Middlesex County Forestry
Rooted in Nature

Consultation Draft

Forest Management Plan
2026 – 2056

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Middlesex County Forestry

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Forest Management Plan

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Acknowledgements

Forest management planning is a complex process influenced by human activity, climate, and a multitude of natural factors. It requires adaptive integrated resource management strategies that can respond to changing conditions and relies on the expertise of professionals, interest holders, and recreational users. Middlesex County extends sincere appreciation to all who contributed to this plan.

Executive Summary

Middlesex County's forests span over 1,025 hectares across 27 tracts and represent a vital ecological, recreational, and cultural resource. Rooted in a forest conservation legacy dating back to 1937, these woodlands now support a rich diversity of native flora and fauna, including many rare and endangered species. They also contribute significantly to climate resilience, carbon sequestration, and community well-being.

The 2026–2056 Forest Management Plan outlines a comprehensive strategy for long-term stewardship, built around four key themes:

- **Ecological Integrity and Biodiversity Conservation**

  Protecting sensitive habitats, enhancing native species regeneration, and maintaining forest interior conditions essential for ecosystem function and wildlife.

- **Sustainable Timber Management**

  Applying adaptive silvicultural systems such as group selection and shelterwood to promote regeneration of mid-tolerant hardwoods and to ensure long-term forest productivity.

- **Climate Resilience and Forest Health**

  Monitoring forest conditions through permanent sample plots, tracking carbon storage, and responding to threats such as invasive species, drought, and disease. Continue collaboration with agency partners to undertake research

- **Community Engagement and Infrastructure Improvement**

  Promoting responsible hunting and recreation, improving access and signage, and supporting education, research, and public involvement.

The plan introduces measurable indicators to assess progress, including:

- Net carbon sequestration rates
- Regeneration success of climate-resilient native species
- Reduction in invasive species coverage
- Stability of forest canopy cover
- Incidence of extreme weather-related forest health issues

- Number of locally lost tree species reintroduced where appropriate

A 5-Year Operating Schedule (2026–2031) prioritizes silvicultural activities, infrastructure upgrades, habitat restoration, enhancement and policy development for responsible recreational use. Additional actions include supporting scientific research, enhancing forest health monitoring, and exploring opportunities for land acquisition.

Through science-based management, community collaboration, and a commitment to ecological sustainability, Middlesex County aims to ensure its forests remain healthy, diverse, and resilient, serving both nature and people for generations to come.

Figure 1 Four Key Management Themes which will guide the new management plan (AI generated graphic)

1.0 Introduction and History

Middlesex County's commitment to forest conservation began in 1937 with the formation of its first Reforestation Committee, tasked with restoring marginal agricultural lands. Following the *Counties Reforestation Amendment Act* in 1939, the County acquired its first plantation near Crumlin. Although later sold, this initiative laid the foundation for a network of forests that today spans 1,025 hectares across 27 tracts.

In 1946, the County partnered with the Province of Ontario to accelerate reforestation efforts. This collaboration was formalized in 1954 under the provincial *Agreement Forests Program*, granting the Ministry of Natural Resources (MNR) full management responsibilities. A revised 40-year agreement signed in 1961 expanded objectives to include timber production, wildlife habitat, flood control, recreation, and water supply protection.

The MNR prepared the first 10-year management plan in 1964, followed by a policy statement and operating plan in 1978. These plans guided silvicultural practices, trail development, and wildlife habitat improvements. From 1978 onward, timber sales generated approximately $125,000 in total, supporting ongoing management.

By 1994, the province began phasing out formal agreements, transferring responsibilities to local authorities. Middlesex County assumed full management in 2000. In 2001, Silv-Econ Ltd. developed a 20-year management plan, enabling the County to implement a sustainable timber harvest program, forest health monitoring, and community engagement programs.

Building on this legacy, the 2026–2056 Forest Management Plan focuses on four key themes 1) Ecological integrity and Biodiversity Conservation 2) Sustainable Timber Management 3) Climate Resilience and Forest Health 4) Community Engagement and Infrastructure Improvement, ensuring the County's forests remain a vital ecological and community resource for generations to come.

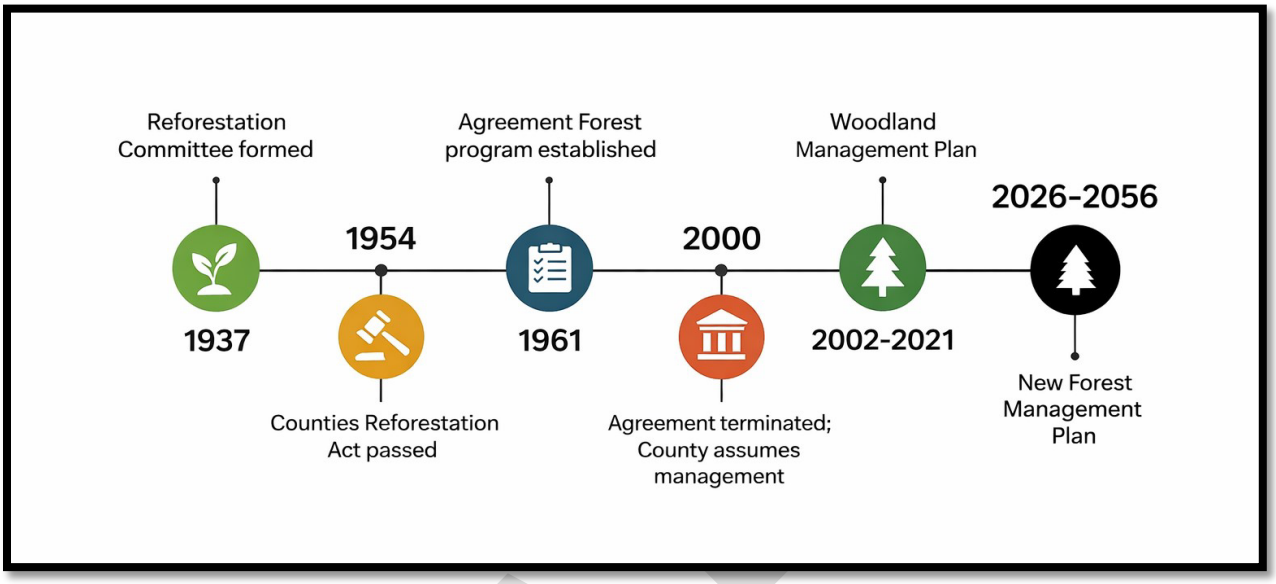

Figure 2 Middlesex County Forest Management Timeline

2.0 Profile of Middlesex County Forests

2.1 Landscape Context

During early European settlement, Middlesex County experienced rapid deforestation, reducing forest cover from an estimated 40% in 1860 to less than 10% forest cover by 1910. Today, forests occupy approximately 20% of the County's land area, with County-owned forests totaling 1,025 hectares, about 1.9% of the total forest cover.

