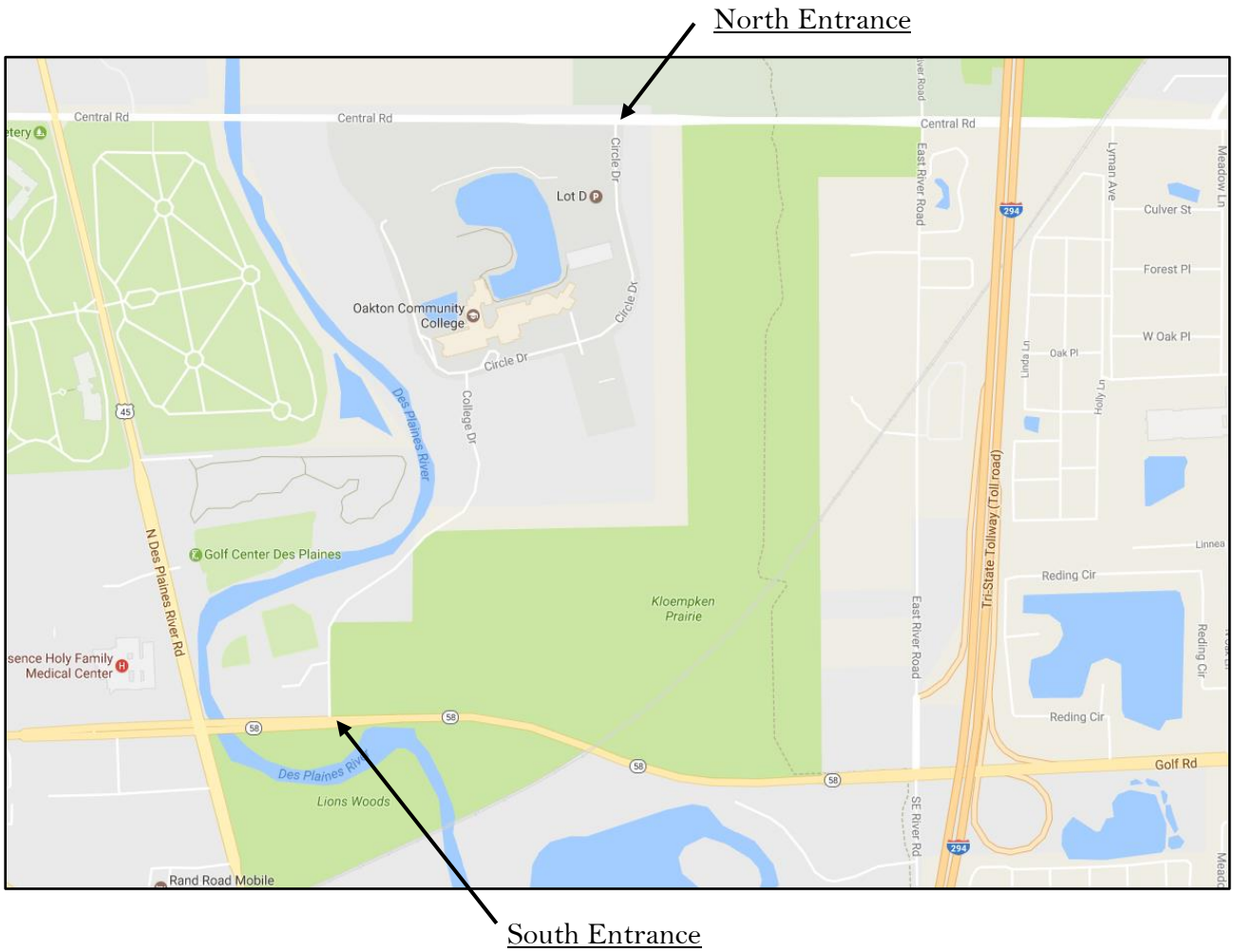
Oakton Community College Natural Landscapes Maintenance Specifications

February 2018

SECTION 1 – INTRODUCTION / GENERAL INFORMATION

1.01 PROJECT LOCATION

A. Oakton Community College (OCC) is located at 1600 East Golf Road, in Des Plaines, Cook County, Illinois. The north entrance to OCC's Circle Drive is from Central Road; the south entrance OCC's College Drive is from Golf Road.



1.02 PROJECT OVERVIEW

A. The project site includes a total of approximately **82+ acres** of timbered and *de novo* ("from scratch") prairie reconstruction landscapes.

1. See **Exhibit 1** (attached at the back of this document) for a plan view of these natural landscapes / natural areas at OCC.
2. Most of the timbered acreage lies across the perimeter of the OCC campus, outside of Circle Drive, although three relatively small timbered areas are located within Circle Drive, namely: (1) at the north end of campus ("Anniversary Oaks"), (2) south of the Lee Center ("Lee Center Wetland"), and (3) southwest of the main building ("Ring Woods").
3. The prairie reconstruction landscapes are in 3 locations, namely: (1) around Lake Oakton ("Lake Oakton Prairie"), (2) near the northwest corner of campus ("Central Road Prairie"), and (3) near the southwest corner of campus ("Southwest Prairie & Wetland").
4. The timbered portions of the project site (totaling approximately **74 acres**) contain Grades B, C, and D Northern Flatwoods, Grades B, C, and D Mesic Upland Forest, and Grades B and C Mesic Floodplain Forest.
5. The prairie portions of the project site (totaling approximately **10.5+ acres**) are man-made prairie landscapes and include some adjacent wetland habitat.
6. Active management by OCC staff over the past 25 years has included invasive species control, selective tree and shrub thinning, prescribed burn management, herbivory protection, and native species overseeding.

