>Eriophorum angustifolium</i>	narrow-leaved cottongrass	Endangered	SH	wet peatlands, bogs

Scientific Name	Common Name	State Status	State Rank	Habitat
<i>spp. angustifolium</i>				
<i>Hedeoma hispida</i>	mock-pennyroyal	Threatened	S2S3	open dry sites, rocky red cedar summits, alvar grasslands, talus slopes, mowed airports
<i>Hippuris vulgaris</i>	common mare's-tail	Endangered	S1	shallow waters and shorelines of ponds and slow-moving streams
<i>Huperzia selago</i>	fir clubmoss	Endangered	S1	anthropogenic, cliffs, balds, ledges, forests meadows, fields, shores of rivers or lakes
<i>Kalmia procumbens</i>	alpine azalea	Endangered	S1	alpine areas
<i>Lycopus rubellus</i>	stalked bugleweed	Endangered	S1	marshes, fens, swamps
<i>Myriophyllum farwellii</i>	Farwell's water-milfoil	Threatened	S2	acidic ponds, lakes, and shorelines
<i>Oclemena nemoralis</i>	bog aster	Rare	S3	acidic bogs
<i>Piptatherum canadense</i>	Canada ricegrass	Threatened	S2	openings in boreal forests, heath barrens, rocky summits, dry-mesic forests
<i>Podostemum ceratophyllum</i>	riverweed	Threatened	S2	cobblestone or bedrock substrates in fast-flowing streams or rivers, often in rapids
<i>Potamogeton alpinus</i>	northern pondweed	Threatened	S2	ponds, lakes, slow-moving streams
<i>Potamogeton diversifolius</i>	water-thread pondweed	Endangered	S1	pond margins, deep emergent marshes
<i>Pyrola asarifolia</i>	pink wintergreen	Threatened	S2	rich calcareous swamps and fens, cool wet-mesic to mesic hardwood and mixed forests and edges, and edges of streams in forests
<i>Rhododendron canadense</i>	rhodora	Threatened	S2	acidic wetlands, rocky summits and barrens, bogs, shrub swamps
<i>Rhynchospora fusca</i>	brown beak-rush	Rare	S3S4	edge of acid lakes
<i>Salix pyrifolia</i>	balsam willow	Rare	S3	acidic peatlands, wet thickets, wet utility corridors, clearings in wet forests
<i>Scheuchzeria palustris</i>	American scheuchzeria	Rare	S3	open, shrubby, or thinly forested acidic and patterned peatlands
<i>Schoenoplectus heterochaetus</i>	slender bulrush	Endangered	S1	emergent marshes along slow-moving creeks and rivers
<i>Solidago leiocarpa</i>	alpine goldenrod	Threatened	S2	alpine meadows
<i>Sparganium natans</i>	small bur-reed	Threatened	S2	still open waters of beaver ponds, fens, bogs, cedar swamps, shrub swamps
<i>Spinulum canadense</i>	northern bristly clubmoss	Endangered	S1S2	alpine and subalpine open habitats, rarely in cool peatlands in the northern part of the state
<i>Subularia aquatica</i> <i>var. americana</i>	American water awlwort	Endangered	S1S2	shallow lake waters with sandy substrates
<i>Symphyotrichum boreale</i>	boreal aster	Threatened	S2	calcareous fens, sedge meadows, coniferous swamps, shorelines of lakes and ponds
<i>Symphyotrichum ontarionis</i>	bottomland aster	Rare	S3	cool mesic to wet forests, swamps, thickets, forest openings, mostly calcareous soils
<i>Utricularia geminiscapa</i>	hiddenfruit bladderwort	Rare	S3	quiet waters of ponds, marshes, open swamps
<i>Vaccinium boreale</i>	high-mountain blueberry	Threatened	S2	alpine meadows, dwarf shrubby areas
<i>Viola nephrophylla</i>	northern bog violet	Endangered	S1	rich and marl fens, calcareous swamps, cracks in exposed bedrock

The habitats identified in Table 1 were then compared to the habitats documented within the Project site and Survey Area during previous field efforts by EDR ecologists and wetland scientists to delineate wetlands and map ecological communities. The Project site, as a whole, lacks suitable habitat for some species, most notably those requiring alpine habitats, such as *Kalmia procumbens* and *Solidago leiocarpa*. Other habitats, such as bogs, fens, or deep water rivers and lakes, may exist within the 5,985-acre Project site, but have been avoided during the iterative process of Project layout design. Therefore, habitat does not occur in the Survey Area for species such as *Arethusa bulbosa*, *Betula pumila*, *Carex oligosperma*, and *Podostemum ceratophyllum*.

To plan the timing of the survey, a matrix was prepared for the 29 species with potential habitat within the Survey Area. This matrix is presented below as Table 2. It should be noted that the assessment of potential habitat within the Survey Area was intentionally very conservative. For example, aquatic species that only occur in deep water habitats were excluded, but those that sometimes occur in the littoral zone were included. Based on this data, it was determined that the survey should be conducted during late July and/or early August.

