



NISWANDER ENVIRONMENTAL, LLC
Finding Solutions in a Complex World

APPENDIX C

HARDING PROPERTY

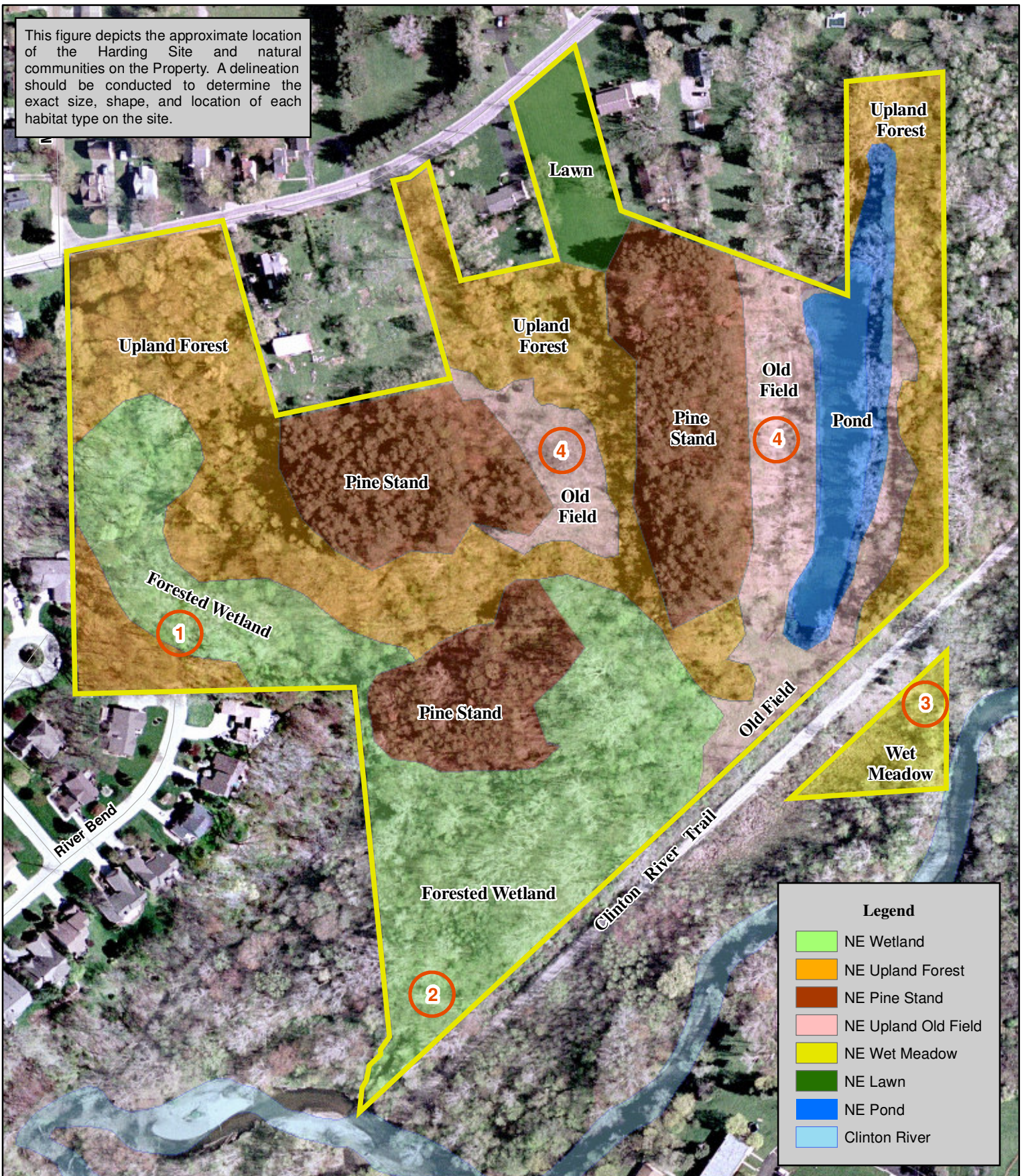


Figure 5. Natural Features Map - Harding Site

NE 1210 Rochester Hills Greenspace Inventory
 26.81-acre Harding Property
 Section 15 of Rochester Hills, Oakland, Co., MI
 Source: MiGDL, City of Rochester Hills GIS Dept.
 Habitat Assessment: May 6, May 19, and June 16, 2010
 Map Created: June 21, 2010