B. **Maintenance Specifications**: Following this 5-page SECTION 1 – INTRODUCTION / GENERAL INFORMATION, are four (4) technical specifications that collectively address routine, seasonal maintenance or "stewardship" of these natural areas / natural landscapes, namely:

- **Section 2**: Prescribed Burn Management [3 pages]
- **Section 3**: Select Weed Control [6 pages]
- **Section 4**: Tree Thinning and Fallen Debris Removal [4 pages]
- **Section 5**: Native Species Enhancement [5 pages]

Much of this information is drawn from language that was prepared as part of a comprehensive bid package, dated August 14, 2017 (see SECTION 1.05.C.). **Note the following regarding the anticipated schedule and expectations of the Landscape Contractor hired to perform these maintenance activities:**

1. It is anticipated the landscape maintenance contractor will work under a multiple-year contract (likely 2 years).
2. It is anticipated the contractor will complete these work activities via regular maintenance / stewardship site visits, scheduled throughout the calendar year.

Each visit will include a walkthrough of the entire project site by a field crew, with appropriate management prescribed and performed.

3. Based upon the current understanding of the project and site conditions, it is anticipated that to effectively carry out these maintenance activities – at least in the first few years of implementation – between 18 and 36 site visits per calendar year will be required. Within a few years of active management, fewer site visits – perhaps between 12 and 18 visits per calendar year – will be necessary to effectively carry out these maintenance activities.
4. The amount of contractor site visits and work will depend, in part, upon how much work will be conducted by OCC. It is anticipated that portions of these maintenance activities will be completed by OCC grounds and facilities staff, faculty, and/or student groups.
5. The "performance criteria and evaluation of work" for each technical specification (SECTIONS 2.06, 3.08, 4.08, 5.05) are included herein as general guidelines only and do not represent contractual requirements.

1.03 CONTRACTOR QUALIFICATIONS

A. The contractor awarded the work as described herein shall provide project management and field crew staff with the skills and expertise necessary to complete habitat restoration work in natural areas. Only bidders that have the qualifications, work ethics, and referrals outlined below will be considered.

1. The contracting firm must have a minimum 3 years of experience working in the field of ecological landscape restoration.
2. The contracting firm shall provide a minimum 3 references of similar landscape restoration work. References shall include project name, location, and contact referral information (including telephone and/or email) of principal contact.
3. The contracting firm shall designate a field project manager and an alternate to the field project manager, both of whom shall be competent in speaking and writing the English language.
4. The field project manager and alternate must have a minimum 3 years of experience working in the field of ecological landscape restoration.
5. The field project manager must have a minimum 2 years of experience working in a high-quality natural area and demonstrate an understanding of the special conditions involved in working in such landscapes.
6. At least 50% of the field crew that will be performing the work as outlined herein must have a minimum 2 years of experience working in a high-quality natural area. All crew members that work with herbicides, particularly in their application, must have a valid, current, pesticide applicators and/or operators license via the State of Illinois, Department of Agriculture. At least one licensed pesticide applicator must be present at the project site whenever herbicides are in use.

1.04 PROJECT COORDINATION

A. The **Project Owner's Primary Contact is Johnnie Dattolo**, OCC Facilities and Grounds Maintenance:

- Johnnie Dattolo, OCC Facilities and Grounds Maintenance
- Phone: 847.774.6032
- Email: jdattolo@oakton.edu

B. All questions that pertain to the work addressed in this specification shall be addressed to the project owner's primary contact.

C. The contractor's field project manager or alternate shall correspond directly with the project owner's primary contact.

D. All questions and communications generated throughout the duration of the project, including but not limited to the materials, execution, and project performance shall be addressed to the project owner's primary contact. The project owner's primary contact, not the selected contractor or the contractor's field project manager, shall address all communications and/or questions by the public.

E. Notifications: The contractor's field project manager shall notify the project owner's primary contact a minimum of 24 hours prior to the initiation of work and/or prior to the resumption of any work following periods of inactivity. In the event of personal injury, fuel spillage, or other accidents that occur at the project site, the contractor shall notify the primary contact at once or at the earliest reasonable time.

F. Traffic and Staging: While on campus the contractor's work vehicles will have access to a minimum of 3 designated parking / staging locations, the locations of which will be determined later. Note the following general conditions:

1. Vehicles and equipment may be stored in designated staging areas at the sole discretion and risk of the contractor. Any damages or losses to vehicles, equipment, and materials during use or in storage shall be the sole responsibility of the contractor.
2. While on campus the contractor's drivers shall obey all posted speed limits, stop / crosswalks, and other traffic signage.
3. Vehicles shall not obstruct roadways and sidewalks at any time.
4. Vehicles and equipment can be driven onto the project site at designated ingress / egress locations and only under conditions that will not cause ruts and/or excessive soil compaction. Any such damage caused by the contractor shall be repaired by the contractor at no expense of OCC. Soil will be regraded and seeded accordingly. Any undue damage to trees and built structures caused by the contractor in the execution of restoration activities shall be replaced in full. The project owner's primary contact shall make the final determination of any such damages.

5. The contractor shall keep all roadways and staging areas clean of mud and debris that might arise from the work activities. Any such debris that is deposited onto road surfaces shall be removed immediately by the contractor.

G. Project Site Hazards: Three primary project site hazards have been identified that require special attention during the work activities:

1. Poison Ivy (*Toxicodendron radicans*): This aggressive plant species is very common across many portions of the project site. All workers shall be made aware of its presence and field identification. Workers shall take necessary precautions to avoid or minimize direct contact with this plant. The contractor's first aid kit shall include cleansers that when properly used can prevent or limit exposure to the poisonous oils of this plant.

2. Fencing; Miscellaneous Debris: Metal stakes and various fencing materials (wire and plastic) are scattered throughout the forested areas. Some of this material exists in piles, while other is used to protect native plants from deer browse and beaver chews. The contractor shall exhibit care when working near fencing and posts so as not to damage these structures.

1.05 RELATED DOCUMENTS

These 4 documents serve as the primary resources for information used in the preparation of these maintenance specifications.

A. Oakton Community College Comprehensive Plan for Managing Natural Areas, dated June 2012, prepared by Applied Ecological Services (West Dundee, IL).

B. Flora of the Chicago Region: A Floristic and Ecological Synthesis. 2017. G. Wilhelm & L. Rericha. Indiana Academy of Science. Indianapolis, IN.