Table 2. Survey Periods for Rare Plants with Habitat in the Survey Area

Species	Recommended Survey Period F=Flowers, R=Fruit, V=Vegetative								
	early May	late May	early June	late June	early July	late July	early Aug	late Aug	early Sept
<i>Boechera stricta</i> rock cress			R	R	R	R	R	R	
<i>Calamagrostis pickeringii</i> Pickering's reed bentgrass				R	R	R	R	R	
<i>Calamagrostis stricta</i> ssp. <i>inexpansa</i> New England northern reedgrass				R	R	R	R	R	R
<i>Carex arcta</i> northern clustered sedge				R	R	R	R	R	R
<i>Carex cryptolepis</i> northeastern sedge				R	R	R	R		
<i>Carex haydenii</i> cloud sedge				R	R	R	R		
<i>Carex houghtoniana</i> Houghton's sedge			R	R	R	R	R		
<i>Carex merritt-feraldii</i> Fernald's sedge				R	R	R	R		
<i>Carex wiegandii</i> Wiegand's sedge				R	R	R	R		
<i>Cynoglossum virginianum</i> var. <i>boreale</i> northern wild comfrey		F	F	F	R	R	R	R	R
<i>Cyperus echinatus</i> globose flatsedge						R	R	R	R

Species	Recommended Survey Period F=Flowers, R=Fruit, V=Vegetative								
	early May	late May	early June	late June	early July	late July	early Aug	late Aug	early Sept
<i>Diphasiastrum sitchense</i> Sitka clubmoss	V	V	V	V	V	V	V	V	V
<i>Dracocephalum parviflorum</i> American dragonhead				F	F	F	F	F	
<i>Eleocharis ovata</i> ovate spikerush					R	R	R	R	R
<i>Hedeoma hispida</i> mock-pennyroyal			F	F	F	F			
<i>Hippuris vulgaris</i> common mare's-tail					V	V	V	V	V
<i>Huperzia selago</i> fir clubmoss			V	V	V	V	V	V	
<i>Lycopus rubellus</i> stalked bugleweed					F	F	R	R	R
<i>Piptatherum canadense</i> Canada ricegrass				R	R	R			
<i>Potamogeton diversifolius</i> water-thread pondweed					V	V	V	V	V
<i>Pyrola asarifolia</i> pink wintergreen				F	F	F	F	F	
<i>Rhynchospora fusca</i> brown beak-rush						R	R	R	R
<i>Rhododendron canadense</i> rhodora		V	V	V	V	V	V	V	V
<i>Salix pyrifolia</i> balsam willow		V	V	V	V	V	V	V	V
<i>Schoenoplectus heterochaetus</i> slender bulrush			F	F	R	R	R	R	R
<i>Sparganium natans</i> small bur-reed						F	F	F	R
<i>Subularia aquatica var. americana</i> American water awlwort						F	F	F	F
<i>Symphyotrichum boreale</i> boreal aster					F	F	F	F	F
<i>Symphyotrichum ontarionis</i> bottomland aster							F	F	F

The rare plant survey was conducted over the course of seven field days from July 27-30 and August 10-12. The surveys were conducted on foot, using meandering routes to cover areas of potentially suitable habitat within the

Survey Area. Actively cultivated agricultural land (e.g., corn and hay fields) were not surveyed. However, pastureland was surveyed because it can potentially provide habitat for rare species such as *Cyperus echinatus* and *Carex wiegandii*.

Unknown plant species encountered during the surveys were keyed out using the *Manual of Vascular Plants of Northeastern United States and Adjacent Canada* (Gleason & Cronquist, 1991), the *Illustrated Companion to Gleason and Cronquist's Manual* (Holmgren, 1988), and the *Flora of North America North of Mexico* (Flora of North America Editorial Committee, 1993+).

Results

No state-listed or rare but unprotected plant species were observed during the field survey. A total of 350 species representing 83 plant families were documented within the Project site. A complete listing of this species is presented below in Table 3. Botanical nomenclature follows the *New York Flora Atlas* (Weldy et al., 2015).

Table 3. Plant Species Observed Within the Project Site

Family	Genus	species	common name
Aceraceae	<i>Acer</i>	<i>negundo</i>	box elder
Aceraceae	<i>Acer</i>	<i>rubrum</i>	red maple
Aceraceae	<i>Acer</i>	<i>spicatum</i>	mountain maple
Aceraceae	<i>Acer</i>	<i>pensylvanicum</i>	striped maple
Aceraceae	<i>Acer</i>	<i>saccharum</i>	sugar maple
Adoxaceae	<i>Sambucus</i>	<i>nigra</i>	common elderberry
Adoxaceae	<i>Sambucus</i>	<i>racemosa</i>	red elderberry
Adoxaceae	<i>Viburnum</i>	<i>nudum</i>	wild raisin
Adoxaceae	<i>Viburnum</i>	<i>lantanoides</i>	hobblebush
Adoxaceae	<i>Viburnum</i>	<i>lentago</i>	nannyberry
Adoxaceae	<i>Viburnum</i>	<i>opulus</i>	highbush cranberry
Alismataceae	<i>Alisma</i>	<i>triviale</i>	northern water-plantain
Alliaceae	<i>Allium</i>	<i>tricoccum</i>	small white leek
Anacardiaceae	<i>Rhus</i>	<i>typhina</i>	staghorn sumac
Anacardiaceae	<i>Toxicodendron</i>	<i>radicans</i>	poison ivy
Apiaceae	<i>Aegopodium</i>	<i>podagraria</i>	bishops goutweed
Apiaceae	<i>Cicuta</i>	<i>bulbifera</i>	water-hemlock
Apiaceae	<i>Conium</i>	<i>maculatum</i>	poison-hemlock
Apiaceae	<i>Daucus</i>	<i>carota</i>	Queen Anne's lace
Apiaceae	<i>Heracleum</i>	<i>maximum</i>	cow-parsnip
Apiaceae	<i>Osmorhiza</i>	<i>claytonii</i>	Clayton's sweetroot
Apiaceae	<i>Pastinaca</i>	<i>sativa</i>	wild parsnip