NE 1210 Rochester Hills Greenspace Assessment and FQA

Site: Harding

Habitat Type: Overall

Sampling Date: May 6, 2010 May 19, 2010 June 16, 2010

Total Species - 170

Mean C Value - 2.76

FQI Score - 35.99

Native - 128 (75%)

Adventive - 42 (25%)

Habitat
W = wetland
UF = upland forest
PS = pine stand
OF = upland old field
WM = wet meadow

Species	Common Name	C Value	Wetness (status)	Habitat
<i>Acer rubrum</i>	red maple	1	0 (FAC)	W, UF
<i>Acer negundo</i>	box elder	0	-2 (FACW-)	W, UF
<i>Acer saccharinum</i>	silver maple	2	-3 (FACW)	W, UF, WM
<i>Acer saccharum</i>	sugar maple	5	3 (FACU)	UF
<i>Achillea millefolium</i>	yarrow	1	3 (FACU)	OF
<i>Agrimonia parviflora</i>	swamp agrimony	4	-1 (FAC+)	W, WM
<i>Agrostis perennans</i>	bent grass	5	1 (FAC-)	OF
<i>Alliaria petiolata</i>	garlic mustard	*	0 (FAC)	W, UF, PS, OF
<i>Ambrosia trifida</i>	giant ragweed	0	-1 (FAC+)	UF, OF
<i>Andropogon gerardii</i>	big bluestem	5	1 (FAC-)	OF
<i>Anemone canadensis</i>	Canada anemone	4	-3 (FACW)	WM
<i>Anemone quinquefolia</i>	wood anemone	5	0 (FAC)	UF
<i>Angelica atropurpurea</i>	angelica	6	-5 (OBL)	OF, WM
<i>Apocynum cannabinum</i>	Indian hemp	3	0 (FAC)	W, OF, WM
<i>Arisaema triphyllum</i>	jack-in-the-pulpit	5	-2 (FACW-)	W
<i>Asclepias syriaca</i>	common milkweed	1	5 (UPL)	OF
<i>Asclepias tuberosa</i>	butterfly weed	5	5 (UPL)	OF
<i>Asplenium platyneuron</i>	ebony spleenwort	2	3 (FACU)	UF
<i>Aster lanceolatus</i>	Eastern lined aster	2	-3 (FACW)	W
<i>Aster puniceus</i>	swamp aster	5	-5 (OBL)	W, WM
<i>Barbarea vulgaris</i>	winter cress	*	0 (FAC)	W, UF, OF
<i>Berberis thunbergii</i>	barberry	*	4 (FACU-)	UF
<i>Bromus ciliatus</i>	fringed brome	6	-3 (FACW)	OF, W
<i>Carex bebbi</i>	Bebb's oval sedge	4	-5 (OBL)	WM
<i>Carex cristatella</i>	crested oval sedge	3	-4 (FACW+)	WM
<i>Carex lacustris</i>	lakebank sedge	6	-5 (OBL)	W, WM
<i>Carex hystericina</i>	porcupine sedge	2	-5 (OBL)	W, WM
<i>Carex pellita</i>	broad leaf wooly sedge	2	-5 (OBL)	WM
<i>Carex pennsylvanica</i>	Pennsylvania sedge	4	5 (UPL)	UF
<i>Carex scoparia</i>	oval sedge	4	-3 (FACW)	W, WM
<i>Carex stricta</i>	tussock sedge	4	-5 (OBL)	WM
<i>Carex tetanica</i>	water sedge	9	-5 (OBL)	WM
<i>Carex utriculata</i>	beaked sedge	5	-5 (OBL)	WM
<i>Carex vulpinoidea</i>	fox sedge	1	-5 (OBL)	W, WM
<i>Carya glabra</i>	pignut hickory	5	3 (FACU)	UF
<i>Carya ovata</i>	shagbark hickory	5	3 (FACU)	UF
<i>Celastrus orbiculatus</i>	Oriental bittersweet	*	5 (UPL)	UF
<i>Centaurea maculosa</i>	spotted knapweed	*	5 (UPL)	OF
<i>Chelidonium majus</i>	celandine	*	5 (UPL)	UF
<i>Chrysanthemum leucanthemum</i>	ox-eye daisy	*	5 (UPL)	OF, WM

