Fermi 3 Terrestrial Vegetation Survey

Final Report

Prepared for

The Detroit Edison Company

One Energy Plaza
Detroit, Michigan 48226

Prepared By

Black & Veatch Corporation

11401 Lamar Avenue
Overland Park, Kansas 66211

November 2009

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1.0 Introduction and Background

This report provides a summary of terrestrial vegetation surveys conducted from June 2008 to May 2009 on the grounds of the Detroit Edison Company's (DECo) Enrico Fermi 2 Nuclear Power Plant (Fermi site). The surveys were conducted based on discussions with the DECo and the Nuclear Regulatory Commission (NRC) during the Fermi T1 and T2 meetings. The DECo proposes to construct a new nuclear reactor, known as Fermi 3, on the Fermi site. Because plant communities would be affected by the construction and operation of the facility, this and other studies are being done to identify the species of vegetation and habitats present within the project site, particularly those associated with the onsite portion of the Detroit River International Wildlife Refuge (DRIWR) (refer to Figure 1). A preliminary discussion of impacts to listed species (i.e., endangered or threatened species or species of special concern) also is presented in this report.

The Fermi site is on the west shore of Lake Erie (refer to Figure 2), approximately 24 miles northeast of Toledo, Ohio, and 30 miles southwest of Detroit, Michigan. The Fermi site lies within parts of Sections 16, 17, 20, and 21 in T6S R10E in Frenchtown Township, Monroe County, Michigan. The U.S./Canada international border runs through Lake Erie approximately 7 miles east of the Fermi site.

These objective surveys were conducted to confirm subjective data obtained from earlier subjective surveys and to further characterize the terrestrial vegetation on the Fermi site. Secondarily, the survey aided in determining if important species[1] inhabit the site to guide decisions concerning avoiding, minimizing, or compensating for impacts to these species resulting from the proposed expansion. As such, vegetation surveys were focused on portions of the Fermi site where construction and operation of Fermi 3 could potentially affect plant communities, whether from habitat destruction, conversion to other habitat types, or through general habitat degradation. This report provides the findings from all the survey sessions. The plant species encountered during transect sampling in this study are presented in Table 1.

In addition to the current study, several previous vegetation studies were performed on the property. The NUS Corporation examined the site during 1973 and 1974 as part of the initial site investigation before Fermi 2 Power Plant construction. In 2000, the DECo Fermi 2 Plant Wildlife Habitat Team, in cooperation with the Wildlife Habitat Council, prepared a Wildlife Management Plan, including a vegetation list. The Wildlife Management Plan was recertified in 2002, resulting in an updated vegetation list. More recently, reconnaissance surveys of the Fermi site and vicinity were made by

[1] NUREG-1555, Table 2.4.2-1 defines an important species as: 1) a species listed or proposed for listing as threatened, endangered, candidate, or species of special concern by the United States Fish and Wildlife Service (USFWS) or the state in which the project is located; 2) commercially or recreationally valuable species: 3) species essential to the maintenance and survival of rare and commercially or recreationally valuable species; 4) species critical to the structure and function of local terrestrial ecosystems; or 5) species that could serve as biological indicators of effects on local terrestrial ecosystems.

Black & Veatch Corporation (B&V) between November 2006 and May 2008. Ducks Unlimited conducted a wetland delineation in May and June 2008 and reported plant species incidentally observed during a wetland delineation, which are provided in Appendix D of its report. Because data collection in these studies was not uniform, the species indicated as present are provided in Table 2 without reference to cover, abundance, or other data from those studies. The presence data provided in Table 2 provides a point of reference for changes in conditions through time on the Fermi site.

2.0 Project Setting

Based on the Fermi 3 Environmental Report[2], land use on the Fermi site is divided into developed areas and undeveloped areas, much of which are wetlands. The undeveloped portion of the Fermi site is a part of the DRIWR, known as the Lagoona Beach Unit. Many of the forested areas on the site are subject to flooding, although they are typically dry for most of the year in any year, with normal precipitation. Undeveloped areas comprise approximately 52 percent of the land (approximately 656 acres) within the Fermi site boundary, most of which are wetlands of various types (e.g., high and low marsh, wet meadow, forested wetland, scrub-shrub wetland, shallow open water, etc.).

The Great Lakes Coastal Wetlands were the dominant landform on the site before European-American settlement, but much of the previous wetland character was diminished by past landscape modifications for agriculture and lakeshore development. An aerial view illustrates the interspersion of open water, emergent marsh, forested areas, cultivated and fallow fields, and developed areas across the site (refer to Figure 3). Multiple roadways fragment some of the undeveloped areas, though most of these are not paved. The most remote section of the site is in the southeast where little development has occurred, although the entire site has experienced some level of past disturbance. Habitats on the site generally consist of mixed hardwood, emergent wetland, shallow open water (i.e., ponds), restored prairie, old-field grassland, agricultural fields, scrub-shrub habitat, lakeshore, rivers, canals or ditches, and developed areas (refer to Figure 3). Developed areas generally lack vegetative cover and are predominately concrete, asphalt, or other structural materials. Old-field grassland generally is a habitat type associated with developed areas along Fermi Drive that was planted with a variety of non-native grasses to provide cover.

The northern and southern areas of the Fermi site feature large lagoons, while the western portions predominately contain wooded areas and two lakes known as the Quarry Lakes. To prevent flooding, areas containing parts of the power plant facilities were elevated during Fermi 2 construction using crushed limestone taken from onsite quarries, which subsequently were allowed to fill with groundwater, forming the two lakes. The eastern portion of the Fermi site adjacent to Lake Erie contains the power plant structures, four natural gas peaking units, and a switchyard for a transmission line extending west. Portions of the transmission line corridor that was originally dominated by shrubs were developed into a prairie restoration area (Transects 1, 2, and 15 on Figure 3).

[2] *Fermi 3 Combined License Application Part 3: Environmental Report*, September 2008, the Detroit Edison Company as accepted for NRC review on November 25, 2008 and accessible online at http://www.nrc.gov/reactors/new-reactors/col/fermi.html.

Surface water is seasonally to semipermanently present throughout the majority of the undeveloped portions of the site, which includes roughly 60 percent of the land area. The average annual precipitation is 31.5 inches, with monthly precipitation rates relatively even across the year. The site receives surface runoff from a 2,440-acre drainage basin, with cropland, wetland, and wooded land as the primary cover types. Of these, cropland is the dominant land use. Some surface water from Lake Erie enters the site during periods of high water and storm events, primarily along the lakeshore, together with several small creeks extending into marshy areas (e.g., Swan Creek north of the Fermi site).

3.0 Methods

Terrestrial vegetation sampling was conducted by B&V, with field assistance provided by AECOM staff. Four sampling sessions were used through the growing season to provide the greatest potential for discovering plant species occurring on the property. The sessions were conducted on the following dates: July 21 to July 24, 2008; October 7 and 8, 2008; May 18 to 20, 2009; and June 29 to July 1, 2009. The July, October, and June sessions were conducted by R. Brooks (B&V) and J. Wilson (AECOM). The May 2009 session was conducted by E. Shadrick (B&V) and J. Wilson (AECOM). The study was conducted using a sampling protocol that was reviewed by the DECo and NRC staff and subsequently modified.

Vegetation sampling was accomplished using a combination of line transect and plot methods (Brower et al., 1998). Fifteen 50-meter line transects were established within the plant community types previously mapped on the Fermi site (refer to Figure 3). Transects were positioned in areas expected to be affected by Fermi 3 construction, generally representing the plant communities present. Vegetation along each transect was sampled using a modified line intercept technique, in which plants that intercept the line are recorded. Plots were sampled at each end and the middle of each transect. These plots included three nested areas, as discussed in more detail in Section 3.2 and illustrated on Figure 4. In addition to plot and transect sampling, three forest cruises were conducted during the July 2008 session to gather additional information on tree species. Each of these sampling methodologies is discussed in greater detail below. Data parameters used to analyze the survey results also are described.

On transects, plots, and the forest cruise, vascular plant species were recorded to the lowest possible taxon, usually to the species level. In cases where identification of species was not possible because of specimen condition (i.e., lacking distinguishing characteristics because of season or dormancy), the lowest identifiable taxon was recorded (usually the genus level). Nonvascular vegetation (e.g., mosses, lichens, and fungi) was not recorded.

Sampling focused on areas potentially affected by Fermi 3 construction activities or operation after construction, based on the site design as referenced in a July 2009 letter to the NRC. Because the current study was focused on terrestrial vegetation, only one transect was located in emergent wetland (Transect 5), three transects were located in restored prairie (Transects 1, 2, and 15), one was located at the Lake Erie shoreline (Transect 14), and the remainder were in woods. The primary objective of the vegetation survey was to provide quantitative data on the abundance, density and cover of plant species on the Fermi site. While species richness was established during previous surveys of the site (refer to Table 2), new sampling provides the potential for the addition of previously undiscovered species.

3.1 Transects

As discussed above, a total of 15 transects, each 50 meters long, were established on the Fermi site. Two polyvinyl chloride (PVC) pipes over a rebar inserted into the soil marked the ends of each transect and made relocation easier (refer to Photos 1, 2, and 3 in Appendix E). As each transect was walked, the transect length intercepted by each plant species was recorded in centimeters (cm) and the values summed for each species to determine the percent species cover for that transect. Where more than one transect was used to sample the same plant community, the scores were pooled. In addition, a cover class was assigned to each species as follows:

- less than 1 percent = T
- 1 to 5 percent = 1
- 6 to 15 percent = 2
- 16 to 25 percent = 3
- 26 to 50 percent = 4
- 51 to 75 percent = 5
- 76 to 95 percent = 6
- greater than 96 percent = 7.

3.2 Plots

Plot data were collected in three locations along each transect, as discussed above and illustrated on Figure 4. Three plot sizes were used to sample different vegetation types as described below. Data from 1-meter squared (m^2) plots for each transect were pooled because sample sizes were small. These plots were sampled in all survey sessions. The other two plot sizes were sampled once in July 2008 as follows:

- 1-m^2. Herbaceous layer: all nonwoody species and woody-stemmed plants less than 3 feet tall. The total cover in a plot often exceeds 100 percent because plant projections often overlap. Unvegetated or bare ground also was estimated.
- 5-m^2. Shrub and sapling layer: woody-stemmed plants between 3 and 20 feet tall with a diameter at breast height (DBH); (approximately 4.5 feet above the ground) between 0.4 and 5.0 inches. The number of woody species present in the plots and the quantity for each species were determined. Standing dead shrubs or other woody plants (e.g., woody vines) were recorded.
- 9-m^2. Trees: woody plants more than 20 feet tall and larger than 5 inches DBH. The number of trees present in the plots and the quantity for each species was determined. Standing dead trees or other woody plants (e.g., woody vines) were recorded.

3.3 Forest Cruise

In addition to transect and plot sampling, three forest cruise surveys were conducted in July 2008 to further evaluate trees on the Fermi site. Forest cruise data collection was not originally proposed, but was added as another methodology because additional time became available during a season suitable for easy identification of trees. The forest cruise locations were selected based on a representative sample without reference to other transects or plots. The first location was near Transects 6 and 7, and the other two were near Transects 10 and 11 (refer to Figure 3). (Note: A forest cruise is an estimate of what species of timber are present and collection of basic measurements for various purposes. Rather than measuring all the trees in a forest, a representative sample is collected from which the entire stand can be extrapolated.) The forest cruise surveys consisted of walking approximately 100 yard transects through the forest and recording species and size for all trees 5 inches DBH or larger within 10 meters on either side of the transect center line. The information gathered provides additional data on tree species present, frequency of occurrence, the range and average size of individuals present, and proportions of live and dead standing timber within the transects.

4.0 Data Parameters and Data Analysis

Data sampling generated information regarding the various characteristics of the plant communities and species present. This information was then used to describe the plant community. Specifically, information regarding the following was obtained:

- Abundance (a count of individuals in each species)
- Density (abundance per unit area)
- Cover (measured here as "Relative Species Cover," which is expressed as the proportion of a horizontal projection of the ground surface along a transect or inside a sampling plot by a species compared to the sample length [transect] or area [plot])
- Richness (the number of species in a defined area).

5.0 Results and Discussion

The plant species encountered during this study are presented in Table 1. Similar numbers of species were reported on transects in each survey session (refer to Table 1), although the species composition on the transects was slightly different during each sampling session because of seasonal changes (refer to Appendix A). For example, spring-blooming species were not usually present in October. Late-blooming species, such as asters, were not readily identifiable during the July session and were better represented in the October session.

The current study identified 169 species; 24 plants were identified only to the genus level (refer to Table 1). Transects 1 and 15 had the highest number of species (63 and 78, respectively), while the lowest number of species was recorded on Transect 5 (refer to Table 1). The low number of plant species on Transect 5 is directly related to the location of the latter transect in emergent wetland, with a near monoculture of cattails (*Typha* spp.) and Reed Canary Grass (*Phalaris arundinacea*). Transect 15 is located in a restored prairie habitat, crossing into a scrub-shrub habitat that supports a much larger number of species because of greater habitat diversity.

Like the present study, the earlier studies did not include significant wetland vegetation with the exception of the Ducks Unlimited wetland delineation study (refer to Table 2). Emergent vegetation may be underrepresented in this and past studies, although the dense and undesirable spread of cattails, Reed Canary Grass and Common Reed (*Phragmites australis*) in many areas of the site have eliminated the habitat for species that might otherwise be present. Plant species dominating emergent wetlands on the Fermi site, such as Common Reed (*Phragmites australis*), are much more abundant than indicated by the transect data in this study because of a focus on terrestrial habitats.

Vegetation cover was determined using the transect intercept length on transects or the percent cover for each species in plots. The results are presented in Tables 3a through 3e grouped by habitat and in Table 4 for 1 m^2 plots. The data from transect lengths were pooled to derive an overall cover estimate for each species. The five species providing the greatest cover over all the transects were Reed Canary Grass (23,850 cm); Big Bluestem (21,508 cm); Jumpseed (13,894 cm); Moneywort (9,468 cm); and Garlic Mustard (7,910 cm). When considered by habitat, the following results were obtained (greatest cover to least in cm):

- Restored Prairie (Transects 1, 2 and 15): Big Bluestem (21,508); Canada Wild Rye (3,921); Little Bluestem (2,494); Indian Grass (2,233); and Field Thistle (1,493).
- Lakeshore (Transect 14): Garlic Mustard (5,999); Tall Goldenrod (461); Sandbar Willow (315); Virginia Creeper (132); and Riverbank Grape (131).

- Emergent Wetland (Transect 5): Blue Cattail (6,025); Reed Canary Grass (6,011); Narrow-leaved Cattail (5,189); Swamp Agrimony (30); and River Bulrush (20).
- Mixed Hardwood Forest (Transects 4, 6, 7, 8, 8, 10, 11, 12, and 13): Reed Canary Grass (17,330); Jumpseed (13,894); Moneywort (9,246); Poison Ivy (7,051); and Whitegrass (5,202).

For the $1m^2$ plots, the five species contributing most to cover were Reed Canary Grass (1,412); Jumpseed (1,314); Moneywort (1,151); Big Bluestem (1,085); and Blue Cattail (630) (refer to Table 4). This is consistent with the results from transects.

Abundance is normally determined as a count of the number of individuals in a species for a given location. Because individuals of some species were difficult to discern in the field (e.g., grasses or vines), the number of times a species was encountered within each transect was used as an estimate of abundance, with each encounter representing one individual of that species. The five most abundant species for all sessions in all habitats were Jumpseed (*Polygonum virginianum*; 1,260 encounters); Moneywort (625); Poison Ivy (595); White Avens (538); and Garlic Mustard (323), representing 43 percent of all encounters (refer to Table 5). When considered by habitat, the following results were obtained (most abundant species to least):

- Restored Prairie (Transects 1, 2 and 15): Big Bluestem (131), Black-eyed Susan (100), Pinnate Prairie Coneflower (98), and American Hogpeanut and Wild Strawberry, tied (89).
- Emergent Wetland (Transect 5): Reed Canary Grass (77), Blue Cattail (6), Narrow-leaved Cattail (3), and River Bulrush and Swamp Agrimony, tied (2).
- Lakeshore (Transect 14): Garlic Mustard (53), Tall Goldenrod (30), Virginia Creeper (22), Riverbank Grape (19) and Sandbar Willow (14).
- Mixed Hardwood Forest (Transects 3, 4, 6, 7, 8, 9, 10, 11, 12 and 13): Jumpseed (1,260); Moneywort (597); Poison Ivy (586); White Avens (520); and Virginia Creeper (281).

Taken together, the five most abundant species in each surveyed habitat represent 52 percent of all encounters. The breakdown by habitat (the percent represented by the top five species in the same order above) is 29 percent, 96 percent, 67 percent, and 58 percent. This suggests that the prairie habitat has a more even distribution of abundance than the other habitats. The wetland habitat is highly concentrated in a few species.

Species richness is the number of species present in a defined area. It is often used as a rough measure of diversity (Brower et al. 1998). Diversity, in general terms, is the number of species, the abundance of those species, and their distribution in a defined area (Wilson 1992). The general quality of an area can be inferred using appropriate measures of diversity; that is, ecosystems or habitats with many species evenly distributed throughout tend to be healthier than the same areas dominated by just a few species

(Alonso et al. 2004). Species richness for this study was determined using species counts from transects (refer to Table 1). Quarterly results were pooled to derive an overall count for each transect, thereby including both species present in all sessions and those present in only one. Figure 5 illustrates the species richness using a species area curve derived from species numbers versus cumulative distance, which is the length of each transect (5,000 cm). In this type of analysis, a straight horizontal line represents maximum diversity, with species counts and abundance within a species evenly distributed. A straight vertical line represents the least diversity, with one or just a few species. As shown on Figure 5, the plant species across the Fermi site are relatively evenly matched for the number of species, as detected by the transects. The exceptions are Transects 1 and 15 in the restored prairie, representing high species counts; and Transect 5 in emergent wetland, representing the lowest species richness.

There were 234 trees identified in the July 2008 forest cruise, with 188 of these (80 percent) being live trees (refer to Table 6). The most frequently encountered species were Silver Maple, Red Oak and American Basswood. The largest trees on average were Eastern Cottonwoods, with Red Oaks close behind. The most numerous trees on the three forest cruise transects were Silver Maple and Red Oak. It should be noted that maples generally limit oak regeneration by shading seedlings, while shade-tolerant maple seedlings can outcompete oak seedlings, eventually replacing them (Bowles et al. 2005). Thus, the forest species composition is likely to change as mature Red Oaks die and are replaced by maples.

5.1 Comparison with Earlier Studies

Trends in species presence that reflect changes in the plant community composition through time (succession) can be detected by considering a range of studies conducted on a site through time. This comparison also allows for a rough test of the efficacy of a given study in detecting less commonly encountered species, such as those listed as threatened, endangered or relatively rare species.

Direct comparison between studies is not possible because earlier studies at the Fermi site may have used different methods for sampling vegetation. However, similar plant communities on the Fermi site were sampled and should have approximately the same species composition. Therefore, the comparison with earlier studies is based primarily on the plant species reported by the various studies. No measures for abundance, density, or cover were considered. Table 2 provides the list of all plant species and the studies from which the species were reported.

Of the 394 plant species identified in all the studies on the Fermi site since 2000, only five species have appeared in every study (in alphabetical order by common name: Common Reed, Eastern Cottonwood, unidentified goldenrods, Silky Dogwood, and Wild Strawberry). An additional 23 species have appeared in four studies, 38 species have been reported in three studies, 150 appeared in two studies and 177 have been reported in a single study.

The greatest number of plant species at the Fermi site previously reported was for the study conducted between 2006 and 2008 (refer to Table 2), which yielded 219 plant species, including four species identified only to the genus level because of specimen condition (e.g., before or after flowering when identification is more difficult). The lowest species count for a study was the Ducks Unlimited study, which was not a vegetation study and primarily recorded only dominant vegetation in wetlands on the site.

Differences in species composition through time on a site or a defined area may reveal trends that are not otherwise apparent. For example, the two studies conducted for Wildlife Habitat Council (WHC) certification represent conditions over approximately 3 years (2000 to 2002). The studies conducted by B&V cover a period of approximately 4 years (2006 to 2009). A total of 59 species were reported from both the earliest studies and the B&V studies (excluding the Ducks Unlimited study because it was focused on one habitat type). For the WHC studies, 90 species were not reported present by B&V. B&V reported 229 species that were not reported from the WHC studies (Table 2). Many of the species unique to the WHC studies were relatively conservative species, requiring a narrow range of conditions for successful persistence. A larger proportion of the unique species to the B&V studies are pioneer species, weedy species tolerant of disturbance, or invasive species that tend to exclude species and occupy large areas. This is further supported by considering abundance. As detected by transect and plot sampling in the current study, the five most abundant species are, in descending order of abundance: a weedy species of woods, an invasive species in shaded habitats, two disturbance-tolerant weedy species, and a species invasive in woods (Jumpseed, Moneywort, Poison Ivy, White Avens, and Garlic Mustard). Therefore, based on this review, the Fermi plant communities are apparently becoming dominated by less conservative plant species at the expense of conservative species intolerant of the current conditions.

5.2 Protected Species

Protected species found in Monroe County, Michigan, in the vicinity of the Fermi site are presented in Table 7. Requests for data concerning known or potential occurrences of endangered, threatened, candidate, or special concern species on or near the Fermi site were submitted to the USFWS and to the Michigan Natural Features Inventory (MNFI) as part of an Environmental Report (ER) for submittal to the NRC in support of a Combined Operating License Application (COLA) for the proposed Fermi 3 project. In addition, a list of threatened, endangered, or candidate species for Monroe County, Michigan, was obtained online from the MNFI [http://web4.msue.msu.edu/mnfi/data/cnty_dat.cfm?county=Monroe].