Family	Genus	species	common name
Apocynaceae	<i>Apocynum</i>	<i>androsaemifolium</i>	spreading dogbane
Apocynaceae	<i>Apocynum</i>	<i>cannabinum</i>	Indian hemp
Apocynaceae	<i>Asclepias</i>	<i>syriaca</i>	common milkweed
Apocynaceae	<i>Vinca</i>	<i>minor</i>	periwinkle
Aquifoliaceae	<i>Nemopanthus</i>	<i>mucronatus</i>	mountain holly
Araceae	<i>Arisaema</i>	<i>triphillum</i>	jack-in-the-pulpit
Araliaceae	<i>Aralia</i>	<i>nudicaulis</i>	wild sarsaparilla
Araliaceae	<i>Hydrocotyle</i>	<i>americana</i>	American water-pennywort
Araliaceae	<i>Panax</i>	<i>trifolius</i>	dwarf ginseng
Aristolochiaceae	<i>Asarum</i>	<i>canadense</i>	wild ginger
Asparagaceae	<i>Asparagus</i>	<i>officinalis</i>	asparagus
Asteraceae	<i>Achillea</i>	<i>millefolium</i>	common yarrow
Asteraceae	<i>Ambrosia</i>	<i>artemesiifolia</i>	ragweed
Asteraceae	<i>Anaphalis</i>	<i>margaritacea</i>	pearly everlasting
Asteraceae	<i>Antennaria</i>	<i>howellii</i>	Howell's pussytoes
Asteraceae	<i>Arctium</i>	<i>lappa</i>	greater burdock
Asteraceae	<i>Arctium</i>	<i>minus</i>	common burdock
Asteraceae	<i>Bidens</i>	<i>cernua</i>	nodding beggar-tick
Asteraceae	<i>Centaurea</i>	<i>jacea</i>	brown knapweed
Asteraceae	<i>Centaurea</i>	<i>stoebe</i>	spotted knapweed
Asteraceae	<i>Cichorium</i>	<i>intybus</i>	chicory
Asteraceae	<i>Cirsium</i>	<i>arvense</i>	Canada thistle
Asteraceae	<i>Cirsium</i>	<i>vulgare</i>	bull thistle
Asteraceae	<i>Conyza</i>	<i>canadensis</i>	horseweed
Asteraceae	<i>Crepis</i>	<i>tectorum</i>	narrow-leaved hawk's-beard
Asteraceae	<i>Doellingeria</i>	<i>umbellata</i>	flat-topped aster
Asteraceae	<i>Erechtites</i>	<i>hieraciifolius</i>	pilewort
Asteraceae	<i>Erigeron</i>	<i>annuus</i>	daisy fleabane
Asteraceae	<i>Erigeron</i>	<i>philadelphicus</i>	Philadelphia fleabane
Asteraceae	<i>Erigeron</i>	<i>strigosus</i>	prairie fleabane
Asteraceae	<i>Eupatorium</i>	<i>perfoliatum</i>	common boneset
Asteraceae	<i>Euthamia</i>	<i>graminifolia</i>	flat-topped goldenrod
Asteraceae	<i>Eutrochium</i>	<i>maculatum</i>	joe-pye weed
Asteraceae	<i>Galinsoga</i>	<i>quadriradiata</i>	quickweed
Asteraceae	<i>Gnaphalium</i>	<i>uliginosum</i>	low cudweed