These woodlands are ecologically significant. The majority are designated Areas of Natural and Scientific Interest (ANSI) and include Provincially Significant Wetlands (PSW) that provide critical habitat for a diverse range of species including many rare and endangered Species at Risk (SAR). The largest forest block, located in Southwest Middlesex, spans 872.6 hectares and forms part of the Skunk's Misery/Bothwell Forest complex, a provincially recognized biodiversity hotspot.

Middlesex County lies within the Deciduous Forest Region of Canada, with pockets of the Carolinian Life Zone, one of Canada's most biologically rich regions. These forests support species at risk and contribute to climate resilience, carbon sequestration, and water regulation, while offering recreational and cultural value.

This ecological foundation shapes the 2026–2056 Forest Management Plan, which prioritizes four key themes 1) Ecological integrity and Biodiversity Conservation 2) Sustainable Timber Management 3) Climate Resilience and Forest Health 4) Community Engagement and Infrastructure Improvement

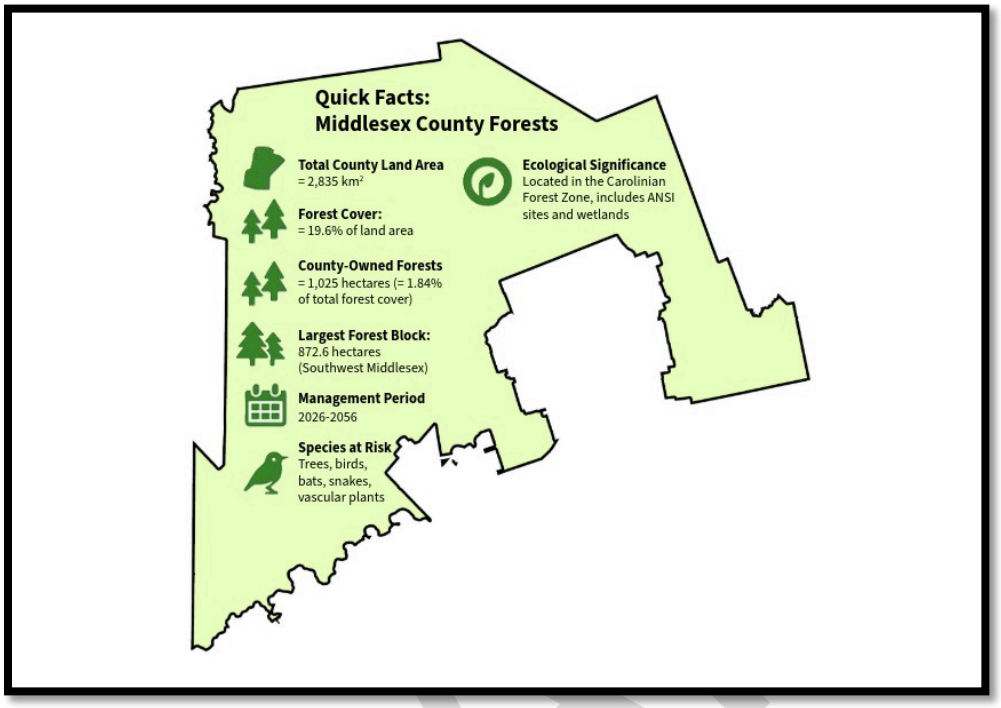

Figure 3 Middlesex County Forest Quick Facts

2.2 Earth Science Features

The glacial history, geology, and physiography of Middlesex County have been well documented by Chapman and Putnam (1984), Bowles (1994), the McIlwraith Field Naturalists (1985), and the Upper Thames River Conservation Authority (1997), among others.

Beneath Southern Ontario's glacial landscape lies a foundation of Paleozoic sedimentary rock, approximately 1,000 metres thick. These rocks form layered sequences of limestone, dolostone, shale, and sandstone that gently slope to the south and west. The most recent glaciation played a major role in shaping the region's current landforms and depositing the soils found today. As the glacier retreated, large lowland areas were temporarily submerged under glacial lakes. One such lake, Glacial Lake Warren, once covered much of southwestern Ontario west of London, including the present-day locations of Lakes Erie and St. Clair (Chapman and Putnam 1984).

Skunk's Misery lies within the Bothwell Sand Plain Physiographic Region (Chapman and Putnam 1984), which represents the ancient delta of the Thames River as it flowed into Lake Warren. Sands from this delta were thinly deposited over the clay lakebed, forming the surface features of the Skunk's Misery complex. Similarly, the lacustrine clays and silts found in Big Swamp, located in the former township of East Williams, were deposited in this glacial lake environment.

Around the Dorchester Swamp, including the Banks Tract, three main physical features define the landscape. Two nearly parallel ridges flank the Thames River: the Dorchester Moraine to the north and the Ingersoll Moraine to the south. Between these ridges, meltwater from the retreating glacier deposited sandy soils, forming the Dorchester Sand Plain. The Dorchester Swamp, including the Banks Tract of the Middlesex County Forests, lies within this sandy plain (Chapman and Putnam 1984).

The clay-based sand deposits found throughout the Middlesex County Forests are generally poorly drained and often low in nutrients. In areas such as Skunk's Misery, Dorchester Swamp, and Big Swamp, the soils retain water near the surface, supporting numerous vernal pools and seeps. These features add ecological diversity to an otherwise flat to gently rolling terrain. Additionally, drainage ditches (or drains) are a common topographic feature across many of the forest tracts.

