



**Restoration Plan**

Powell #3 Site

Richmond Township, McHenry County,  
IL

Stantec Project #:193707428

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### 1.0 INTRODUCTION AND PURPOSE

Stantec Consulting Services Inc. (Stantec) prepared this Restoration Plan (the “Plan”) for initial ecological management of the 22-acre Powell #3 woodlot property located in Richmond Township, McHenry County, Illinois (the “Site”; Figure 1, Appendix A). Openlands is the Site owner but will eventually transfer the Site to the U.S. Fish and Wildlife Service for addition to Hackmatack National Wildlife Refuge. This Plan includes basic Site background information, restoration goals and objectives, and proposed management activities including removal of undesirable woody plant species, enhancement of native vegetative, and stewardship.

### 2.0 SITE ASSESSMENT

Prior to acquisition by Openlands, the Site was selectively logged to harvest mature Oak trees. Stantec conducted a Site review on January 21, 2020 to perform an existing conditions assessment focused on identification and mapping of:

- Notable desirable native trees, such as any remaining mature Oaks and Hickories and indicators of regeneration (seedlings and saplings);
- Other indicators of natural quality, such as native shrubs and representative Oak ecosystem groundlayer plants;
- Major natural community divisions;
- Notable undesirable woody species; and
- Approximate wetland boundaries and drainageways.

The Site now contains an assemblage of hardwood trees and heavy brushy undergrowth. Scattered Bur Oak (*Quercus macrocarpa*), Pin Oak (*Q. palustris*) and Red Oak (*Q. rubra*) are present in low densities, mainly concentrated along the northeastern and northwestern edges of the Site. Other tree species favoring more mesic conditions such as black cherry (*Prunus serotina*), Elm (*Ulmus americana*), and Black Walnut (*Juglans nigra*) are abundant. One small grove of Poplar (*Populus sp.*) was located within the interior portion of the Site. The shrub layer is largely dominated by small size class (1-3” DBH) Common Buckthorn (*Rhamnus cathartica*). A few native shrubs were scattered throughout the Site including Hawthorn (*Crataegus spp.*), Dogwoods (*Cornus spp.*), Gooseberry (*Ribes missouriensis*), and Elderberry (*Sambucus canadensis*). While the Site assessment was conducted during the dormant season, native species that are representative of Oak ecosystems were not observed. Additional scouting efforts should be conducted during the 2020 growing season to further evaluate Site conditions.

#### 2.1 SOILS

The Site is comprised of five (5) mapped series based on review of the Natural Resources Conservation Services (NRCS) Web Soil Survey (Soil Survey Staff, 2020), as follows:

- Fox silt loam: Soils in the Fox series are well-drained and formed on 2-6% slopes in thin loess and in loamy alluvium or just in loamy alluvium overlying stratified calcareous sandy outwash on

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stream terraces, kames, outwash plains, and moraines. These soils comprise the majority of the Site and occur under degraded woodland. Associated native vegetation is mesic mixed hardwood forest.

- Virgil silt loam: Soils in the Virgil series are somewhat poorly drained and formed on 0-2% slopes in loess or other silty material and in the underlying loamy outwash or sandy loam till on outwash plains, stream terraces, or till plains. These soils are restricted to the north edge of the Site. Associated native vegetation is prairie grasses and widely spaced trees.
- Pella silty clay loam: Soils in the Pella series are poorly drained formed on 0-2% slopes in silty clay loam (glacial drift) over loamy. These soils are restricted to the west edge of the Site. Native vegetation is marsh grasses and sedges.
- Millbrook silt loam: Soils in the Millbrook series are somewhat poorly drained and formed on 0-2% slopes in silt loam (loess) overlying stratified loamy sand to clay loam outwash on stream terraces and outwash plains. These soils are restricted to the north edge of the Site. Associated native vegetation is prairie grass and widely spaced trees.
- Harpster silt clay loam: Soils in the Harpster series are poorly drained and formed on 0-2% slopes in calcareous loess or glacial drift on outwash plains, till plains, glacial lake plains, or stream terraces. These soils are restricted to the north edge of the Site. Associated native vegetation is wetland grasses, rushes, and sedges.