Family	Genus	species	common name
Asteraceae	<i>Hieracium</i>	<i>scabrum</i>	rough hawkweed
Asteraceae	<i>Inula</i>	<i>helenium</i>	elecampane
Asteraceae	<i>Lactuca</i>	<i>canadenis</i>	Canada lettuce
Asteraceae	<i>Lactuca</i>	<i>serriola</i>	prickly lettuce
Asteraceae	<i>Leontodon</i>	<i>autumnalis</i>	autumn hawkbit
Asteraceae	<i>Leucanthemum</i>	<i>vulgare</i>	ox-eye daisy
Asteraceae	<i>Matricaria</i>	<i>chamomilla</i>	wild chamomile
Asteraceae	<i>Matricaria</i>	<i>discoidea</i>	pineapple-weed
Asteraceae	<i>Oclemena</i>	<i>acuminata</i>	whorled aster
Asteraceae	<i>Pilosella</i>	<i>aurantiaca</i>	orange hawkweed
Asteraceae	<i>Prenanthes</i>	<i>alba</i>	white rattlesnakeroot
Asteraceae	<i>Pseudognaphalium</i>	<i>macounii</i>	Macoun's cudweed
Asteraceae	<i>Rudbeckia</i>	<i>hirta</i>	black-eyed Susan
Asteraceae	<i>Solidago</i>	<i>flexicaulis</i>	zigzag goldenrod
Asteraceae	<i>Sonchus</i>	<i>arvensis</i>	field sowthistle
Asteraceae	<i>Symphyotrichum</i>	<i>cordifolium</i>	heart-leaved aster
Asteraceae	<i>Symphyotrichum</i>	<i>lanceolatum</i>	white panicle aster
Asteraceae	<i>Symphyotrichum</i>	<i>puniceum</i>	purplestem aster
Asteraceae	<i>Taraxacum</i>	<i>officinale</i>	common dandelion
Asteraceae	<i>Tragopogon</i>	<i>pratensis</i>	meadow goat's-beard
Asteraceae	<i>Tussilago</i>	<i>farfara</i>	colt's foot
Balsaminaceae	<i>Impatiens</i>	<i>capensis</i>	spotted jewelweed
Berberidaceae	<i>Caulophyllum</i>	<i>thalictroides</i>	blue cohosh
Betulaceae	<i>Alnus</i>	<i>incana</i>	speckled alder
Betulaceae	<i>Betula</i>	<i>papyrifera</i>	paper birch
Betulaceae	<i>Betula</i>	<i>alleghaniensis</i>	yellow birch
Betulaceae	<i>Betula</i>	<i>populifolia</i>	gray birch
Betulaceae	<i>Corylus</i>	<i>cornuta</i>	beaked hazelnut
Betulaceae	<i>Ostrya</i>	<i>virginiana</i>	eastern hophornbeam
Boraginaceae	<i>Hydrophyllum</i>	<i>virginianum</i>	Virginia waterleaf
Boraginaceae	<i>Myosotis</i>	<i>scorpioides</i>	true forget-me-not
Brassicaceae	<i>Alliaria</i>	<i>petiolata</i>	garlic mustard
Brassicaceae	<i>Berteroa</i>	<i>incana</i>	hoary alyssum
Brassicaceae	<i>Brassica</i>	<i>rapa</i>	field mustard
Brassicaceae	<i>Capsella</i>	<i>bursa-pastoris</i>	shepherd's purse

Family	Genus	species	common name
Brassicaceae	<i>Cardamine</i>	<i>diphylla</i>	two-leaved toothwort
Brassicaceae	<i>Cardamine</i>	<i>pennsylvanica</i>	Pennsylvanica bittercress
Brassicaceae	<i>Lepidium</i>	<i>virginicum</i>	wild peppergrass
Brassicaceae	<i>Raphanus</i>	<i>raphanistrum</i>	wild radish
Brassicaceae	<i>Rorippa</i>	<i>palustris</i>	common yellow-cress
Brassicaceae	<i>Sisymbrium</i>	<i>officinale</i>	hairy-podded hedgemustard
Brassicaceae	<i>Thlaspi</i>	<i>arvense</i>	field penny-cress
Campanulaceae	<i>Campanula</i>	<i>rapunculooides</i>	creeping bellflower
Campanulaceae	<i>Lobelia</i>	<i>inflata</i>	Indian-tobacco
Cannabaceae	<i>Humulus</i>	<i>lupulus</i>	hops
Caprifoliaceae	<i>Lonicera</i>	<i>morrowii</i>	Morrow honeysuckle
Caryophyllaceae	<i>Cerastium</i>	<i>fontanum</i>	mouse-ear chickweed
Caryophyllaceae	<i>Dianthus</i>	<i>armeria</i>	Deptford pink
Caryophyllaceae	<i>Silene</i>	<i>latifolia</i>	white campion
Caryophyllaceae	<i>Silene</i>	<i>vulgaris</i>	bladder campion
Caryophyllaceae	<i>Spergula</i>	<i>arvensis</i>	corn spurrey
Caryophyllaceae	<i>Stellaria</i>	<i>graminea</i>	lesser stitchwort
Chenopodiaceae	<i>Chenopodium</i>	<i>album</i>	lambs-quarters
Convolvulaceae	<i>Calystegia</i>	<i>sepium</i>	hedge false bindweed
Cornaceae	<i>Cornus</i>	<i>canadensis</i>	bunchberry
Cornaceae	<i>Cornus</i>	<i>alternifolia</i>	alternate-leaved dogwood
Cornaceae	<i>Cornus</i>	<i>amomum</i>	silky dogwood
Cornaceae	<i>Cornus</i>	<i>sericea</i>	red osier dogwood
Crassulaceae	<i>Hylotelephium</i>	<i>telephium</i>	live-forever
Cucurbitaceae	<i>Echinocystis</i>	<i>lobata</i>	wild cucumber
Cupressaceae	<i>Juniperus</i>	<i>communis</i>	dwarf juniper
Cupressaceae	<i>Thuja</i>	<i>occidentalis</i>	northern white cedar
Cyperaceae	<i>Carex</i>	<i>arctata</i>	drooping woodland sedge
Cyperaceae	<i>Carex</i>	<i>crinita</i>	fringed sedge
Cyperaceae	<i>Carex</i>	<i>intumescens</i>	bladder sedge
Cyperaceae	<i>Carex</i>	<i>lurida</i>	shallow sedge
Cyperaceae	<i>Carex</i>	<i>pennsylvanica</i>	Pennsylvania sedge
Cyperaceae	<i>Carex</i>	<i>plantaginea</i>	plantain-leaved sedge
Cyperaceae	<i>Carex</i>	<i>scoparia</i>	broom sedge
Cyperaceae	<i>Carex</i>	<i>stipata</i>	owlfruit sedge

