

# ***La Riviere Farm Park Forest Area Assessment City of Prairie du Chien***



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**La Riviere Park  
Forest Area Assessment**

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## **EXECUTIVE SUMMARY**

The City of Prairie du Chien has long recognized that trees provide important economic, ecological and environmental benefits that significantly improve the quality of urban life. City parks, greenspace and forested areas also contribute to these benefits while providing a draw to diverse user groups. Management of forested areas can be a complex and multi-faceted proposition influenced heavily by personal beliefs of what forested areas are designed for. Any management scheme must be based on sound science and factual data. This document reports the findings of the forest inventory for La Riviere Farm Park and makes specific, prioritized recommendations for managing the forested areas within the park for upcoming years based on resources and needs.

## **STATEMENT OF PURPOSE AND SCOPE**

This forest area assessment is intended to provide resource management guidance for the City of Prairie du Chien in managing and fulfilling their objectives for the wooded areas within La Riviere Park. It is also meant to provide guidance and understanding for the factors that affect a healthy forested ecosystem. The City of Prairie du Chien's objectives and sound forest management principles have guided the development of this plan.

This assessment describes the various forest types that occur within each park's forested areas and the management options associated with each type. Management options provided in this plan range from simply doing nothing (*"let nature take its course"*) to more intensive management options for certain forest types. The plan will also give recommendations for complete stewardship of the land including aesthetic, recreational, invasive species, wildlife and water quality management.

## **METHODOLOGY**

During the spring of 2011, Bluestem Forestry Consulting Inc. conducted a forested area assessment of La Riviere Farm Park. Within the wooded areas, random sample points were established for data collection. Data collected at each point included species, diameter and number of log and pulp cuts and percentage of defect for each tree. A 100<sup>th</sup> acre regeneration plot was embedded at each point where adequate seedling and saplings were found. Invasive species and their density were also noted for each plot. Overall health and quality of the trees in each area were evaluated as well as soil types, drainage patterns and any other unique features. The data collected were used to determine the species composition, stocking level, total board footage and cordage as well as its fair market value.

## **HISTORY AND BACKGROUND**

La Riviere Farm Park was a gift to Prairie du Chien from Daniel and Elsie La Riviere Farm. The property was willed to be “used and maintained in perpetuity as and for a public park and recreation area.” It was La Riviere Farm’s “desire and purpose to make available for...present and future generations...an area of unspoiled wooded hills and wildlife.”

Prior to being given to the city, the La Riviere Farm’s actively farmed the property. While a few areas are still farmed, the majority has been allowed to naturally revert back to forestland. It is apparent that some of the wooded area was grazed in the past and is in the process of recovering. The fallow farmland is being slowly overtaken by varying degrees of brush, seedlings, saplings and small trees.

The past practices of farming, grazing, firewooding and logging have shaped the forest stands as they appear now.

## **GENERAL SOILS AND HABITAT INFORMATION**

The wooded portions of La Riviere Farm Park are generally characterized by rolling upland with steep slopes. The forest types generally contain differing components oak and hardwood species. Dependant upon soil drainage and past land use, forest types typically fall into and oak/hardwood mix or a wet phase hardwood type. The driest sites are populated with black oak and cedar and hickory, with better drained sites having varying degrees of red and white oak along with sugar maple, basswood, white ash and pine. The poorer drained sites along the bottomland creeks are dominated by green ash and red maple.

Soil types also range widely throughout the property. In general, the upland flats contain excessively drained fine sand (Chelsea fine sand). These are the driest soils on the property and support the black oak, red oak and some hickories. The gentle rolling topography common in the south end of the park contains a moderately well drained silt loam (Arenzville silt loam) and supports stands of mixed hardwoods. The steep slopes contain a somewhat excessively drained loam soil. Red and white oaks along with other mixed hardwoods dominate these sites. The bottomland drainages range from silt loam to silty clay loam (Fayette silt loam) and support bottomland hardwoods such as elm, cottonwood, river birch and boxelder.