2.3 Biological Significance

The Middlesex County Forests are ecologically important and host a rich diversity of plant and animal life. The majority of the forest tracts in Southwest Middlesex fall within the Skunk's Misery/Bothwell Forest Area of Natural and Scientific Interest (ANSI), a region known for its ecological diversity and significance in Southwestern Ontario.

Portions of this forest, including the Banks Tract in the Dorchester Swamp ANSI and the Big Swamp in North Middlesex, are designated as Provincially Significant Wetlands (Class 1). These areas are protected under the Middlesex County Official Plan (2026), which restricts development and limits land use to preserve their ecological integrity.

2.4 Vegetation and Flora

The Skunk's Misery/Bothwell Forest Complex supports approximately 710 vascular plant taxa, including 583 native and 124 non-native species across 105 plant families. This represents nearly 30% of all plant species recorded in Middlesex County. Among

these, 35 species are provincially rare, and 77 are considered rare within the County. Many of the rare species found in the County Forests at Skunk's Misery are indicative of prairie and oak savanna ecosystems, thriving in open areas, roadsides, trails, wet meadows, and ditches. Notable provincially rare species include Tulip Tree (*Liriodendron tulipifera*), American Chestnut (*Castanea dentata*), Fox Grape (*Vitis labrusca*), Panic Grass (*Panicum dichotomum*), Broad Beech Fern (*Phegopteris hexagonoptera*) and Butler's garter snake (*Thamnophis butleri*).

The Skunks Misery forest complex is situated on the Bothwell Sand Plain; a flat landscape formed approximately 15,000 years ago as a glacial outwash plain. The terrain becomes more varied in the south, where tributary ravines lead to the Thames River. The forests are primarily composed of oak (*Quercus* spp.) and red maple (*Acer rubrum*), with swampy areas dominated by soft maples. A total of 39 tree species were recorded during forest inventories, with some stands containing up to 17 different species. This high species diversity is attributed to the large size of the forest complex—one of the largest in southwestern Ontario and its location within the Carolinian Zone.

Skunk's Misery lies in Canada's Carolinian Zone, where several species reach the northern edge of their range. These include Tulip Tree (*Liriodendron Tulipifera*), Sassafras (*Sassafras albidum*), Black Gum (*Nyssa sylvatica*), and Flowering Dogwood (*Cornus florida*), along with understory plants like Wild Geranium (*Geranium maculatum*) and Running Strawberry Bush (*Euonymus obovatus*), which are common in this area but rare further north. Sassafras occurs frequently throughout the Skunks Misery complex and has also been documented in the Big Swamp Tract in North Middlesex.

The sandy soils of Skunk's Misery provide ideal conditions for prairie species that occur at the eastern edge of their range in Ontario. These species are typically found in forest openings, oak savanna patches, and along the Thames River. Examples include Tick-trefoils (*Desmodium* spp.), Bush-clovers (*Lespedeza* spp.), and Wingstem (*Verbesina alternifolia*).

The Dorchester Swamp ANSI, including the Banks Tract, was surveyed in 1987 by McLeod, who recorded 485 native vascular plant species, including 46 rare species. The swamp is particularly notable for its orchid diversity, containing about one-third of all known orchid species in Middlesex County.

2.5 Culturally significant species (First Nations)

Several species within the County Forest hold particular cultural importance (Anishinaabemowin names according to discussions with Caldwell First Nation and CIER 2020's Anishinaabemowin Climate Change Glossary). Plants and Mawinzwaan (berries) include Ode'iminan (strawberries), Miskomin (raspberries), Ozigwaakomin (Saskatoon berry), and Omagakii-aniibiish (plantain). Trees of importance include Ininaatig (Silver Maple) and Baapaagimaak (Black Ash).

The bark of Ininaatig has several medicinal uses and is tapped to produce zhiiwaagamizigan (maple syrup), while Baapaagimaak is used for basket weaving. Maanaagwaakmish (Sassafras, *Sassafras albidum*) is also a significant medicinal and cultural tree for numerous North American First Nations peoples.

Culturally important wildlife at the site includes mammals such as Waawaashkeshiwag (deer) and birds such as Gekek (hawks), including Broad-winged Hawk and Red-shouldered Hawk. In addition, the Zagaakwaa (mature forest, literally "dense wood") and Mashkode (tallgrass prairie) habitats are associated with Anishinaabe teachings, ceremonies, and lifeways. Prairie landscapes were also shaped by First Nations Peoples through stewardship practices such as cultural burning.

Figure 4 Trillium are abundant in the deciduous forest understory in spring.

2.6 Fauna

The Middlesex County Forests comprise approximately 50% of the Skunk's Misery/Bothwell Forest Complex, one of the largest remaining forested areas in southwestern Ontario. This expansive habitat supports a rich diversity of forest-dwelling wildlife, including 85 breeding bird species, as well as numerous reptiles, amphibians, mammals, and butterflies. Several of these species are classified as vulnerable, threatened, or endangered (VTE).

Importantly, the diversity of fauna is not limited to the Skunk's Misery tracts. For example, a 1987 life science inventory of the Dorchester Swamp, including the Banks Tract, recorded 87 bird species, many of which are forest interior specialists (McLeod 1987). Faunal diversity in these forests is influenced by three key factors: habitat size, vegetation community connectivity and diversity, and forest structural complexity.

2.7 Habitat Size

The extensive forest cover within the County Forests, especially in the Skunk's Misery area, plays a critical role in supporting a wide range of species. Larger tracts attract area-sensitive and forest interior species, such as certain birds and butterflies, which are typically absent from smaller forest patches (MNR 2000b). These species also benefit from the presence of edge habitats, meadows, and shrub communities.