The USFWS indicated that the project occurs within the potential range of some federally listed species, but that it has no records of species occurrences for the Fermi site nor is there any designated critical habitat in the area. The USFWS further stated that no further action is required under the Endangered Species Act (ESA). If a new action or modification of existing plans is proposed, additional consultation with USFWS may be necessary.

Because the Canada shoreline is within 10 miles of the Fermi site, a list of species considered threatened, endangered or special concern under the Species at Risk Act (SARA) in the deciduous forest region of Ontario, Canada, is provided in Table 8. Eight plant species are listed in both the United States and Ontario, Canada, near the Fermi site (*Agalinis gattingeri*, *Camassia scilloides*, *Hibiscus moscheutos*, *Hydrastis canadensis*, *Justicia americana*, *Morus rubra*, *Platanthera leucophaea* and *Quercus shumardii*; refer to Tables 7 and 8). However, most of the plant species on the SARA list are not likely to disperse to the U.S. side of the international border nor are existing populations likely to be affected by the proposed Fermi expansion. Therefore, the SARA list is included primarily for informational purposes.

In responding to the request for known occurrences in the Fermi vicinity, the MNFI indicated there are four terrestrial plant species known to occur on or near the Fermi site that could be affected by the project (American Lotus [*Nelumbo lutea*], Trailing Wild Bean [*Strophostyles helvula*], Giant Arrowhead [*Sagittaria montevidensis*], and Frank's Sedge [*Carex frankii*]). These species are listed in Table 7 and discussed in more detail in the next section. There are no established agency survey protocols for these species, and transect sampling is not an effective methodology for surveying for specific species on large tracts. In mixed plant communities, transect positioning that ensures a representative sample of the entire plant community is nearly impossible, because rare or highly clustered species are likely to be missed by the transect. Plot sampling or irregular pedestrian transects in habitat deemed highly suitable for a target species tend to be more effective at locating rare species. Therefore, pedestrian transects in areas with a high probability of containing the above mentioned species were used in this study to locate populations of the listed species.

In addition to the four MNFI species mentioned above, 49 other vascular plant species were added from the Monroe County MNFI element occurrences list (refer to Table 7) to ensure that consideration for possible unreported species occurrences was included.

Four species listed by the MNFI as threatened, endangered, candidate, or special concern species were observed on the site or are potentially present, based on past observations during other studies (Frank's Sedge, Swamp Rose-mallow [*Hibiscus moscheutos*], Red Mulberry [*Morus rubra*], and American Lotus; refer to Table 2). Two of the species identified as occurring on or near the Fermi site by the MNFI were not located during any of the studies at the Fermi site (Trailing Wild Bean and Giant Arrowhead). Two species were delisted effective April 9, 2009 (Swamp Rose-mallow and Frank's Sedge). In addition, although located during a previous study during 2006-2008, Frank's Sedge was not relocated during the current study.

5.3 Determination of Effects on Listed Species

In accordance with the MNFI survey guidelines, the following is a brief discussion of the listed species (threatened, endangered, or candidate species or species of special concern) known to be present, or potentially present based on available habitat, on the Fermi site

and possible effects on these species arising from the proposed project. No detailed mitigation measures are proposed here and are outside the scope of this study. Mitigation recommendations for some species are included to indicate a general course or strategy to reduce impacts.

Forty-eight plant species reported by the MNFI for Monroe County were excluded from further consideration because they were not reported as occurring near the Fermi site by the MNFI and were not observed during this study or in the past. These species are presented in Table 7. During the terrestrial sampling conducted from 2006 through the current study, field investigators were aware of a potential for the occurrence of listed species and had access to listed species information. Surveys conducted during the current study from 2008 to 2009 included searches for listed species with a high probability of occurrence in appropriate habitats.

Four MNFI-listed plant species were observed in this or previous surveys at the Fermi site (refer to Table 2). These are Frank's Sedge, Swamp Rose-mallow, Red Mulberry, and American Lotus. An unidentified lettuce (*Lactuca* sp.) and an unidentified arrowhead (*Sagittaria* sp.) were encountered that match genera for listed species, Woodland Lettuce (*Lactuca floridana*) and Giant Arrowhead (*Sagittaria montevidensis*), respectively. Conclusive species identification could not be made in either case. Appendix F contains MNFI survey forms for one listed species observed during this survey. Each of the species reported as potentially present on the Fermi site is discussed in more detail below.

5.3.1 Frank's Sedge (Carex frankii)

Frank's Sedge was previously listed as a State Species of Special Concern, but was delisted in 2009 (MNFI 2007). It is found in a variety of habitats, including openings in floodplain woodlands, prairie sloughs, wet dolomite prairie, fens and seeps, sedge meadows, soggy areas along rivers, and ditches. This sedge can be found in both disturbed and higher quality wetlands, sometimes in great abundance (Hilty 2002).

The sedge was observed in the transmission line prairie in 2005, but no voucher specimen was available to verify the occurrence, and it was not relocated during the current study (refer to Table 2). Late spring (May to June) is the time for optimal sedge identification, after fruits have developed, but before they shatter. Searches for Frank's Sedge early in 2009 in lakeplain wet-mesic prairie and floodplain forest habitats on the Fermi site were unsuccessful. The preferred habitats of this species will not be significantly reduced or affected by the proposed Fermi 3 construction. Therefore, impacts to this species are unlikely to jeopardize its existence on the site.

5.3.2 Swamp Rose-mallow (Hibiscus moscheutos)

This was previously a State Species of Special Concern, but was delisted in 2009 (MNFI 2007). It occurs in emergent marshes and adjacent disturbed ground, including the inundated margins of agricultural fields and wet ditches.

This species was observed on the Fermi site during surveys conducted from 2006 to 2008 (refer to Table 2). It is present along the shoreline of the dredge disposal facility near Boomerang Road, west of Transect 14 (refer to Figure 2). This area is not expected to be adversely affected by activities related to construction or operation of the proposed expansion. Dredge disposal is a routine annual activity in the dredge disposal area under an existing U.S. Army Corps of Engineers permit. Based on currently available information, the survival of the existing population is not likely to be jeopardized by proposed activities.

5.3.3 Red Mulberry (Morus rubra)

This species is state threatened. It is a small tree of valleys, floodplains, and low, moist hillsides (Burns and Honkala 1990). In southern Michigan, it usually is confined to riparian floodplains (MNFI 2007). Fruits produced by mature trees are foraged by a wide variety of wildlife. Hybridization with White Mulberry (*Morus alba*), a tree native to China that has naturalized throughout the eastern United States, is a threat to the survival of Red Mulberry (Burns and Honkala 1990).

Red Mulberry was reported in earlier studies, but it has not been reported at the Fermi site since 2002 (refer to Table 2). Riparian floodplain on the Fermi site is limited to portions of the site near Swan Creek and the south lagoon outlet to Lake Erie, both of which would not be affected by Fermi 3 construction. Therefore, if present, the species is not likely to be affected by the proposed activities.

5.3.4 American Lotus (Nelumbo lutea)

American Lotus is a state threatened species. However, large local populations of American Lotus are found in scattered areas of southern Michigan, reaching an apparent peak in Monroe County (MNFI 2007). It occurs in shallow water, usually in marshes, quiet backwaters and near-shore areas of large rivers and lakes. A large perennial plant, it grows from thick tubers and flowers in mid-summer (MNFI 2007). American Lotus is notable for its ability to support itself above the water level during a drawdown period; other aquatic plants have floating leaves that rise or fall with the water level.

American Lotus is abundant in the south and north lagoons and in open water areas throughout the Fermi site. Because impacts to open water areas and wetlands could affect this species, mitigation in the form of transplantation from areas to be affected to currently occupied areas that would not be impacted is being considered. Portions of the Fermi site that contain large populations of American Lotus would not be impacted by Fermi 3 construction actvities. This includes the north lagoon and the south lagoon. Therefore, despite potential impacts from construction, the species is likely to continue as a significant feature on the Fermi site and its survival on the site is not in jeopardy.

5.3.5 Giant Arrowhead (*Sagittaria montevidensis*)

Giant Arrowhead is a state threatened species. The species is distributed sporadically in the Mississippi River drainage. It is reported in other areas of the eastern United States, although some consider the species non-native in North America (NatureServe 2008). Southeastern Michigan populations represent a northern limit of distribution for the species. This perennial aquatic plant grows in wet to shallowly inundated mud flats and banks, lagoons, and estuaries. It flowers in mid to late summer and sets fruit by fall. This wetland species was not observed on the Fermi property during this or past field surveys (refer to Table 2), but it has been reported in Monroe County as recently as 2001 (MNFI 2007).

An unidentified arrowhead plant was discovered in emergent wetlands in the west-central portion of the Fermi site near Transect 5. The area was investigated by R. Brooks, a B&V botanist familiar with *S. montevidensis*, but mature specimens (i.e., with flowers and seeds) were not available to determine with complete certainty whether this was *S. montevidensis* or a more common unlisted species. The plants encountered occur within a dense stand of cattails and are severely affected by shading from the cattails. However, it is the opinion of Brooks that the vegetative characters of the plants present do not support this plant being *S. montevidensis*. Based on observations of vegetative characteristics, the plants are more likely to be *S. latifolia* or *S. cuneata*, both of which are common in the vicinity and are protected species in southeastern Michigan. Furthermore, the portion of the site containing the unknown *Sagittaria* would not be directly affected by the project. Therefore, no impacts to Giant Arrowhead are anticipated. It is recommended that the west-central wetland be checked frequently to obtain identifiable reproductive material (i.e., flowers or seeds) for further evaluatation regarding the presence of Giant Arrowhead. If present, the extent of the population should be determined and the results reported to the MDNR.

5.3.6 Trailing Wild Bean (*Strophostyles helulva*)

This is a State Species of Special Concern. Trailing Wild Bean is found in sandy soil, thickets on disturbed ground, roadsides, ditch banks, beaches and dunes (MNFI 2007).

The optimal period for locating the species is when it flowers (usually from the fourth week of July to the fourth week of September), but despite an emphasis on locating the wild bean in July and October 2008, it was not located in this or during previous surveys on the Fermi site (refer to Table 2).

Soils within the Fermi site are predominately clay to loamy soils. Sandy soils are restricted to portions of the Lake Erie shoreline, limited areas along Swan Creek, and the south lagoon outlet. None of these locations would be affected by Fermi 3 construction, so should the species be present, its continued existence is not likely to be adversely affected by the project.

5.3.7 Tall Nut-rush (Scleria triglomerata)

This is a State Species of Special Concern that was first listed in 2009. Tall Nut-rush is found in dry or moist, open to shaded sandy ground, in prairies and borders of marshes. It was last reported in Monroe County in 1921 (MNFI 2007).

The coastal wetlands on the Fermi site do not provide the sandy and acidic soil conditions preferred by this species. Although some of the plant associates for this species are present on the Fermi site (MNFI 2007), they generally do not form a distinctive plant community under conditions suitable for Tall Nut-rush. It was not encountered during the 2008-2009 onsite surveys. Therefore, it is considered unlikely that the project would affect any populations of this species or increase the potential for it being listed.

6.0 Conclusions

The current study results provide confirmation of the previous studies in that many of the same plant species were observed and most of the species reported in the current study are considered relatively common, many of which are introduced or otherwise weedy species. The vegetation survey, as reported herein, further confirms that the plant communities at the Fermi site have good species richness, but that a few common species make up the largest proportion of individuals (i.e., the number of species and abundance within a species is not evenly distributed). As mentioned in Section 4.0, the five most abundant species (i.e., recorded most often in large numbers across all survey sessions) were Jumpseed, Moneywort, White Avens, Poison Ivy, and Garlic Mustard. These represent common species associated with early successional and disturbed habitats, such as the Fermi site.

The major plant communities revealed by the transect sampling include grassland (restored prairie), thicket (shrub-dominated areas intermediate between wetland and upland), emergent wetland, and two dominant forest types (lowland hardwood and mesic hardwood) (Eagle et al. 2005). The forest habitat is further divided between coastal and inland areas. On the Fermi site, coastal lowland forest is present along the Lake Erie shoreline (e.g., Transect 14) and is dominated by cottonwoods and willows. The inland forested habitat is dominated by a few hardwoods, mainly ash trees and concentrations of oaks or maples, with openings that include transitions to other habitat types, such as emergent wetland or scrub-shrub habitat. Silver Maple, a wet-tolerant species, tends to be more dominant in lowland forest areas (e.g., Transects 3, 4, 10, 11, 12 and 13), while oaks, hickories, and ashes tend to be dominant in mesic forest areas (e.g., Transects 6, 7, 8 and 9).

The restored prairie habitat (Transects 1, 2, and the northern part of Transect 15) is dominated by grass species, primarily Big Bluestem. Disturbance tolerant species are common in parts of the area, with few conservative (i.e., species requiring a narrow set of conditions) species present. On the Fermi site, this area was previously dominated by shrubs that were cleared for safety reasons. The prairie is now mantained by mowing in the late fall. At the fringes of the prairie area, woody shrubs, especially dogwoods and saplings blend with grasses (e.g., the southern half of Transect 15).

Emergent wetland is densely populated by just a few invasive emergent plant species, and overall diversity is low (e.g., Transect 5). Thicket (e.g., the southern portion of Transect 15) is maintained by a fluctuating, seasonally high water table that, along with dense shade, excludes most trees. The understory vegetation is mostly composed of shade-tolerant herbaceous species.

7.0 References Cited

Alfonso Alonso, Francisco Dallmeier, Elise Granek, and Peter Raven, eds., "Biodiversity: Connecting with the Tapestry of Life," prepared for Smithsonian Institution Monitoring & Assessment of Biodiversity Program, Smithsonian National Zoological Park and President's Committee of Advisors on Science and Technology, 2001, <http://nationalzoo.si.edu/ConservationAndScience/MAB/publications/biotapestry.pdf,> (May 2004).

M. Bowles, M. Jones, J. McBride, T. Bell, and C. Dunn, "Temporal Instability in Chicago's Upland Old Growth Forests," *Chicago Wilderness Journal*, Volume 3(2), July 2005, pp. 5-16.

J. E. Brower, J. H. Zar, and C. N. von Ende, *Field and Laboratory Methods for General Ecology*, Fourth Edition, McGraw-Hill, Boston, p. 273.

Russell M. Burns and Barbara H. Honkala, tech. coords, "Silvics of North America," *Agriculture Handbook 654*, Timber Management Research, U.S. Department of Agriculture, Forest Service, Washington, D.C., Volume 2, p. 877.

A. C. Eagle, E. M. Hay-Chmielewski, K. T. Cleveland, A. L. Derosier, M. E. Herbert, and R. A. Rustem, eds., "Michigan's Wildlife Action Plan," Michigan Department of Natural Resources, Lansing, Michigan, 2005, p. 1592, available online at <http://www.michigan.gov/dnrwildlifeactionplan> (September 27, 2009).

John Hilty, "Illinois Wildflowers: Grasses, Sedges and Plants without Flowers; *Carex frankii*," <http://www.illinoiswildflowers.info/grasses/plants/frank_sedge.htm> (December 4, 2008).

Integrated Taxonomic Information System (ITIS), Online database, <http://www.itis.gov> (November 4, 2008).

Gary E. Larson, "Aquatic and wetland vascular plants of the northern Great Plains," *Gen. Tech. Rep. RM-238*, U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station, Northern Prairie Wildlife Research Center Online, 1993, <http://www.npwrc.usgs.gov/resource/plants/vascplnt/species/txgl.htm> (February 2, 1999).

Michigan Natural Features Inventory, "Rare Species Explorer Web Application," 2007, <http://web4.msue.msu.edu/mnfi/explorer> (May 15, 2009).

NatureServe, "NatureServe Explorer: An online encyclopedia of life" Web Application. Version 7.0, 2008, <http://www.natureserve.org/explorer> (December 3, 2008).

USDA and NRCS, "The PLANTS Database" prepared for National Plant Data Center, 2008, http://plants.usda.gov (November 4, 2008).

Wilson, E. O. 1992. *The Diversity of Life*, The Belknap Press of Harvard University Press, Cambridge, Massachusetts.

Table 1. Plant Species Encountered at the Fermi Site during 2008-2009

Common Name	Scientific Name	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14	T15
Three-seeded Mercury	*Acalypha virginica*														X	
Box Elder	*Acer negundo*							X								X
Red Maple	*Acer rubrum*															X
Silver Maple	*Acer saccharinum*								X	X	X	X		X	X	
Swamp Agrimony	*Agrimonia parviflora*		X	X	X	X	X	X	X		X	X	X	X		X
Quackgrass	*Agropyron repens*	X														
Creeping Bentgrass	*Agrostis stolonifera*	X							X							
Garlic Mustard	*Alliaria petiolata*			X			X	X			X	X	X		X	
Wild Chives	*Allium schoenoprasum*															X
Onion	*Allium* sp.	X	X													
Annual Ragweed	*Ambrosia artemisiifolia*	X														X
Giant Ragweed	*Ambrosia trifida*						X		X		X					X
American Hogpeanut	*Amphicarpaea bracteata*								X							
Big Bluestem	*Andropogon gerardii*	X	X													X
Canada Anemone	*Anemone canadensis*			X	X		X	X		X	X		X			X
Dogbane	*Apocynum cannabinum*	X														X
Burdock	*Arctium minus*		X							X						
Heath Aster	*Aster ericoides*								X							
White Heath Aster	*Aster pilosus*	X														X
White Panicle Aster	*Aster simplex*						X				X		X			X
Aster	*Aster* sp.								X		X		X	X	X	X
Yellow Rocket	*Barbarea vulgaris*	X														
Bearded Beggarticks	*Bidens aristosa*	X														
Spanish Needles	*Bidens bipinnata*						X	X	X							
Beggar-ticks	*Bidens* sp.						X	X	X						X	X
False Nettle	*Boehmeria cylindrica*			X	X		X	X	X		X	X	X			
Smooth Brome	*Bromus inermis*	X	X													X
Japanese Brome	*Bromus japonicus*	X														
Bluejoint Grass	*Calamagrostis canadensis*	X														
Gray's Sedge	*Carex grayi*						X									

Table 1 (Continued). Plant Species Encountered at the Fermi Site during 2008-2009

Common Name	Scientific Name	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14	T15
Sedge	*Carex* sp.	X	X	X	X		X	X	X	X	X	X	X	X	X	X
American Hornbeam	*Carpinus caroliniana*												X	X		
Shagbark Hickory	*Carya ovata*												X			
Hickory	*Carya* sp.															
Common Hackberry	*Celtis occidentalis*										X	X				
Goosefoot	*Chenopodium* sp.						X	X								
Ox-eye Daisy	*Chrysanthemum leucanthemum*	X														
Enchanter's Nightshade	*Circaea lutetiana*			X			X	X	X	X	X	X	X	X	X	
Creeping Thistle	*Cirsium arvense*	X			X		X	X	X							X
Field Thistle	*Cirsium discolor*															X
Spring Beauty	*Claytonia virginica*												X			
Canada Horseweed	*Conyza canadensis*		X											X	X	
Silky Dogwood	*Cornus amomum*			X	X	X	X	X	X	X		X	X	X		X
Rough-leaf Dogwood	*Cornus drummondii*	X	X	X	X		X	X		X						X
Downy Hawthorne	*Crataegus mollis*							X	X							
Hawthorn	*Crataegus* sp.															
Canadian Honewort	*Cryptotaenia canadensis*			X												
Wild Carrot	*Daucus carota*	X	X													
Rosette Grass	*Dichanthelium* sp.	X														X
Fuller's Teasel	*Dipsacus fullonum*	X														X
Purple Coneflower	*Echinacea purpurea*	X	X													
Barnyard Grass	*Echinochloa crusgalli*	X														
Bald Spikerush	*Eleocharis erythropoda*															X
Canada Wild Rye	*Elymus canadensis*	X	X													X
Bottlebrush Grass	*Elymus hystrix*			X				X	X	X			X			
Hairy Wild Rye	*Elymus villosus*			X												
Virginia Wild Rye	*Elymus virginicus*			X									X			
Annual Fleabane	*Erigeron annuus*	X	X													
Philadelphia Fleabane	*Erigeron philadelphicus*	X														
Fleabane Daisy	*Erigeron strigosus*	X														X

Table 1 (Continued). Plant Species Encountered at the Fermi Site during 2008-2009

Common Name	Scientific Name	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14	T15
Late Boneset	*Eupatorium serotinum*															X
Spurge	*Euphorbia* sp.	X														
Flattop-Fragrant Goldenrod	*Euthamia graminifolia*	X														X
Wild Strawberry	*Fragaria virginiana*	X	X										X	X		X
Green Ash	*Fraxinus pennsylvanica*	X	X	X	X			X	X	X	X		X	X		X
Cleavers	*Galium aparine*		X				X	X							X	
Bedstraw	*Galium* sp.		X	X	X		X	X	X	X	X	X		X		X
Wild Geranium	*Geranium maculatum*			X	X					X	X	X				X
White Avens	*Geum canadense*	X	X	X			X	X	X	X	X	X	X	X	X	X
Honey Locust	*Gleditsia triacanthos*								X	X						
Fowl Manna Grass	*Glyceria striata*	X	X	X				X				X	X	X		X
Virginia Stickseed	*Hackelia virginiana*			X									X			
Sneezeweed	*Helenium autumnale*															X
Virginia Waterleaf	*Hydrophyllum virginianum*									X						
Spotted Touch-me-not	*Impatiens capensis*						X		X		X	X				
Touch-me-not	*Impatiens* sp.						X		X	X	X	X	X	X		
Dudley's Rush	*Juncus dudleyi*	X														X
Inland Rush	*Juncus interior*	X														
Grassleaf Rush	*Juncus marginatus*															X
Path Rush	*Juncus tenuis*												X	X		
Prickly Lettuce	*Lactuca serriola*														X	
Lettuce	*Lactuca* sp.	X														
Whitegrass	*Leersia virginica*			X			X	X	X	X	X	X	X	X	X	X
Prairie Blazing Star	*Liatris pycnostachya*	X														
Great Blue Lobelia	*Lobelia siphilitica*															X
Common Water Horehound	*Lycopus americanus*	X			X											X
Bugleweed	*Lycopus virginicus*															
Horehound	*Lycopus* sp.												X			
Fringed Loosestrife	*Lysimachia ciliata*															X
Moneywort	*Lysimachia nummularia*			X	X		X					X	X	X		X