NE 1210 Rochester Hills Greenspace Assessment and FQA

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Habitat

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Species	Common Name	C Value	Wetness (status)	Habitat
<i>Cicuta maculata</i>	water hemlock	4	-5 (OBL)	W, WM
<i>Cinna arundinacea</i>	wood reedgrass	7	-3 (FACW)	WM
<i>Cirsium arvense</i>	Canada thistle	*	3 (FACU)	UF, OF
<i>Convallaria majalis</i>	lily-of-the-valley	*	5 (UPL)	UF
<i>Cornus amomum</i>	silky dogwood	2	-4 (FACW+)	W, UF, WM
<i>Cornus florida</i>	flowering dogwood	8	4 (FACU-)	UF
<i>Cornus foemina</i>	gray dogwood	1	-2 (FACW-)	W, UF
<i>Cornus stolonifera</i>	red-osier dogwood	2	-3 (FACW)	W, WM
<i>Coronilla varia</i>	crown vetch	*	5 (UPL)	OF
<i>Crataegus crus-galli</i>	cockspur thorn	5	0 (FAC)	UF
<i>Cypripedium calceolus</i>	small yellow lady's slipper	7	-1 (FAC+)	WM
<i>Dactylis glomerata</i>	orchard grass	*	3 (FACU)	OF
<i>Daucus carota</i>	Queen Anne's lace	*	5 (UPL)	UF, OF, PS
<i>Dioscorea villosa</i>	wild yam	4	1 (FAC-)	UF
<i>Elaeagnus umbellata</i>	autumn olive	*	3 (FACU)	UF, OF, WM
<i>Eleocharis obtusa</i>	spikerush	3	-5 (OBL)	W
<i>Elymus riparius</i>	riverbank wild rye	8	-3 (FACW)	W
<i>Equisetum fluviatile</i>	water horsetail	7	-5 (OBL)	W
<i>Equisetum hyemale</i>	common scouring rush	2	-2 (FACW-)	UF, OF
<i>Erigeron annuus</i>	daisy fleabane	0	1 (FAC-)	UF, OF
<i>Erythronium americanum</i>	trout lily	5	5 (UPL)	UF
<i>Euonymus alata</i>	winged wahoo	*	5 (UPL)	UF
<i>Eupatorium maculatum</i>	joe-pye weed	4	-5 (OBL)	WM
<i>Festuca arundinacea</i>	tall fescue	*	3 (FACU)	OF
<i>Fragaria virginiana</i>	wild strawberry	2	1 (FAC-)	UF, OF
<i>Fraxinus americana</i>	white ash	6	3 (FACU)	UF
<i>Fraxinus pennsylvanica</i>	green ash	2	-3 (FACW)	W, UF, OF
<i>Galium aparine</i>	annual bedstraw	0	3 (FACU)	UF
<i>Galium asprellum</i>	rough bedstraw	5	-5 (OBL)	W, UF
<i>Geranium maculatum</i>	wild geranium	4	3 (FACU)	UF, PS
<i>Geum aleppicum</i>	yellow avens	3	-1 (FAC+)	W, UF
<i>Geum canadense</i>	white avens	1	0 (FAC)	W, UF
<i>Glechoma hederacea</i>	ground ivy	*	3 (FACU)	UF
<i>Glyceria striata</i>	fowl manna grass	4	-5 (OBL)	W
<i>Hamamelis virginiana</i>	witch hazel	5	3 (FACU)	UF
<i>Hesperis matronalis</i>	dame's rocket	*	5 (UPL)	UF
<i>Impatiens capensis</i>	jewelweed	2	-3 (FACW)	W
<i>Iris versicolor</i>	blue flag iris	5	-5 (OBL)	W, WM
<i>Juglans nigra</i>	black walnut	5	3 (FACU)	UF
<i>Juncus effusus</i>	soft rush	3	-5 (OBL)	W
<i>Juncus tenuis</i>	path rush	1	0 (FAC)	W, WM
<i>Juniperus communis</i>	ground juniper	4	3 (FACU)	OF
<i>Juniperus virginiana</i>	red cedar	3	3 (FACU)	UF, OF
<i>Leonurus cardiaca</i>	motherwort	*	5 (UPL)	UF, OF
<i>Ligustrum vulgare</i>	common privet	*	1 (FAC-)	UF
<i>Lonicera tatarica</i>	tartarian honeysuckle	*	3 (FACU)	W, UF, OF, PS