2.8 Vegetation Community Diversity

The variety of vegetation types found in the County Forests from forested swamps and upland forests to shrub thickets and meadows contribute significantly to the diversity of bird and butterfly populations. Forest management practices can help conserve and enhance these communities. For instance, aging conifer plantations now support species that prefer coniferous habitats, such as the Sharp-shinned Hawk (*Accipiter striatus*), Blackburnian Warbler (*Dendroica fusca*), and Pine Warbler (*Dendroica pinus*). Notably, Pine Warblers were absent during the 1983/84 Life Science Inventory (McIlwraith Field Naturalists 1985), highlighting the evolving habitat value of these plantations.

Certain species are also closely tied to specific plant types. The Cerulean Warbler (*Dendroica cerulea*), a canopy specialist, is found throughout the forest complex and in clusters where super-canopy white oaks (*Quercus alba*) are present. Managing these large and old growth trees may help increase Cerulean Warbler populations.

Rare forest butterflies such as the Giant Swallowtail (*Heraclides cresphontes*), Tawny Emperor (*Asterocampa clyton*), and Hackberry Emperor (*Asterocampa celtis*) are found in good numbers at Skunk's Misery. Their caterpillars rely on specific host plants: Prickly-ash (*Zanthoxylum americanum*) for the Giant Swallowtail, and Hackberry (*Celtis occidentalis*) trees for the Hackberry Emperor.

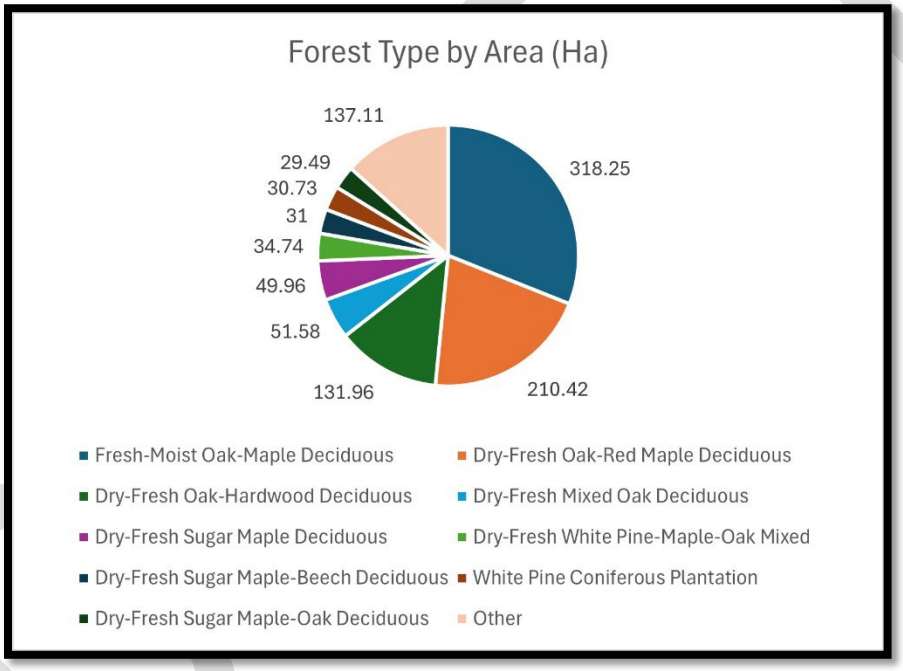

Figure 5 Forest Type represented by area.

2.9 Forest Structural Diversity

The structural complexity of the County Forests including features like multi-layered canopies, cavity trees, snags, and coarse woody debris supports species that thrive in late seral or "old growth" conditions. These forests attract specialists such as the Acadian Flycatcher (*Empidonax virescens*), Cerulean Warbler (*Setophaga cerulea*),

Broad-winged Hawk (*Buteo platypterus*), Pileated Woodpecker (*Dryocopus pileatus*), and Black Rat Snake (*Elaphe obsoleta*). Each species has unique habitat preferences: the Acadian Flycatcher favors open understories beneath dense canopies (Friesen et al. 1999), while the Pileated Woodpecker requires large, mature trees for nesting and foraging and minimum 100 hectares territory per breeding pair (Naylor et al. 1996). The Black Rat Snake uses broad horizontal limbs for basking and tree cavities for shelter and nesting (MNR 2000b).

Recent studies indicate that even species that colonize forest openings, such as the Hooded Warbler (*Wilsonia citrina*), and Prothonotary Warbler (*Protonotaria citrea*) benefit from the presence of large trees (diameter >38 cm) within canopy gaps, which improve nesting success (pers. comm. Dave Martin, Acadian Flycatcher/Hooded Warbler Recovery Team).

Additional notable wildlife observed in the County Forests includes the Eastern Hognose Snake (*Heterodon platirhinos*) in the Ritchie Tract (2001), and birds such as the Ovenbird (*Seiurus aurocapillus*), Scarlet Tanager (*Piranga olivacea*), Chestnut-sided Warbler (*Dendroica pensylvanica*), Blue-winged Warbler (*Vermivora pinus*), American Redstart (*Setophaga ruticilla*), and Cooper's Hawk (*Accipiter cooperii*) in the McLaren Tract (2001). The endangered Prothonotary Warbler (*Protonotaria citrea*) was also recorded in the Miller Tract in 2001.

Amphibians including frogs, toads, and salamanders inhabit the numerous small wetland ponds throughout the County Forests. One particularly notable species is the Blue-spotted Salamander (*Ambystoma laterale*), distinguished by its grey-black body and fluorescent blue spots.

The forests also support a range of mammals, such as White-tailed Deer (*Odocoileus virginianus borealis*) and other small mammals typical of southern Ontario. Of special interest are two endangered species: the Southern Flying Squirrel (*Glaucomys volans*), which has been documented in the area, and the American Badger (*Taxidea taxus*), historically recorded in fair numbers across southwestern Ontario.