There are numerous lenses of different soil types found throughout the property. The soil types transition gradually creating soft edges for timber stand delineation.

The composition of the forest varies with slight changes in topographic aspect, drainage pattern, soil type and past land use practices.



## **STAND DESCRIPTIONS AND MANAGEMENT OPTIONS**

This section subdivides the forest into stands and presents a description along with the management options for each cover type. The best and most appropriate management options are described for each stand in order to meet the goals and objectives previously described. Stands were identified in the wooded areas through field examination, collection of stand and site data, and aerial photo interpretation. A stand is an area in which the tree species composition is similar in both numbers and size. The composition of the stand may vary with slight changes in topographic aspect, drainage pattern, soil type and past land use practices. There may be inclusions or areas within a cover type where tree species composition or size deviates from the overall type. The purpose of this project and document is to evaluate the overall forest resource, and not to intensively identify minor nuances. Therefore, stands have been identified using a broad approach based on general similarities. Although inclusions are not mapped separately due to their small size, they are noted within the discussion.

A table is included as Attachment 2 that identifies the total merchantable volume and value of timber by species. The volumes were collected from sample plots established within the stand. Values were derived from current (2011) prices actually paid for standing forest products (stumpage) in the area as compiled by the Wisconsin Department of Natural Resources. Volumes and values represent ALL current timber estimated to be growing in the stand. The value represents the total potential income if ALL the timber were harvested. Less income will be realized as various species or products are retained on the property for continued growth and proper management.

Maps illustrating the location of wooded stands in the park also are included as attachments.

**STAND DESCRIPTION: Large Mixed Oak**

**Description of Stand:** This forested stand is located in the northwest portion of the park. It is situated on rolling to steep uplands with gradients of sand and silt loam soils. The stand is dominated by large oak sawtimber with minor amounts of mixed hardwood species. The average stand diameter is 16 inches with the largest trees reaching 30+ inches in diameter. Overall, the stand is well stocked at 98 square feet per acre (sfa) of basal area stocking. Red and white oak account for 78 % the total stocking (41% and 37% respectively) with shagbark hickory, basswood bitternut hickory and black cherry found throughout. Also present are white birch, cottonwood, elm, white ash and ironwood.

The quality of the timber is good to excellent. Soils within the stand have the nutrient potential for supporting quality stands of timber. Seedlings, saplings and poletimber (5-10 inches diameter) are generally absent from the stand.

**Invasive Species:** Very few invasive species were noted occurring within this stand. A few scattered buckthorn plants were found, but currently do not pose a high level threat.

**EAB Implications:** Ash species within this stand account for 2% of the total tree population. An EAB infestation will have a minimal effect.

**Timeline for Active Management:** The maturing nature and lack of advanced regeneration within this stand warrants active management within the near future.

**Management Options:**

- **No Management.** Passive or non-management of a stand is always an option. Stands may be chosen to remain unmanaged for a variety of reasons. Philosophical, social and political reasons are common driving forces behind such a decision. Often there is a desire to allow nature to take its course and develop free of human impacts. Some wildlife species prefer relatively undisturbed forests. Aesthetic and recreation opportunities may require that an area be unmanaged to maintain a certain feel of "wilderness". However, occasionally sound management dictates that a stand is left to biological influences only. This occurs largely on extremely wet sites where fluctuating water tables make regeneration difficult or when a site is naturally converting to a desired forest type. There may also be areas that need to be protected and/or preserved such as fragile or special sites and communities.

No management may be considered an option for all stands within La Riviere Farm Park. Given the soil and habitat types of the property, natural forest succession will begin slowly over time working towards a climax forest type mixed hardwoods. Each stand's current location in the successional path will dictate the length of time to reach climax forest. The no

management option will only be listed when it is appropriate based on forest management principles.