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<i>Ludwigia alternifolia</i>	seedbox	8	-5 (OBL)	WM
<i>Lycopus americanus</i>	common water horehound	2	-5 (OBL)	WM
<i>Lysimachia nummularia</i>	moneywort	*	-4 (FACW+)	W, WM
<i>Lythrum salicaria</i>	purple loosestrife	*	-5 (OBL)	WM
<i>Malus coronaria</i>	american crabapple	4	5 (UPL)	UF
<i>Melilotus officinalis</i>	yellow sweet clover	*	3 (FACU)	OF
<i>Myosotis scorpioides</i>	forget-me-not	*	-5 (OBL)	WM
<i>Nepta cataria</i>	catnip	*	1 (FAC-)	UF
<i>Onoclea sensibilis</i>	sensitive fern	2	-3 (FACW)	W
<i>Ostrya virginiana</i>	hop hornbeam	5	4 (FACU-)	UF
<i>Oxalis stricta</i>	yellow wood sorrel	0	3 (FACU)	UF
<i>Panicum capillare</i>	witchgrass	1	0 (FAC)	OF
<i>Panicum virgatum</i>	switchgrass	4	-1 (FAC+)	OF
<i>Parthenocissus quinquefolia</i>	Virginia creeper	5	1 (FAC-)	W, UF, OF
<i>Phalaris arundinacea</i>	reed canary grass	0	-4 (FACW+)	W, WM
<i>Phleum pratense</i>	timothy	*	3 (FACU)	OF
<i>Phragmites australis</i>	common reed	*	-4 (FACW+)	W
<i>Physocarpus opulifolius</i>	ninebark	4	-2 (FACW-)	WM
<i>Phytolacca americana</i>	pokeweed	2	1 (FAC-)	UF
<i>Picea pungens</i>	blue spruce	*	5 (UPL)	UF
<i>Pinus sylvestris</i>	scotch pine	*	5 (UPL)	UF, PS, WM
<i>Plantago lanceolata</i>	English plantain	*	0 (FAC)	OF
<i>Poa pratensis</i>	Kentucky bluegrass	*	-1 (FAC+)	OF
<i>Podophyllum peltatum</i>	may apple	3	3 (FACU)	UF
<i>Polygonatum biflorum</i>	solomon's-seal	4	3 (FACU)	UF
<i>Polygonum virginianum</i>	Virginia knotweed	4	0 (FAC)	UF
<i>Populus deltoides</i>	Eastern cottonwood	1	-1 (FAC+)	UF
<i>Potentilla recta</i>	rough-fruited cinquefoil	*	5 (UPL)	UF, OF
<i>Prunus serotina</i>	black cherry	2	3 (FACU)	UF
<i>Pycnanthemum virginianum</i>	common mountain mint	5	-4 (FACW+)	W, WM
<i>Quercus alba</i>	white oak	5	3 (FACU)	UF, OF, PS
<i>Quercus bicolor</i>	swamp white oak	8	-4 (FACW+)	W
<i>Quercus rubra</i>	red oak	5	3 (FACU)	UF, OF, PS
<i>Quercus velutina</i>	black oak	6	5 (UPL)	UF, OF, PS
<i>Ranunculus abortivus</i>	small flowered buttercup	0	-2 (FACW-)	W, WM
<i>Ranunculus hispidus</i>	swamp buttercup	5	0 (FAC)	WM
<i>Rhamnus cathartica</i>	common buckthorn	*	3 (FACU)	UF, OF, PS
<i>Rhamnus frangula</i>	glossy buckthorn	*	-1 (FAC+)	W, UF
<i>Rhus typhina</i>	staghorn sumac	2	5 (UPL)	UF
<i>Rosa carolina</i>	pasture rose	4	4 (FACU-)	OF
<i>Rosa palustris</i>	swamp rose	5	-5 (OBL)	WM
<i>Rubus allegheniensis</i>	common blackberry	1	2 (FACU+)	UF
<i>Rubus flagellaris</i>	northern dewberry	1	-2 (FACW-)	W
<i>Rubus occidentalis</i>	black raspberry	1	5 (UPL)	UF, OF
<i>Rudbeckia hirta</i>	black-eyed susan	1	3 (FACU)	OF, WM
<i>Salix exigua</i>	sandbar willow	1	-5 (OBL)	W, WM