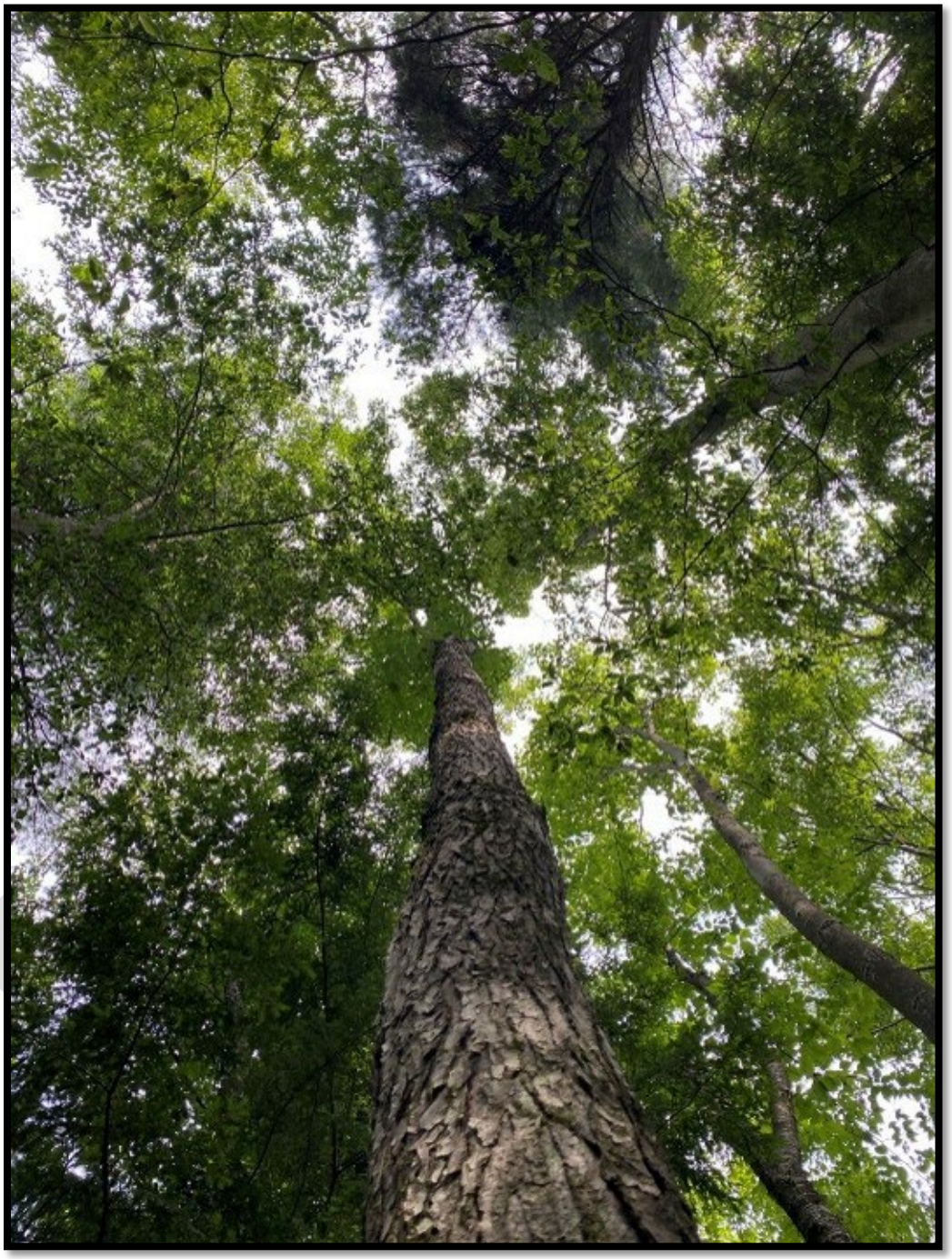

Figure 6 Understanding Forest structure in a 3D spatial and temporal context is essential to ecosystem-based management.

2.10 Forest Communities

Forest ecosystems in Middlesex County have been classified using the Ecological Land Classification for Southern Ontario (Lee et al., 1998) and other systems that identify recurring patterns in vegetation and site conditions. These classifications simplify natural variation into meaningful units based on ecological factors such as soil properties, vegetation structure, and species composition. While the forest resource inventory lacks the detailed field data required for full ecosite classification, it does provide comprehensive stand-level information, including species makeup, age, height, basal area, and regeneration.

In this plan, forest communities are categorized by species composition, associations, and shade tolerance. The classification criteria are outlined in Appendix B. Twenty-two distinct forest communities have been identified within the Middlesex County Forests.

Table 1: Distribution of Forest Communities by area.

ELC Classification	ELC Code	Number of Stands	Area (Ha)	% of Total
Fresh-Moist Oak-Maple Deciduous	FOD9-2	113	318.25	31
Dry-Fresh Oak-Red Maple Deciduous	FOD2-1	53	210.42	20.7
Dry-Fresh Oak-Hardwood Deciduous	FOD2-4	40	131.96	12.9
White Pine Coniferous Plantation	CUP3-2	22	30.73	3.0
Dry-Fresh White Pine-Maple-Oak Mixed	FOM2	16	34.74	3.4
Dry-Fresh Mixed Oak Deciduous	FOD1-4	11	51.58	5.0
Norway Spruce-European Larch Coniferous Plantation	CUP3-9	9	19.48	1.9
Dry-Fresh Sugar Maple Deciduous	FOD5	7	49.96	4.8
Dry-Fresh Sugar Maple-Beech Deciduous	FOD5-2	7	31	3.1
Red Pine Coniferous Plantation	CUP3-1	7	6.86	0.7
Dry-Fresh Sugar Maple-Oak Deciduous	FOD5-3	6	29.49	2.9
Maple Organic Deciduous Swamp	SWD6	4	26.02	2.6
Fresh-Moist Sugar Maple-Lowland Ash Deciduous	FOD6-1	4	19.33	1.9
Fresh-Moist Oak-Sugar Maple Deciduous	FOD9-1	4	8.14	0.8
Cultural Meadow	CUM	3	3.4	0.1
Dry-Fresh Pine Coniferous	FOC1	2	1.95	0.2
Dry-Fresh White Oak Deciduous	FOD1-2	1	26.06	2.5

ELC Classification	ELC Code	Number of Stands	Area (Ha)	% of Total
Dry-Fresh Sugar Maple-Red Maple Deciduous	FOD5-9	1	11.06	1.0
Fresh-Moist White Cedar-Hardwood Mixed	FOM7-2	1	9.52	0.9
Mineral Cultural Meadow	CUM1	1	4.32	0.4
Buttonbush Mineral Thicket Swamp	SWT2-4	1	0.61	0.1
Dry-Fresh White Pine-Oak Mixed	FOM2-1	1	0.36	0.1
Total		**314**	**1025.24**	**100**

The sandy soils at Skunk's Misery suggest that the original upland forest was likely dominated by oak species. Prairie and savanna indicator species found in canopy openings support this, along with the low branching and wide crowns of mature oaks traits typical of trees that developed in open conditions.