In an unmanaged situation, stocking remains high and the trees become stressed due to limited site resources such as water, sunlight and nutrients. Individual tree mortality and slow growth of residual trees is characteristic of unmanaged forests.

In the absence of management within this stand, natural forest succession will continue to favor the more central hardwood species such as ash, hickory and maples. Oak will remain, but as a lesser component. As the oak reach maturity they will slowly decline, weaken and die. As they fall out of the stand, young oak and mixed hardwoods will eventually become established in the canopy gaps created by the dead trees.

- **All-aged Management (Individual Tree Selection).** This type of management is applied through individual tree selection methods and is typically used to manage northern hardwood forest types. As the name implies, it manages a forest by retaining or removing individual trees to promote increased growth, quality and health of the forest. Individual trees selected for removal are marked with tree marking paint. Trees selected for removal are typically diseased, deformed, defective or suppressed. Removing these trees provides crown release and room for the better trees to grow. Small canopy gaps, 40 to 60 feet in diameter, are also created during each harvest to provide for a new generation of seedlings. To achieve all-aged management, there needs to be a correct distribution of age classes within the forest. This provides the sustained growth and yield in northern hardwood forests that permit harvests every 10-15 years on a sustained basis.

Historically loggers have sought to remove the larger more valuable trees because they are “mature”. This perception and practice is absolutely contrary to sustainable management of a northern hardwood forest. The first and most important criteria in northern hardwood management is the removal of high risk trees, such as those that are diseased, defective, or may decline rapidly within the 10 to 15-year cutting cycle. Each harvest should improve the overall growing stock and quality of the forest. As trees reach biological maturity, there are then ample quality trees of various ages to replace the large mature tree that is harvested.

Proper application of northern hardwood management should be done through a professional forester with significant experience with this forest type. A harvest utilizing the individual tree selection method should be conducted by marking the basal area down to between 60 and 70 sfa in areas dominated by poletimber, and down to approximately 80 sfa in areas with a greater amount of sawtimber. Target crown closure should be approximately 80% in poletimber stands and 90% in stands containing sawtimber. Canopy gaps that are created for regeneration should have all submerchantable trees marked for removal.

Unfortunately, the all-aged management option does NOT promote the regeneration and maintenance of oak stands. Due to the intolerance for shade, red oak seedlings typically fail from lack of adequate light. This method as expressed above is not typically used to maintain

or promote oak. Continual partial thinning will promote a greater presence of the more shade tolerant species such as red and sugar maple. White oak species have a better chance of regenerating under this management scheme, but it is not optimal.

- **Even-aged Management (Two-Cut Shelterwood).** If the retention of oak is desired, then this cover type will need to be regenerated using a two-cut shelterwood method. Since the trees within this stand are mature/overmature, regeneration must be considered.

Once the oak has reached its biological maturity on these sites, then a two-cut shelterwood should be applied to regenerate the site back to oak and pine. This method is typically applied when the main oak stand reaches about 100 to 110 years of age on these sites. The shelterwood method is designed to regenerate species that require a moderate amount of sunlight for germination and seedling development as well as a mineral seedbed. Species such as white birch, oak, and white pine regenerate well under these conditions. This method is applied through two cuts; the first removes excess trees and scarifies the ground, and the second removes the remaining trees following successful regeneration.

The first cut involves a combination of harvesting and soil disturbance. Harvesting involves removing all trees, except those specifically marked to be retained for seed dispersal and intermittent shade. A forester marks a sufficient number of healthy large oak trees per acre which are not to be cut. These trees provide the seed and dispersed shade favorable for regeneration. The ground must then be scarified prior to, during, or after the logging operation to create an exposed mineral seedbed for seedling establishment. Scarification involves exposing at least 50% of the mineral soil for proper seedbed conditions which favors the establishment of oak seedlings. Scarification can be performed by a bulldozer, or other heavy equipment as long as the results are achieved. It is imperative that the competing vegetation be destroyed, especially the maple. Once seedlings become established within 5 years, the remainder of the standing trees should be harvested to provide full sun to the seedlings. This type of management provides the best opportunity for the retention of the oak cover type on the landscape over the long term. However, the final harvest basically resembles a clearcut and is difficult for individuals to accept.