Overall, the soils are supportive of mesic to dry-mesic Oak ecosystems with scattered areas of wetland.

## 2.2 DRAINAGE

The Site lies in the Nippersink Creek watershed. The Site generally slopes from a high point of about 870 feet mean sea level (msl) in the southwest and west portion towards the 860-foot contour along the eastern edge of the Site. One small wetland swale drains north to south through the central portion of the Site.

## 3.0 GOALS AND OBJECTIVES

The primary goal of the project is to reduce undesirable woody plant species and enhance native vegetative to create a more stable ecological condition with plant community structure and composition that is more representative of Oak ecosystems than the present condition.

## 4.0 RESTORATION IMPLEMENTATION

Results from the assessment were used to guide development of feasible restoration goals and objectives and an implementation plan, including proposed restoration units, clearing methods, ingress/egress, and specifications. The primary phase of restoration will focus on the removal of undesirable woody species and will be followed by native seeding and stewardship.

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### **4.1 WOODY PLANT REMOVAL**

Two methods are proposed for management of undesirable woody species, as discussed below.

#### **4.1.1 Forestry Shredding**

A skid steer with a forestry mowing attachment should be utilized to remove invasive brush and small undesirable trees throughout the Site. This should be completed during the dormant season to minimize ground disturbance.

#### **4.1.2 Selective Canopy Thinning**

Following forestry shredding, canopy thinning should focus on removal of shade tolerant native trees and non-native trees throughout the Site. Target species for protection and removal are provide in Appendix B.

### **4.2 RE-SPROUT TREATMENTS**

Two (2) targeted herbicide applications to woody re-sprouts should be conducted during the first growing season following woody removal. Application should be timed to enhance effectiveness and minimize off-target impacts and is recommended to occur when re-sprouts reach a height of 6 to 24 inches. Re-sprouts should be treated with appropriate herbicides (triclopyr and/or glyphosate, depending on target species) at appropriate rates. Appropriate surfactants and additives should be chosen based on Site conditions.

### **4.3 HERBACEOUS INVASIVE SPECIES CONTROL**

Herbaceous invasive species should be managed throughout the Site during the initial restoration phases of the Project, and during subsequent Site stewardship. Table 1 specifies initial target species for treatment, methods, and broad timelines for implementation. Final treatment methodologies and timing may vary according to Site conditions. Ongoing monitoring and adaptive management protocols may reveal the need for additional treatment methods, application timing, and target species.

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**Table 1.** Summary of Treatment Protocols for Known Herbaceous Invasive Species

Target Species	Common Name	Treatment Method(s)	Treatment Timing
<i>Alliaria petiolata</i>	Garlic Mustard	Hand pull	March-May
		Spot herbicide	March-May
		Spot herbicide (first-year rosettes)	September-October
<i>Cirsium spp.</i>	Exotic Thistles	Spot herbicide	May-July
		Spot herbicide (first-year rosettes)	August-September
		Hand cut	July-October
<i>Phalaris arundinacea</i>	Reed Canary Grass	Spot herbicide	April-May; August
		Hand cut (remove flowers)	May-June

### 4.4 PRESCRIBED BURNING

Following the initial phases of restoration including tree and shrub removal, prescription burning will play an important role in stimulating native species and controlling invasive shrubs. The first prescribed burns should be conducted one year after woody plant removal and prior to native plant installations. Once implemented it is recommended that prescribed burning be conducted at annual to biennial intervals for the first five (5) years.

### 4.5 NATIVE PLANT INSTALLATION

Hand broadcasting of native seed should be the primary means of enhance native vegetation throughout the Site.

#### 4.5.1 Woodlands

The woodland seed mix should consist of native graminoids and a few readily established forbs selected for the Site based anticipated sun exposure and soils. The primary goal of the initial seeding will be to provide fuel for subsequent prescribed burns. Seed should be installed during the dormant season, preferably after a burn to thin the thatch and leaf litter. Container-grown trees and shrubs may be considered for enhancement following clearing and re-sprout control.

#### 4.5.2 Wetland

The wetland should be evaluated following clearing to assess native seedbank response. A native seed mix, if needed, may be developed at that time.