A significant historical change in forest composition was the loss of American chestnut (*Castanea dentata*) due to Chestnut Blight (*Cryphonectria parasitica*) in the early 1940s. This species once played a key role in the deciduous forests. Its decline allowed other species to fill its niche, altering forest structure. Encouraging the growth of chestnut saplings currently present in the understory could help restore some of this lost diversity.

Soft maple (particularly red maple) is highly adaptable and has expanded across various site types in the county, from swamps to dry uplands. Its proliferation is linked to both chestnut loss and fire suppression (Abrams, 1992, 1998). In oak-dominated forests, red maple often appears in the sub-canopy and sapling layers, indicating its increasing presence. On wet sites, it hybridizes with silver maple to form Freeman maple (Acer × freemanii), which thrives in swampy conditions.

Most forest stands are between 50 and 80 years old, reflecting historical land use and management. Many tree species in the County can live well beyond 150 years under similar conditions. Table 2 outlines the age distribution in 10-year intervals. Although only two stands are younger than 20 years, all stands contain regeneration seedlings and saplings under 20 years old.

Common regeneration species include white ash, green ash, red maple, basswood, and white elm. Dense understories of witch hazel and blue beech may compete with other regenerating species, though witch hazel also provides nesting habitat for the Acadian

flycatcher. Regeneration of oak, hickory, sassafras, tulip, and hackberry is limited, as is that of eastern hemlock, white pine, and white cedar. Silvicultural practices are recommended to promote regeneration of underrepresented species such as red oak, white oak, and white pine.

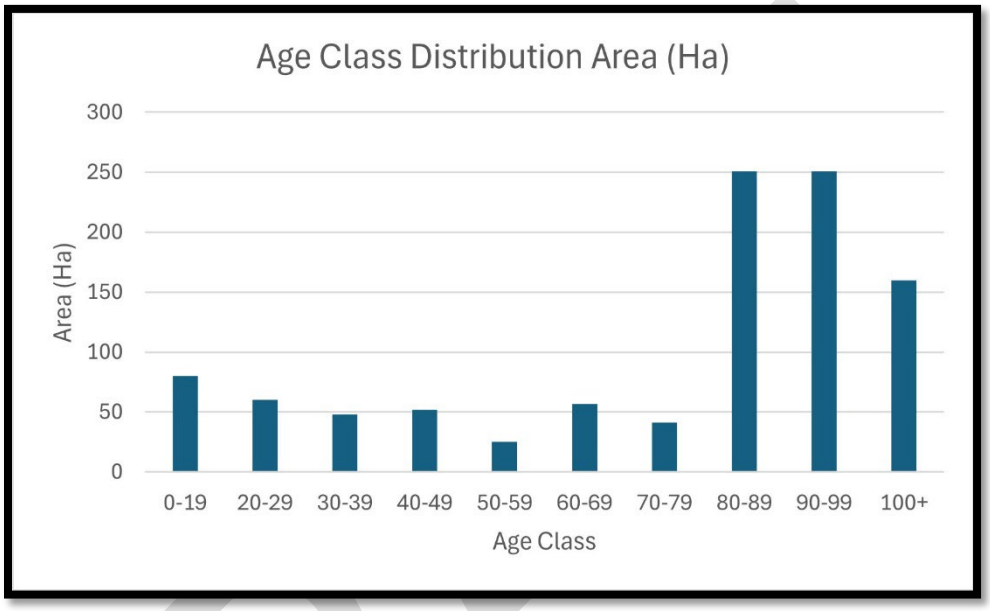

Figure 7 Age Class Distribution

3.0 Wildlife Habitat

3.1 Core Forest Areas and Habitat Linkages

The Middlesex County Official Plan outlines a policy framework for Natural Heritage Areas and Functions, aiming to establish a “green system” of interconnected natural features across the County. These forests provide essential Core Forest areas and corridors that link them to other natural heritage features.

Core Forest Areas are defined as forest patches larger than 25 hectares, with at least 4 hectares located 200 metres or more from any edge habitat (e.g., roads, fields, or development) (Henshaw & Leadbeater, 1999). These interior zones are critical for forest-dependent bird species (Sandilands & Hounsel, 1994; Environment Canada et al., 1998).

Corridors are elongated stretches of similar habitat, typically 40–50 metres wide or more, that provide continuous ecological connectivity. Their effectiveness depends on scale and structure (Fielder & Jain, 1992; Riley & Mohr, 1994). While some corridors primarily support movement, others must also offer breeding habitat and be resilient to edge effects. In such cases, widths of 200 metres or more are recommended (Riley & Mohr, 1994; Environment Canada et al., 1998).

This plan identifies two corridor types:

- Regional Corridors: Broad, landscape-scale linkages (e.g., 1:50,000 scale)that often include one or more core natural areas. These corridors are generally 200 metres or wider.
- Pathways of Connectivity: Similar to corridors but interrupted by fragmented or unsuitable habitat (e.g., roads, railways, pipelines, wide trails).

3.2 Wildlife Habitat Features

3.21 Overview

The Middlesex County Forests support a diverse range of wildlife, including many southern Ontario and Carolinian bird species. Several of these are classified as area-sensitive or forest interior species, which rely on large, undisturbed forest habitats. To maintain and enhance these conditions, forestry operations should adopt silvicultural

systems that prioritize habitat conservation. A forest-level approach to bird habitat management is recommended over traditional stand-level methods. Guidance for such systems can be found in references such as Dickson et al. (1993), Thompson et al. (1993, 1995), and Annand & Thompson (1997).