Table 1 (Continued). Plant Species Encountered at the Fermi Site during 2008-2009

Common Name	Scientific Name	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14	T15
Purple Loosestrife	*Lythrum salicaria*															X
Black Medick	*Medicago lupulina*	X	X													
White Sweet Clover	*Melilotus alba*	X														
Moonseed	*Menispermum canadense*										X				X	
Wild Mint	*Mentha arvensis*															X
Wild Bergamot	*Monarda fistulosa*	X	X													X
Muhly	*Muhlenbergia* sp.			X												
Catnip	*Nepeta cataria*														X	
Sensitive Fern	*Onoclea sensibilis*						X									X
Hophornbeam	*Ostrya virginiana*								X		X					
Common Yellow Wood Sorrel	*Oxalis stricta*	X	X	X			X	X	X	X		X	X	X	X	X
Witchgrass	*Panicum capillare*	X	X													X
Virginia Creeper	*Parthenocissus quinquefolia*		X	X			X	X	X	X	X	X	X	X	X	X
Reed Canary Grass	*Phalaris arundinacea*		X	X	X	X		X			X					X
Common Reed	*Phragmites australis*	X			X				X	X	X	X	X	X		X
Clearweed	*Pilea pumila*			X			X	X								
Common Plantain	*Plantago major*	X		X												X
Blackseed Plantain	*Plantago rugelii*	X														
Virginia Plantain	*Plantago virginica*	X	X													X
Sycamore	*Platanus occidentalis*															
Canada Bluegrass	*Poa compressa*	X														
Kentucky Bluegrass	*Poa pratensis*	X														X
Woodland Bluegrass	*Poa sylvestris*												X	X		
Prince's Feather	*Polygonum orientale*									X						
Climbing False Buckwheat	*Polygonum scandens*			X											X	
Jumpseed	*Polygonum virginianum*			X	X		X	X	X	X	X	X	X	X		
Eastern Cottonwood	*Populus deltoides*															X
Sulphur Cinquefoil	*Potentilla recta*	X														
Common Cinquefoil	*Potentilla simplex*	X	X										X			X
Common Selfheal	*Prunella vulgaris*	X	X													X

Table 1 (Continued). Plant Species Encountered at the Fermi Site during 2008-2009

Common Name	Scientific Name	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14	T15
Narrowleaf Mountain Mint	*Pycnanthemum tenuifolium*															X
White Oak	*Quercus alba*															
Swamp White Oak	*Quercus bicolor*															
Bur Oak	*Quercus rubra*															
Pinnate Prairie Coneflower	*Ratibida pinnata*	X	X													X
Common Buckthorn	*Rhamnus cathartica*				X			X	X		X		X	X	X	
Buckthorn	*Rhamnus* sp.												X	X		
Currant	*Ribes* sp.									X	X	X		X	X	X
Multiflora Rose	*Rosa multiflora*			X				X		X						
Rose	*Rosa* sp.			X	X											X
Northern Dewberry	*Rubus flagellaris*		X													
Black Raspberry	*Rubus occidentalis*						X	X								
Blackberry	*Rubus* sp.		X	X	X		X	X	X	X					X	X
Black-eyed Susan	*Rudbeckia hirta*	X	X													X
Rosepink	*Sabatia angularis*	X														
Sandbar Willow	*Salix exigua*														X	
Willow	*Salix* sp.															X
Canadian Black Snakeroot	*Sanicula canadensis*			X												
Maryland Sanicle	*Sanicula marilandica*			X				X	X	X	X	X	X	X		
Little Bluestem	*Schizachyrium scoparium*	X	X													
Dark Green Bullrush	*Scirpus atrovirens*															X
River Bulrush	*Scirpus fluviatilis*					X										
Nodding Bulrush	*Scirpus pendulus*	X												X		X
Yellow Foxtail	*Setaria glauca*	X	X													X
Narrowleaf Blue-eyed Grass	*Sisyrinchium angustifolium*	X														X
Black Nightshade	*Solanum nigrum*														X	
Nightshade	*Solanum* sp.				X											
Tall Goldenrod	*Solidago altissimus*														X	
Canada Goldenrod	*Solidago canadensis*	X	X										X	X		X
Goldenrod	*Solidago* sp.										X					

Table 1 (Continued). Plant Species Encountered at the Fermi Site during 2008-2009

Common Name	Scientific Name	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14	T15
Indiangrass	*Sorghastrum nutans*	X	X													X
Prairie Wedgescale	*Sphenopholis obtusata*							X								
Dandelion	*Taraxacum officinale*	X	X				X					X				X
American Basswood	*Tilia americana*												X			
Poison Ivy	*Toxicodendron radicans*	X		X	X		X	X	X	X	X	X	X	X		X
Trillium	*Trillium* sp.							X	X	X						
Narrow-leaf Cattail	*Typha angustifolia*					X										
Blue Cattail	*Typha glauca*					X										
American Elm	*Ulmus americana*			X			X		X		X	X	X	X		X
Stinging Nettle	*Urtica dioica*			X				X	X						X	
Moth Mullein	*Verbascum blattaria*															X
Blue Vervain	*Verbena hastata*	X													X	X
White Vervain	*Verbena urticifolia*								X							
Baldwin's Ironweed	*Vernonia baldwini*	X														X
Viburnum	*Viburnum* sp.															X
Canadian White Violet	*Viola canadensis*			X			X	X	X	X	X	X	X	X		
Common Blue Violet	*Viola sororia*		X													X
Violet	*Viola* sp.		X					X								X
Riverbank Grape	*Vitis riparia*		X	X	X		X	X	X	X		X		X	X	X
	Number of Species (169 species total):	67	43	42	25	10	38	42	42	33	35	31	42	36	30	82

Table 2. Plant Species on or Near the Fermi Site as Reported in Current and Previous Studies

English Name	Latin Name	2000 WHC*	2002 WHC*	Fermi Studies 2006-2008*	DU*	Current Study
Velvet Leaf	*Abutilon theophrasti*			X		
Three-seeded Mercury	*Acalypha virginica*			X		X
Box Elder	*Acer negundo*	X	X	X		X
Red Maple	*Acer rubrum*				X	X
Silver Maple	*Acer saccharinum*			X	X	X
Sugar Maple	*Acer saccharum*			X		
Yarrow	*Achillea millefolium*		X			
Soft Agrimony	*Agrimonia pubescens*			X		
Swamp Agrimony	*Agrimonia parviflora*			X		X
Quackgrass	*Agropyron repens*			X		X
Creeping Bentgrass	*Agrostis stolonifera*					X
Tree-of-Heaven	*Ailanthus altissimus*			X		
Broad-leaf Water Plantain	*Alisma plantago-aquatica*			X		
Garlic Mustard	*Alliaria petiolata*		X	X	X	X
Wild Chives	*Allium schoenoprasum*					X
Tapertip Onion	*Allium acuminatum*		X			
Onion	*Allium* sp.					X
White Pigweed	*Amaranthus albus*			X		
Annual Ragweed	*Ambrosia artemisiifolia*			X		X
Naked-spike Ragweed	*Ambrosia psilostachya*			X		
Giant Ragweed	*Ambrosia trifida*					X
American Hogpeanut	*Amphicarpaea bracteata*					X
Big Bluestem	*Andropogon gerardii*	X	X	X		X
Broomsedge	*Andropogon virginicus*			X		
Canada Anemone	*Anemone canadensis*	X	X	X		X
Thimbleweed	*Anemone cylindrica*	X	X	X		
Ever-Lasting	*Antennaria neglecta*	X	X			
Dogbane	*Apocynum androseaemifolium*	X	X			
Prairie Indianhemp	*Apocynum cannabinum*			X		X
Wild Columbine	*Aquilegia canadensis*	X	X			
Burdock	*Arctium minus*		X	X		X
Bearberry	*Arctostaphylos uva-ursi*	X	X			
Mouse-ear Cress	*Arabidopsis thaliana*		X			
Jack in the Pulpit	*Arisaema triphyllum*		X			
Swamp Milkweed	*Asclepias incarnata*	X	X	X		
Common Milkweed	*Asclepias syriaca*	X	X	X		
Butterflyweed	*Asclepias tuberosa*	X	X			
Whorled Milkweed	*Asclepias verticillata*	X	X			
Heath Aster	*Aster ericoides*	X	X			X
Smooth Aster	*Aster laevis*	X	X			
Side-flowering Aster	*Aster lateriflorus*			X		

Table 2 (Continued). Plant Species on or Near the Fermi Site as Reported in Current and Previous Studies

English Name	Latin Name	2000 WHC*	2002 WHC*	Fermi Studies 2006-2008*	DU*	Current Study
New England Aster	*Aster novae-angliae*	X	X			
White Heath Aster	*Aster pilosus*			X		X
White Aster	*Aster ptarmicoides*	X	X			
Red Stem Aster	*Aster puniceus*	X	X			
Arrow Aster	*Aster sagittifolius*	X	X			
White Panicle Aster	*Aster simplex*	X	X			X
Flat-Topped Aster	*Aster umbellatus*	X	X			
Aster	*Aster* sp.					X
Water Hyssop	*Bacopa rotundifolia*				X	
Yellow Mustard	*Barbarea vulgaris*			X		X
Bearded Beggarticks	*Bidens aristosa*					X
Spanish Needles	*Bidens bipinnata*					X
Beggar-ticks	*Bidens* sp.			X		X
False Nettle	*Boehmeria cylindrica*			X		X
Side-Oats Gramma	*Bouteloua curtipendula*	X	X			
Black Mustard	*Brassica nigra*				X	
Smooth Brome	*Bromus inermis*			X		X
Japanese Brome	*Bromus japonicus*			X		X
Cheat	*Bromus tectorum*			X		
Bluejoint Grass	*Calamagrostis canadensis*					X
Harebell	*Campanula rotundifolia*	X	X			
Trumpet Creeper	*Campsis radicans*	X	X			
Sedge	*Carex blanda*			X		
Crested Sedge	*Carex cristatella*			X		
Frank's Sedge	*Carex frankii*			X		
Gray's Sedge	*Carex grayi*			X	X	X
Sedge	*Carex hirtifolia*			X		
Sedge	*Carex stipata*			X		
Inflated Sedge	*Carex vesicaria*				X	
Fox Sedge	*Carex vulpinoidea*			X		
Sedge	*Carex* sp.					X
American Hornbeam	*Carpinus caroliniana*					X
Pignut Hickory	*Carya glabra*			X		
Shellbark Hickory	*Carya laciniosa*				X	
Shagbark Hickory	*Carya ovata*	X	X			X
Hickory	*Carya* sp.					X
Painted-Cup	*Castilleja coccinea*		X			
New Jersey Tea	*Ceanothus americanus*	X	X			
Cedar Tree	*Cedrus atlantica*		X#			
Common Hackberry	*Celtis occidentalis*	X	X	X		X

Table 2 (Continued). Plant Species on or Near the Fermi Site as Reported in Current and Previous Studies

English Name	Latin Name	2000 WHC*	2002 WHC*	Fermi Studies 2006-2008*	DU*	Current Study
Sandbur	*Cenchrus longispinus*			X		
Spotted Knapweed	*Centaurea maculosa*		X	X		
Buttonbush	*Cephalanthus occidentalis*	X	X		X	
Common Hornwort	*Ceratophyllum demersum*			X	X	
Turtlehead	*Chelone glabra*	X	X			
Eastern Redbud	*Cercis canadensis*		X			
Lamb's Quarters	*Chenopodium album*			X		
Goosefoot	*Chenopodium* sp.					X
Oxeye Daisy	*Chrysanthemum leucanthemum*					X
Chicory	*Cichorium intybus*			X		
Enchanter's Nightshade	*Circaea lutetiana*			X		X
Creeping Thistle	*Cirsium arvense*			X		X
Field Thistle	*Cirsium discolor*			X		X
Swamp Thistle	*Cirsium muticum*			X		
Bull Thistle	*Cirsium vulgare*		X	X		
Spring Beauty	*Claytonia virginica*		X			X
Canada Horseweed	*Conyza canadensis*			X		X
Sand Coreopsis	*Coreopsis lanceolata*	X	X	X		
Coreopsis Sp.	*Coreopsis* sp.	X	X			
Silky Dogwood	*Cornus amomum*	X	X	X	X	X
Rough-leaf Dogwood	*Cornus drummondii*			X		X
Flowering Dogwood	*Cornus florida*	X	X			
Stiff Dogwood	*Cornus foemina*			X		
Gray Dogwood	*Cornus racemosa*	X	X			
Red-osier Dogwood	*Cornus stolonifera*		X		X	
Cockspur Hawthorn	*Crataegus crus-galli*	X	X			
Downy Hawthorne	*Crataegus mollis*			X		X
Hawthorn	*Crataegus* sp.				X	X
Canadian Honewort	*Cryptotaenia canadensis*					X
Chufa	*Cyperus esculentus*			X		
Shining Flatsedge	*Cyperus rivularis*			X		
Orchard Grass	*Dactylis glomerata*			X		
Jimson-weed	*Datura strumonium*			X		
Queen Ann's Lace	*Daucus carota*		X	X		X
Cut-Leaved Toothwort	*Dentaria concatenata*		X			
Deptford Pink	*Dianthus armeria*			X		
Rosette Grass	*Dichanthelium* sp.					X
Bush Honeysuckle	*Diervilla lonicera*	X	X			
Smooth Crabgrass	*Digitaria ischaemum*			X		
Hairy Crabgrass	*Digitaria sanguinalis*			X		

Table 2 (Continued). Plant Species on or Near the Fermi Site as Reported in Current and Previous Studies

English Name	Latin Name	2000 WHC*	2002 WHC*	Fermi Studies 2006-2008*	DU*	Current Study
Fuller's Teasel	*Dipsacus fullonum*			X		X
Teasel	*Dipsacus* sp.	X	X			
Purple Coneflower	*Echinacea purpurea*	X	X	X		X
Barnyard Grass	*Echinochloa crusgalli*			X		X
Rough Barnyard	*Echinochloa muricata*			X		
Autumn Olive	*Elaeagnus umbellata*			X		
Bald Spikerush	*Eleocharis erythropoda*					X
Canada Wild Rye	*Elymus canadensis*	X	X	X		X
Bottlebrush Grass	*Elymus hystrix*					X
Hairy Wild Rye	*Elymus villosus*					X
Virginia Wild Rye	*Elymus virginicus*			X		X
Field Horsetail	*Equisetum arvense*		X	X		
Scouring Rush	*Equisetum* sp.				X	
Purple Lovegrass	*Eragrostis spectabilis*			X		
American Burn	*Erechtites hieracifolia*			X		
Annual Fleabane	*Erigeron annuus*	X	X	X		X
Philadelphia Fleabane	*Erigeron philadelphicus*					X
Prairie Fleabane	*Erigeron strigosus*			X		X
Fleabane	*Erigeron* sp.				X	
Trout Lily	*Erythronium americanum*		X			
Burning Bush	*Euonymus alatus*		X			
Boneset	*Eupatorium maculatum*	X	X			
Common Boneset	*Eupatorium perfoliatum*			X	X	
White Snakeroot	*Eupatorium rugosum*				X	
Late-flowering Thoroughwort	*Eupatorium serotinum*			X		X
Eyebane Broomspurge	*Euphorbia nutans*			X		
Spotted Broomspurge	*Euphorbia maculata*			X		
Spurge	*Euphorbia* sp.					X
Flattop-Fragrant Goldenrod	*Euthamia graminifolia*	X	X	X		X
Kentucky Fescue	*Festuca arundinacea*			X		
Wild Strawberry	*Fragaria virginiana*	X	X	X	X	X
White Ash	*Fraxinus americana*			X	X	
Green Ash	*Fraxinus pennsylvanica*		X	X		X
Cleavers	*Galium aparine*			X		X
Northern Bedstraw	*Galium borealis*	X	X			
Marsh Bedstraw	*Galium palulstre*				X	
Bedstraw	*Galium* sp.				X	X
Bracket Fungus	*Ganoderma applanatum*		X			
Bottle Gentian	*Gentiana andrewsii*	X	X			
Wild Geranium	*Geranium maculatum*		X	X		X

Table 2 (Continued). Plant Species on or Near the Fermi Site as Reported in Current and Previous Studies

English Name	Latin Name	2000 WHC*	2002 WHC*	Fermi Studies 2006-2008*	DU*	Current Study
White Avens	*Geum canadense*			X		X
Purple Avens	*Geum rivale*			X		
Avens	*Geum* sp.				X	
Honey Locust	*Gleditsia triacanthos*			X		X
Fowl Manna Grass	*Glyceria striata*			X		X
Virginia Stickseed	*Hackelia virginiana*			X		X
Sneezeweed	*Helenium autumnale*	X	X	X		X
Woodland Sunflower	*Helianthus divaricatus*	X	X			
Giant Sunflower	*Helianthus giganteus*	X	X			
Canada Hawkweed	*Hieracium canadense*	X	X			
Swamp Mallow	*Hibiscus moscheutos*			X		
Foxtail	*Hordeum jubatum*			X		
Common Hops	*Humulus lupulus*			X		
Virginia Waterleaf	*Hydrophyllum virginianum*					X
Common St. John's wort	*Hypericum perforatum*			X		
Spotted St. John's wort	*Hypericum punctatum*			X		
Great St. John's wort	*Hypericum ascyron*	X	X			
Spotted Touch-me-not	*Impatiens capensis*	X	X		X	X
Touch-me-not	*Impatiens* sp.					X
Blue Flag	*Iris versicolor*	X	X			
Southern Blue Flag	*Iris virginica*	X	X	X		
Black Walnut	*Juglans nigra*	X	X		X	
Black-grass	*Juncus gerardii*			X		
Dudley's Rush	*Juncus dudleyi*			X		X
Inland Rush	*Juncus interior*					X
Grass-leaf Rush	*Juncus marginatus*			X		X
Path Rush	*Juncus tenuis*			X		X
Common Juniper	*Juniperus canadensis*	X				
Eastern Redcedar	*Juniperus virginiana*	X	X			
Mexican Summer-cypress	*Kochia scoparia*			X		
Junegrass	*Koelaria cristata*	X	X			
False Boneset	*Kuhnia eupatorioides*			X		
Prickly Lettuce	*Lactuca serriola*			X		X
Lettuce	*Lactuca* sp.					X
Whitegrass	*Leersia virginica*					X
Duckweed	*Lemna* sp.			X		
Pepper-grass	*Lepidium perfoliatum*			X		
Poor Man's Pepper	*Lepidium virginicum*			X		
Shrub Lespedeza	*Lespedeza thunbergii*	X	X			
Marsh Blazing Star	*Liatris pycnostachya*			X		X

Table 2 (Continued). Plant Species on or Near the Fermi Site as Reported in Current and Previous Studies

English Name	Latin Name	2000 WHC*	2002 WHC*	Fermi Studies 2006-2008*	DU*	Current Study
European Privet	*Ligustrum vulgare*			X		
Canada Lily	*Lilium canadense*	X	X			
Wood Lily	*Lilium philadelphicum*	X	X			
Tiger Lily	*Lilium lancifolium*	X	X			
Tulip Poplar	*Liriodendron tulipifera*	X	X			
Hoary Puccoon	*Lithospermum canascens*	X	X			
Cardinal Flower	*Lobelia cardinalis*	X	X			
Great Blue Lobelia	*Lobelia siphilitica*	X	X	X		X
Pale Lobelia	*Lobelia spicata*	X	X			
Bird's-foot Trefoil	*Lotus corniculatus*			X		
Common Water Horehound	*Lycopus americanus*			X	X	X
Bugleweed	*Lycopus virginicus*					X
Horehound	*Lycopus* sp.					X
Fringed Loosestrife	*Lysimachia ciliata*			X		X
Moneywort	*Lysimachia nummularia*			X		X
Winged Loosestrife	*Lythrum alatum*			X		
Purple Loosestrife	*Lythrum salicaria*			X		X
Wild Lupine	*Lupinus perennis*	X	X			
Purple Loosestrife	*Lythrum salicaria*	X	X			
Wild Crab	*Malus coronaria*			X		
Black Medick	*Medicago lupulina*			X		X
Alfalfa	*Medicago sativa*			X		
White Sweet Clover	*Melilotus alba*			X		X
Yellow Sweet Clover	*Melilotus officinalis*			X		
Moonseed	*Menispermum canadense*					X
Wild Mint	*Mentha arvensis*			X		X
Spearmint	*Mentha spicata*			X		
Monkey Flower	*Mimulus ringens*	X	X			
Bee Balm	*Monarda didyma*	X	X			
Wild Bergamot	*Monarda fistulosa*	X	X	X		X
Purple Bergamot	*Monarda media*	X	X			
Red Mulberry	*Morus rubra*	X	X			
Nimble-will	*Muhlenbergia schreberi*			X		
Muhly	*Muhlenbergia* sp.					X
Cut-leaf Water-milfoil	*Myriophyllum pinnatum*			X		
American Lotus	*Nelumbo lutea*	X	X	X		
Catnip	*Nepeta cataria*			X		X
Cow-lily	*Nuphar variegata*			X		
White Water-lily	*Nymphaea odorata*	X		X	X	
Common Evening Primrose	*Oenothera biennis*	X	X	X		

Table 2 (Continued). Plant Species on or Near the Fermi Site as Reported in Current and Previous Studies