C. Oakton Community College Natural Areas Restoration Project Manual Issued for Bidding, dated August 14, 2017, prepared by Farr Associates (Chicago, IL).

D. Oakton Community College Natural Landscapes Operations and Maintenance Manual, dated April 2018 (draft), prepared by Farr Associates and Conservation Design Forum (Lombard, IL).

[END OF SECTION 1 – INTRODUCTION / GENERAL INFORMATION]

SECTION 2 – PRESCRIBED BURN MANAGEMENT

2.01 SUMMARY

A. Regarding SECTION 2 – PRESCRIBED BURN MANAGEMENT, the project scope involves preparation of a burn plan and execution of controlled burns across these 82+ acres.

B. The primary goals of prescribed burn management are to:

1. Prepare a comprehensive burn plan for the project site.
2. Secure all necessary permits from state and local authorities.
3. Execute the controlled burns in a safe and effective manner.

C. The primary objectives of prescribed burn management are to:

1. Implement prescribed burn management on an annual basis, following an approved burn plan.
2. To implement controlled burns as an annual management activity for the continued improvement of forested and prairie landscapes across the project site.

2.02 DEFINITIONS

A. Burn Plan: A burn plan provides a comprehensive description of the burn area, burn units, weather conditions, potential hazards that might be encountered, personnel and safety needs, and contacts to make prior to execution (see SECTION 2.05.A.).

B. Project Boundary: The project boundaries are depicted on Exhibit 1.

2.03 PROJECT SITE CONDITIONS

A. The forested portions of the project site, particularly the high-quality remnant Northern Flatwoods and Mesic Upland Forest landscapes, are known to provide habitat to amphibians, snakes, birds, and myriad insect species. Some of this fauna is sensitive to landscape burns, especially when burns are conducted on mild days in early spring and/or in autumn. The contractor shall be mindful of the presence of these and all other herpetofauna and is expected to exhibit extra care to protect their safety during a prescribed burn.

B. See SECTIONS 1.04.F and 1.04.G for more on the project site conditions.

2.04 PERSONAL PROTECTIVE GEAR AND SAFTEY MATERIALS

A. Personal Protective Gear: In the burn plan the contractor shall include narrative that addresses personal protective equipment anticipated for all work activities encountered while executing a controlled burn.

B. Safety Materials: While conducting a controlled burn, the contractor shall have on site, at a minimum, a first aid kit, portable eye wash station, and a chemical (absorbent) spill kit for use in the event of worker injury or accident. All materials shall be sufficient in terms of components and quantity to match the work activities outlined herein.

2.05 BURN PLAN AND PRESCRIBED BURN – EXECUTION

A. The burn plan prepared by a contractor shall include, at a minimum:

1. Narrative that addresses all equipment needs and usage.
2. Map and description of burn units.
3. All state and local burn permits applied for and secured.
4. Emergency contact information.
5. Identification of burn boss and crew.
6. Other Components: Acceptable conditions for executing a controlled burn, including wind speed, wind direction, fuel moisture, air temperature, and other parameters; smoke management plan; mop-up plan; surrounding area considerations; fire breaks; list of equipment to use during burn execution.

B. It is typical that an approved burn plan and associated permits are valid for 12 months, and it is recommended, therefore, the contractor obtain all permits during the summer. This practice allows plenty of time for the burn plan and permits to be approved and secured prior to the fall burn season and is valid for all prescribed burn activities through the spring burn season. This practice also allows for burning brush piles throughout the winter months.

C. As per the burn plan, and in coordination with OCC, the controlled burns shall be completed during the burn seasons, generally as follows:

1. Fall Burn Season: Between October 15 and December 15.
2. Spring Burn Season: Between February 15 and April 15.
3. Note that in some years, a controlled burn can be conducted during the winter months, outside the burn windows described above.
4. No landscape fires should be attempted during the growing season, as this practice is highly deleterious to native flora and fauna.

2.06 PERFORMANCE CRITERIA AND EVALUATION OF WORK

A. Burn Plan Acceptance: Completion of an approved burn plan and all necessary permits warrants acceptance of the burn plan. It is anticipated that any update to information in the burn plan and resubmittal for permits will be required on an annual basis. As mentioned above, it is recommended that a burn plan be prepared and submitted during the summer months, since if approved, it will be valid for both the fall and spring burn seasons.

B. The contractor shall complete controlled burns across the burn unit(s) that are scheduled to burn, under optimum weather conditions that favor a successful burn.

1. In general, a "successful burn" can be described as one that results in the combustion of approximately 70-90% of herbaceous vegetative material across the ground plain of the burn unit. Landscape conditions, weather, and other factors influence combustion of ground plain material. It is not desirable to "blacken" or "char" every portion of a burn unit, although this may happen from time to time, especially in mature prairie reconstructions.
2. After each controlled burn, OCC shall conduct a post-burn site evaluation to determine if the burn was successful. If less than 50% of dead-standing and ground plain vegetative material burns to ash, based upon a qualitative assessment, then it is possible the burn was not conducted under optimum conditions. If this is the case, the contractor may be required to burn the area a second time under more favorable burn conditions, or the contractor may not be paid in-full for execution of the controlled burn.

[END OF SECTION 2 – PRESCRIBED BURN MANAGEMENT]

SECTION 3 – SELECT WEED CONTROL

3.01 SUMMARY

A. Regarding SECTION 3 – SELECT WEED CONTROL, the project scope involves targeted weed management throughout the 82+-acre project site.

B. The primary goal is to eliminate or significantly reduce the presence of invasive and/or undesirable plant species. The removal of these species is necessary to improve the growth, vigor, and diversity of native vegetation and native plant communities, and aids in the efficacy of land management.

C. The primary objective is to eliminate or significantly reduce the presence of invasive species via targeted herbicide applications and other weed control methods.

3.02 DEFINITIONS

A. Herbicide Application: Targeted herbicide applications shall be the primary method deployed in the control of herbaceous weeds. Specific information regarding chemical formulations, methods of application, etc., are addressed in more detail later in this section.