Family	Genus	species	common name
Cyperaceae	<i>Carex</i>	<i>stricta</i>	tussock sedge
Cyperaceae	<i>Carex</i>	<i>vulpinoidea</i>	fox sedge
Cyperaceae	<i>Scirpus</i>	<i>cyperinus</i>	woolgrass
Cyperaceae	<i>Scirpus</i>	<i>atrovirens</i>	green bulrush
Dennstaedtiaceae	<i>Dennstaedtia</i>	<i>punctilobula</i>	eastern hay-scented fern
Dennstaedtiaceae	<i>Pteridium</i>	<i>aquilinum</i>	bracken fern
Diervillaceae	<i>Diervilla</i>	<i>lonicera</i>	bush-honeysuckle
Dryopteridaceae	<i>Dryopteris</i>	<i>carthusiana</i>	spinulose woodfern
Dryopteridaceae	<i>Dryopteris</i>	<i>cristata</i>	crested shieldfern
Dryopteridaceae	<i>Dryopteris</i>	<i>intermedia</i>	evergreen woodfern
Dryopteridaceae	<i>Polystichum</i>	<i>acrostichoides</i>	Christmas fern
Equisetaceae	<i>Equisetum</i>	<i>arvense</i>	field horsetail
Equisetaceae	<i>Equisetum</i>	<i>hyemale</i>	scouring rush
Equisetaceae	<i>Equisetum</i>	<i>sylvaticum</i>	woodland horsetail
Ericaceae	<i>Monotropa</i>	<i>hypopithys</i>	pinemap
Ericaceae	<i>Monotropa</i>	<i>uniflora</i>	Indian pipes
Ericaceae	<i>Pyrola</i>	<i>elliptica</i>	shinleaf
Ericaceae	<i>Vaccinium</i>	<i>angustifolium</i>	lowbush blueberry
Ericaceae	<i>Vaccinium</i>	<i>myrtilloides</i>	velvetleaf blueberry
Fabaceae	<i>Lotus</i>	<i>corniculatus</i>	bird's foot trefoil
Fabaceae	<i>Medicago</i>	<i>lupulina</i>	black medick
Fabaceae	<i>Medicago</i>	<i>sativa</i>	alfafa
Fabaceae	<i>Mellilotus</i>	<i>albus</i>	white sweet clover
Fabaceae	<i>Trifolium</i>	<i>arvense</i>	rabbit-foot clover
Fabaceae	<i>Trifolium</i>	<i>campestre</i>	low hop-clover
Fabaceae	<i>Trifolium</i>	<i>hybridum</i>	alsike clover
Fabaceae	<i>Trifolium</i>	<i>pratense</i>	red clover
Fabaceae	<i>Trifolium</i>	<i>repens</i>	white clover
Fabaceae	<i>Vicia</i>	<i>cracca</i>	cow vetch
Fagaceae	<i>Fagus</i>	<i>grandifolia</i>	American beech
Grossulariaceae	<i>Ribes</i>	<i>cynosbati</i>	prickly gooseberry
Grossulariaceae	<i>Ribes</i>	<i>glandulosum</i>	skunk currant
Hypericaceae	<i>Hypericum</i>	<i>ellipticum</i>	pale St. John's-wort
Hypericaceae	<i>Hypericum</i>	<i>mutilum</i>	dwarf St. John's-wort
Hypericaceae	<i>Hypericum</i>	<i>perforatum</i>	common St. John's-wort

Family	Genus	species	common name
Hypericaceae	<i>Hypericum</i>	<i>punctatum</i>	spotted St.John's-wort
Iridaceae	<i>Iris</i>	<i>versicolor</i>	blueflag
Iridaceae	<i>Sisyrinchium</i>	<i>montanum</i>	strict blue-eyed-grass
Iridaceae	<i>Sisyrinchium</i>	<i>atlanticum</i>	eastern blue-eyed grass
Juglandaceae	<i>Carya</i>	<i>ovata</i>	shagbark hickory
Juncaceae	<i>Juncus</i>	<i>articulatus</i>	jointed rush
Juncaceae	<i>Juncus</i>	<i>bufonius</i>	toad rush
Juncaceae	<i>Juncus</i>	<i>effusus</i>	soft rush
Juncaceae	<i>Juncus</i>	<i>tenuis</i>	path rush
Lamiaceae	<i>Clinopodium</i>	<i>vulgare</i>	field basil
Lamiaceae	<i>Galeopsis</i>	<i>tetrahit</i>	hemp nettle
Lamiaceae	<i>Glechoma</i>	<i>hederacea</i>	ground ivy
Lamiaceae	<i>Leonurus</i>	<i>cardiaca</i>	motherwort
Lamiaceae	<i>Lycopus</i>	<i>americanus</i>	American bugleweed
Lamiaceae	<i>Lycopus</i>	<i>uniflorus</i>	northern bugleweed
Lamiaceae	<i>Mentha</i>	<i>arvensis</i>	wild mint
Lamiaceae	<i>Monarda</i>	<i>didyma</i>	Oswego tea
Lamiaceae	<i>Monarda</i>	<i>media</i>	purple bergamot
Lamiaceae	<i>Prunella</i>	<i>vulgaris</i>	self-heal
Lamiaceae	<i>Scutellaria</i>	<i>galericulata</i>	hooded skullcap
Lamiaceae	<i>Scutellaria</i>	<i>lateriflora</i>	mad-dog skullcap
Lamiaceae	<i>Thymus</i>	<i>pulgioides</i>	lemon thyme
Liliaceae	<i>Clintonia</i>	<i>borealis</i>	blue bead-lily
Liliaceae	<i>Erythronium</i>	<i>americanum</i>	trout lily
Liliaceae	<i>Medeola</i>	<i>virginiana</i>	Indian cucumber-root
Lycopodiaceae	<i>Dendrolycopodium</i>	<i>dendroideum</i>	treelike clubmoss
Lycopodiaceae	<i>Dendrolycopodium</i>	<i>obscurum</i>	flat-branched tree clubmoss
Lycopodiaceae	<i>Diphasiastrum</i>	<i>digitatum</i>	fan clubmoss
Lycopodiaceae	<i>Lycopodium</i>	<i>clavatum</i>	running clubmoss
Lycopodiaceae	<i>Spinulum</i>	<i>annotinum</i>	stiff clubmoss
Lythraceae	<i>Lythrum</i>	<i>salicaria</i>	purple loosestrife
Malvaceae	<i>Malva</i>	<i>moschata</i>	musk mallow
Malvaceae	<i>Malva</i>	<i>neglecta</i>	common mallow
Melanthiaceae	<i>Trillium</i>	<i>undulatum</i>	painted trillium
Melanthiaceae	<i>Trillium</i>	<i>erectum</i>	red trillium