English Name	Latin Name	2000 WHC*	2002 WHC*	Fermi Studies 2006-2008*	DU*	Current Study
Sensitive Fern	*Onoclea sensibilis*				X	X
Hop Hornbeam	*Ostrya virginiana*					X
Common Yellow Wood Sorrel	*Oxalis stricta*			X		X
Witchgrass	*Panicum capillare*			X		X
Fall Panic Grass	*Panicum dichotomiflorum*			X		
Switchgrass	*Panicum virgatum*	X	X	X		
Poppy	*Papavera* sp.	X	X			
Virginia Creeper	*Parthenocissus quinquefolia*		X	X	X	X
Foxglove Beard Tongue	*Penstemon digitalis*			X		
Reed Canary Grass	*Phalaris arundinacea*			X	X	X
Timothy	*Phleum pratense*			X		
Wild Sweet-William	*Phlox maculata*	X	X			
Common Reed	*Phragmites australis*	X	X	X	X	X
False Dragonhead	*Physostegia virginiana*	X	X			
Common Pokeweed	*Phytolacca americana*			X		
Clearweed	*Pilea pumila*				X	X
English Plantain	*Plantago lanceolata*			X		
Common Plantain	*Plantago major*		X	X		X
Black-seed Plantain	*Plantago rugellei*			X		X
Virginia Plantain	*Plantago virginica*					X
Sycamore	*Platanus occidentalis*	X	X		X	X
Annual Bluegrass	*Poa annua*			X		
Canada Bluegrass	*Poa compressa*			X		X
Kentucky Bluegrass	*Poa pratensis*			X		X
Woodland Bluegrass	*Poa sylvestris*			X		X
May-apple	*Podophylum peltatum*	X	X	X		
Clammy-weed	*Polanisia dodecandra*			X		
Water Smartweed	*Polygonum amphibium*			X		
Prostrate Knotweed	*Polygonum aviculare*			X		
Buckwheat	*Polygonum convolvulus*			X		
Willow-weed	*Polygonum lapathifolium*			X		
Prince's Feather	*Polygonum orientale*					X
Pennsylvania Smartweed	*Polygonum pensylvanicum*			X		
Climbing False Buckwheat	*Polygonum scandens*					X
Virginia Smartweed	*Polygonum virginianum*			X		X
Smartweed	*Polygonum* sp.				X	
Eastern Cottonwood	*Populus deltoides*	X	X	X	X	X
Purslane	*Portulaca oleracea*		X			
Pondweed	*Potamogeton* sp.			X		
Silverweed	*Potentilla anserina*		X			

Table 2 (Continued). Plant Species on or Near the Fermi Site as Reported in Current and Previous Studies

English Name	Latin Name	2000 WHC*	2002 WHC*	Fermi Studies 2006-2008*	DU*	Current Study
Sulphur Cinquefoil	*Potentilla recta*					X
Old Field Cinquefoil	*Potentilla simplex*			X		X
Norwegian Cinquefoil	*Potentilla norvegica*			X		
Heal-all	*Prunella vulgaris*			X		X
Wild Plum	*Prunus americana*	X	X			
Pin Cherry	*Prunus pensylvanica*	X	X			
Black Cherry	*Prunus serotina*				X	
Narrowleaf Mountain Mint	*Pycnanthemum tenuifolium*					X
Common Mountain Mint	*Pycnanthemum virginianum*	X	X	X		
White Oak	*Quercus alba*	X	X			X
Swamp White Oak	*Quercus bicolor*				X	X
Bur Oak	*Quercus macrocarpa*			X	X	
Northern Red Oak	*Quercus rubra*			X	X	X
Black Oak	*Quercus velutina*	X	X			
Early Buttercup	*Ranunculus fasicularis*	X	X			
Yellow Coneflower	*Ratibida pinnata*			X		X
Common Buckthorn	*Rhamnus cathcartica*			X		X
Glossy Buckthorn	*Rhamnus frangula*				X	
Buckthorn	*Rhamnus* sp.				X	X
Pink Azalea	*Rhododendron nudiflorum*	X	X			
Aromatic Sumac	*Rhus aromatica*	X	X			
Shining Sumac	*Rhus copallina*	X	X			
Smooth Sumac	*Rhus glabra*	X	X	X		
Staghorn Sumac	*Rhus typhina*	X	X	X		
Wild Black Current	*Ribes americanum*			X		
Currant	*Ribes* sp.					X
Pasture Rose	*Rosa carolina*			X		
Multiflora Rose	*Rosa multiflora*	X	X	X		X
Swamp Wild Rose	*Rosa palustris*	X	X			
Rose	*Rosa* sp.					X
Common Blackberry	*Rubus allegheniensis*	X	X	X		
Northern Dewberry	*Rubus flagellaris*			X		X
Black Raspberry	*Rubus occidentalis*	X	X	X		X
Blackberry	*Rubus* sp.	X	X			X
Black-eyed Susan	*Rudbeckia hirta*	X	X	X		X
Curly Dock	*Rumex crispus*			X		
Wild Rhubarb	*Rumex hymenosepalus*		X			
Rosepink	*Sabatia angularis*					X
Arrowhead	*Sagittaria* sp.				X	
Peach-leaved Willow	*Salix amygdaloides*			X		

Table 2 (Continued). Plant Species on or Near the Fermi Site as Reported in Current and Previous Studies

English Name	Latin Name	2000 WHC*	2002 WHC*	Fermi Studies 2006-2008*	DU*	Current Study
Pussy Willow	*Salix discolor*	X	X			
Sandbar Willow	*Salix exigua*	X	X	X		X
Crack Willow	*Salix fragilis*		X			
Willow	*Salix* sp.	X	X		X	X
Black Snakeroot	*Sanicula canadensis*					X
Maryland Sanicle	*Sanicula marilandica*			X		X
Little Bluestem	*Schizachyrium scoparium*	X	X			X
Softstem Bulrush	*Schoenoplectus tabernaemontani*	X	X			
Olney's Bulrush	*Scirpus americana*			X		
Green Bullrush	*Scirpus atrovirens*			X		X
River Bulrush	*Scirpus fluviatilis*					X
Nodding Bulrush	*Scirpus pendulus*			X		X
Lance-leaf Figwort	*Scrophularia lanceolata*			X		
Balsam Ragwort	*Senecio paperculus*		X			
Giant Foxtail	*Setaria faberi*			X		
Yellow Foxtail	*Setaria glauca*			X		X
Green Foxtail	*Setaria viridis*			X		
Narrowleaf Blue-eyed Grass	*Sisyrinchium angustifolium*					X
False Spikenard	*Smilacina racemosa*			X		
Black Nightshade	*Solanum nigrum*			X		X
Nightshade	*Solanum* sp.					X
Tall Goldenrod	*Solidago altissima*			X		X
Canada Goldenrod	*Solidago canadensis*			X		X
Gray Goldenrod	Solidago nemoralis	X	X			
Showy Goldenrod	*Solidago speciosa*	X				
Goldenrod	*Solidago* sp.	X	X	X	X	X
Perennial Sow Thistle	*Sonchus arvensis*			X		
Indiangrass	*Sorghastrum nutans*	X	X	X		X
Prairie Wedgescale	*Sphenopholis obtusata*					X
Greater Duckweed	*Spirodela polyrrhiza*			X		
Dropseed	*Sporobolus aspera*			X		
Sand Dropseed	*Sporobolus cyptandrus*	X	X			
Poverty Dropseed	*Sporobolus vaginiflorus*			X		
Needlegrass	*Stipa spartea*	X	X			
Dandelion	*Taraxacum officinale*			X	X	X
Yellow Pimpernel	*Taenidia integrima*	X	X			
American Germander	*Teucrium canadense*			X		
Tall Meadow Rue	*Thalictrum dasycarpum*	X	X			
American Basswood	*Tilia americana*			X	X	X
Poison Ivy	*Toxicodendron radicans*		X	X	X	X

Table 2 (Continued). Plant Species on or Near the Fermi Site as Reported in Current and Previous Studies

English Name	Latin Name	2000 WHC*	2002 WHC*	Fermi Studies 2006-2008*	DU*	Current Study
Common Spiderwort	*Tradescantia ohiensis*	X	X			
Purpletop	*Tridens flavus*			X		
Red Clover	*Trifolium pratense*			X		
White Clover	*Trifolium repens*			X		
Trillium	*Trillium* sp.					X
Narrow-leaf Cattail	*Typha angustifolia*			X	X	X
Blue Cattail	*Typha x glauca*			X		X
Broad-leaf Cattail	*Typha latifolia*			X		
Cattail Sp.	*Typha* sp.	X	X			
American Elm	*Ulmus americana*		X	X	X	X
Slippery Elm	*Ulmus rubra*				X	
Stinging Nettle	*Urtica dioica*			X		X
Lowbush Blueberry	*Vaccinium angustifolium*	X	X			
Moth Mullein	*Verbascum blattaria*		X			X
Velvetleaf	*Verbascum thapsus*	X	X	X		
Blue Vervain	*Verbena hastata*	X	X	X		X
White Vervain	*Verbena urticifolia*			X		X
Hoary Vervain	*Verbena stricta*			X		
Baldwin's Ironweed	*Vernonia baldwini*					X
Missouri Ironweed	*Vernonia missurica*			X		
New York Ironweed	*Vernonia noveboracensis*	X	X			
Viburnum	*Viburnum* sp.					X
Canadian White Violet	*Viola canadensis*					X
Bird's Foot Violet	*Viola pedata*		X			
Common Blue Violet	*Viola sororia*					X
Violet	*Viola* sp.				X	X
Summer Grape	*Vitis aestivalis*			X		
Riverbank Grape	*Vitis riparia*			X	X	X
Wild Grape	*Vitis* sp.	X	X		X	
Prickly Ash	*Xanthoxylum americanum*			X		
Golden Alexander	*Zizia aurea*			X		
	Total number of species = 394	120	149	219	52	169

The species' normal range is outside Michigan, so this may have been a planted specimen or an escape from cultivation.

[1] 2000 WHC = Data adapted from the Wildlife Management Plan for Fermi 2 Power Plant, Detroit Edison, Fermi 2 Power Plant Wildlife Habitat Team in cooperation with Wildlife Habitat Council, August 2000.

[2] 2002 WHC = Data adapted from the Wildlife Habitat Program Recertification for Fermi 2 Power Plant, prepared by Fermi 2 Power Plant Wildlife Habitat Team, July 2002.

[3] 2006-2008 Data from Meander Pedestrian Surveys completed on the Fermi Site from November 2006 to May 2008.

[4] DU = Ducks Unlimited, based on data reported in *DTE Fermi II Site, Monroe County Wetland Investigation Report*, Appendix D as prepared by Ducks Unlimited on behalf of DTE.

Table 3a. Cover by Vegetation on Transects at the Fermi Site: Restored Prairie

Common Name	Scientific Name	T1*	T2	T15	T1 Cover Length (cm)*	Avg. Plant Cover (%)	T2 Cover Length (cm)	Avg. Plant Cover (%)	T15 Cover Length (cm)	Avg. Plant Cover (%)	Pooled Length (cm)	Pooled Avg. Cover (%)
Box Elder	*Acer negundo*			X					3	0.08	3	0.005
Red Maple	*Acer rubrum*			X					2	0.05	2	0.003
Swamp Agrimony	*Agrimonia parviflora*		X	X			8	0.19	759	4.64	767	1.278
Quackgrass	*Agropyron repens*	X			6	0.31					6	0.010
Creeping Bentgrass	*Agrostis stolonifera*	X			4	0.08					4	0.007
Wild Chives	*Allium schoenoprasum*			X					12	0.31	12	0.020
Onion	*Allium* sp.	X	X		4	0.21	9	0.21			13	0.022
Common Ragweed	*Ambrosia artemisiifolia*	X		X	31	0.40			5	0.10	36	0.060
Giant Ragweed	*Ambrosia trifida*			X					5	0.13	5	0.008
Big Bluestem	*Andropogon gerardii*	X	X	X	6423	45.04	11308	60.90	3777	23.76	21,508	35.847
Canada Anemone	*Anemone canadensis*			X					21	0.42	21	0.035
Indian Hemp	*Apocynum cannabinum*	X		X	118	0.85			8	0.16	126	0.210
Common Burdock	*Arctium minus*		X				113	0.86			113	0.188
Hairy Aster	*Aster pilosus*	X		X	8	0.16			51	1.02	59	0.098
White Panicle Aster	*Aster simplex*			X					52	0.62	52	0.087
Yellow Rocket	*Barbarea vulgaris*	X			16	0.84					16	0.027
Bearded Beggars Ticks	*Bidens aristosa*	X			10	0.10					10	0.017
Beggars Ticks	*Bidens* sp.			X					40	0.80	40	0.067
Smooth Brome	*Bromus inermis*	X	X	X	521	5.47	163	3.79	12	0.40	696	1.160
Japanese Brome	*Bromus japonicus*	X			1	0.04					1	0.002
Bluejoint Grass	*Calamagrostis canadensis*	X			27	1.09					27	0.045
Sedge	*Carex* sp.	X	X	X	161	2.44	250	1.41	607	3.78	1,018	1.697
Ox-eye Daisy	*Chrysanthemum leucanthemum*	X			10	0.20					10	0.017
Field Thistle	*Cirsium arvense*	X		X	1108	7.43			385	2.01	1,493	2.488
Field Thistle	*Cirsium discolor*			X					64	0.76	64	0.107
Canada Horseweed	*Conyza canadensis*		X				2	0.04			2	0.003
Silky Dogwood	*Cornus amomum*			X					733	19.16	733	1.222
Rough-leaved Dogwood	*Cornus drummondii*	X	X	X	32	0.73	110	0.58	213	4.26	355	0.592

Table 3a (Continued). Cover by Vegetation on Transects at the Fermi Site: Restored Prairie

Common Name	Scientific Name	T1*	T2	T15	T1 Cover Length (cm)*	Avg. Plant Cover (%)	T2 Cover Length (cm)	Avg. Plant Cover (%)	T15 Cover Length (cm)	Avg. Plant Cover (%)	Pooled Length (cm)	Pooled Avg. Cover (%)
Wild Carrot	*Daucus carota*	X	X		47	0.49	33	0.25			80	0.133
Rosette Grass	*Dichanthelium* sp.	X		X	20	0.30			20	0.67	40	0.067
Fuller's Teasel	*Dipsacus fullonum*	X			33	0.22			26	0.68	59	0.098
Purple Coneflower	*Echinacea purpurea*	X			8	0.11					8	0.013
Barnyard Grass	*Echinochloa crusgalli*	X			5	0.05					5	0.008
Bald Spikerush	*Eleocharis erythropoda*			X					3	0.08	3	0.005
Canada Wild Rye	*Elymus canadensis*	X	X	X	1570	14.15	817	4.27	1534	12.99	3,921	6.535
Annual Fleabane	*Erigeron annuus*	X	X		17	0.69	22	0.51			39	0.065
Philadelphia Fleabane	*Erigeron philadelphicus*	X			8	0.16					8	0.013
Daisy Fleabane	*Erigeron strigosus*	X		X	13	0.26			94	1.49	107	0.178
Late Boneset	*Eupatorium serotinum*			X					37	0.27	37	0.062
Spurge	*Euphorbia* sp.	X			10	0.07					10	0.017
Grass-leaved Goldenrod	*Euthamia graminifolia*	X		X	19	0.13			19	0.19	38	0.063
Wild Strawberry	*Fragaria virginiana*	X	X	X	80	0.58	6	0.14	671	4.14	757	1.262
Green Ash	*Fraxinus pennsylvanica*	X	X	X	8	0.42	3	0.07	99	0.83	110	0.183
Cleavers	*Galium aparine*		X				5	0.12			5	0.008
Bedstraw	*Galium* sp.		X	X			3	0.07	11	0.29	14	0.023
Wild Geranium	*Geranium maculatum*			X					77	2.01	77	0.128
White Avens	*Geum canadense*	X	X	X	2	0.10	81	0.45	26	0.41	109	0.182
Fowl Manna Grass	*Glyceria striata*	X	X	X	30	0.33	38	0.44	30	0.37	98	0.163
Sneezeweed	*Helenium autumnale*			X					231	2.31	231	0.385
Dudley's Rush	*Juncus dudleyi*	X		X	18	0.13			154	1.47	172	0.287
Inland Rush	*Juncus interior*	X			2	0.08					2	0.003
Grassleaf Rush	*Juncus marginatus*			X					98	0.81	98	0.163
Lettuce	*Lactuca* sp.	X			13	0.09					13	0.022
Whitegrass	*Leersia virginica*			X					23	0.46	23	0.038
Great Blue Lobelia	*Liatris pycnostachya*		X		1	1.00					1	0.002
Prairie Blazing Star	*Lobelia siphilitica*			X					5	0.10	5	0.008

Table 3a (Continued). Cover by Vegetation on Transects at the Fermi Site: Restored Prairie

Common Name	Scientific Name	T1*	T2	T15	T1 Cover Length (cm)*	Avg. Plant Cover (%)	T2 Cover Length (cm)	Avg. Plant Cover (%)	T15 Cover Length (cm)	Avg. Plant Cover (%)	Pooled Length (cm)	Pooled Avg. Cover (%)
Common Water Horehound	*Lycopus americanus*	X		X	19	0.21			155	0.92	174	0.290
Fringed Loosestrife	*Lysimachia ciliata*			X					30	0.38	30	0.050
Moneywort	*Lysimachia nummularia*			X					222	1.60	222	0.370
Purple Loosestrife	*Lythrum salicaria*			X					3	0.10	3	0.005
Black Medick	*Medicago lupulina*	X			39	0.78	8	0.08			47	0.078
White Sweet Clover	*Melilotus alba*	X		X	6	0.24			12	0.24	18	0.030
Wild Mint	*Mentha arvensis*		X				12	0.24			12	0.020
Wild Bergamot	*Monarda fistulosa*	X	X	X	79	1.20	156	0.86	36	0.45	271	0.452
Sensitive Fern	*Onoclea sensibilis*	X		X	62	0.64			247	3.47	309	0.515
Common Wood Sorrel	*Oxalis stricta*	X	X	X	55	0.55	54	0.39	15	0.18	124	0.207
Witchgrass	*Panicum capillare*	X	X	X	4	0.10	20	0.40	12	0.24	36	0.060
Virginia Creeper	*Parthenocissus quinquefolia*	X	X	X	71	0.90	16	0.37	85	0.78	172	0.287
Reed Canary Grass	*Phalaris arundinacea*	X	X	X	8	0.42	253	2.53	248	1.66	509	0.848
Common Reed	*Phragmites australis*			X					82	0.72	82	0.137
Common Plantain	*Plantago major*			X					253	2.55	253	0.422
Blackseed Plantain	*Plantago rugelii*						8	0.42			8	0.013
Virginia Plantain	*Plantago virginica*		X	X	0		25	0.50	137	2.74	162	0.270
Canada Bluegrass	*Poa compressa*	X			14	0.28					14	0.023
Kentucky Bluegrass	*Poa pratensis*	X		X	69	1.49			168	2.20	237	0.395
Eastern Cottonwood	*Populus deltoides*			X					93	0.67	93	0.155
Sulphur Cinquefoil	*Potentilla recta*	X			12	0.48					12	0.020
Common Cinquefoil	*Potentilla simplex*	X	X	X	29	0.69	30	0.71	51	0.35	110	0.183
Common Selfheal	*Prunella vulgaris*	X	X	X	57	1.13	5	0.10	73	1.46	135	0.225
Narrowleaf Mountain Mint	*Pycnanthemum tenuifolium*			X					38	0.28	38	0.063
Pinnate Prairie Coneflower	*Ratibida pinnata*	X	X	X	641	5.26	215	1.47	129	0.73	985	1.642
Currant	*Ribes* sp.			X					49	0.98	49	0.082
Rose	*Rosa* sp.			X					77	0.77	77	0.128
Northern Dewberry	*Rubus flagellaris*		X				51	1.19			51	0.085

Table 3a (Continued). Cover by Vegetation on Transects at the Fermi Site: Restored Prairie

Common Name	Scientific Name	T1*	T2	T15	T1 Cover Length (cm)*	Avg. Plant Cover (%)	T2 Cover Length (cm)	Avg. Plant Cover (%)	T15 Cover Length (cm)	Avg. Plant Cover (%)	Pooled Length (cm)	Pooled Avg. Cover (%)
Blackberry	*Rubus* sp.		X	X			211	1.09	28	0.34	239	0.398
Black-eyed Susan	*Rudbeckia hirta*	X	X	X	454	4.74	26	0.31	217	1.34	697	1.162
Rosepink	*Sabatia angularis*	X			4	0.08					4	0.007
Willow	*Salix* sp.			X					7	0.23	7	0.012
Little Bluestem	*Schizachyrium scoparium*	X	X		286	14.93	2208	17.12			2,494	4.157
Nodding Bulrush	*Scirpus pendulus*	X		X	2	0.08			14	0.23	16	0.027
Yellow Foxtail	*Setaria glauca*	X	X	X	1404	15.07	40	0.80	2	0.04	1,446	2.410
Blue-eyed Grass	*Sisyrinchium angustifolium*	X		X	99	0.81			1	0.03	100	0.167
Canada Goldenrod	*Solidago canadensis*	X	X	X	49	0.43	25	0.29	221	1.18	295	0.492
Indian Grass	*Sorghastrum nutans*	X	X	X	865	6.36	627	4.21	743	4.21	2,235	3.725
Dandelion	*Taraxacum officinale*	X	X	X	66	1.43	77	1.82	62	0.72	205	0.342
Poison Ivy	*Toxicodendron radicans*	X		X					101	0.71	101	0.168
American Elm	*Ulmus americanus*			X					13	0.34	13	0.022
Moth Mullein	*Verbascum blattaria*			X					18	0.36	18	0.030
Blue Vervain	*Verbena hastata*	X		X					54	0.56	54	0.090
Baldwin's Ironweed	*Vernonia baldwini*	X		X					68	0.51	68	0.113
Viburnum	*Viburnum* sp.			X					18	0.36	18	0.030
Common Blue Violet	*Viola sororia*		X	X	10	0.40	35	0.83	44	0.29	89	0.148
Violet	*Viola* sp.		X	X	92	0.51	7	0.14	8	0.16	107	0.178
Riverbank Grape	*Vitis riparia*		X	X	21	0.18	12	0.24	446	3.53	479	0.798
	Number of Species (total 169)	61	39	75							46,180	
										Bare Ground:	13,820	
										Total Length (cm):	60,000	