- **Group Selection.** A compromise between the all-aged and even-aged is a treatment known as group selection. Group selection is the preferred silvicultural treatment for the long-term production of mid-tolerant species such as oaks, ashes, basswood, white pine and red maple. Group selection tends to promote increased species diversity in other hardwoods as compared to single tree selection. With group selection, groups of trees are selectively removed to create medium sized gaps in the canopy up to ½ acre in size (~75' to 170" wide). These gaps provide the necessary amount of sunlight to promote regeneration of mid-tolerant species.

This group selection harvest will seek to further develop the age structure of oak, ash and basswood and continue to promote tree health and quality. For this harvest, canopy gaps of 75-170 feet in diameter (drip-edge to drip-edge) must be created over 10% of the stand area. The gaps must be located where groups of poor form poles or sawtimber-size trees provide

opportunity and/or where there is advance regeneration already established. All suppressed trees down to 1" dbh within the gap must be cut down to promote the establishment or release of the desired mid-tolerant hardwood regeneration. The gaps must also receive at least 50% scarification of the soil to provide a suitable seedbed of adequate regeneration. Over the remainder of the stand, crop trees need to be released and individual trees 'thinned' to achieve the desired 84 sfa of basal area with 26 sfa in the poletimber class and 58 sfa in all sizes of sawtimber, while maintaining 90% crown closure. Harvesting needs to focus on removal from the overstocked size classes.



*Rock outcrop*

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**STAND #2**

**STAND SIZE: 9 acres**

**STAND DESCRIPTION: Black Oak with Mixed Hardwoods**

**Description of Stand:** This small stand is located just south of stand #1. It is located on a dry upland flat with a slight south facing aspect. The dry sandy soils limit the species and growth potential. Black oak thrives in such nutrient poor sites. Black oak makes up 57% of the total basal area stocking. Red oak and bitternut hickory each account for 9%. The remainder of the 77 sfa stocking includes elm, cottonwood, butternut, aspen, mulberry and hackberry. The stand has an average diameter of 14 inches with 20 inch trees common.

Because of the nutrient poor and excessively drained sand soils, the quality of the timber is fair to good. Again, advanced regeneration is lacking except for the areas along the field edge. This area receives adequate sunlight to encourage young seedling establishment.

**Invasive Species:** No invasive species were noted within the stand.

**EAB Implications:** No ash was noted within this stand, therefore an EAB infestation is not an issue.

**Timeline for Active Management:** Similar to stand #1, active management should be applied within the near future.

**Management Options:** The same management options apply as listed for stand #1. Both stands should be managed together. The difference between the two is based on species composition and soil type.

- **No Management.**
- **All-aged Management (Individual Tree Selection).**
- **Even-aged Management (Two-Cut Shelterwood).**
- **Group Selection.**

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STAND #3

STAND SIZE: 11 acres

STAND DESCRIPTION: **Oak and Mixed Hardwood**

**Description of Stand:** This stand is located at the north end of the park just west of Wilderness Road. Portions of this stand were once crop or pasture lands. There is still an old remnant field being taken back by the forest. The current forest is composed of larger oaks that were pasture trees and younger trees filling in underneath. The oak average 16 inches in diameter and account for 54% of the stand's stocking. Red, black and minor amounts of white oak are found on this well drained site. The young stand being established underneath consists of pockets of boxelder, mulberry, aspen and black locust. Other species found include hackberry, butternut, various hickories, elm and cottonwood.

The older larger pasture trees do not have good "timber" form but are healthy. The younger stand has a higher potential for producing quality.

**Invasive Species:** Honeysuckle, barberry and multiflora rose are all found within the stand. Their appearance is scattered and currently do not pose a real threat to the continued growth and health of the forest. Invasives are often found in and around areas of forest encroachment. The increased sunlight and lack of competition allow them to get a good start.