B. Hand Work: This is the physical act of applying herbicide, cutting select plants, and removing cut herbaceous weeds by hand and on foot only, i.e., without the aid of any type of vehicle. "**Hand Work Areas**" include high-quality, remnant Northern Flatwoods and Mesic Upland Forest as identified on Exhibit 1.

C. Debris Removal: This includes the collection and removal of excess plant material that might be generated from pulling and/or cutting activities. Miscellaneous debris can be left on the ground as long as it does not contain viable seed, does not impact the growth of native vegetation, and does not impact land management. All excess debris shall be removed from the project site by the contractor and disposed of in a responsible manner. OCC shall have the final say as to whether debris must be removed or can be left in place.

D. The invasive species targeted for select weed control are listed in **Table 3-A**. This list is specific to the OCC project site; however, the list should not be considered all-inclusive and in all likelihood additional weedy species will be found at the site.

Table 3-A. Species Targeted for Select Weed Control at the OCC Natural Areas Restoration Project Site[1]

Species	Common Name
Alliaria petiolata	Garlic Mustard
Amaranthus spp.	Amaranth species
Ambrosia trifida	Giant Ragweed
Barbarea vulgaris	Yellow Rocket
Berberis thunbergii	Japanese Barberry
Celastrus orbiculatus	Oriental Bittersweet
Cirsium arvense	Field Thistle
Cirsium vulgare	Bull Thistle
Dipsacus spp.	Teasel species
Euonymus alatus	Winged Euonymus
Frangula alnus	Glossy Buckthorn
Hesperis matronalis	Dame's Rocket
Iris pseudacorus	Tall Yellow Iris
Ligustrum vulgare	Common Privet
Lonicera ×bella	Showy Fly Honeysuckle
Lotus corniculatus	Bird's-foot Trefoil
Lythrum salicaria	Purple Loosestrife
Melilotus spp.	Sweet Clover species
Packera glabella	Butterweed
Phalaris arundinacea	Reed Canary Grass
Phragmites australis	Common Reed
Rhamnus cathartica	Common Buckthorn
Rosa multiflora	Multiflora Rose
Rubus spp.	Raspberry species
Rumex crispus	Curly Dock
Securigera varia	Crown Vetch
Solidago altissima	Tall Goldenrod
Toxicodendron radicans	Poison Ivy
Typha spp.	Cattail species
Viburnum opulus	European Cranberry Bush
Viburnum recognitum	Smooth Arrowwood
Xanthium strumarium canadense	Common Cocklebur

[1] This list is not to be considered all inclusive, and other species not listed may also be targeted for control. See the narrative portion of this specification for more information.

3.03 PROJECT SITE CONDITIONS

A. OCC Natural Areas / Natural Landscapes: As mentioned in SECTION 1, the project site contains remnant Northern Flatwoods, Mesic Upland Forest, and Mesic Floodplain Forest. The higher-quality portions of Northern Flatwoods and Mesic Upland Forest, particularly, are rare, native habitats, and all work conducted in these areas needs to be respectful of their inherent natural quality.

1. All maintenance work in high-quality portions of these areas ("Hand Work Areas," see Exhibit 1) shall be done by hand and on foot. Extra care will be required during herbicide applications, cutting, and debris removal activities to ensure no damage results from these work activities.
2. These landscapes are known to support important fauna, including several species of snakes, salamanders, and birds, plus myriad insect species.
3. Several native, conservative plant species have been recorded from these landscapes, including, but not limited to: Woodland Brome (*Bromus pubescens*); Brome Tussock Sedge (*Carex bromoides*); Awnless Graceful Sedge (*Carex formosa*); Swamp Oval Sedge (*Carex muskingumensis*); Wood's Stiff Sedge (*Carex woodii*); Running Strawberry Bush (*Euonymus obovatus*); Large Flowered Trillium (*Trillium grandiflorum*); Hooded Violet (*Viola cucullata*).

B. The acreage that lies outside of high-quality / "Hand Work Areas," including the prairie reconstruction landscapes, is generally of lower quality. As described below, management in these areas can include the use of vehicles and other more invasive means to target weeds. Also, see SECTION 1.04.F and 1.04.G for more on the project site conditions.

3.04 PERSONAL PROTECTIVE GEAR AND SAFTEY MATERIALS

A. Personal Protective Gear: The contractor shall have on site and at all times personal protective equipment that is appropriate for the work activities outlined herein, including but not limited to working with machetes, brush clearing saws, chain saws, etc., and as specified on herbicide labels.

B. All equipment shall be kept in safe and proper working conditions.

C. Prior to use, all herbicide application equipment shall be inspected for damage or ware that might cause leaks, clogs, or other unsafe working conditions to the operator.

D. Safety Materials: The contractor shall have on site, at a minimum, a first aid kit, portable eye wash station, and a chemical (absorbent) spill kit for use in the event of worker injury or accident. All materials shall be sufficient in terms of components and quantity to match the work activities outlined herein.

3.05 HERBICIDE APPLICATION AND HERBICIDE PRODUCTS

A. All crew members that work with herbicides, particularly in their application, shall have a valid, current, pesticide applicators and/or operators license via the State of Illinois, Department of Agriculture. At least one licensed pesticide applicator shall be present at the project site whenever herbicides are in use. The contractor shall provide documentation to this effect to the project owner's representative.

B. Storage of herbicide shall not take place on site but delivered to and from the project site by the contractor on a daily or as-needed basis.

C. Herbicide formulations are specific to their application and shall follow the manufacture's specifications. Herbicides shall include the following, unless the contractor recommends an appropriate alternative and upon approval by OCC:

1. Herbicide Formulations:
   a. Glyphosate-based product; 50% solution (e.g., Roundup).
   b. Glyphosate-based product; 50% solution approved for aquatic and wetland habitats; 50% solution (e.g., Aquaneat).
   c. Triclopyr ester formulation, in basal oil; 20% solution (e.g., Garlon 4).
   d. Triclopyr amine formulation, water-based; 5% solution (e.g., Garlon 3A).