* T# = Transects

Table 3b. Cover by Vegetation on Transects at the Fermi Site: Lakeshore

English Name	Latin Name	T14*	Cover Length (cm)	Avg. Plant Cover (%)	Pooled Avg. Plant Cover (%)
Three-seeded Mercury	*Acalypha virginica*	X	45	2.09	0.23
Silver Maple	*Acer saccharinum*	X	4	0.08	0.02
Garlic Mustard	*Alliaria petiolata*	X	5,999	48.63	30.00
Daisy	*Aster* sp.	X	21	0.58	0.11
Beggar's Ticks	*Bidens* sp.	X	15	0.70	0.08
Sedge	*Carex* sp.	X	54	0.54	0.27
Creeping Thistle	*Circaea lutetiana*	X	2	0.06	0.01
Canada Horseweed	*Conyza canadensis*	X	12	0.12	0.06
Cleavers	*Galium aparine*	X	14	0.29	0.07
White Avens	*Geum canadense*	X	32	0.24	0.16
Prickly Lettuce	*Lactuca serriola*	X	13	0.13	0.07
Whitegrass	*Leersia virginica*	X	12	0.24	0.06
Moonseed	*Menispermum canadense*	X	11	0.22	0.06
Catnip	*Nepeta cataria*	X	29	0.55	0.15
Common Yellow Wood Sorrel	*Oxalis stricta*	X	35	0.33	0.18
Virginia Creeper	*Parthenocissus quinquefolia*	X	132	0.90	0.66
Climbing False Buckwheat	*Polygonum scandens*	X	79	0.88	0.40
Buckthorn	*Rhamnus* sp.	X	7	0.14	0.04
Currant	*Ribes* sp.	X	20	0.20	0.10
Blackberry	*Rubus* sp.	X	87	0.61	0.44
Sandbar Willow	*Salix exigua*	X	315	3.07	1.58
Black Nightshade	*Solanum nigrum*	X	8	0.09	0.04
Tall Goldenrod	*Solidago altissimus*	X	461	4.04	2.31
Stinging Nettle	*Urtica dioica*	X	63	0.63	0.32
Blue Vervain	*Verbena hastata*	X	7	0.19	0.04
Riverbank Grape	*Vitis riparia*	X	131	0.94	0.66
	Number of Species:	26	7,608		38.0
* T# = Transects	Bare Ground:		12,392		62.0
	Total Length (cm):		20,000		

Table 3c. Cover by Vegetation on Transects at the Fermi Site: Emergent Wetland

English Name	Latin Name	T5*	Cover Length (cm)	Avg. Plant Cover (%)	Pooled Avg. Plant Cover (%)
Swamp Agrimony	*Agrimonia parviflora*	X	30	0.30	0.15
Silky Dogwood	*Cornus amomum*	X	10	0.20	0.05
Reed Canary Grass	*Phalaris arundinacea*	X	6,011	30.43	30.06
River Bulrush	*Scirpus fluviatilis*	X	20	0.20	0.10
Narrow-leaved Cattail	*Typha angustifolia*	X	5,189	51.89	25.95
Blue Cattail	*Typha glauca*	X	6,025	61.30	30.13
	Number of Species:	6	17,285		86.43
* T# = Transects	Bare Ground:		2,715		13.58
	Total Length:		20,000		

Table 3d. Cover by Vegetation on Transects at the Fermi Site: Mixed Hardwood Forest. [transects north of Fermi Drive]

English Name	Latin Name	T3*	T4	T8	T9	T3 Cover Length (cm)*	Avg. Plant Cover (%)	T4 Cover Length (cm)	Avg. Plant Cover (%)	T8 Cover Length (cm)	Avg. Plant Cover (%)	T9 Cover Length (cm)	Avg. Plant Cover (%)	Pooled Length (cm)	Pooled Avg. Plant Cover (%)
Box Elder	*Acer negundo*													0	0.00
Silver Maple	*Acer saccharinum*			X	X					2	0.12	4	0.08	6	0.01
Swamp Agrimony	*Agrimonia parviflora*	X	X	X		66	0.66	15	0.15	12	1.74			93	0.12
Creeping Bentgrass	*Agrostis stolonifera*			X						15	0.30			15	0.02
Garlic Mustard	*Alliaria petiolata*	X				109	2.64							109	0.14
Giant Ragweed	*Ambrosia trifida*			X						5	0.73			5	0.01
American Hogpeanut	*Amphicarpaea bracteata*			X						6	0.12			6	0.01
Canada Anemone	*Anemone canadensis*	X	X		X	463	2.59	49	0.35			19	0.38	531	0.66
Common Burdock	*Arctium minus*				X							7	0.14	7	0.01
Heath Aster	*Aster ericoides*			X						4	0.08			4	0.01
White Panicle Aster	*Aster simplex*													0	0.00
Aster	*Aster* sp.			X						33	1.04			33	0.04
Spanish Needles	*Bidens bipinnata*			X						98	1.96			98	0.12
Beggar's Ticks	*Bidens* sp.			X						247	4.51			247	0.31
False Nettle	*Boehmeria cylindrica*	X	X	X		242	1.61	40	0.43	120	7.16			402	0.50
Gray's Sedge	*Carex grayi*													0	0.00
Sedge	*Carex* sp.	X	X	X	X	412	2.98	13	0.26	167	1.71	48	0.53	640	0.80
Goosefoot	*Chenopodium* sp.													0	0.00
American Hornbeam	*Carpinus caroliniana*													0	0.00
Shagbark Hickory	*Carya ovata*													0	0.00
Hackberry	*Celtis occidentalis*													0	0.00
Enchanter's Nightshade	*Circaea lutetiana*	X		X	X	47	0.72			13	1.89	51	2.09	111	0.14
Field Thistle	*Cirsium arvense*		X	X				135	0.73	3	0.44			138	0.17
Spring Beauty	*Claytonia virginica*													0	0.00
Canada Horseweed	*Conyza canadensis*													0	0.00
Silky Dogwood	*Cornus amomum*	X	X	X	X	67	2.52	239	1.71	48	0.78	31	1.28	385	0.48
Rough-leaf Dogwood	*Cornus drummondii*	X	X			452	4.21	106	1.06					558	0.70
Downy Hawthorn	*Crataegus mollis*			X	X					8	0.16	8	0.67	16	0.02
Canadian Honewort	*Cryptotaenia canadensis*	X			X	17	0.34					1	0.08	18	0.02
Bottlebrush Grass	*Elymus hystrix*	X		X		15	0.56			47	0.55			62	0.08
Virginia Wild Rye	*Elymus viginicus*	X				851	5.95							851	1.06
Hairy Wild Rye	*Elymus villosus*													0	0.00
Wild Strawberry	*Fragaria virginiana*													0	0.00
Green Ash	*Fraxinus pennsylvanica*	X	X	X	X	47	0.50	63	0.42	138	1.61	2	0.04	250	0.31
Cleavers	*Galium aparine*													0	0.00
Bedstraw	*Galium* sp.	X	X	X	X	59	0.70	6	0.12	80	1.39	55	0.70	200	0.25
Wild Geranium	*Geranium maculatum*	X			X	290	6.27					11	0.93	301	0.38
White Avens	*Geum canadense*	X	X	X	X	1,194	10.31	31	0.21	197	4.12	367	5.34	1,789	2.24
Fowl Manna Grass	*Glyceria striata*	X		X	X	8	0.07			97	1.98	6	0.25	111	0.14

Table 3d (Continued). Cover by Vegetation on Transects at the Fermi Site: Mixed Hardwood Forest. [transects north of Fermi Drive]

English Name	Latin Name	T3*	T4	T8	T9	T3 Cover Length (cm)*	Avg. Plant Cover (%)	T4 Cover Length (cm)	Avg. Plant Cover (%)	T8 Cover Length (cm)	Avg. Plant Cover (%)	T9 Cover Length (cm)	Avg. Plant Cover (%)	Pooled Length (cm)	Pooled Avg. Plant Cover (%)
Stickseed	*Hackelia virginiana*	X				12	0.24							12	0.02
Virginia Waterleaf	*Hydrophyllum virginianum*				X							10	0.77	10	0.01
Spotted Touch-me-not	*Impatiens capensis*			X						8	1.16			8	0.01
Touch-me-not	*Impatiens* sp.			X	X					29	0.57	58	1.44	87	0.11
Path Rush	*Juncus tenuis*													0	0.00
Whitegrass	*Leersia virginica*	X		X	X	605	4.03			890	9.07	185	1.28	1,680	2.10
Bugleweed	*Lycopus virginicus*		X					15	0.30					15	0.02
Horehound	*Lycopus* sp.													0	0.00
Moneywort	*Lysimachia nummularia*	X	X			3,339	26.61	14	0.28					3,353	4.19
Moonseed	*Menispermum canadense*													0	0.00
Muhly	*Muhlenbergia* sp.	X				30	0.30							30	0.04
Sensitive Fern	*Onoclea sensibilis*													0	0.00
Hophornbeam	*Ostrya virginiana*			X						4	0.58			4	0.01
Common Yellow Wood Sorrel	*Oxalis stricta*	X		X	X	43	0.50			2	0.29	24	0.24	69	0.09
Virginia Creeper	*Parthenocissus quinquefolia*	X		X	X	16	0.83			61	1.53	254	6.76	331	0.41
Reed Canary Grass	*Phalaris arundinacea*	X	X			163	3.49	17,264	89.79					17,427	21.78
Common Reed	*Phragmites australis*		X					18	0.36					18	0.02
Clearweed	*Pilea pumila*	X		X	X	70	1.31			650	6.50	55	4.63	775	0.97
Common Plantain	*Plantago major*	X				6	0.31							6	0.01
Woodland Bluegrass	*Poa sylvestris*													0	0.00
Prince's Feather	*Polygonum orientale*				X							854	9.02	854	1.07
Climbing False Buckwheat	*Polygonum scandens*	X				16	0.32							16	0.02
Virginia Knotweed	*Polygonum virginianum*	X	X	X	X	1,132	8.94	15	0.15	1,064	13.47	1,135	27.29	3,346	4.18
Common Cinquefoil	*Potentilla simplex*													0	0.00
Common Buckthorn	*Rhamnus cathartica*		X	X				5	0.10	6	0.87			11	0.01
Buckthorn	*Rhamnus* sp.													0	0.00
Currant	*Ribes* sp.				X							21	0.21	21	0.03
Multiflora Rose	*Rosa multiflora*	X			X	14	0.73					23	0.58	37	0.05
Rose	*Rosa* sp.	X	X			33	0.64	19	0.38					52	0.07
Black Raspberry	*Rubus occidentalis*													0	0.00
Blackberry	*Rubus* sp.	X	X	X	X	50	0.55	6	0.12	894	10.45	5	0.42	955	1.19
Canadian Black Snakeroot	*Sanicula canadense*	X				6	0.06							6	0.01
Maryland Sanicle	*Sanicula marilandica*	X		X	X	65	2.45			26	0.52	352	4.68	443	0.55
Nodding Bulrush	*Scirpus pendulus*													0	0.00
Nightshade	*Solanum* sp.		X					6	0.12					6	0.01
Canada Goldenrod	*Solidago canadensis*													0	0.00
Goldenrod	*Solidago* sp.													0	0.00
Prairie Wedgescale	*Sphenopholis obtusata*													0	0.00
Dandelion	*Taraxacum officinale*													0	0.00
Poison Ivy	*Toxicodendron radicans*	X	X	X	X	221	1.41	130	0.68	576	7.03	1,109	12.44	2,036	2.55

Table 3d (Continued). Cover by Vegetation on Transects at the Fermi Site: Mixed Hardwood Forest. [transects north of Fermi Drive]

English Name	Latin Name	T3*	T4	T8	T9	T3 Cover Length (cm)*	Avg. Plant Cover (%)	T4 Cover Length (cm)	Avg. Plant Cover (%)	T8 Cover Length (cm)	Avg. Plant Cover (%)	T9 Cover Length (cm)	Avg. Plant Cover (%)	Pooled Length (cm)	Pooled Avg. Plant Cover (%)
Trillium	*Trillium* sp.			X	X					6	0.87	62	2.40	68	0.09
American Elm	*Ulmus americana*	X		X		35	0.70			4	0.20			39	0.05
Stinging Nettle	*Urtica dioica*	X		X		15	0.56			120	1.71			135	0.17
White Vervain	*Verbena urticifolia*			X						7	0.42			7	0.01
Canada White Violet	*Viola canadensis*	X		X	X	80	0.73			46	1.20	196	2.78	322	0.40
Violet	*Viola* sp.													0	0.00
Riverbank Grape	*Vitis riparia*	X	X	X	X	14	0.18	68	0.35	3	0.06	11	0.25	96	0.12
	Number of Species:	37	21	38	29									39,261	49.08
													Bare Ground:	40,739	50.92
													Total Length (cm):	80,000	

* T# = Transects

Table 3e. Cover by Vegetation on Transects at the Fermi Site: Mixed Hardwood Forest. [transects south of Fermi Drive]

English Name	Latin Name	T6*	T7	T10	T11	T12	T13	T6 Cover Length (cm)	Avg. Plant Cover (%)	T7 Cover Length (cm)	Avg. Plant Cover (%)	T10 Cover Length (cm)	Avg. Plant Cover (%)	T11 Cover Length (cm)	Avg. Plant Cover (%)	T12 Cover Length (cm)	Avg. Plant Cover (%)	T13 Cover Length (cm)	Avg. Plant Cover (%)	Pooled Length (cm)	Pooled Avg. Plant Cover (%)
Box Elder	*Acer negundo*		X							11	0.22									11	0.01
Silver Maple	*Acer saccharinum*			X	X		X					81	0.70	3	0.06			4	0.29	88	0.04
Swamp Agrimony	*Agrimonia parviflora*	X	X	X	X	X	X	254	17.91	203	10.75	57	0.82	99	11.25	55	0.70	357	2.24	1,025	0.51
Creeping Bentgrass	*Agrostis stolonifera*																			0	0.00
Garlic Mustard	*Alliaria petiolata*	X	X	X	X	X		748	15.83	1,023	16.14	24	0.24	2	0.04	5	0.09			1,802	0.90
Giant Ragweed	*Ambrosia trifida*	X		X				3	0.21			3	0.33							6	0.00
American Hogpeanut	*Amphicarpaea bracteata*																			0	0.00
Canada Anemone	*Anemone canadensis*	X	X	X		X		65	0.84	26	1.38	58	0.56			9	0.18			158	0.08
Burdock	*Arctium minus*																			0	0.00
Heath Aster	*Aster ericoides*																			0	0.00
White Panicle Aster	*Aster simplex*	X		X				5	0.05			21	0.21			4	0.08			30	0.02
Aster	*Aster* sp.			X			X					225	2.50			10	0.65	12	0.24	247	0.12
Spanish Needles	*Bidens bipinnata*	X	X					35	2.05	567	24.09									602	0.30
Beggar's Ticks	*Bidens* sp.	X	X					66	0.44	1,847	14.86									1,913	0.96
False Nettle	*Boehmeria cylindrica*	X	X	X	X	X		20	0.62	4	0.08	27	0.57	106	1.17	8	0.59			165	0.08
Gray's Sedge	*Carex grayi*	X						101	2.02											101	0.05
Sedge	*Carex* sp.	X	X	X	X	X	X	406	5.34	99	1.13	402	2.63	67	0.73	126	1.55	296	2.80	1,396	0.70
Goosefoot	*Chenopodium* sp.	X	X					51	0.70	15	0.64									66	0.03
American Hornbeam	*Carpinus caroliniana*					X	X									9	0.58	1	0.07	10	0.01
Shagbark Hickory	*Carya ovata*					X										147	9.53			147	0.07
Hackberry	*Celtis occidentalis*			X	X							2	0.22	16	0.81					18	0.01
Enchanter's Nightshade	*Circaea lutetiana*	X	X	X	X	X	X	75	1.44	220	2.46	9	0.59	33	1.13	21	1.36	49	1.58	407	0.20
Field Thistle	*Cirsium arvense*	X	X					30	0.50	86	1.04									116	0.06
Spring Beauty	*Claytonia virginica*					X										3	0.19			3	0.00
Canada Horseweed	*Conyza canadensis*						X											18	0.78	18	0.01
Silky Dogwood	*Cornus amomum*	X	X		X	X	X	82	1.74	58	0.48			181	1.59	584	8.09	10	0.18	915	0.46
Rough-leaf Dogwood	*Cornus drummondii*	X						10	0.20											10	0.01
Downy Hawthorn	*Crataegus mollis*		X							18	0.36									18	0.01
Canadian Honewort	*Cryptotaenia canadensis*																			0	0.00
Bottlebrush Grass	*Elymus hystrix*		X			X				15	0.30					2	0.15			17	0.01
Virginia Wild Rye	*Elymus viginicus*					X										16	1.04			16	0.01
Hairy Wild Rye	*Elymus villosus*																			0	0.00
Wild Strawberry	*Fragaria virginiana*					X	X									30	0.26	61	0.57	91	0.05
Green Ash	*Fraxinus pennsylvanica*		X			X	X			177	1.05					65	0.83	163	1.04	405	0.20
Cleavers	*Galium aparine*	X	X					8	0.47	10	0.42									18	0.01
Bedstraw	*Galium* sp.	X	X	X	X		X	4	0.28	112	1.53	52	5.67	19	2.16			13	0.13	200	0.10
Wild Geranium	*Geranium maculatum*			X	X	X						6	0.39	8	0.78	8	0.59			22	0.01
White Avens	*Geum canadense*	X	X	X	X	X	X	566	4.22	403	2.59	88	1.15	188	2.81	276	3.12	834	8.17	2,355	1.18
Fowl Manna Grass	*Glyceria striata*		X		X	X	X			95	1.07			55	1.13	8	0.13	137	0.92	295	0.15
Stickseed	*Hackelia virginiana*					X										18	0.36			18	0.01

Table 3e (Continued). Cover by Vegetation on Transects at the Fermi Site: Mixed Hardwood Forest. [transects south of Fermi Drive]

English Name	Latin Name	T6*	T7	T10	T11	T12	T13	T6 Cover Length (cm)	Avg. Plant Cover (%)	T7 Cover Length (cm)	Avg. Plant Cover (%)	T10 Cover Length (cm)	Avg. Plant Cover (%)	T11 Cover Length (cm)	Avg. Plant Cover (%)	T12 Cover Length (cm)	Avg. Plant Cover (%)	T13 Cover Length (cm)	Avg. Plant Cover (%)	Pooled Length (cm)	Pooled Avg. Plant Cover (%)
Virginia Waterleaf	*Hydrophyllum virginianum*																			0	0.00
Spotted Touch-me-not	*Impatiens capensis*	X		X	X	X		4	0.28			8	0.87	10	1.14	12	0.23			34	0.02
Touch-me-not	*Impatiens* sp.	X		X	X		X	27	0.39			18	1.18	21	2.05			34	1.47	100	0.05
Path Rush	*Juncus tenuis*					X	X									5	0.10	99	1.19	104	0.05
Whitegrass	*Leersia virginica*	X	X	X	X	X	X	6	0.35	8	0.16	2,091	11.68	1,329	10.05	14	0.28	74	0.80	3,522	1.76
Bugleweed	*Lycopus virginicus*																			0	0.00
Horehound	*Lycopus* sp.					X										11	0.81			11	0.01
Moneywort	*Lysimachia nummularia*	X			X	X	X	169	2.61					1,701	18.20	2,244	23.37	1,779	18.23	5,893	2.95
Moonseed	*Menispermum canadense*			X								11	1.20							11	0.01
Muhly	*Muhlenbergia* sp.																			0	0.00
Sensitive Fern	*Onoclea sensibilis*	X						10	0.20											10	0.01
Hophornbeam	*Ostrya virginiana*			X								13	0.13							13	0.01
Common Yellow Wood Sorrel	*Oxalis stricta*	X	X		X	X	X	3	0.21	5	0.10			1	0.11	29	0.29	21	0.30	59	0.03
Virginia Creeper	*Parthenocissus quinquefolia*	X	X	X	X	X	X	185	2.20	141	1.10	202	3.96	251	3.99	589	6.10	118	1.36	1,486	0.74
Reed Canary Grass	*Phalaris arundinacea*		X	X						20	1.06	13	1.42							33	0.02
Common Reed	*Phragmites australis*																			0	0.00
Clearweed	*Pilea pumila*	X	X	X	X	X	X	24	0.45	603	3.26	16	1.74	564	4.06	35	2.27	25	1.82	1,267	0.63
Common Plantain	*Plantago major*				X									1,076	16.59					1,076	0.54
Woodland Bluegrass	*Poa sylvestris*					X	X									2	0.04	149	1.31	151	0.08
Prince's Feather	*Polygonum orientale*																			0	0.00
Climbing False Buckwheat	*Polygonum scandens*																			0	0.00
Jumpseed	*Polygonum virginianum*	X	X	X		X	X	3,174	27.39	2,938	22.60	2,528	35.57			678	6.96	1,230	11.58	10,548	5.27
Common Cinquefoil	*Potentilla simplex*					X										9	0.32			9	0.00
Common Buckthorn	*Rhamnus cathartica*		X	X		X	X			11	0.58	1	0.11			8	0.52	49	1.37	69	0.03
Buckthorn	*Rhamnus* sp.					X	X									7	0.14	11	0.22	18	0.01
Currant	*Ribes* sp.			X	X		X					3	0.33	4	0.45			113	1.42	120	0.06
Multiflora Rose	*Rosa multiflora*		X							2	0.04									2	0.00
Rose	*Rosa* sp.																			0	0.00
Black Raspberry	*Rubus occidentalis*	X	X					37	1.22	112	2.81									149	0.07
Blackberry	*Rubus* sp.	X	X					65	0.65	665	6.65									730	0.37
Canadian Black Snakeroot	*Sanicula canadense*																			0	0.00
Maryland Sanicle	*Sanicula marilandica*			X	X	X	X			10	0.42	46	3.00	90	2.81	32	0.29	9	0.18	187	0.09
Nodding Bulrush	*Scirpus pendulus*						X											2	0.09	2	0.00
Nightshade	*Solanum* sp.																			0	0.00
Canada Goldenrod	*Solidago canadensis*					X	X									3	0.22	16	0.16	19	0.01
Goldenrod	*Solidago* sp.			X		X						8	0.87			13	0.84			21	0.01
Prairie Wedgescale	*Sphenopholis obtusata*		X							35	0.70									35	0.02
Dandelion	*Taraxacum officinale*	X			X			3	0.21					10	1.14					13	0.01
Poison Ivy	*Toxicodendron radicans*	X	X	X	X	X	X	872	7.58	323	2.49	362	5.54	452	4.95	939	8.81	2,067	16.68	5,015	2.51
Trillium	*Trillium* sp.		X							15	0.79									15	0.01
American Elm	*Ulmus americana*	X		X	X	X	X	67	0.71			15	1.64	40	0.89	5	0.10	27	1.17	154	0.08