**EAB Implications:** Ash species account for 2% of the stands total population. An EAB attack would have minimal influence on the stand's composition.

**Timeline for Active Management:** This stand will not be due for management for another 25 years based on the stocking, diameter and site conditions.

**Management Options:** Management options remain the same as described for the previous stands. An opportunity to increase the number of mixed hardwood species exists and would be greatly benefitted by the use of All-Aged Management.

- **No Management.**
- **All-aged Management (Individual Tree Selection).**
- **Even-aged Management (Two-Cut Shelterwood).**
- **Group Selection.**



*Honeysuckle*



*Barberry*

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STAND #4

STAND SIZE: 24 acres

STAND DESCRIPTION: **Red Oak and Mixed Hardwood**

**Description of Stand:** Located in the far northwest corner of the park, this stand is dominated by red oak. The topography becomes rolling with several drainages bisecting the stand. Red oak makes up 50% of the stand 47 sfa basal area stocking. Mulberry accounts for 21% and elm species 14%. The stocking is low especially in the open areas directly within drainages. The oak average 17 inches in diameter, with the other species averaging 9 inches. Because of the topography, most of this area was spared from grazing. Past firewooding or logging may have taken place and played a role in the lower stocking levels. Overall, potential is good to produce a quality stand of timber.

**Invasive Species:** A few honeysuckle were noted particularly along the transition where grazing

took place.

**EAB Implications:** No ash were noted within the stand.

**Timeline for Active Management:** Management may be considered at any time. Active management in the near future would focus on removal of the poor quality trees and create canopy gaps for new regeneration to become established.

**Management Options:** Again, management options remain the same as described for the previous stands. Group Selection may be the best choice for this stand given current mix of species.

- **No Management.**
- **All-aged Management (Individual Tree Selection).**
- **Even-aged Management (Two-Cut Shelterwood).**
- **Group Selection.**

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STAND #5

STAND SIZE: 24 acres

STAND DESCRIPTION: **Mixed Hardwoods**

**Description of Stand:** This is sandwiched between the utility ROW and Vineyard Coulee Road. It contains a mix of hardwood species on moderately well drained soils. Black locust and river birch are the two most dominant species accounting for 48% and 33% of the stocking. Other species include boxelder, elm, black cherry, white ash, mulberry, hackberry, basswood and black walnut. The stocking is highly variable ranging from 70 sfa to 200 sfa. This stand appears to have been subject to past grazing and portions may have had crops planted. Black locust are found scattered throughout and as thick pockets. The locust obviously became established in the open field areas as they were left fallow. A few seedlings and saplings were noted but are generally lacking in most areas. A small 3-4 acre area of pine is located along the south end of the stand.

**Invasive Species:** Black locust were the only invasive species noted.

**EAB Implications:** The ash component of the stand is less than 2%, so EAB should have no noticeable affect on the tree population.

**Timeline for Active Management:** Active management should be considered in 25 years. Other than the black locust thickets the overall stocking needs to increase before management is attempted.

**Management Options:** Mixed hardwoods are best managed using Individual Selection or Group Selection.

- **No Management.**
- **All-aged Management (Individual Tree Selection).**

- **Group Selection.**



*Black locust seeding in old field*

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**STAND #6**

**STAND SIZE: 42 acres**

**STAND DESCRIPTION: Mixed Hardwoods**

**Description of Stand:** This stand is located around the field in the southeastern portion of the property. It contains a wide array of species. The varying topography, drainages and soil types support the variability. Over nineteen different species were identified. The three most prevalent are black walnut (22%), black locust (14%) and basswood (14%). Red oak, white and green ash, hackberry and hickories are also common. The drainages and coves allow for the production of quality and diversity in timber. The stand, however, is not homogeneous in species composition. The species make up ranges from dry oak ridges to river birch to ash and elm pockets to hickory and cherry.