D. Other Herbicide Products:

1. Material Safety Data Sheets (MSDS): The contractor shall have on site and at all times the appropriate MSDS for all herbicide products.
2. Signage: The contractor shall supply and post signage designating areas that have been treated with herbicide. The contractor shall repost signage daily as work progresses. Signs shall remain in place for a minimum 72 hours after the last herbicide application and remain in place as per herbicide label recommendations, after which they are to be removed. All signs shall be removed by the contractor upon completion of the project.
3. Before any herbicide application, the contractor shall provide a list of herbicides, surfactants, water conditioners, dyes, pH balancers, and any other chemicals and adjuvants intended for use on the project site.
4. Herbicide solutions shall include a dye / color tracer to aid in the chemical application and site inspections.
5. Herbicide solutions shall include a non-ionic surfactant to aid in absorption and uptake by the target species.
6. The contractor shall provide all water necessary for the herbicide applications. Herbicide shall be mixed and stored in containers in designated staging locations away from the project site. An adequate catch basin shall be utilized to guard against any spills or leaks that might occur.
7. Any substitutions and/or modifications to these herbicide products and solutions shall first be approved by the project owner's representative.
8. Herbicide Record Log: A record or log of daily herbicide activity shall be kept by the contractor to document herbicides used, locations of application, and target

species. This shall be shared and reviewed with OCC on a weekly basis or as necessary throughout the duration of the project. The record log does not serve as an invoice.

3.06 SELECT WEED CONTROL – EXECUTION

A. Target Species: Refer to Table 3-A in SECTION 3.02.D for species to target for control. The contractor's field project manager and alternate, at a minimum, must be able to accurately identify the species listed in Table 3-A.

B. In high-quality, "Hand Work Areas" (see SECTION 3.02.B) all weed control activities shall be completed by hand and on foot. Extra care shall be taken while working in high-quality remnant habitats, particularly to protect non-target native vegetation from herbicide drift.

C. Outside of the high-quality / "Hand Work Areas," weed control efforts can be aided by use of vehicles approved by OCC.

D. Processing and Disposal of Cut Vegetation: If minimal debris is generated from the cutting of select weeds then the cut material can be left on the ground. In areas where the cut material is excessive, then this material shall be removed from the project area (and from the OCC campus) and disposed of in a responsible manner. OCC shall make the final determination whether cut vegetation needs to be removed from the landscape.

E. Herbicide Application:

1. All herbicide applications shall target those species listed in Table 3-A plus other select weeds that might appear on the project site. Appropriate signage for use as public notice shall be installed to indicate herbicide use and application.
2. A backpack or handheld wand sprayer shall be used by the herbicide applicator and operator. Caution shall be exercised to prevent herbicide spillage, over-application, runoff, and/or drift on to adjacent, non-target vegetation.
3. In designated high-quality areas: An end-of-wand, sponge-wick applicator shall be used to apply the herbicide directly onto the target surface.
4. Outside of high-quality areas: In addition to a sponge-wick applicator, if desired by the contractor an end-of-wand, low-pressure spray nozzle can be used for herbicide application.
5. Herbicide shall be applied when weather conditions allow, as instructions. Herbicide shall not be applied if precipitation is expected within the window of time the herbicide is considered "rain-fast," if precipitation has resulted in rain or snow cover, or if heavy dew covers the target spray area.
6. The herbicide application shall result in necrosis of no less than 95% of targeted species. If it is determined that more than 5% of targeted species are still alive, then a second herbicide application shall be required at the contractor's expense.

3.07 SELECT WEED CONTROL – SCHEDULE

A. Weather and site conditions depending, select weed control activities shall occur throughout the calendar year, during scheduled maintenance / stewardship visits.

B. The timing of select weed control visits (mechanical and chemical) shall be based upon each species life cycle. Initially, for all target species, the goal is to prevent the species from expanding its range and to prevent fruit and seed maturation; and, over time, to reduce the target species' presence and/or to eliminate it entirely from the project site. The following are general guidelines regarding when to schedule select weed control visits:

1. Perennial herbaceous species: In most cases, timed herbicide applications shall be scheduled during the growing season, when the plant is actively growing and before the onset of seed and fruit maturation. For some aggressive species it is necessary to repeat herbicide applications several times throughout a growing season to accomplish the desired results.
2. Annual and short-lived perennial, herbaceous species: Similar to #1 above; additionally, however, simply preventing a species from "setting seed" will keep a given population from expanding. In many instances this can be accomplished solely by mechanical means, and over time the target species will wane from the landscape.
3. Woody species: Similar to #1 above, with herbicide applied to actively growing foliage and young stems. In addition, it is often necessary to cut stems (generally those greater than 2 inches in diameter) of target shrubs and trees, with follow-up herbicide applied directly to the cut wound / stump to prevent or reduce re-spouting. This work is often carried out in the winter months and typically includes a follow-up herbicide event(s) the following growing season to target re-sprouts.

3.08 PERFORMANCE CRITERIA AND EVALUATION OF WORK

A. The contractor shall have cut and/or removed a minimum 95% of all flowering and fruiting stems from select weed species prior to seed set / fruit maturity, as determined via ground-truthing site inspections by OCC.

B. The contractor shall have killed and/or caused brown-out / necrosis to a minimum 95% of all targeted, select weed species, as measured via ground-truthing site inspections by OCC.

C. The timing of ground-truthing site inspections by OCC will be scheduled on an as-needed basis, but generally, these inspections shall occur approximately 1-3 weeks after each herbicide application.

[END OF SECTION 3 – SELECT WEED CONTROL]

SECTION 4 – TREE THINNING AND FALLEN DEBRIS REMOVAL

4.01 SUMMARY

A. Regarding SECTION 4 – TREE THINNING and FALLEN DEBRIS REMOVAL, the scope involves the targeted removal of trees (and large shrubs) and fallen debris at the OCC project site.

B. The removal of this woody vegetation (including trees that are deemed hazards to people and property) is necessary to improve overall health and vigor of the forested natural areas, and aids in the efficacy of land management. No grubbing of root systems or any other type of soil disturbance shall occur as part of these activities.