3.22 Habitat Types Present

These forests offer a variety of habitat types, including:

- Upland deciduous forests
- Mixed conifer stands
- Conifer plantations
- Forested Wetlands (swamps)

3.23 Key Structural Features

Important structural elements that enhance wildlife habitat include:

- Snags (standing dead trees)
- Coarse woody debris (fallen logs and rotting wood)
- Cavity trees (trees with natural hollows used for nesting, feeding, or shelter)
- Compared to old-growth forests in southern Ontario, the County Forests have a typical abundance of snags, but fewer cavity trees and coarse woody debris. Table 3 summarizes the average abundance and distribution of these features:

Table 2 Forest wildlife habitat features

Habitat Feature	Average Abundance	Hot Spots / Notes
Snags (Standing Dead Trees)	47 snags/ha (avg. diameter 25 cm) Range: 0–419/ha Old growth benchmark: 40 snags/ha	Most abundant in conifer-dominated stands: Mixed conifer (234/ha), Spruce plantations (138/ha), White pine (117/ha), Red pine (104/ha) Least common in soft maple stands (25/ha)
Cavity Trees	5 trees/ha (avg. diameter 47 cm) Range: 0–26/ha Old growth benchmark: 9/ha	Most common mature hardwood stands dominated by soft maple (7/ha) Rare or absent in plantations
Coarse Woody Debris (CWD)	58 logs/ha (7 m^3/ha) Range: 0–326/ha Avg. diameter: 22 cm Old growth benchmark: 100 m^3/ha	Most abundant in conifer-dominated stands: Red pine (110/ha), Mixed conifer (106/ha), White pine (75/ha), Spruce (69/ha)

These habitat features are essential for supporting biodiversity and ecological resilience. Enhancing their presence through targeted forest management practices will help maintain the ecological integrity of the County Forests.

Figure 8 Red Headed Woodpecker in Skunks Misery courtesy Trish Snider

4.0 Forest Disturbance

Between 2001 and 2021, the County forests experienced several significant disturbances both native and non-native that altered species composition and structural diversity across the landscape.

- Emerald Ash Borer Infestation

  The invasive Emerald Ash Borer spread throughout the County and across the entire province and into adjacent provinces, resulting in near-total mortality of native ash species. This loss has created substantial canopy gaps, altering light availability and forest regeneration dynamics.

- Beaver Activity and Ecosystem Transformation

  Two large beaver colonies established themselves in the Miller and Plaine tracts during the plan period. Their dam-building activities of municipal drains temporarily flooded over 100 acres of forest, significantly shifting the ecosystem away from its natural successional path. During the period of flooding these areas were characterized by standing deadwood, permanent open water, and large volumes of coarse woody debris. The municipal drain blockage in the Miller tract has now been partially cleared and the beaver were relocated, it is therefore expected the area will gradually recover naturally to former ecosystem/habitat characteristics.

- Hickory Bark Beetle (Scolytus quadrispinosus) outbreak

  Populations of the hickory bark beetle increased, leading to widespread mortality among mature hickory trees across the County forests.

- Drought and Spongy Moth Defoliation

  Several consecutive years of summer drought coincided with a cyclical outbreak of spongy moths (circa 2020–2024), causing repeated defoliation of mature oak stands. The outbreak subsided in 2023/2024 due to natural biological controls, including predatory wasps and viral pathogens.

These events have collectively reshaped forest structure, species dynamics, and habitat conditions, underscoring the need for adaptive management and ongoing forest health monitoring.

Figure 9 County staff participate in collaborative invasive species monitoring programs to increase the potential for early detection rapid response.

5.0 Integrated Forest Management

5.1 Vision

It is now widely recognized that sustainable forest management must be rooted in an integrated, ecosystem-based approach. This method ensures the long-term health and productivity of forest ecosystems while delivering a range of ecological, social, and economic benefits (Heilman, 1990; Kimmins, 1992). This concept known as ecosystem management forms the foundation of the vision for the future stewardship of the Middlesex County Forests.

Vision Statement:

The Middlesex County Forests will be managed to ensure their ecological sustainability, protect associated natural heritage features, and support social and economic values through the application of an integrated, ecosystem-based management approach.

5.2 Forest Resource Inventory

As part of the development of the 2026-2056 Forest Management Plan, a comprehensive update to the Forest Inventory was completed. This inventory was informed by field surveys, data collection, the 2001 Woodland Management Plan (WMP), and other relevant forestry resources.

To strengthen this component, future plans should incorporate connections to:

- Asset Management Planning (AMP)
- Carbon accounting and sequestration strategies
- Forest health and productivity metrics

5.3 Forest Resource Inventory Mapping

Detailed forest mapping has been completed for all Middlesex County forest tracts with discreet management units being delineated based on forest stand types and species composition. All of the Forest Resource Inventory (FRI) mapping is stored and updated in a comprehensive GIS database which facilitates the storage and analysis of the detailed management unit records. The GIS database allows the forest manager to model and predict sustainable tree harvest volumes, species distribution, forest health

and wildfire risk scenarios, wildlife and SAR habitat distribution as well as climate resilience risk management.