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### 5.0 RESTORATION PHASING AND COMPLETION DATES

Management units were prioritized to provide options for the initial restoration, subject to available resources (Figure 2, Appendix A). Highest priority units are associated with presence of Oak canopy. The overall 5-year schedule is proposed below in Table 2.

**Table 2.** Proposed Restoration Implementation Schedule

Restoration Task	Management Zone	Target Completion Date*
Tree and Shrub Removal	All Units	March 2020
Re-Sprout Treatments	All Units	September 2020
Herbaceous Invasive Species Control	All Units	September 2020
Prescribed Burning (Seedbed Preparation)	All Units	March 2021
Native Plant Installation	All Units	March 2021
Prescribed Burning (Site Maintenance)	All Units	April 2025

\* Target completions dates are subject to change based on available resources and appropriate weather conditions.

### 6.0 MONITORING AND REPORTING

The Site should be monitored on an annual basis (May-June timeframe) during the restoration implementation process. Monitoring should include invasive species assessments, meander surveys, and site photographs to inform and guide adaptive management activities. The results of monitoring activities should be summarized in an annual field report.

### 7.0 REFERENCES

Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. Web Soil Survey. Available online at the following link: <https://websoilsurvey.sc.egov.usda.gov/>. Accessed February 6, 2020.

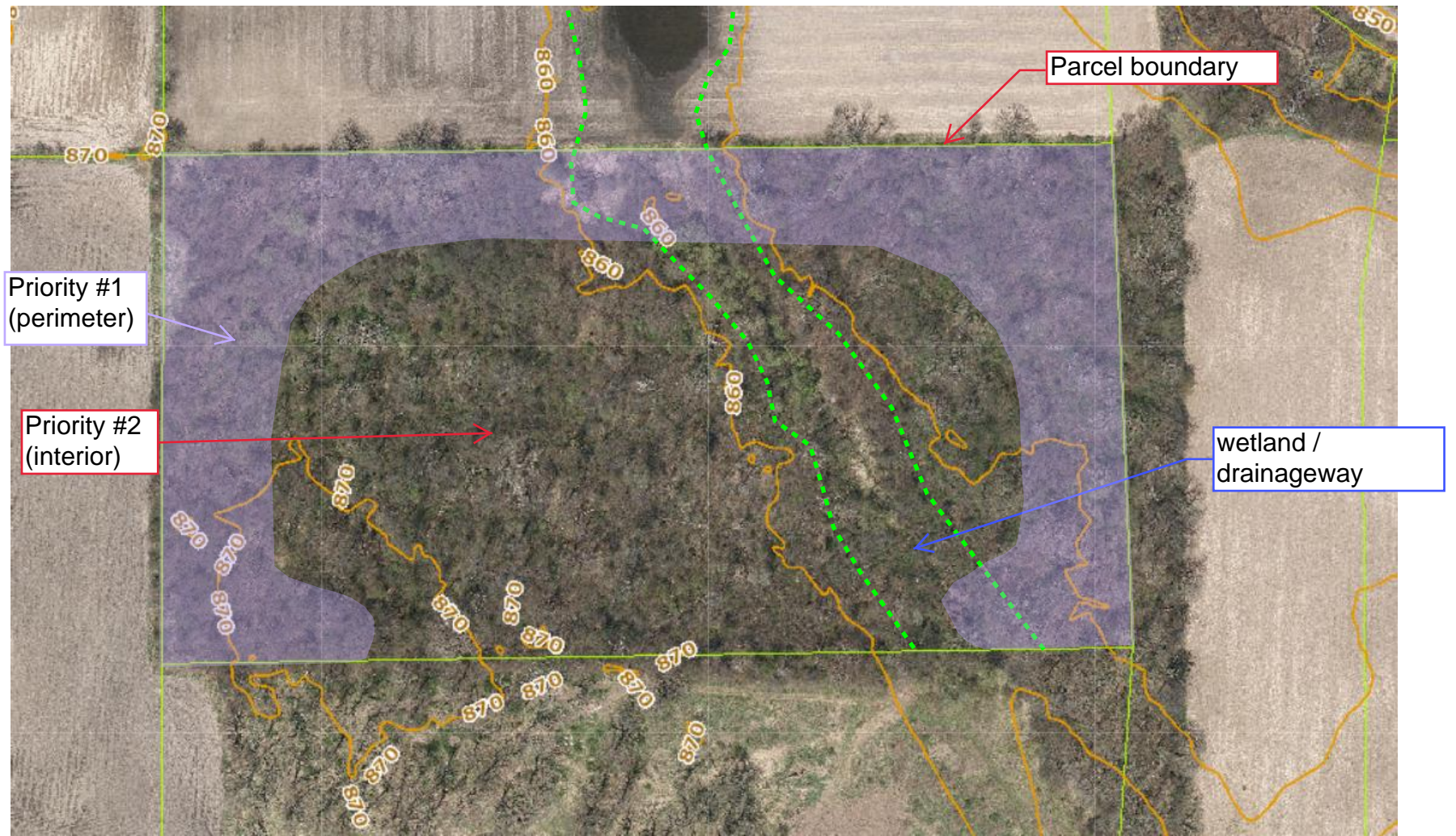
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### Appendix A      **FIGURES**