4.02 DEFINITIONS

A. Hand Work: This is the physical act of felling and removing targeted trees, by hand and on foot only, i.e., without the aid of any type of vehicle. "**Hand Work Areas**" include high-quality, remnant Northern Flatwoods and Mesic Upland Forest, generally as identified on Exhibit 1. Extra care shall be taken while working in these locations, particularly to protect trees and other native plants from damage that might result from tree felling and debris removal activities. Outside of these high-quality remnants, this work can be executed with the aid of approved vehicles, including trucks, tractors, skid steers, wood chippers, etc. The use of such vehicles shall not be allowed if there is a possibility of causing ruts and/or excessive soil compaction. OCC shall have the final say as to whether a vehicle can be used to assist in these activities.

B. Removal / Processing of Cut Debris: This includes the collection and removal of woody debris generated from tree thinning / felling activities. Miscellaneous debris can be left on the ground as long as it does not impact the growth of native vegetation and/or does not impact land management; otherwise, all debris shall be removed from the project site by the contractor and disposed of in a responsible manner. OCC shall have the final say as to whether debris must be removed or can be left in place.

C. Tree species targeted for woody plant thinning are listed in **Table 4-A**. This list is specific to the OCC project site. The list should not be considered all inclusive, since over time additional species may be found at the site. Table 4-A includes most tree species recorded from the site, the majority of which are native to the region. Management of shrubs, vines and woody re-spouts is addressed in SECTION 3 – SELECT WEED CONTROL.

D. Removal of Existing Fallen Debris: This includes targeted removal of existing, fallen timber on the forest floor. Generally, scattered, decaying wood <4 inches in diameter and regarded as part of the woodland litter is to remain, and similarly, decaying large trunks, stumps, and limbs that on average are >20 inches in diameter

and regarded as part of the woodland litter are to remain in place. Most other fallen woody debris shall be removed from the project site and disposed of in a responsible manner. OCC shall have the final say as to what qualifies as fallen debris for removal versus debris that is to be left in place.

Table 4-A. Tree Species Targeted for Removal at the OCC Natural Areas Restoration Project[1]

Species	Common Name
Acer negundo	Boxelder
Acer saccharinum	Silver Maple
Acer saccharum	Sugar Maple
Ailanthus altissima	Tree of Heaven
Carya cordiformis	Bitternut Hickory
Carya ovata	Shagbark Hickory
Catalpa speciosa	Northern Cigar Tree
Celtis occidentalis	Hackberry
Crataegus spp.	Hawthorn species
Fraxinus spp.	Ash species
Gleditsia triacanthos	Honey Locust
Juglans nigra	Black Walnut
Morus alba	White Mulberry
Populus deltoides	Eastern Cottonwood
Prunus serotina	Wild Black Cherry
Pyrus calleryana	Bradford Pear
Quercus spp.	Oak species
Robinia pseudoacacia	Black Locust
Salix spp.	Willow species
Tilia americana	American Linden
Ulmus spp.	Elm species

[1] This list is not to be considered all inclusive, and other species not listed may also be targeted for control. See the narrative portion of this specification for more information.

4.03 PROJECT SITE CONDITIONS

A. See SECTION 3.03.

4.04 PERSONAL PROTECTIVE GEAR AND SAFETY MATERIALS

A. See SECTION 3.04.

4.05 HERBICIDE APPLICATION AND HERBICIDE PRODUCTS

A. See SECTION 3.05.

4.06 TREE THINNING & FALLEN DEBRIS REMOVAL – EXECUTION

A. Target Trees: Refer to Table 4-A in SECTION 4.02.D for the tree species that are likely to be targeted as part of tree thinning. The contractor's field project manager and alternate, at a minimum, must be able to accurately identify the species listed in Table 4-A. [Note that management of other woody plants (shrubs and vines) that are considered invasive or undesirable is addressed in SECTION 3.]

B. Target trees shall be cut flush with the ground surface, resulting in a stump no more than 2 inches in height. In some instances, this may require the contractor to lower the remaining stump after the initial felling cut.

C. Cut stumps of live trees shall be treated with an herbicide within 30 minutes of cutting. Appropriate signage for use as public notice shall be installed to indicate herbicide use and application. A 20% solution of a Triclopyr ester formulation in basal oil (e.g., Garlon 4) shall be applied, as per label specifications. Herbicide shall be applied to the entire cut surface down to the root collar.

1. Herbicide shall be applied when weather conditions allow, as per label instructions. Herbicide shall not be applied if precipitation is expected within the window of time the herbicide is considered "rain-fast," if precipitation has resulted in rain or snow cover, or if heavy dew covers the target spray area.
2. A backpack or handheld wand sprayer shall be used by the herbicide applicator and operator. Caution shall be exercised to prevent herbicide spillage, over-application, runoff, and/or drift on to adjacent, non-target vegetation.
3. In designated high-quality areas: An end-of-wand, sponge-wick applicator shall be used to apply the herbicide directly onto the stump surface.
4. Outside of high-quality areas: In addition to a sponge-wick applicator, if desired by the contractor an end-of-wand, low-pressure spray nozzle can be used for herbicide application.
5. The initial herbicide application shall result in necrosis of no less than 85% of cut stumps.
6. There shall be a follow-up foliar application of herbicide in the early growing season following the tree felling to target resprouts that may arise from cut stumps. Herbicide shall be applied to foliage and new stem growth. The application shall be timed to occur when regrowth is "leafy" and approximately 3-6 inches in length. Herbicide applications made after this stage on larger, more robust material requires more herbicide and is more likely to impact non-target species. Timing of the follow-up herbicide application shall be approved by OCC. In designated high-quality areas, herbicide shall only be applied via an end-of-wand sponge-wick applicator, and/or via a hand-wick application ("sponge-glove of death") method. Outside of high-quality areas, in addition to a sponge-wick applicator, an end-of-wand, low-pressure spray nozzle can be used. The follow-up herbicide application shall result in necrosis of no less than 95% of all cut stumps. If it is determined that more than 5% of targeted species are still alive, then a third herbicide application shall be required at the contractor's expense.