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<i>Salix nigra</i>	black willow	5	-5 (OBL)	W, WM
<i>Sanguinaria canadensis</i>	bloodroot	5	4 (FACU-)	UF
<i>Scirpus acutus</i>	hardstem bulrush	5	-5 (OBL)	WM
<i>Scirpus atrovirens</i>	green bulrush	3	-5 (OBL)	WM
<i>Scirpus cyperinus</i>	woolgrass	5	-5 (OBL)	W, WM
<i>Scirpus pendulus</i>	drooping bulrush	3	-5 (OBL)	WM
<i>Silene vulgaris</i>	bladder campion	*	5 (UPL)	OF
<i>Sisyrinchium montanum</i>	mountain blue-eyed grass	4	-1 (FAC+)	WM
<i>Sium suave</i>	water parsnip	5	-5 (OBL)	W
<i>Smilacina stellata</i>	starry false solomon's-seal	5	1 (FAC-)	UF
<i>Solanum dulcamara</i>	bittersweet nightshade	*	0 (FAC)	UF
<i>Solidago gigantea</i>	late goldenrod	3	-2 (FACW-)	W, OF
<i>Solidago rugosa</i>	rough goldenrod	3	-1 (FAC+)	UF, OF
<i>Symplocarpus foetidus</i>	skunk cabbage	6	-5 (OBL)	W
<i>Syringa vulgaris</i>	common lilac	*	5 (UPL)	UF, OF
<i>Taraxacum officinale</i>	dandelion	*	3 (FACU)	UF, OF, PS
<i>Thalictrum dioicum</i>	early meadow rue	6	2 (FACU+)	UF
<i>Thaspium trifoliatum</i>	meadow parsnip	8	2 (FACU+)	OF, WM
<i>Thelypteris palustris</i>	marsh fern	2	-4 (FACW+)	W
<i>Tilia americana</i>	basswood	5	3 (FACU)	W, UF
<i>Toxicodendron radicans</i>	poison ivy	2	-1 (FAC+)	W, UF, OF, PS
<i>Tragopogon pratensis</i>	yellow goat's beard	*	5 (UPL)	OF
<i>Trifolium pratense</i>	red clover	*	2 (FACU+)	OF, WM
<i>Trifolium repens</i>	white clover	*	2 (FACU+)	UF, OF
<i>Trillium grandiflorum</i>	common trillium	5	5 (UPL)	UF
<i>Typha latifolia</i>	cattail	1	-5 (OBL)	W, WM
<i>Ulmus americana</i>	American elm	1	-2 (FACW-)	W, UF
<i>Ulmus rubra</i>	slippery elm	2	0 (FAC)	W, UF
<i>Urtica dioica</i>	stinging nettle	1	-1 (FAC+)	W
<i>Verbascum thapsus</i>	common mullein	*	5 (UPL)	OF
<i>Verbena hastata</i>	vervain	4	-4 (FACW+)	W, WM
<i>Veronica scutellata</i>	marsh speedwell	6	-5 (OBL)	WM
<i>Viburnum lentago</i>	nannyberry	4	-1 (FAC+)	W
<i>Viburnum opulus americanum</i>	highbush cranberry	5	-3 (FACW)	W, WM
<i>Viola palmata</i>	wood violet	5	5 (UPL)	UF
<i>Vitis aestivalis</i>	summer grape	6	3 (FACU)	UF
<i>Vitis riparia</i>	riverbank grape	3	-2 (FACW-)	W
<i>Zizia aurea</i>	golden Alexanders	6	-1 (FAC+)	WM

Photographic Log



Photo 1

The Clinton River Trail constitutes the southern boundary of the Harding Property, and separates the main parcel from a small, high quality wet meadow.