Site map: Powell #3



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**Appendix B      SELECTIVE CLEARING SPECIFICATIONS**

**Oak Woodland Brush Clearing and Selective Canopy Thinning Specs:**

Botanical Name	Common Name	Size Class (DBH)	Removal Goal
<b>Acer negundo</b>	box elder	All size classes	100% removal
<b>Acer saccharinum</b>	silver maple	All size classes	100% removal
<b>Acer saccharum</b>	sugar maple	<10"	75% removal
<b>Berberis thubergii</b>	Japanese barberry	All size classes	100% removal
<b>Carya cordiformis</b>	bitternut hickory	All size classes	No removal
<b>Carya ovata</b>	shagbark hickory	All size classes	No removal
<b>Celtis occidentalis</b>	hackberry	<8"	25% removal
<b>Cornus alternifolia</b>	pagoda dogwood	All size classes	No removal
<b>Coronus racemosa</b>	gray dogwood	All size classes	50% removal
<b>Cornus serica</b>	silky dogwood	All size classes	No removal
<b>Cratageous spp.</b>	Hawthorns	All size classes	Limited removal
<b>Euonymus alatus</b>	winged euonymus	All size classes	100% removal
<b>Fraxinus pennsylvanica subintegerima</b>	green ash	<4"	100% removal
<b>Juglans nigra</b>	black walnut	<8"	25% removal
		>8"	Limited removal
<b>Lonicera spp. (non-native)</b>	Honeysuckle	All size classes	100% removal
<b>Malus spp. (non-native)</b>	crabapple	All size classes	100% removal
<b>Populus alba</b>	White poplar	All size classes	100% removal
<b>Populus deltoides</b>	cottonwood	<12"	75% removal
		>12"	50% removal
<b>Prunus serotina</b>	black cherry	<12"	50% removal
		>12"	Limited removal
<b>Prunus virginiana</b>	Chokecherry	All size classes	25% removal
<b>Pyrus calleryana</b>	Callery Pear	All size classes	100% removal
<b>Quercus alba</b>	white oak	All size classes	No removal
<b>Quercus macrocarpa</b>	bur oak	All size classes	No removal
<b>Quercus palustris</b>	pin oak	All size classes	Limited removal
<b>Quercus rubra</b>	red oak	All size classes	No removal
<b>Rhanums cathartica</b>	common buckthorn	All size classes	100% removal
<b>Ribes missouriense</b>	Gooseberry	All size classes	No removal
<b>Robinia psuedoacacia</b>	black locust	All size classes	100% removal
<b>Rosa multiflora</b>	multiflora rose	All size classes	100% removal
<b>Sambucus canadensis</b>	elderberry	All size classes	Limited removal
<b>Ulmus americana</b>	american elm	<8"	25 % removal
		<8''''	Limited removal
<b>Ulmus pumila</b>	siberian elm	All size classes	100% removal
<b>Viburnum dentatum</b>	arrow Wood	All size classes	100% removal
<b>Viburnum lentago</b>	nannyberry	All size classes	No removal

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<b>Viburnum opulus</b>	european highbush cranberry	All size classes	100% removal
<b>Viburnum prunifolium</b>	black haw	All size classes	No removal