This is a healthy and vigorous stand of timber that has an average diameter of 13 inches and an over stocking level of 100 sfa. Advanced regeneration was noted throughout the stand. It contains a healthy mix of all size classes.

**Invasive Species:** No invasive species were noted within the stand.

**EAB Implications:** This stand has one of the highest ash components within the park. Ash species account for 7% of the stocking. The ash are scattered throughout both the upland and

drainage areas. An EAB infestation would, again, only have a minor effect on this stand.

**Timeline for Active Management:** Management should be considered within 10-15 years as the stand reaches an overstocked condition.

**Management Options:** The same management options apply as listed for stand #5. Both stand should be managed together.

- **No Management.**
- **All-aged Management (Individual Tree Selection).**
- **Group Selection.**

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STAND #7

STAND SIZE: **40 acres**

STAND DESCRIPTION: **Mixed Hardwoods with Young Regeneration**

**Description of Stand:** This stand is located in the far southern end of the park. It appears to have been the last place farming/grazing took place. A young forest is becoming established. The stand contains a mix hardwood poletimber and saplings. The most abundant tree species are river birch and red oak both making up 21% of the stocking. Black oak (13%), white birch (11%), and aspen (11%) are common throughout. White oak, green ash, boxelder, elm, hackberry, black walnut, burr oak and cedar can all be found. The stand has an average diameter of 9 inches, with many larger old pasture trees present.

**Invasive Species:** Honeysuckle is well established within the stand. It most likely will pose a threat to future management of the stand.

**EAB Implications:** Ash species account for <2% of the stand's stocking. An EAB infestation will not severely impact the stand.

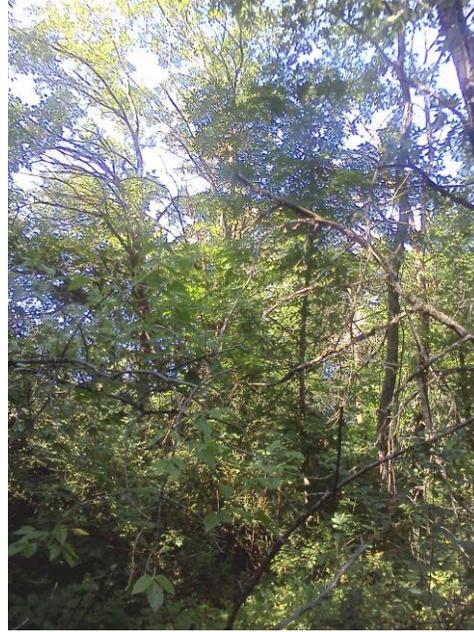
**Timeline for Active Management:** Active management should be considered in 20 years as the saplings grow into the poletimber size class.

**Management Options:** Management options follow those for stands # 5 & 6

- **No Management.**
- **All-aged Management (Individual Tree Selection).**
- **Group Selection.**



*Honeysuckle*



*Young forest*



## **SUSTAINABILITY**

Proper land and forest stewardship require that any and all management actions be undertaken with careful considerations to the future of the resource. Forest management projects are deliberate actions with obvious outcomes. Any management undertaken, be it harvesting, site preparation, trail establishment, or prairie restoration, on La Riviere Park should be well planned and heavy consideration given to the desired outcome.

While economics is a very important part of timber management, it should not be the dominant factor. Site potential, desired outcome and future of the resource should all trump economics. Many harvesting options exist that can be very detrimental to the future of the forest. Removing only select species, to feed a hungry timber market, harvesting only “mature” or large trees, or cutting only the best quality trees may maximize income, but can and will jeopardize the future of the forest resource.

All management activities should be undertaken with guidance of a forester, who can evaluate the resource and well as the economics and future productivity of the forest. A professional forester will be able to determine which trees need to be harvested and the appropriate method to do so, that will result in a sustainable harvest.