D. See SECTION 4.02.B for the removal / processing of felled woody debris resulting from tree thinning.

1. In addition, upon approval of OCC, it may be possible that some woody debris can be piled and burned on site.

E. See SECTION 4.02.D for the removal / processing of existing fallen debris.

1. In addition, in high-quality, remnant areas more material shall be intentionally left on the forest floor since this serves as habitat for sensitive fauna, particularly herpetofauna that are known from the site. The approach in these areas shall be to remove all but the lowest tiers of woody stems from the brush piles so that they continue to serve as hibernacula.
2. In addition, upon approval of OCC, it may be possible that some woody debris can be piled and burned on site.

4.07 TREE THINNING & FALLEN DEBRIS REMOVAL – SCHEDULE

A. Tree thinning and fallen debris work activities shall be scheduled in coordination with OCC. It is assumed that much of this work will be completed during routine maintenance site visits, as outlined in SECTION 1.02.B.1-5; however, some of emergency tree removal, for example, would be considered an additional service.

B. In designated high-quality areas, all work shall be restricted to the winter months when the ground is frozen. Weather and site conditions depending, work shall begin no sooner than December 15 and must be completed before March 1.

C. Outside of high-quality areas, weather and site conditions depending, work activities can be completed at any time during the calendar year.

4.08 PERFORMANCE CRITERIA AND EVALUATION OF WORK

A. The contractor shall have cut and removed select trees and fallen debris as outlined herein. The contractor is required to kill / cause necrosis to a minimum 85% of all cut stumps, and a minimum of 95% of all woody resprouts.

B. The timing of ground-truthing site inspections by OCC will be scheduled on an as-needed basis, but generally, these inspections shall occur approximately 1-3 weeks after tree felling, debris removal, and herbicide application activities.

[END OF SECTION 4 – TREE THINNING AND FALLEN DEBRIS REMOVAL]

SECTION 5 – NATIVE SPECIES ENHANCEMENT

5.01 SUMMARY

A. Regarding SECTION 5 – NATIVE SPECIES ENHANCEMENT, the scope involves improving the cover and diversity of native plant species across the 82+-acre project site.

B. As outlined below, native species enhancement can be accomplished via *in situ* seed collection and dispersal, and – *in de novo prairie and wetland landscapes only* – through the introduction of native seed and/or live plant material from off-site sources.

5.02 DEFINITIONS

A. The **high-quality, remnant Northern Flatwoods and Mesic Upland Forest** portions of the project site are described in SECTION 3.30.A. and their location depicted on Exhibit 1. All native species enhancement within and adjacent to these areas should be via *in situ* seed collection and dispersal only. No seed or plant material shall be introduced into these areas from outside sources.

B. Away from the high-quality remnant landscapes, particularly in *de novo* prairie and wetland habitat, appropriate prairie and wetland seed can be introduced from off-site as part of a native species enhancement program; native prairie and wetland species that are commonly used for such purposes are listed in **Table 5-A** and **Table 5-B**.

Table 5-A. Mesic Prairie Species Appropriate for Seeding within OCC *De Novo* Prairie Landscapes[1]

Species	Common Name
Allium cernuum	Nodding Wild Onion
*Amorpha canescens**	Lead Plant
Andropogon gerardii	Big Bluestem
Asclepias tuberosa	Butterfly Weed
*Astragalus canadensis**	Canada Milk Vetch
Baptisia lactea	White Wild Indigo
Bouteloua curtipendula	Side-oats Grama
Bromus kalmii	Prairie Brome
Carex bicknellii	Copper-shouldered Oval Sedge
Carex brevior	Plains Oval Sedge
*Chamaecrista fasciculata**	Partridge Pea
Coreopsis palmata	Prairie Coreopsis
Coreopsis tripteris	Tall Coreopsis
*Dalea candida**	White Prairie Clover
*Dalea purpurea**	Purple Prairie Clover

Table 5-A. Mesic Prairie Species Appropriate for Seeding within OCC *De Novo* Prairie Landscapes[1]	
Species	**Common Name**
*Desmanthus illinoensis**	Illinois Bundleflower
*Desmodium canadense**	Showy Tick Trefoil
Dodecatheon meadia	Shooting Star
Echinacea pallida	Pale Purple Coneflower
Elymus canadensis	Canada Wild Rye
Eryngium yuccifolium	Rattlesnake Master
Heliopsis helianthoides	False Sunflower
*Lespedeza capitata**	Round-headed Bush Clover
Liatris spicata	Marsh Gay Feather
Monarda fistulosa	Wild Bergamot
Parthenium integrifolium	Wild Quinine
Penstemon digitalis	Foxglove Beard Tongue
Pycnanthemum virginianum	Common Mountain Mint
Ratibida pinnata	Yellow Coneflower
Rudbeckia hirta	Black-eyed Susan
Rudbeckia subtomentosa	Sweet Black-eyed Susan
Schizachyrium scoparium	Little Bluestem
Silphium integrifolium	Rosin Weed
Silphium laciniatum	Compass Plant
Silphium terebinthinaceum	Prairie Dock
Sorghastrum nutans	Indian Grass
Sporobolus heterolepis	Prairie Dropseed
Symphyotrichum laeve	Smooth Blue Aster
Symphyotrichum novae-angliae	New England Aster
Veronicastrum virginicum	Culver's Root
Zizia aurea	Golden Alexanders

[1] See Exhibit 1 for locations of *de novo* prairies at OCC. This list is not to be considered all inclusive. See the narrative portion of this specification for more information.
* =Legumes that require a rhizobium inoculum prior to sowing.