Table 3e (Continued). Cover by Vegetation on Transects at the Fermi Site: Mixed Hardwood Forest. [transects south of Fermi Drive]

English Name	Latin Name	T6*	T7	T10	T11	T12	T13	T6 Cover Length (cm)	Avg. Plant Cover (%)	T7 Cover Length (cm)	Avg. Plant Cover (%)	T10 Cover Length (cm)	Avg. Plant Cover (%)	T11 Cover Length (cm)	Avg. Plant Cover (%)	T12 Cover Length (cm)	Avg. Plant Cover (%)	T13 Cover Length (cm)	Avg. Plant Cover (%)	Pooled Length (cm)	Pooled Avg. Plant Cover (%)
Stinging Nettle	*Urtica dioica*		X							15	0.79									15	0.01
White Vervain	*Verbena urticifolia*																			0	0.00
Canada White Violet	*Viola canadensis*	X	X	X	X	X	X	39	0.44	20	1.06	62	0.98	57	1.72	54	0.94	15	0.21	247	0.12
Violet	*Viola* sp.		X							6	0.12									6	0.00
Riverbank Grape	*Vitis riparia*	X	X		X		X	9	0.06	58	0.45			5	0.10			29	0.77	101	0.05
	Number of Species:	34	36	30	27	37	32													43,954	21.98
																			Bare Ground:	76,046	78.02
																			Total Length (cm):	120,000	

* T# = Transects

Table 4. Vegetation Cover from 1 Meter Plots on Transects at the Fermi Site

Transects and Plots Pooled	July 2008		October 2008		May 2009		June 2009	
Species	1 Meter Plot		1 Meter Plot		1 Meter Plot		1 Meter Plot	
	Est. Aerial Coverage (%)	Coverage Class	Est. Aerial Coverage (%)	Coverage Class	Est. Aerial Coverage (%)	Coverage Class	Est. Aerial Coverage (%)	Coverage Class
Acer negundo	0.2	T	1	1			2	1
Acer saccharinum			1	1	3	1	1	1
Agrimonia parviflora	3.1	1	49	4	42	4	10	2
Agrimonia striata			1	1	1	1	3	1
Alliaria petiolata	22.5	3	5	1	108		59	5
Allium schoenoprasum					1	1		
Ambrosia artemisiifolia	2	1	1	1	1	1	4	1
Amphicarpaea bracteata							5	1
Andropogon gerardii	373	7	100	7	217	7	395	7
Anemone canadensis	40	4	10	2	11	2	5	1
Apocynum cannabinum	0.1	T					12	2
Arctium minus	0.1	T			3	1		
Arisaema triloba	3	1						
Asclepias speciosa							10	2
Aster ericoides			5	1				
Aster pilosus							1	1
Aster simplex			3	1				
Aster sp.	3	1			5	1	4	1
Bidens bipinnata			18	3			58	5
Bidens sp.	134	7	2	1	4	1	13	2
Boehmeria cylindrica	33	4	22	3	2	1	9	2
Bromus inermis	35	4						
Bromus japonicus	2	1						
Carex sp.	85.4	6	90.1	6	61	5	52	5
Carya ovata					12	2		
Celtis occidentalis					2	1		
Chenopodium sp.					1	1		
Cicuta maculata	3	1						
Circaea lutetiana	2	1			5	1	2	1
Cirsium arvense	63	5	70.1	5	28	4	36	4
Cornus amomum	68.2	5	31	4	11	2	13	2
Cornus drummondii	19	3	2	1	22	3	20	3
Crataegus sp.			1	1				
Cryptotaenia canadensis					5	1		
Daucus carota	12	2	7	2	1	1		
Dipsacus fullonum					3	1		
Echinacea purpurea					3	1		
Elymus canadensis	125	7	20	3	130	7	38	4
Elymus hystrix	0.1	T						

Table 4 (Continued). Vegetation Cover from 1 Meter Plots on Transects at the Fermi Site

Transects and Plots Pooled	July 2008		October 2008		May 2009		June 2009	
Species	1 Meter Plot		1 Meter Plot		1 Meter Plot		1 Meter Plot	
	Est. Aerial Coverage (%)	Coverage Class	Est. Aerial Coverage (%)	Coverage Class	Est. Aerial Coverage (%)	Coverage Class	Est. Aerial Coverage (%)	Coverage Class
Elymus villosus	5	1						
Elymus virginicus	47.1	4	20	3	40	4		
Erigeron annuus					1	1		
Erigeron strigosus	24.1	3	1	1			1	1
Eupatorium perfoliatum	10	2						
Eupatorium serotinum			1	1				
Euthamia graminifolia			1	1				
Fragaria virginiana	6	2	28	4	18	3	36	4
Fraxinus pennsylvanica	50	4	58	5	23	3	41	4
Galium aparine					3	1	3	1
Galium tinctorum	0.1	T						
Galium sp.	6.2	2	4	1	9	2		
Geranium maculatum					1	1	7	2
Geum canadense	113.8		52	5	66	5	73	5
Geum sp.			14	2				
Glyceria striata	26	4	20	3			32	4
Hackelia virginiana	2	1						
Helenium autumnale	15	2	2	1				
Impatiens sp.	2.2	1			2	1	1	1
Juncus dudleyi	4.2	1	2	1			10	2
Juncus marginatus	1.1	1			5	1		
Juncus tenuis							2	1
Juncus torreyi							1	1
Leersia virginica	7	2	110		34	4	32	4
Liatris pycnostachya							1	1
Ligustrum sp.			2	1				
Lycopus americanus	2.1	1	3	1				
Lycopus virginicus			3	1				
Lysimachia ciliata	145							
Lysimachia nummularia	130	7	243	7	322	7	456	7
Medicago lupulina	2	1	2	1			1	1
Melilotus alba							1	1
Menispermum canadense	2.5	1						
Monarda fistulosa	1	1	1	1	14	2	5	1
Muhlenbergia sp.	2	1	3	1				
Ostrya virginiana	0.1	T						
Oxalis stricta	17	3	6	2	7	2	16	3
Panicum capillare	2	1	2	1				
Parthenocissus quinquefolia	77.7	6	13	2	38	4	70	5

Table 4 (Continued). Vegetation Cover from 1 Meter Plots on Transects at the Fermi Site

Transects and Plots Pooled	July 2008		October 2008		May 2009		June 2009	
Species	1 Meter Plot		1 Meter Plot		1 Meter Plot		1 Meter Plot	
	Est. Aerial Coverage (%)	Coverage Class	Est. Aerial Coverage (%)	Coverage Class	Est. Aerial Coverage (%)	Coverage Class	Est. Aerial Coverage (%)	Coverage Class
Phalaris arundinacea	335	7	410	7	307	7	360	7
Phragmites australis	40	4	8	2	12	2		
Pilea pumila	62.1	5	35	4	25	4	19	3
Plantago major					2	1		
Plantago virginica	37	4	52	5				
Poa pratensis	1	1			2	1		
Poa sylvestris			1	1	17	3	3	1
Polygonum coccineum	5	1						
Polygonum scandens	30.1	4						
Polygonum virginianum	605	7	190	7	150	7	369	7
Populus deltoides	5.5	1	10	2			5	1
Potentilla recta							2	1
Potentilla simplex	2.1	1	3	1	4	1	6	2
Prunella vulgaris	35	4	2	1	1	1		
Pycnanthemum tenuifolium	3	1						
Quercus muhlenbergii							2	1
Ranunculus fascicularis					6	2		
Ratibida pinnata	14	2	21	3	4	1	23	3
Rhamnus cathartica					6	2	11	2
Rhamnus sp.					1	1	1	1
Ribes sp.	7.1	2	5	1	10	2	6	2
Rosa multiflora	5	1	1	1				
Rubus flagellaris							5	1
Rubus sp.	10	2	27	4	7	2	15	2
Rudbeckia hirta	53	5	7	2	19	3	36	4
Sabatia angularis	1	1						
Salix exigua					40	4		
Sanicula canadensis							1	1
Sanicula marilandica	65.2	5	28	4			11	2
Schizachyrium scoparium	5	1			100	7		
Scirpus pendulus	4	1					2	1
Setaria glauca	35	4	68	5				
Solanum nigrum	2.5	1						
Solidago altissima					1	1	1	1
Solidago canadensis	6	2	5	1	3	1	2	1
Sorghastrum avenaceum			160	7	5	1		
Taraxacum officinale			1	1	16	3		
Tilia americana	20	3						
Toxicodendron radicans	243.1	7	91	6	54	5	236	7

Table 4 (Continued). Vegetation Cover from 1 Meter Plots on Transects at the Fermi Site

Transects and Plots Pooled	July 2008		October 2008		May 2009		June 2009	
Species	1 Meter Plot		1 Meter Plot		1 Meter Plot		1 Meter Plot	
	Est. Aerial Coverage (%)	Coverage Class	Est. Aerial Coverage (%)	Coverage Class	Est. Aerial Coverage (%)	Coverage Class	Est. Aerial Coverage (%)	Coverage Class
Trifolium repens	0.1	T						
Trillium sp.					4	1		
Typha x glauca	150	7	150	7	130	7	200	7
Ulmus americana			3	1			1	1
Urtica dioica					1	1	5	1
Verbena hastata	2	1	3	1	3	1	10	2
Viola canadensis	4.1	1	2	1	18	3	7	2
Viola sororia	1.1	1			1	1	2	1
Viola sp.			8	2				
Vitis riparia	8.3	2	4.1	1	4	1	13	2
Vitis sp.	75.1	6						
Bare Ground	1518	7	2035	7	2722	7	1989	7
Total Vegetation Cover (%)	3,602.3		2325.3		2218		2895	
Number of Species	83		69		70		69	

Table 5. Plant Species Abundance by Habitat at the Fermi Site

Common Name	Scientific Name	Restored Prairie	Relative Abundance	Emergent Wetland	Relative Abundance	Lakeshore	Relative Abundance	Woods	Relative Abundance	All Habitats	Relative Abundance
Three-seeded Mercury	*Acalypha virginica*	0	0.00	0	0.00	2	0.98	0	0.00	2	0.03
Box Elder	*Acer negundo*	1	0.06	0	0.00	0	0.00	1	0.02	2	0.03
Red Maple	*Acer rubrum*	1	0.06	0	0.00	0	0.00	0	0.00	1	0.01
Silver Maple	*Acer saccharinum*	0	0.00	0	0.00	1	0.49	17	0.29	18	0.23
Swamp Agrimony	*Agrimonia parviflora*	39	2.29	2	8.70	0	0.00	172	2.98	213	2.76
Agrimony	*Agrimonia*	1	0.06	0	0.00	0	0.00	5	0.09	6	0.08
Quackgrass	*Agropyron repens*	1	0.06	0	0.00	0	0.00	0	0.00	1	0.01
Creeping Bentgrass	*Agrostis stolonifera*	0	0.00	0	0.00	0	0.00	3	0.05	3	0.04
Garlic Mustard	*Alliaria petiolata*	0	0.00	0	0.00	53	25.85	270	4.67	323	4.19
Wild Chives	*Allium schoenoprasum*	2	0.12	0	0.00	0	0.00	0	0.00	2	0.03
Onion	*Allium* sp.	11	0.64	0	0.00	0	0.00	0	0.00	11	0.14
Common Ragweed	*Ambrosia artemisiifolia*	1	0.06	0	0.00	0	0.00	0	0.00	1	0.01
Giant Ragweed	*Ambrosia trifida*	1	0.06	0	0.00	0	0.00	7	0.12	8	0.10
American Hogpeanut	*Amphicarpaea bracteata*	88	5.16	0	0.00	0	0.00	1	0.02	89	1.15
Big Bluestem	*Andropogon gerardii*	131	7.68	0	0.00	0	0.00	0	0.00	131	1.70
Canada Anemone	*Anemone canadensis*	13	0.76	0	0.00	0	0.00	95	1.64	108	1.40
Prairie Indian Hemp	*Apocynum cannabinum*	1	0.06	0	0.00	0	0.00	0	0.00	1	0.01
Common Burdock	*Arctium minus*	17	1.00	0	0.00	0	0.00	1	0.02	18	0.23
Heath Aster	*Aster ericoides*	1	0.06	0	0.00	0	0.00	1	0.02	2	0.03
White Heath Aster	*Aster pilosus*	3	0.18	0	0.00	0	0.00	0	0.00	3	0.04
White Panicle Aster	*Aster simplex*	5	0.29	0	0.00	0	0.00	5	0.09	10	0.13
Aster	*Aster* sp.	3	0.18	0	0.00	4	1.95	14	0.24	21	0.27
Wintercress	*Barbarea vulgaris*	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Bearded Beggarticks	*Bidens aristosa*	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Spanish Needles	*Bidens bipinnata*	1	0.06	0	0.00	0	0.00	27	0.47	28	0.36
Beggarticks	*Bidens* sp.	1	0.06	0	0.00	1	0.49	100	1.73	102	1.32
False Nettle	*Boehmeria cylindrica*	9	0.53	0	0.00	0	0.00	33	0.57	42	0.54
Smooth Brome	*Bromus inermis*	8	0.47	0	0.00	0	0.00	0	0.00	8	0.10
Japanese Brome	*Bromus japonicus*	1	0.06	0	0.00	0	0.00	0	0.00	1	0.01
Blue Joint Grass	*Calamagrostis canadensis*	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Gray's Sedge	*Carex grayi*	32	1.88	0	0.00	0	0.00	8	0.14	40	0.52
Sedge	*Carex* sp.	67	3.93	0	0.00	11	5.37	227	3.93	305	3.96
American Hornbeam	*Carpinus caroliniana*	0	0.00	0	0.00	0	0.00	4	0.07	4	0.05
Shagbark Hickory	*Carya ovata*	0	0.00	0	0.00	0	0.00	4	0.07	4	0.05
Hickory	*Carya* sp.	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Hackberry	*Celtis occidentalis*	0	0.00	0	0.00	0	0.00	5	0.09	5	0.06
Goosefoot	*Chenopodium* sp.	1	0.06	0	0.00	0	0.00	9	0.16	10	0.13
Ox-eye Daisy	*Chrysanthemum leucanthemum*	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Enchanter's Nightshade	*Circaea lutetiana*	66	3.87	0	0.00	1	0.49	100	1.73	167	2.17
Creeping Thistle	*Cirsium arvense*	17	1.00	0	0.00	0	0.00	18	0.31	35	0.45
Field Thistle	*Cirsium discolor*	8	0.47	0	0.00	0	0.00	0	0.00	8	0.10
Spring Beauty	*Claytonia virginica*	0	0.00	0	0.00	0	0.00	1	0.02	1	0.01

Table 5 (Continued). Plant Species Abundance by Habitat at the Fermi Site

Common Name	Scientific Name	Restored Prairie	Relative Abundance	Emergent Wetland	Relative Abundance	Lakeshore	Relative Abundance	Woods	Relative Abundance	All Habitats	Relative Abundance
Horseweed	*Conyza canadensis*	1	0.06	0	0.00	2	0.98	2	0.03	5	0.06
Silky Dogwood	*Cornus amomum*	16	0.94	1	4.35	0	0.00	86	1.49	103	1.34
Roughleaf Dogwood	*Cornus drummondii*	20	1.17	0	0.00	0	0.00	39	0.68	59	0.77
Downy Hawthorn	*Crataegus mollis*	0	0.00	0	0.00	0	0.00	2	0.03	2	0.03
Hawthorn	*Crataegus* sp.	0	0.00	0	0.00	0	0.00	1	0.02	1	0.01
Canadian Honewort	*Cryptotaenia canadensis*	10	0.59	0	0.00	0	0.00	3	0.05	13	0.17
Wild Carrot	*Daucus carota*	7	0.41	0	0.00	0	0.00	0	0.00	7	0.09
Rosette Grass	*Dichanthelium* sp.	3	0.18	0	0.00	0	0.00	0	0.00	3	0.04
Fuller's Teasel	*Dipsacus fullonum*	8	0.47	0	0.00	0	0.00	0	0.00	8	0.10
Eastern Purple Coneflower	*Echinacea purpurea*	1	0.06	0	0.00	0	0.00	0	0.00	1	0.01
Barnyard Grass	*Echinochloa crusgalli*	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Red-rooted Spike Rush	*Eleocharis erythropoda*	49	2.87	0	0.00	0	0.00	0	0.00	49	0.64
Canada Wild Rye	*Elymus canadensis*	66	3.87	0	0.00	0	0.00	0	0.00	66	0.86
Bottlebrush Grass	*Elymus hystrix*	0	0.00	0	0.00	0	0.00	9	0.16	9	0.12
Hairy Wild Rye	*Elymus villosus*	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Virginia Wild Rye	*Elymus virginicus*	3	0.18	0	0.00	0	0.00	29	0.50	32	0.41
Annual Fleabane	*Erigeron annuus*	5	0.29	0	0.00	0	0.00	0	0.00	5	0.06
Philadelphia Fleabane	*Erigeron philadelphicus*	2	0.12	0	0.00	0	0.00	0	0.00	2	0.03
Fleabane Daisy	*Erigeron strigosus*	4	0.23	0	0.00	0	0.00	0	0.00	4	0.05
Late Boneset	*Eupatorium serotinum*	4	0.23	0	0.00	0	0.00	0	0.00	4	0.05
Euphorbia	*Euphorbia* sp.	2	0.12	0	0.00	0	0.00	0	0.00	2	0.03
Grass-leaved Goldenrod	*Euthamia graminifolia*	7	0.41	0	0.00	0	0.00	0	0.00	7	0.09
Wild Strawberry	*Fragaria virginiana*	73	4.28	0	0.00	0	0.00	16	0.28	89	1.15
Green Ash	*Fraxinus pennsylvanica*	8	0.47	0	0.00	0	0.00	50	0.87	58	0.75
Cleavers	*Galium aparine*	1	0.06	0	0.00	6	2.93	3	0.05	10	0.13
Bedstraw	*Galium* sp.	4	0.23	0	0.00	0	0.00	99	1.71	103	1.34
Wild Geranium	*Geranium maculatum*	11	0.64	0	0.00	0	0.00	48	0.83	59	0.77
White Avens	*Geum canadense*	14	0.82	0	0.00	4	1.95	520	9.00	538	6.98
Honey Locust	*Gleditsia triacanthos*	2	0.12	0	0.00	0	0.00	0	0.00	2	0.03
Fowl Manna Grass	*Glyceria striata*	8	0.47	0	0.00	0	0.00	39	0.68	47	0.61
Virginia Stickseed	*Hackelia virginiana*	0	0.00	0	0.00	0	0.00	2	0.03	2	0.03
Sneezeweed	*Helenium autumnale*	12	0.70	0	0.00	0	0.00	0	0.00	12	0.16
Virginia Waterleaf	*Hydrophyllum virginianum*	0	0.00	0	0.00	0	0.00	1	0.02	1	0.01
Orange Jewelweed	*Impatiens capensis*	0	0.00	0	0.00	0	0.00	14	0.24	14	0.18
Jewelweed	*Impatiens* sp.	0	0.00	0	0.00	0	0.00	31	0.54	31	0.40
Dudley's Rush	*Juncus dudleyi*	30	1.76	0	0.00	0	0.00	0	0.00	30	0.39
Inland Rush	*Juncus interior*	1	0.06	0	0.00	0	0.00	0	0.00	1	0.01
Grassleaf Rush	*Juncus marginatus*	14	0.82	0	0.00	0	0.00	0	0.00	14	0.18
Path Rush	*Juncus tenuis*	0	0.00	0	0.00	0	0.00	10	0.17	10	0.13
Prickly Lettuce	*Lactuca serriola*	0	0.00	0	0.00	2	0.98	0	0.00	2	0.03
Lettuce	*Lactuca* sp.	1	0.06	0	0.00	0	0.00	0	0.00	1	0.01
Whitegrass	*Leersia virginica*	2	0.12	0	0.00	2	0.98	198	3.43	202	2.62