## RECREATION CONCERNS

This park is accessed by a large number of recreational user groups. The forested area of the park houses a horseman's campground with numerous bridle trails. Hiking and nature trails weave their way around the through the entire park. An archery range is also located within the wooded area.

As trails were encountered during the forest assessment, each was evaluated for erosion and soil stability issues. The majority of trails were in excellent condition. Gravel was used to armor the steep or heavily traveled sections of trail. Only on a few short sections of trail was rutting noted. Continue monitoring of all trails is necessary, especially in times of wet weather and after a period of heavy usage.

A recreational specialist should be contacted to assist with further evaluation of the recreational potential of the park.



*Rutting of a bridle trail*



*Archery range.*



## HONEYSUCKLE CONTROL

### **Mechanical Control**

Since honeysuckle roots are fairly shallow, small- to medium-sized plants can often be dug or pulled. Plants are particularly easy to remove in spring when the soil is moist. A shovel or grubbing hoe will often loosen the roots enough to allow a fairly large plant to be pulled. A mattock or weed wrench can also be used. In sensitive areas, this type of physical removal may disturb the soil and lead to more invasions, in which case it should be avoided. Soil should be tamped down to discourage further establishment of honeysuckle seedlings.

In fire-adapted communities, spring prescribed burning may kill seedlings and top-kill larger plants, although results have been mixed. Resprouts may occur, so repeated prescribed burning annually or biennially for several years may be necessary.

### **Chemical Control**

Bush Honeysuckles can be controlled by cutting the stems at the base with brush-cutters, chain saws or other tools. After cutting, stumps should be treated immediately with a 20% active ingredient (a.i.) glyphosate solution using a low-pressure, hand-held sprayer, sponge applicator, or contact solution bottles. Stumps can be treated later after cutting with the same herbicide solution, although it may not be as effective. Two cuts per year--the first in early spring followed by one in early autumn--are recommended. If not followed by herbicide treatment, cuts made in winter will encourage vigorous resprouting when the plant comes out of dormancy. Triclopyr formulated for water dilution is not effective on this species: triclopyr formulated for dilution in diesel fuel can be used for applications on cut stumps throughout the year, although winter application has in some cases proven to be 100% effective, whereas spring treatment has shown 70-80% effectiveness. If stump treatment is not done at the time of cutting, foliage on the resprouts may be sprayed, taking care of non-target plants.

Where burning is not possible a 1.5% a.i. glyphosate solution can be sprayed to cover the foliage. Spraying after the plant blooms may kill mature and seedling plants. Spraying prior to the emergence of native shrubs and ground flora is the safest time to spray without impacting native species. In wetlands, glyphosate formulated for use over water must be used.

Both mechanical and chemical control methods must be repeated for at least three to five years in order to stop new plants emerging from the seed bank. Re-invasion by bush honeysuckles may be aided by "underplanting" disturbed areas with tolerant native species.



## BLACK LOCUST CONTROL

### **Mechanical Control**

Cutting black locust stimulates sprouting and clonal spread. For this reason, additional treatments are recommended along with cutting the stems. Mowing and burning temporarily control spreading, but mowing seems to promote seed germination, and burning stimulates sprouting. Girdling is ineffective because it kills the stem but does not prevent sucker formation. Annual haying may be adequate to control first year seedlings and prevent spreading in prairie or old-field communities. Bulldozing may be an option on disturbed lands.

### **Chemical Control**

The extensive root system of black locust spreads herbicides over large areas. Basal stem application is preferred for treatment because it is selective and easy to apply. The herbicide should be applied in a band at least 6 inches high all around the trunk approximately 12 inches from the ground. Triclopyr formulated for dilution in diesel fuel or mineral oil is currently the herbicide of choice for black locust. Both diesel fuel and mineral oil release volatile organic compounds into the immediate area. Although more expensive, mineral oil is potentially less toxic to neighboring organisms. The triclopyr/oil mixture may also be applied to a girdle cut at standing height or to cut stumps.