Family	Genus	species	common name
Melanthiaceae	<i>Veratrum</i>	<i>viride</i>	American false-hellebore
Nyctaginaceae	<i>Mirabilis</i>	<i>nyctaginea</i>	wild four-o'clock
Oleaceae	<i>Fraxinus</i>	<i>pennsylvanica</i>	green ash
Oleaceae	<i>Fraxinus</i>	<i>americana</i>	white ash
Onagraceae	<i>Chamerion</i>	<i>angustifolium</i>	fireweed
Onagraceae	<i>Circaea</i>	<i>alpina</i>	small enchanter's nightshade
Onagraceae	<i>Circaea</i>	<i>lutetiana</i>	enchanter's nightshade
Onagraceae	<i>Epilobium</i>	<i>ciliatum</i>	hairy willow-herb
Onagraceae	<i>Epilobium</i>	<i>hirsutum</i>	codlins and cream
Onagraceae	<i>Epilobium</i>	<i>leptophyllum</i>	linear-leaved willow-herb
Onagraceae	<i>Oenothera</i>	<i>biennis</i>	evening primrose
Onagraceae	<i>Oenothera</i>	<i>perennis</i>	sundrops
Onocleaceae	<i>Matteuccia</i>	<i>struthiopteris</i>	ostrich fern
Onocleaceae	<i>Onoclea</i>	<i>sensibilis</i>	sensitive fern
Ophioglossaceae	<i>Botrychium</i>	<i>dissectum</i>	cutleaf grapefern
Orchidaceae	<i>Corallorhiza</i>	<i>trifida</i>	early coralroot
Orchidaceae	<i>Cypripedium</i>	<i>acaule</i>	pink lady's-slipper
Orchidaceae	<i>Epipactis</i>	<i>helleborine</i>	weed orchid
Orchidaceae	<i>Platanthera</i>	<i>clavellata</i>	small green woodland orchid
Orchidaceae	<i>Platanthera</i>	<i>psycodes</i>	lesser purple fringed orchid
Orobanchaceae	<i>Epifagus</i>	<i>virginiana</i>	beechdrops
Orobanchaceae	<i>Euphrasia</i>	<i>stricta</i>	drug eyebright
Orobanchaceae	<i>Rhinanthus</i>	<i>minor</i>	yellow rattle
Osmundaceae	<i>Osmunda</i>	<i>cinnamomea</i>	cinnamon fern
Osmundaceae	<i>Osmunda</i>	<i>claytoniana</i>	interrupted fern
Osmundaceae	<i>Osmunda</i>	<i>regalis</i>	royal fern
Oxalidaceae	<i>Oxalis</i>	<i>montana</i>	white wood sorrel
Oxalidaceae	<i>Oxalis</i>	<i>stricta</i>	upright yellow wood sorrel
Papaveraceae	<i>Dicentra</i>	<i>canadensis</i>	squirrel-corn
Phrymaceae	<i>Mimulus</i>	<i>ringens</i>	monkey flower
Pinaceae	<i>Abies</i>	<i>balsamea</i>	balsam fir
Pinaceae	<i>Picea</i>	<i>glauca</i>	white spruce
Pinaceae	<i>Picea</i>	<i>pungens</i>	blue spruce
Pinaceae	<i>Picea</i>	<i>rubens</i>	red spruce
Pinaceae	<i>Pinus</i>	<i>sylvestris</i>	Scotch pine