Table 5-B. Wetland Species Appropriate for Seeding and/or Planting within OCC *De Novo* Wetland Landscapes[1]	
Species	**Common Name**
Acorus americanus	American Sweet Flag
Alisma subcordatum	Common Water Plantain
Angelica atropurpurea	Great Angelica
Asclepias incarnata	Swamp Milkweed
Bolboschoenus fluviatilis	River Bulrush
Calamagrostis canadensis	Blue Joint Grass
Carex comosa	Bristly Sedge

Table 5-B. Wetland Species Appropriate for Seeding and/or Planting within OCC *De Novo* Wetland Landscapes[1]	
Species	**Common Name**
Carex cristatella	Crested Oval Sedge
Carex frankii	Bristly Cattail Sedge
Carex hystericina	Porcupine Sedge
Carex stipata	Common Fox Sedge
Carex tribuloides	Awl-fruited Oval Sedge
Carex vulpinoidea	Brown Fox Sedge
Coreopsis tripteris	Tall Coreopsis
Eleocharis obtusa	Blunt Spikerush
Elymus virginicus	Virginia Wild Rye
Eupatorium perfoliatum	Common Boneset
Eutrochium maculatum	Spotted Joe Pye Weed
Glyceria striata	Green Fowl Manna Grass
Helenium autumnale	Sneezeweed
Iris virginica shrevei	Blue Flag
Leersia oryzoides	Rice Cut Grass
Lobelia cardinalis	Cardinal Flower
Lycopus americanus	Common Water Horehound
Lythrum alatum	Winged Loosestrife
Mentha canadensis	Wild Mint
Mimulus ringens	Monkey Flower
Nuphar advena	Yellow Pond Lily
Nymphaea odorata tuberosa	White Water Lily
Oligoneuron riddellii	Riddell's Goldenrod
Penthorum sedoides	Ditch Stonecrop
Pontederia cordata	Pickerelweed
Physostegia virginiana	Obedient Plant
Silphium perfoliatum	Cup Plant
Sagittaria latifolia	Common Arrowhead
Schoenoplectus tabernaemontani	Great Bulrush
Scirpus atrovirens	Dark Green Rush
Scirpus cyperinus	Woolgrass
Scirpus pendulus	Red Bulrush
Spartina pectinata	Prairie Cordgrass
Symphyotrichum firmum	Shinning Aster
Verbena hastata	Blue Vervain
Vernonia fasciculata	Common Ironweed
[1] This list is not to be considered all inclusive. See the narrative portion of this specification for more information.	

5.03 PROJECT SITE CONDITIONS

A. See SECTION 3.03.

5.04 NATIVE SPECIES ENHANCEMENT – EXECUTION AND SCHEDULE

A. Across all landscapes, *in situ* native seed shall be collected by hand and on foot, from areas where it is common. A bag or bags can be used to temporarily hold the collected seed as a mix or as individual species.

1. Care shall be taken to not over collect seed from extant, remnant populations or to damage living plant material while collecting seed and/or fruit.
2. When collecting seed, only mature seed should be harvested. Collected seed from the same habitat can be mixed together. One should never mix seed that is collected from different habitats / plant community types. If one is unsure of a species' habitat preference, then it is best to keep different seed in separate bags.
3. Mature seed shall be collected on a regular basis from late spring and throughout the summer and fall months (generally May through November), since seed and/or fruit maturity varies from one plant species to the next.
4. All plant species have specific habitat requirements, particularly conservative native species, and so care needs to be taken to sow collected seed into appropriate habitats – this is especially true when working in the high-quality portions of Northern Flatwoods and Mesic Upland Forest. After seed is collected, one simply walks to suitable, nearby locales to disperse the seed over the ground.
5. Away from the high-quality portions of Northern Flatwoods and Mesic Upland Forest, appropriate, locally-collect native seed from within a 15-mile radius of OCC can be used to enhance the native quality and composition of forested areas.

B. Tables 5-A and 5-B list many common prairie and wetland species that could be used to enhance these *de novo* landscapes.

1. The species listed in these two tables do not represent all prairie and wetland plants that could be added to these landscapes at OCC. Based upon monitoring data, many other species native to the region could be considered as part of a species enhancement program. [Refer to Flora of the Chicago Region (SECTION 1.05.C) for a comprehensive understanding of habitat-appropriate species.]
2. Species intended for introduction must be approved by OCC, and OCC has the final say as to whether a species from off-site will be allowed to be introduced onto property.
3. If available, prairie and wetland seed and plants should be sourced from within a 15-mile radius from OCC. In all likelihood, however, much of the prairie and wetland seed / plants will need to be sourced from a much broader region, and so a range of up to 150 miles from OCC is acceptable.

4. As depicted on Exhibit 1 and described in SECTION 1.02, three prairie landscapes are found on the campus. Wetland is associated with the Lake Oakton Prairie and the Southwest Prairie.
5. Prairie seed shall be broadcast in the late fall or early winter, preferably immediately after a landscape burn if this can be arranged. It is assumed herein that no site preparation will be required – seed introduction will simply be via overseeding into standing or recently-burned vegetation. [Note that if there is a desire to expand prairie into adjacent lawn, for example, then there may be a need to first prepare the area, via herbicide applications (typically) to "burndown" the existing turf / vegetation prior to seeding. Woody plant removal may also be necessary prior to overseeding prairie, and post-seeding may require installation of an erosion control blanket.]
6. Wetland seed can be sown over moist soil in summer and early fall. It is recommended, however, that species enhancement of wetland habitat occur primarily via installation of live plants during the summer months. It may be necessary to irrigate the newly-installed plants until they are acclimated to the site. Also, it is common to construct herbivory protection fencing to protect against damage from muskrats and waterfowl.

C. It is anticipated that some of this work will be conducted by the landscape maintenance contractor during routine site visits, as per direction and coordination with OCC grounds and facilities staff. It is also anticipated, however, that some of this work may be conducted by OCC faculty, and/or students.

5.05 PERFORMANCE CRITERIA AND EVALUATION OF WORK

A. The timing of ground-truthing site inspections by OCC will be scheduled on an as-needed basis. These inspections / evaluations will help guide native species enhancement decisions, including where and when seed should be collected and dispersed, the need for supplemental irrigation, herbivory protection, etc.

B. A review of data from comprehensive monitoring of vegetation, fauna, and other components of these landscapes by OCC will provide additional guidance and recommendations for native species enhancement.

[END OF SECTION 5 – NATIVE SPECIES ENHANCEMENT]