Table 5 (Continued). Plant Species Abundance by Habitat at the Fermi Site

Common Name	Scientific Name	Restored Prairie	Relative Abundance	Emergent Wetland	Relative Abundance	Lakeshore	Relative Abundance	Woods	Relative Abundance	All Habitats	Relative Abundance
Prairie Blazing Star	*Liatris pycnostachya*	1	0.06	0	0.00	0	0.00	0	0.00	1	0.01
Great Blue Lobelia	*Lobelia siphilitica*	1	0.06	0	0.00	0	0.00	0	0.00	1	0.01
Common Water Horehound	*Lycopus americanus*	16	0.94	0	0.00	0	0.00	1	0.02	17	0.22
Bugleweed	*Lycopus virginicus*	1	0.06	0	0.00	0	0.00	3	0.05	4	0.05
Horehound	*Lycopus* sp.	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Fringed Loosestrife	*Lysimachia ciliata*	5	0.29	0	0.00	0	0.00	0	0.00	5	0.06
Moneywort	*Lysimachia nummularia*	28	1.64	0	0.00	0	0.00	597	10.33	625	8.11
Purple Loosestrife	*Lythrum salicaria*	1	0.06	0	0.00	0	0.00	0	0.00	1	0.01
Black Medick	*Medicago lupulina*	4	0.23	0	0.00	0	0.00	0	0.00	4	0.05
White Sweet Clover	*Melilotus alba*	1	0.06	0	0.00	0	0.00	0	0.00	1	0.01
Moonseed	*Menispermum canadense*	0	0.00	0	0.00	1	0.49	11	0.19	12	0.16
Wild Mint	*Mentha arvensis*	1	0.06	0	0.00	0	0.00	0	0.00	1	0.01
Wild Bergamot	*Monarda fistulosa*	44	2.58	0	0.00	0	0.00	0	0.00	44	0.57
Muhly	*Muhlenbergia* sp.	0	0.00	0	0.00	0	0.00	7	0.12	7	0.09
Catnip	*Nepeta cataria*	0	0.00	0	0.00	2	0.98	0	0.00	2	0.03
Sensitive Fern	*Onoclea sensibilis*	8	0.47	0	0.00	0	0.00	1	0.02	9	0.12
Hophornbeam	*Ostrya virginiana*	0	0.00	0	0.00	0	0.00	2	0.03	2	0.03
Common Yellow Wood Sorrel	*Oxalis stricta*	24	1.41	0	0.00	4	1.95	28	0.48	56	0.73
Witchgrass	*Panicum capillare*	5	0.29	0	0.00	0	0.00	0	0.00	5	0.06
Virginia Creeper	*Parthenocissus quinquefolia*	12	0.70	0	0.00	22	10.73	281	4.86	315	4.09
Reed Canary Grass	*Phalaris arundinacea*	25	1.47	9	39.13	0	0.00	43	0.74	77	1.00
Common Reed	*Phragmites australis*	9	0.53	0	0.00	0	0.00	1	0.02	10	0.13
Clearweed	*Pilea pumila*	0	0.00	0	0.00	0	0.00	144	2.49	144	1.87
Common Plantain	*Plantago major*	11	0.64	0	0.00	0	0.00	1	0.02	12	0.16
Red-stalked Plantain	*Plantago rugelii*	1	0.06	0	0.00	0	0.00	0	0.00	1	0.01
Virginia Plantain	*Plantago virginica*	12	0.70	0	0.00	0	0.00	60	1.04	72	0.93
Sycamore	*Platanus occidentalis*	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Canada Bluegrass	*Poa compressa*	2	0.12	0	0.00	0	0.00	0	0.00	2	0.03
Kentucky Bluegrass	*Poa pratensis*	11	0.64	0	0.00	0	0.00	0	0.00	11	0.14
Woodland Bluegrass	*Poa sylvestris*	0	0.00	0	0.00	0	0.00	18	0.31	18	0.23
Prince's Feather	*Polygonum orientale*	0	0.00	0	0.00	0	0.00	2	0.03	2	0.03
False Climbing Buckwheat	*Polygonum scandens*	0	0.00	0	0.00	4	1.95	2	0.03	6	0.08
Jumpseed	*Polygonum virginianum*	0	0.00	0	0.00	0	0.00	1260	21.81	1,260	16.34
Eastern Cottonwood	*Populus deltoides*	6	0.35	0	0.00	0	0.00	0	0.00	6	0.08
Sulphur Cinquefoil	*Potentilla recta*	1	0.06	0	0.00	0	0.00	0	0.00	1	0.01
Common Cinquefoil	*Potentilla simplex*	15	0.88	0	0.00	0	0.00	2	0.03	17	0.22
Common Selfheal	*Prunella vulgaris*	19	1.11	0	0.00	0	0.00	0	0.00	19	0.25
Narrowleaf Mountain Mint	*Pycnanthemum tenuifolium*	5	0.29	0	0.00	0	0.00	0	0.00	5	0.06
White Oak	*Quercus alba*	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Swamp White Oak	*Quercus bicolor*	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Red Oak	*Quercus rubra*	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Pinnate Prairie Coneflower	*Ratibida pinnata*	98	5.74	0	0.00	0	0.00	0	0.00	98	1.27

Table 5 (Continued). Plant Species Abundance by Habitat at the Fermi Site

Common Name	Scientific Name	Restored Prairie	Relative Abundance	Emergent Wetland	Relative Abundance	Lakeshore	Relative Abundance	Woods	Relative Abundance	All Habitats	Relative Abundance
Common Buckthorn	*Rhamnus cathartica*	0	0.00	0	0.00	0	0.00	14	0.24	14	0.18
Buckthorn	*Rhamnus* sp.	0	0.00	0	0.00	1	0.49	2	0.03	3	0.04
Currant	*Ribes* sp.	2	0.12	0	0.00	3	1.46	24	0.42	29	0.38
Multiflora Rose	*Rosa multiflora*	0	0.00	0	0.00	0	0.00	5	0.09	5	0.06
Rose	*Rosa* sp.	2	0.12	0	0.00	0	0.00	9	0.16	11	0.14
Northern Dewberry	*Rubus flagellaris*	5	0.29	0	0.00	0	0.00	0	0.00	5	0.06
Black Raspberry	*Rubus occidentalis*	0	0.00	0	0.00	0	0.00	15	0.26	15	0.19
Blackberry	*Rubus* sp.	20	1.17	0	0.00	8	3.90	65	1.13	93	1.21
Black-eyed Susan	*Rudbeckia hirta*	100	5.86	0	0.00	0	0.00	0	0.00	100	1.30
Rose Pink	*Sabatia angularis*	1	0.06	0	0.00	0	0.00	0	0.00	1	0.01
Sandbar Willow	*Salix exigua*	0	0.00	0	0.00	14	6.83	0	0.00	14	0.18
Willow	*Salix* sp.	1	0.06	0	0.00	0	0.00	0	0.00	1	0.01
Canadian Black Snakeroot	*Sanicula canadensis*	0	0.00	0	0.00	0	0.00	3	0.05	3	0.04
Maryland Sanicle	*Sanicula marilandica*	0	0.00	0	0.00	0	0.00	39	0.68	39	0.51
Little Bluestem	*Schizachyrium scoparium*	39	2.29	0	0.00	0	0.00	0	0.00	39	0.51
Dark Green Rush	*Scirpus atrovirens*	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
River Bulrush	*Scirpus fluviatilis*	0	0.00	2	8.70	0	0.00	0	0.00	2	0.03
Nodding Bulrush	*Scirpus pendulus*	4	0.23	0	0.00	0	0.00	1	0.02	5	0.06
Yellow Foxtail	*Setaria glauca*	19	1.11	0	0.00	0	0.00	0	0.00	19	0.25
Blue-eyed Grass	*Sisyrinchium angustifolium*	9	0.53	0	0.00	0	0.00	0	0.00	9	0.12
Black Nightshade	*Solanum nigrum*	0	0.00	0	0.00	2	0.98	0	0.00	2	0.03
Nightshade	*Solanum* sp.	0	0.00	0	0.00	0	0.00	1	0.02	1	0.01
Tall Goldenrod	*Solidago altissimus*	0	0.00	0	0.00	30	14.63	0	0.00	30	0.39
Canada Goldenrod	*Solidago canadensis*	44	2.58	0	0.00	0	0.00	3	0.05	47	0.61
Goldenrod	*Solidago* sp.	0	0.00	0	0.00	0	0.00	8	0.14	8	0.10
Indian Grass	*Sorghastrum nutans*	60	3.52	0	0.00	0	0.00	0	0.00	60	0.78
Prairie Wedgescale	*Sphenopholis obtusata*	0	0.00	0	0.00	0	0.00	1	0.02	1	0.01
Dandelion	*Taraxacum officinale*	43	2.52	0	0.00	0	0.00	2	0.03	45	0.58
Basswood	*Tilia americana*	0	0.00	0	0.00	0	0.00	2	0.03	2	0.03
Poison Ivy	*Toxicodendron radicans*	9	0.53	0	0.00	0	0.00	586	10.14	595	7.72
Trillium	*Trillium* sp.	0	0.00	0	0.00	0	0.00	3	0.05	3	0.04
Narrow-leaved Cattail	*Typha angustifolia*	0	0.00	3	13.04	0	0.00	0	0.00	3	0.04
Blue Cattail	*Typha glauca*	0	0.00	6	26.09	0	0.00	0	0.00	6	0.08
American Elm	*Ulmus americana*	1	0.06	0	0.00	0	0.00	31	0.54	32	0.41
Stinging Nettle	*Urtica dioica*	0	0.00	0	0.00	5	2.44	10	0.17	15	0.19
Moth Mullein	*Verbascum blattaria*	1	0.06	0	0.00	0	0.00	0	0.00	1	0.01
Blue Vervain	*Verbena hastata*	10	0.59	0	0.00	1	0.49	0	0.00	11	0.14
White Vervain	*Verbena urticifolia*	0	0.00	0	0.00	0	0.00	1	0.02	1	0.01
Baldwin's Ironweed	*Vernonia baldwini*	8	0.47	0	0.00	0	0.00	0	0.00	8	0.10
Viburnum	*Viburnum* sp.	1	0.06	0	0.00	0	0.00	0	0.00	1	0.01

Table 5 (Continued). Plant Species Abundance by Habitat at the Fermi Site

Common Name	Scientific Name	Restored Prairie	Relative Abundance	Emergent Wetland	Relative Abundance	Lakeshore	Relative Abundance	Woods	Relative Abundance	All Habitats	Relative Abundance
Canada Violet	*Viola canadensis*	0	0.00	0	0.00	0	0.00	127	2.20	127	1.65
Blue Violet	*Viola sororia*	15	0.88	0	0.00	0	0.00	0	0.00	15	0.19
Violet	*Viola* sp.	8	0.47	0	0.00	0	0.00	1	0.02	9	0.12
Riverbank Grape	*Vitis riparia*	17	1.00	0	0.00	19	9.27	30	0.52	66	0.86
	Abundance (all species)	1,706	100.00	23	100.00	205	100.00	5777	100.00	7,711	100.00
	Number of Species (by habitat)	111		6		26		89		157	

Table 6. July 2008 Forest Cruise at the Fermi Site

West Side of South Lagoon (July 2008)

Lowland Hardwood Forest				No. of Specimens		Frequency (%)	
English Name	**Latin Name**	**Average DBH* (in.)**	**Size Range (in.)**	**Dead**	**Live**	**All**	**Live**
Box Elder	*Acer negundo*	8.9	8-11		7	5.1	6.4
Silver Maple	*Acer saccharinum*	13.0	3-17		5	3.7	4.5
Hickory	*Carya* sp.	8.6	5-19		9	6.6	8.2
Common Hackberry	*Celtis occidentalis*		8		1	0.7	0.9
Green Ash	*Fraxinus pennsylvanica*	11.2	5-16.5	23	0	16.9	0.0
Honey Locust	*Gleditsia triacanthos*	18.5	2-20		2	1.5	1.8
Ironwood	*Ostrya virginiana*	13.0	13	1	0	0.7	0.0
Eastern Cottonwood	*Populus deltoides*	22.8	21-24		4	2.9	3.6
Swamp White Oak	*Quercus bicolor*	14.6	8.5-19.5		11	8.1	10.0
Red Oak	*Quercus rubra*	15.4	6-28	1	36	27.2	32.7
American Basswood	*Tilia americana*	8.5	5-14		32	23.5	29.1
American Elm	*Ulmus americana*	7.6	5-7.5	1	3	2.9	2.7
				Total (all trees):	136	100.0	100.0
				Total Live Trees:	110		

Between Fermi Drive and Quarry Lakes (July 2008)

Lowland Hardwood Forest				No. of Specimens		Frequency (%)	
English Name	**Latin Name**	**Average DBH* (in.)**	**Size Range (in.)**	**Dead**	**Live**	**All**	**Live**
Box Elder	*Acer negundo*	9.5	9.5	0	1	1.0	1.3
Silver Maple	*Acer saccharinum*	13.2	6-42	0	40	40.8	51.3
Hickory	*Carya* sp.	7.8	5-10.5	0	11	11.2	14.1
Green Ash	*Fraxinus pennsylvanica*	14.2	9-20	19	0	19.4	0.0
Sycamore	*Platanus occidentalis*	13.0	20	0	1	1.0	1.3
Eastern Cottonwood	*Populus deltoides*	13.5	12-15	0	2	2.0	2.6
White Oak	*Quercus alba*	16.0	16	0	1	1.0	1.3
Swamp White Oak	*Quercus bicolor*	16.3	10-22	0	8	8.2	10.3
Red Oak	*Quercus rubra*	16.5	15-18	0	2	2.0	2.6
American Basswood	*Tilia americana*	7.8	5-10.5	0	9	9.2	11.5
American Elm	*Ulmus americana*	12.0	8-17	0	3	3.1	3.8
				Total (all trees):	98	99.0	100.0
				Total Live Trees:	78		

* DBH = Diameter at Breast Height; 4.5 ft above ground

Overall Total:	234	
Overall Live Trees:	188	80.3%

Table 7. Listed Plant Species in Monroe County, Michigan [1]

Common Name	Scientific Name	Federal Status*	State Status*
Gattinger's Gerardia	*Agalinis gattingeri*		E
Hairy Angelica	*Angelica venenosa*		SC
Missouri Rock-cress	*Arabis missouriensis* var. *deamii*		SC
Three-awned Grass	*Aristida longespica*		T
Tall Green Milkweed	*Asclepias hirtella*		T
Purple Milkweed	*Asclepias purpurascens*		T
Sullivant's Milkweed	*Asclepias sullivantii*		T
Forked Aster	*Aster furcatus*		T
Willow Aster	*Aster praealtus*		SC
White Or Prairie False Indigo	*Baptisia lactea*		SC
Wild Hyacinth	*Camassia scilloides*		T
Raven's-foot Sedge	*Carex crus-corvi*		E
Davis's Sedge	*Carex davisii*		SC
Fescue Sedge	*Carex festucacea*		SC
Sedge	*Carex squarrosa*		SC
American Chestnut	*Castanea dentata*		E
Knotweed Dodder	*Cuscuta polygonorum*		SC
Beak Grass	*Diarrhena obovata*		T
Leiberg's Panic Grass	*Dichanthelium leibergii*		T
Downy Sunflower	*Helianthus mollis*		T
Dwarf-bulrush	*Hemicarpha micrantha*		SC
Smooth Rose-mallow	*Hibiscus laevis*		X
Goldenseal	*Hydrastis canadensis*		T
Gentian-leaved St. John's wort	*Hypericum gentianoides*		SC
Round-fruited St. John's wort	*Hypericum sphaerocarpum*		E
Short-fruited Rush	*Juncus brachycarpus*		T
Water Willow	*Justicia americana*		T
Woodland Lettuce	*Lactuca floridana*		T
Least Pinweed	*Lechea minor*		X
Leggett's Pinweed	*Lechea pulchella*		T
Conobea	*Leucospora multifida*		SC
Red Mulberry	*Morus rubra*		T
American Lotus [#]	*Nelumbo lutea*		T
Round Hickorynut	*Obovaria subrotunda*		E
Violet Wood Sorrel	*Oxalis violacea*		X
Ginseng	*Panax quinquefolius*		T
Orange- or Yellow-fringed Orchid	*Platanthera ciliaris*		E
Prairie White-fringed Orchid	*Platanthera leucophaea*	LT	E
Cross-leaved Milkwort	*Polygala cruciata*		SC
Sand Cinquefoil	*Potentilla paradoxa*		T
Hairy Mountain Mint	*Pycnanthemum pilosum*		T

Table 7 (Continued). Listed Plant Species in Monroe County, Michigan [1]

Common Name	Scientific Name	Federal Status*	State Status*
Shumard's Oak	*Quercus shumardii*		SC
Arrowhead	*Sagittaria montevidensis*		T
Tall Nut-rush	*Scleria triglomerata*		SC
Cup Plant	*Silphium perfoliatum*		T
Trailing Wild Bean	*Strophostyles helvula*		SC
Virginia Spiderwort	*Tradescantia virginiana*		SC
Corn Salad	*Valerianella umbilicata*		T
Wild Rice	*Zizania aquatica var. aquatica*		T

* LT = Federal Threatened; E = State Endangered, T = State Threatened, SC = State Species of Special Concern, X = Extirpated from State, Considered Endangered if Rediscovered.

[1] List obtained online from the MNFI at http://web4.msue.msu.edu/mnfi/data/cnty_dat.cfm?county=Monroe.

Species observed on the Fermi site during the current study. Refer to Table 2 for more information.

Note: Species delisted in 2009 include Frank's Sedge (*Carex frankii*), Kentucky Coffee-tree (*Gymnocladus dioicus*), Swamp Rose-mallow (*Hibiscus moscheutos*), Seedbox (*Ludwigia alternifolia*), and Tooth-cup *(Rotala ramosior*). Species with changed status in 2009: Purple Milkweed (uplisted to T from SC), Raven's Foot Sedge (uplisted to E from T), Smooth Rose-mallow downlisted from SC to X, Round-fruited St. John's Wort (uplisted from T to E), Least Pinweed (downlisted from SC to X), Violet Wood Sorrel (downlisted from T to X), Orange-fringed Orchid (uplisted from T to E), and Tall Nut-rush (added as SC, not previously listed).

Table 8. Species listed in Deciduous Forest Region, Ontario, Canada under SARA*

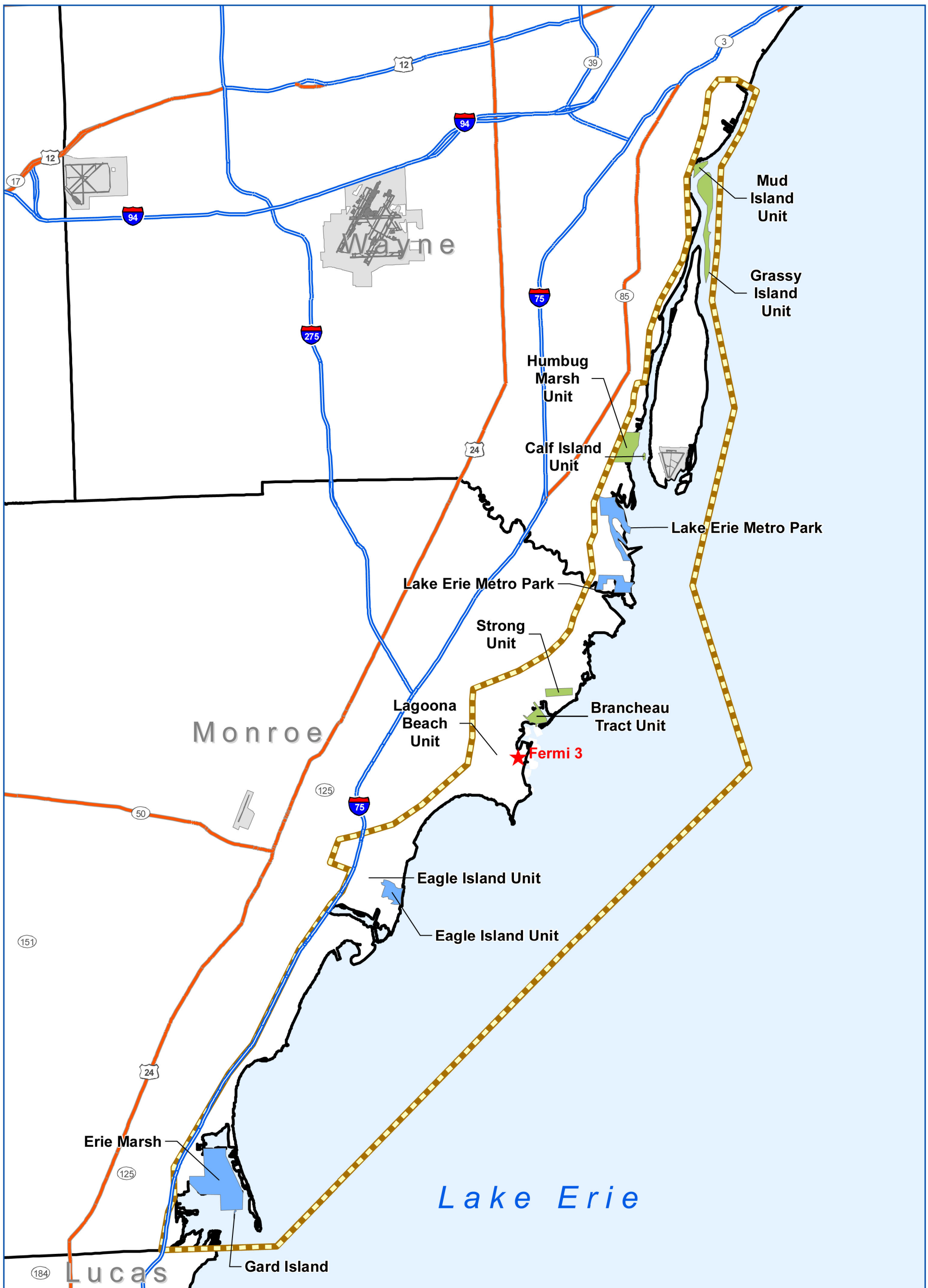
English Name	Latin Name	SARA Status*
Gattinger's Agalinis	*Agalinis gattingeri*	E
Skinner's Agalinis	*Agalinis skinneriana*	E
Colicroot	*Aletris farinosa*	T
Scarlet Ammannia	*Ammannia robusta*	E
Green Dragon	*Arisaema dracontium*	SC
Tuberous Indian-plantain	*Arnoglossum plantagineum*	SC
American Hart's-tongue Fern	*Asplenium scolopendrium americanum*	SC
Cherry Birch	*Betula lenta*	E
Wild Hyacinth	*Camassia scilloides*	T
False Hop Sedge	*Carex lupuliformis*	E
American Chestnut	*Castanea dentata*	E
Dwarf Hackberry	*Celtis tenuifolia*	T
Spotted Wintergreen	*Chimaphila maculata*	E
Pitcher's Thistle	*Cirsium pitcheri*	E
Spring Blue-eyed Mary	*Collinsia verna*	X
Eastern Flowering Dogwood	*Cornus florida*	E
Small White Lady's-slipper	*Cypripedium candidum*	E
Illinois Tick-trefoil	*Desmodium illinoense*	X
Horsetail Spike-rush	*Eleocharis equisetoides*	E
False Rue-anemone	*Enemion biternatum*	T
White Wood Aster	*Eurybia divaricata*	T
American Columbo	*Frasera caroliniensis*	E
Blue Ash	*Fraxinus quadrangulata*	SC
White Prairie Gentian	*Gentiana alba*	E
Kentucky Coffeetree	*Gymnocladus dioica*	T
Swamp Rose-mallow	*Hibiscus moscheutos*	SC
Goldenseal	*Hydrastis canadensis*	T
Small Whorled Pogonia	*Isotria medeoloides*	E
Large Whorled Pogonia	*Isotria verticillata*	E
Butternut	*Juglans cinerea*	E
American Water-willow	*Justicia americana*	T
Slender Bush Clover	*Lespedeza virginica*	E
Dense Blazing Star	*Liatris spicata*	T
Purple Twayblade	*Liparis liliifolia*	E
Small-flowered Lipocarpha	*Lipocarpha micrantha*	E
Cucumber Tree	*Magnolia acuminata*	E
Red Mulberry	*Morus rubra*	E
Eastern Prickly Pear Cactus	*Opuntia humifusa*	E
American Ginseng	*Panax quinquefolius*	E
Broad Beech Fern	*Phegopteris hexagonoptera*	SC
Heart-leaved Plantain	*Plantago cordata*	E