Family	Genus	species	common name
Pinaceae	<i>Pinus</i>	<i>resinosa</i>	red pine
Pinaceae	<i>Pinus</i>	<i>strobus</i>	eastern white pine
Pinaceae	<i>Tsuga</i>	<i>canadensis</i>	eastern hemlock
Plantaginaceae	<i>Chelone</i>	<i>glabra</i>	white turtlehead
Plantaginaceae	<i>Linaria</i>	<i>vulgaris</i>	butter-and-eggs
Plantaginaceae	<i>Plantago</i>	<i>lanceolata</i>	narrow-leaved plantain
Plantaginaceae	<i>Plantago</i>	<i>major</i>	nipple-seeded plantain
Plantaginaceae	<i>Veronica</i>	<i>americana</i>	American speedwell
Plantaginaceae	<i>Veronica</i>	<i>officinalis</i>	common speedwell
Plantaginaceae	<i>Veronica</i>	<i>scutellata</i>	marsh speedwell
Plantaginaceae	<i>Veronica</i>	<i>serpyllifolia</i>	brightblue speedwell
Poaceae	<i>Anthoxanthum</i>	<i>odoratum</i>	sweet vernal grass
Poaceae	<i>Brachyelytrum</i>	<i>aristosum</i>	northern shorthusk
Poaceae	<i>Bromus</i>	<i>inermis</i>	smooth brome
Poaceae	<i>Cinna</i>	<i>arundinacea</i>	sweet woodreed
Poaceae	<i>Dactylis</i>	<i>glomerata</i>	orchard grass
Poaceae	<i>Danthonia</i>	<i>compressa</i>	flattened oatgrass
Poaceae	<i>Dichanthelium</i>	<i>acuminatum</i>	hairy rosette-panicgrass
Poaceae	<i>Digitaria</i>	<i>ischaemum</i>	smooth crabgrass
Poaceae	<i>Echinochloa</i>	sp.	barnyard grass
Poaceae	<i>Elymus</i>	<i>repens</i>	quackgrass
Poaceae	<i>Glyceria</i>	<i>canadensis</i>	Canada manna grass
Poaceae	<i>Glyceria</i>	<i>grandis</i>	American manna grass
Poaceae	<i>Glyceria</i>	<i>melicaria</i>	slender manna grass
Poaceae	<i>Leersia</i>	<i>oryzoides</i>	rice cutgrass
Poaceae	<i>Phalaris</i>	<i>arundinacea</i>	reed canary grass
Poaceae	<i>Phleum</i>	<i>pratense</i>	timothy
Poaceae	<i>Phragmites</i>	<i>australis</i>	common reed
Poaceae	<i>Poa</i>	<i>annua</i>	annual bluegrass
Poaceae	<i>Poa</i>	<i>pratensis</i>	Kentucky bluegrass
Poaceae	<i>Setaria</i>	<i>viridis</i>	green bristle grass
Polygonaceae	<i>Fallopia</i>	<i>cilinodis</i>	fringed black bindweed
Polygonaceae	<i>Fallopia</i>	<i>convolvulus</i>	black bindweed
Polygonaceae	<i>Persicaria</i>	<i>hydropiper</i>	water pepper
Polygonaceae	<i>Persicaria</i>	<i>maculosa</i>	spotted lady's-thumb

Family	Genus	species	common name
Polygonaceae	<i>Persicaria</i>	<i>sagittata</i>	arrow-leaf tearthumb
Polygonaceae	<i>Reynoutria</i>	<i>japonica</i>	Japanese knotweed
Polygonaceae	<i>Rumex</i>	<i>acetosella</i>	sheep sorrel
Polygonaceae	<i>Rumex</i>	<i>crispus</i>	curly dock
Polygonaceae	<i>Rumex</i>	<i>obtusifolius</i>	bitter dock
Polypodiaceae	<i>Polypodium</i>	<i>virginianum</i>	rock polypody
Portulacaceae	<i>Claytonia</i>	<i>caroliniana</i>	Carolina spring-beauty
Primulaceae	<i>Lysimachia</i>	<i>ciliata</i>	fringed loosestrife
Primulaceae	<i>Lysimachia</i>	<i>nummularia</i>	creeping Jennie
Primulaceae	<i>Lysimachia</i>	<i>terrestris</i>	swamp candles
Primulaceae	<i>Trientalis</i>	<i>borealis</i>	northern starflower
Ranunculaceae	<i>Actaea</i>	<i>pachypoda</i>	white baneberry
Ranunculaceae	<i>Actaea</i>	<i>rubra</i>	red baneberry
Ranunculaceae	<i>Anemone</i>	<i>acutiloba</i>	sharp-lobed hepatica
Ranunculaceae	<i>Caltha</i>	<i>palustris</i>	marsh marigold
Ranunculaceae	<i>Clematis</i>	<i>virginiana</i>	virgin's bower
Ranunculaceae	<i>Coptis</i>	<i>trifolia</i>	goldthread
Ranunculaceae	<i>Ranunculus</i>	<i>acris</i>	tall buttercup
Ranunculaceae	<i>Ranunculus</i>	<i>hispidus</i>	bristly buttercup
Ranunculaceae	<i>Ranunculus</i>	<i>longirostris</i>	eastern white water-crowfoot
Ranunculaceae	<i>Ranunculus</i>	<i>pensylvanicus</i>	bristly crowfoot
Ranunculaceae	<i>Ranunculus</i>	<i>repens</i>	creeping buttercup
Rhamnaceae	<i>Rhamnus</i>	<i>cathartica</i>	buckthorn
Rosaceae	<i>Agrimonia</i>	<i>gryposepala</i>	tall agrimony
Rosaceae	<i>Amelanchier</i>	<i>sp.</i>	serviceberry
Rosaceae	<i>Aronia</i>	<i>melanocarpa</i>	black chokeberry
Rosaceae	<i>Crataegus</i>	<i>sp.</i>	hawthorn
Rosaceae	<i>Dalibarda</i>	<i>repens</i>	dewdrop
Rosaceae	<i>Fragaria</i>	<i>vesca</i>	woodland strawberry
Rosaceae	<i>Fragaria</i>	<i>virginiana</i>	wild strawberry
Rosaceae	<i>Geum</i>	<i>canadense</i>	white avens
Rosaceae	<i>Geum</i>	<i>rivale</i>	purple avens
Rosaceae	<i>Malus</i>	<i>pumila</i>	apple
Rosaceae	<i>Potentilla</i>	<i>argentea</i>	silvery cinquefoil
Rosaceae	<i>Potentilla</i>	<i>norvegica</i>	Norwegian cinquefoil