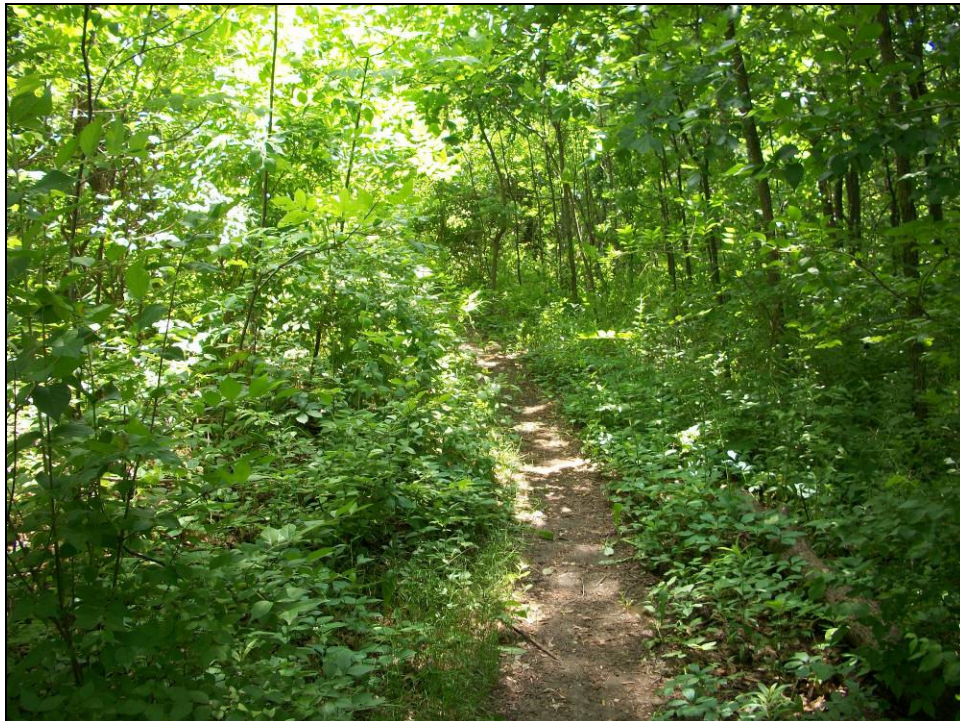


Photo 2

Trails are common throughout much of the Harding site.

Photographic Log



Photo 3

Upland hardwood portions of the forest are very diverse and offer a variety of densities and age classes.



Photo 4

Upland forest.

Photographic Log



Photo 5

Less mature portions of the upland forest tend to contain more herbaceous vegetation, including garlic mustard.



Photo 6

Upland hardwood forest.

Photographic Log



Photo 7

Non-native vegetation such as tartarian honeysuckle and Oriental bittersweet is common throughout upland portions of the Harding Property.



Photo 8

Spring wildflowers such as mayapple (above) are also common throughout the forested portions of the site.

Photographic Log



Photo 9

Forested wetland habitat in the western portion of the Harding site.



Photo 10

Areas of bare soils within forested wetland indicate long durations of standing water in the spring.

Photographic Log



Photo 11

Forested floodplain wetland in the southwestern portion of the site.



Photo 12

Forested floodplain wetland.

Photographic Log



Photo 13

Small openings within the forested wetland allow a variety of sedges, rushes, and other herbaceous wetland species to flourish.



Photo 14

Old field habitat is present within the Harding Property.

Photographic Log



Photo 15

Successional old field offers habitat for a variety of wildlife.



Photo 16

A variety of prairie species, including butterfly weed, milkweed, and pasture rose (above) are common within old field portions of the site.

Photographic Log



Photo 17

A shallow pond offers habitat for fish, frogs, and a variety of aquatic insects.



Photo 18

Trees and shrubs buffer the pond.

Photographic Log



Photo 19

A small, high quality wet meadow is located south of the Clinton River Trail. This area exhibits characteristics commonly associated with fen communities, which are locally rare.



Photo 20

Wet meadow communities are typically dominated by wetland grasses and sedges.

Photographic Log



Photo 21

High quality wetland species, including blue flag iris (above), are abundant within the on-site wet meadow.



Photo 22

small lady's slipper orchid



Photo 23

mountain blue-eyed grass