Table 8 (Continued). Species listed in Deciduous Forest Region, Ontario, Canada under SARA*

English Name	Latin Name	SARA Status*
Eastern Prairie Fringed-orchid	*Platanthera leucophaea*	E
Pink Milkwort	*Polygala incarnata*	E
Hill's Pondweed	*Potamogeton hillii*	SC
Ogden's Pondweed	*Potamogeton ogdenii*	E
Common Hoptree	*Ptelea trifoliata*	T
Hoary Mountain Mint	*Pycnanthemum incanum*	E
Shumard Oak	*Quercus shumardii*	SC
Climbing Prairie Rose	*Rosa setigera*	SC
Toothcup	*Rotala ramosior*	E
Round-leaved Greenbrier	*Smilax rotundifolia*	T
Riddell's Goldenrod	*Solidago riddellii*	SC
Showy Goldenrod	*Solidago speciosa*	E
Wood Poppy	*Stylophorum diphyllum*	E
Willowleaf Aster	*Symphyotrichum praealtum*	T
Crooked-Stem Aster	*Symphyotrichum prenanthoides*	T
Virginia Goat's-rue	*Tephrosia virginiana*	E
Few-flowered Club-rush	*Trichophorum planifolium*	E
Drooping Trillium	*Trillium flexipes*	E
Nodding Pogonia	*Triphora trianthophora*	E
Deerberry	*Vaccinium stamineum*	T
Bird's Foot Violet	*Viola pedata*	E

* SARA = Species at Risk Act. Data adapted from the Ontario list of Species at Risk in the Deciduous Forest Region at http://www.rom.on.ca/ontario/risk.php?doc_type=listall&region=5. The Deciduous Forest Region is the portion of Ontario, Canada, closest to the Fermi site. Site accessed August 17, 2009.

X = Extirpated (local extinction), E = Endangered, T = Threatened, SC = Species of Special Concern



Fermi 3
Approved Acquisition Boundary
Limited Access
Highway
County Boundary

Airports
Airport Area
Airport Runway

FWS
Agreement
Owned

N
W E
S

0 3 6
Miles

Detroit River International Wildlife Refuge Units Map

Figure 1

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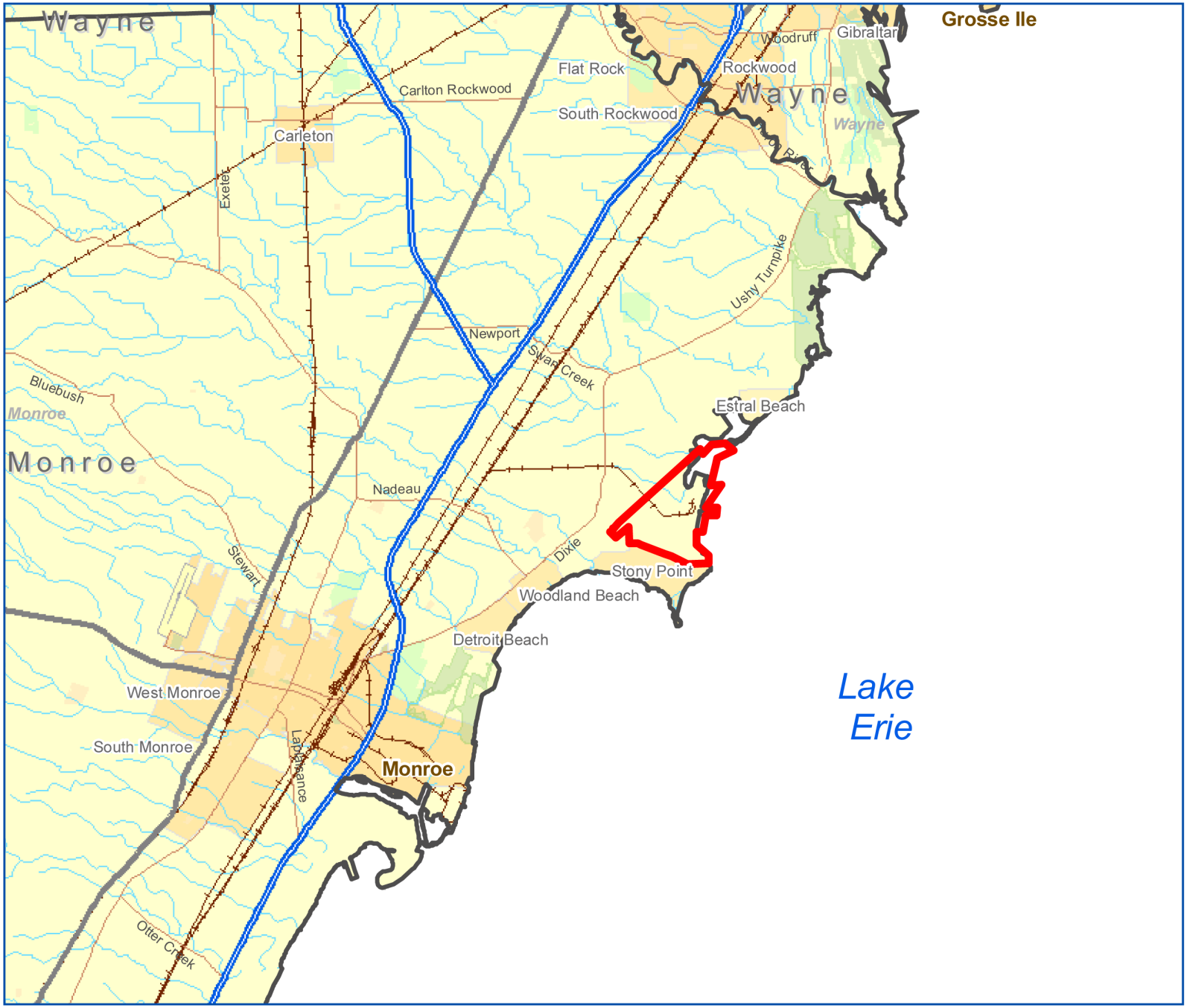
Building a world of difference.

Path: C:\Projects\163696.3007_GreatLakesEnvironmental\D_Design_Phase\D_1_3_Technical_Data\D_1_3C_GIS\C_01_ProjectFiles_MXDs\Fig_1_WildlifeRefuge.mxd Date Printed: July 23, 2009 By: K Robinson



Monroe County, Michigan Project Location

Figure 2

LEGEND

- Railroads (Local)
- Rivers (Local)
- Limited Access
- Highway
- Major Road
- Local Road
- County
- Study Site

N
W E
S

0 1.25 2.5
Miles

Data source:

ESRI Street Map data

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building a world of difference™
ENERGY WATER INFORMATION GOVERNMENT

C:\Projects\GreatLakeEnvironmental\Mapdoc\fig_1_LocationMap.mxd K. Robinson 11/07/08

Terrestrial Vegetation Transects

Figure 3

LEGEND

- Vegetation Transects
- Roads
- Study Site

Habitats

- AF Agricultural Fields
- CA Canals or Ditches
- DA Developed Areas
- EM Emergent Wetland
- LK Lakeshore
- MH Mixed Hardwood
- OFG Old-Field Grassland
- P Ponds
- RP Restored Prairie
- RVR Rivers
- SS Scrub-Shrub

N
W E
S

0 600 1,200
Feet

Data source:

Aerials are from ESRI ArcGIS Map Service
I3_Imagery_Prime_World_2D http://services.arcgisonline.com/v92

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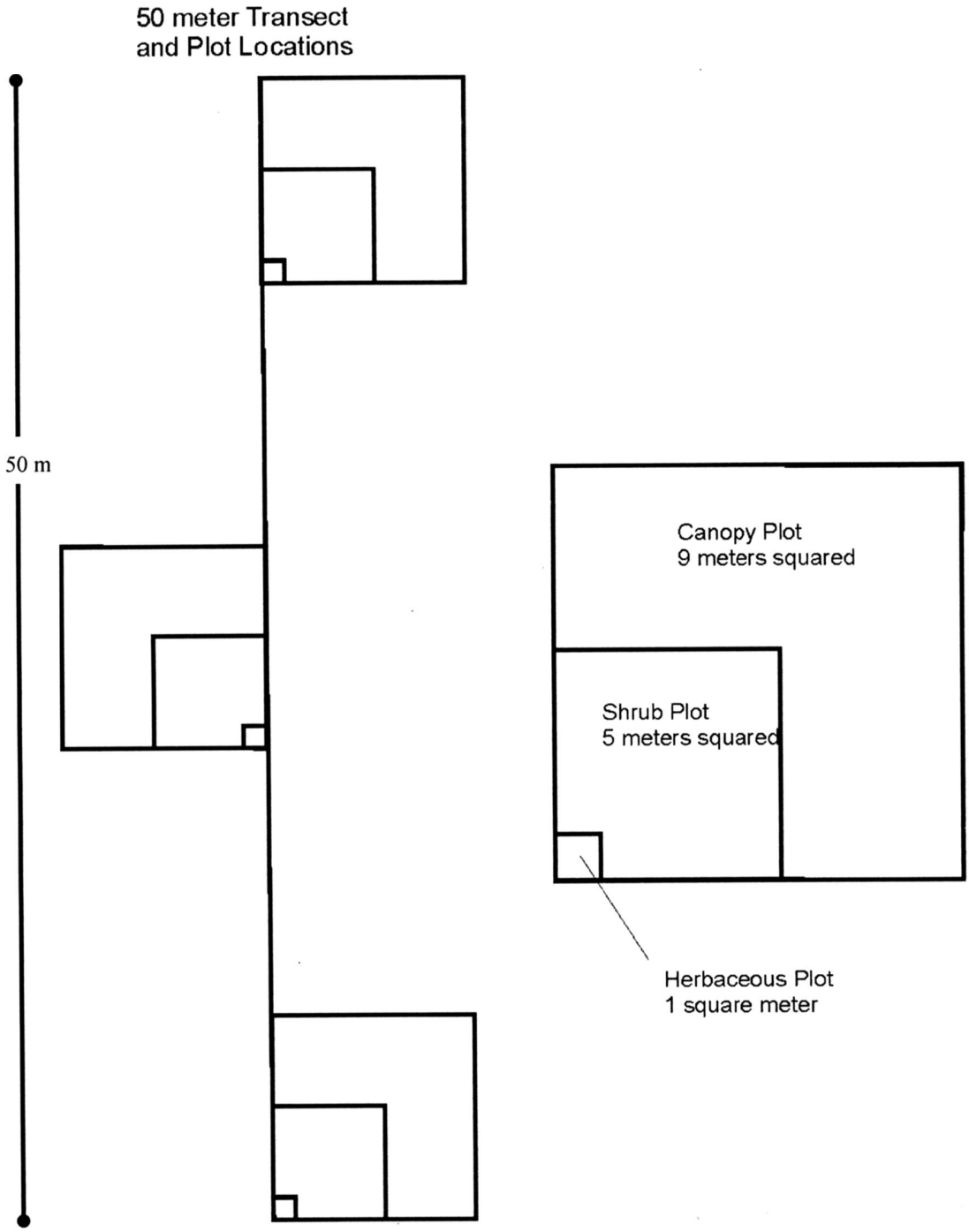

Figure 4. Typical Transect with Plot Arrangement

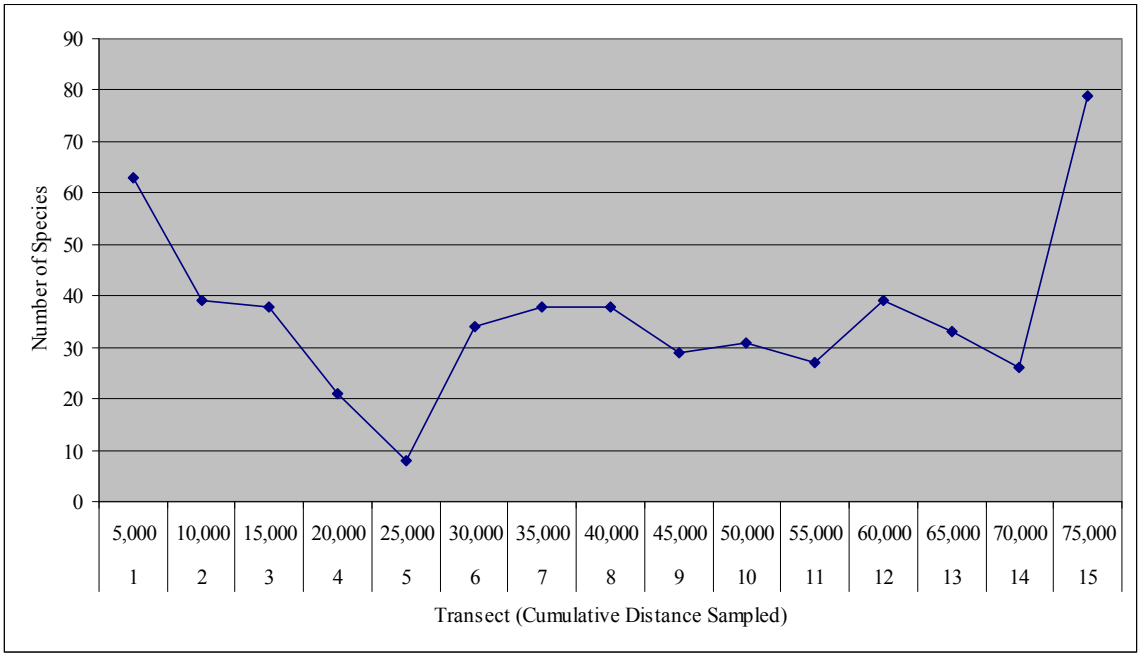

Figure 5. Species-area curve using total species counts for each transect at the Fermi site compared to cumulative distance in cm. The curve indicates that species richness is relatively even across most of the site, with Transects 1 and 15 having the most richness, while Transect 5 has the least.

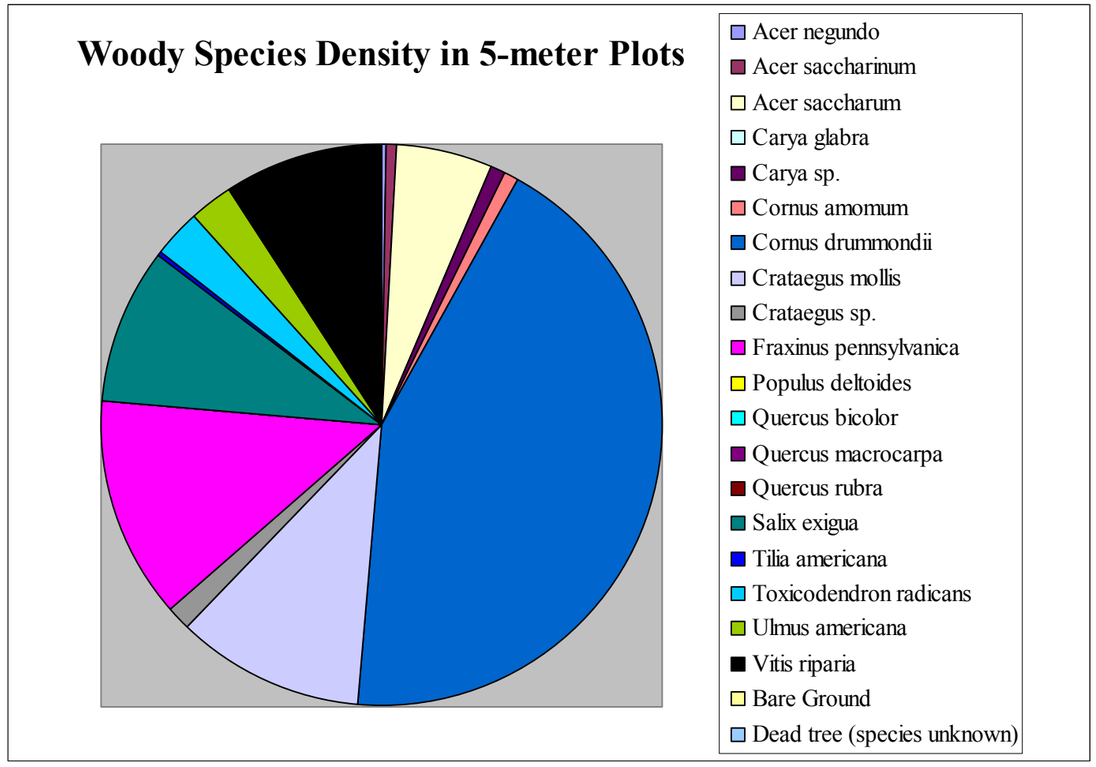

Figure 6. Woody Species Density in 5 m^2 Plots. Sampling included woody-stemmed plants (shrubs and saplings) between 3 and 20 feet tall, with a DBH between 0.4 and 5.0 inches at the Fermi Site. Refer to Appendix D for plot data.

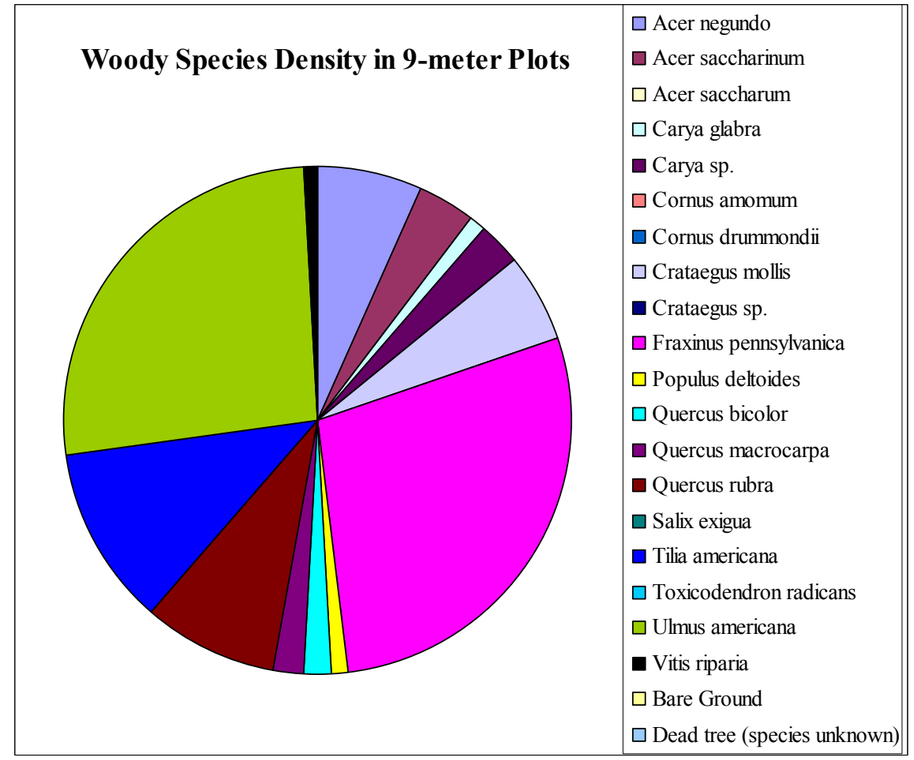

Figure 7. Woody Species Density in 9-m^2 Plots. Sampling included woody-stemmed plants (shrubs and saplings between 3 and 20 feet tall with a DBH between 0.4 and 5.0 inches at the Fermi Site on transects. See Appendix D for plot data.