For small isolated plants or thick patches under 5 feet in height (such as those resulting from cutting or fire), fosamine ammonium can be applied as a foliar spray. Fosamine ammonium kills plants by inhibiting leaf bud growth and flower formation in the spring. Fosamine ammonium should be applied at the end of the growing season. In order to effectively curb regeneration, every branch or stem must be sprayed because missed stems will leaf out. Triclopyr mixed with water may also be used effectively as a foliar spray in the latter half of the growing season.

Glyphosate can be applied to foliage of actively growing trees using a hand sprayer (1-1.5% active ingredient solution). However, foliar glyphosate spray should not be applied in high quality natural areas because it is a nonselective herbicide. Black locust stems can be cut at the base with brush-cutters, chainsaws, or hand tools; stumps should be treated immediately with a 20% active ingredient solution of glyphosate. The treatment works best when applied in late summer, early fall, or during the dormant season.

*(Source: Wisconsin Department of Natural Resources)*

# ATTACHMENT 1:

## Volume & Value Tables

*The volumes were collected from sample plots established within the stand. Values were derived from current (2011) prices actually paid for standing forest products (stumpage) in the area as compiled by the Wisconsin Department of Natural Resources. Volumes and values represent ALL current timber estimated to be growing in the stand. The value represents the total potential income if ALL the timber were harvested. Less income will be realized as various species or products are retained on the property for continued growth and proper management.*

Estimated cordwood & sawlog volumes and stumpage values for  
**La Riviere Farm Park**

Species	Cordwood Volume (Cords)	Stumpage Rate (\$/cord)	Sawlog Volume (MBF)	Stumpage Rate (\$/MBF)	Stumpage Value
Misc. Hardwood	1836	\$9.00	33.3	\$100.00	\$19,854.00
Red Oak	740	\$10.00	105.5	\$241.00	\$32,825.50
White Oak	350	\$10.00	23.2	\$172.00	\$7,490.40
Black Oak	245	\$10.00	12.5	\$140.00	\$4,200.00
Black Walnut	240	\$9.00	25.3	\$1380.00	\$37,074.00
Basswood	180	\$7.00	20.4	\$95.00	\$3,198.00
Ash Species	150	\$9.00	6.3	\$100.00	\$1,980.00
Aspen	139	\$13.00	-	-	\$1,807.00
Cedar	30	\$8.00	-	-	\$240.00
<b>TOTALS:</b>	<b>3910</b>		<b>226.5</b>		<b>\$108,668.90</b>

# ATTACHMENT 2:

## *Glossary of Terms*

### GLOSSARY OF COMMON FORESTRY TERMS

<u>Term</u>	<u>Definition</u>
Basal Area	Same definition as sfa below.
Clearcut	Method of harvesting in which all trees are removed at the same time. It is effective management for trees which are shade intolerant and cannot thrive under a forested canopy (ie. Aspen, red maple, jack pine)
Dbh	Diameter at breast height. The diameter of the tree as measured at 4½ feet above the ground.
Forest Management	The practical application of biological, physical, quantitative, economic and social principles to regeneration, management, utilization and conservation of forests to meet specified goals and objectives while maintaining the productivity of the forest. Forest management includes management for aesthetics, fish, recreation, urban value, water, wildlife and wood products.
Forest Succession	A predictable series of changes in vegetation over time.
Invasive	A species that does not naturally occur in a specific area and whose introduction does or is likely to cause economic or environmental harm or harm to human health.
Overstory	The upper portion of the trees (crowns) that make up the main canopy in the forest.
sfa	Square feet per acre, also known as basal area. The cross-sectional area 4½ feet above ground expressed in square feet per acre of all trees with a diameter of 5 inches and larger. This represents the amount of solid wood on an area basis.
Understory	Younger trees and shrubs that make up the lower canopy in the forest.

# **ATTACHMENT 3:**

## *Forest Area Stand Maps*