Family	Genus	species	common name
Rosaceae	<i>Potentilla</i>	<i>recta</i>	sulphur cinquefoil
Rosaceae	<i>Potentilla</i>	<i>simplex</i>	old field cinquefoil
Rosaceae	<i>Prunus</i>	<i>pensylvanica</i>	pin cherry
Rosaceae	<i>Prunus</i>	<i>serotina</i>	wild black cherry
Rosaceae	<i>Prunus</i>	<i>virginiana</i>	choke cherry
Rosaceae	<i>Rubus</i>	<i>allegheniensis</i>	Allegheny blackberry
Rosaceae	<i>Rubus</i>	<i>flagellaris</i>	northern dewberry
Rosaceae	<i>Rubus</i>	<i>hispidus</i>	bristly dewberry
Rosaceae	<i>Rubus</i>	<i>idaeus</i>	red raspberry
Rosaceae	<i>Rubus</i>	<i>occidentalis</i>	black raspberry
Rosaceae	<i>Rubus</i>	<i>pubescens</i>	dwarf red blackberry
Rosaceae	<i>Sorbus</i>	<i>americana</i>	American mountain-ash
Rosaceae	<i>Spiraea</i>	<i>alba</i>	northern meadow-sweet
Rosaceae	<i>Spiraea</i>	<i>tomentosa</i>	steeplebush
Rubiaceae	<i>Galium</i>	<i>asprellum</i>	rough bedstraw
Rubiaceae	<i>Galium</i>	<i>mollugo</i>	wild madder
Rubiaceae	<i>Galium</i>	<i>palustre</i>	marsh bedstraw
Rubiaceae	<i>Galium</i>	<i>trifidum</i>	small bedstraw
Rubiaceae	<i>Galium</i>	<i>triflorum</i>	fragrant bedstraw
Rubiaceae	<i>Mitchella</i>	<i>repens</i>	partridgeberry
Ruscaceae	<i>Maianthemum</i>	<i>canadense</i>	Canada mayflower
Ruscaceae	<i>Maianthemum</i>	<i>racemosum</i>	false Solomon's-seal
Ruscaceae	<i>Polygonatum</i>	<i>pubescens</i>	downy Solomon's-seal
Salicaceae	<i>Populus</i>	<i>deltoides</i>	eastern cottonwood
Salicaceae	<i>Populus</i>	<i>grandidentata</i>	bigtooth aspen
Salicaceae	<i>Populus</i>	<i>tremuloides</i>	quaking aspen
Saxifragaceae	<i>Chrysosplenium</i>	<i>americanum</i>	American golden-saxifrage
Saxifragaceae	<i>Tiarella</i>	<i>cordifolia</i>	heart-leaved foam flower
Scrophulariaceae	<i>Verbascum</i>	<i>thapsus</i>	common mullein
Solanaceae	<i>Solanum</i>	<i>dulcamara</i>	deadly nightshade
Thelypteridaceae	<i>Phegopteris</i>	<i>connectilis</i>	northern beech fern
Thelypteridaceae	<i>Thelypteris</i>	<i>noveboracensis</i>	New York fern
Thelypteridaceae	<i>Thelypteris</i>	<i>palustris</i>	marsh fern
Tiliaceae	<i>Tilia</i>	<i>americana</i>	American basswood
Typhaceae	<i>Typha</i>	<i>angustifolia</i>	narrowleaf cattail

Family	Genus	species	common name
Typhaceae	<i>Typha</i>	<i>latifolia</i>	broadleaf cattail
Ulmaceae	<i>Ulmus</i>	<i>americana</i>	American elm
Urticaceae	<i>Laportea</i>	<i>canadensis</i>	wood nettle
Urticaceae	<i>Pilea</i>	<i>pumila</i>	clearweed
Urticaceae	<i>Urtica</i>	<i>dioica</i>	stinging nettle
Verbenaceae	<i>Verbena</i>	<i>hastata</i>	blue vervain
Violaceae	<i>Viola</i>	<i>rotundifolia</i>	roundleaf violet
Violaceae	<i>Viola</i>	<i>canadensis</i>	Canada violet
Violaceae	<i>Viola</i>	<i>sororia</i>	common violet
Vitaceae	<i>Parthenocissus</i>	<i>quinquefolia</i>	Virginia creeper
Vitaceae	<i>Vitis</i>	<i>riparia</i>	riverbank grape
Woodsiaceae	<i>Athyrium</i>	<i>filix-femina</i>	lady fern
Woodsiaceae	<i>Gymnocarpium</i>	<i>dryopteris</i>	oak fern

Conclusion

As indicated above, no endangered, threatened, or rare plant species were observed in the Survey Area during a comprehensive survey of suitable habitat within the disturbance footprint of the Project. Therefore, the Project is not expected to adversely impact any state or federally-listed or rare plant species.

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