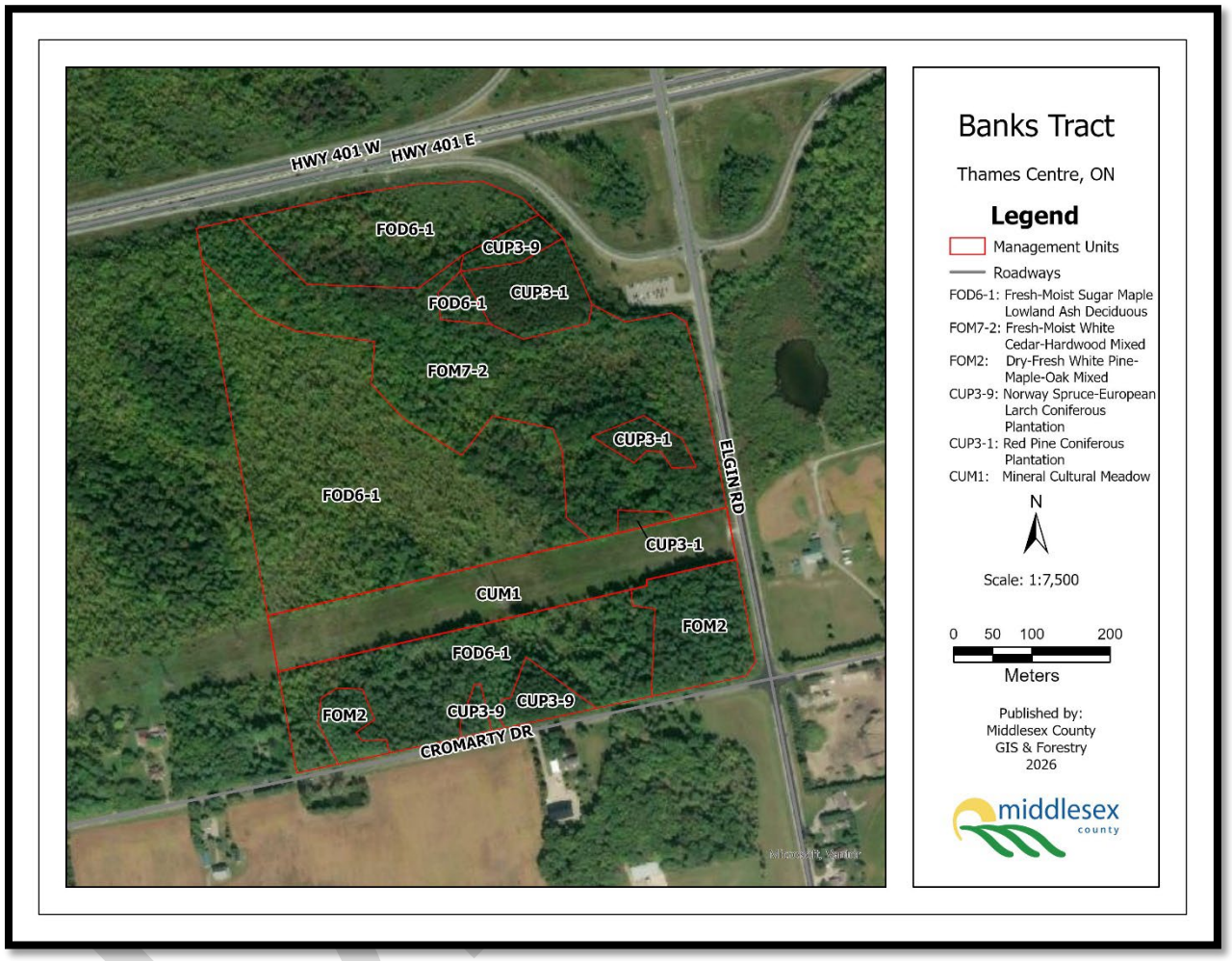

Figure 10 Example of the forest resource inventory spatial database mapping capabilities which are now available

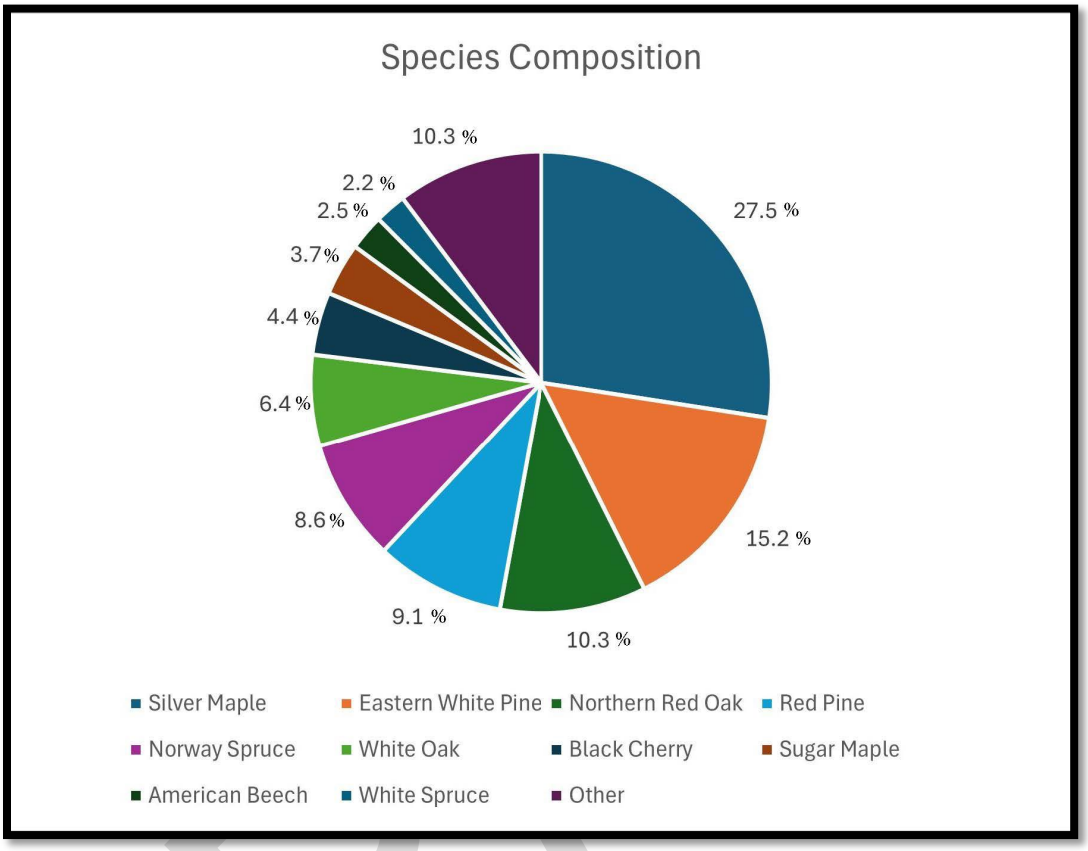

Figure 11 Species composition expressed as percentage

5.4 Monitoring and Assessments

Permanent Sample Plots (PSPs) have been established throughout the County Forest as part of the AMP Carbon Report. These geotagged plots serve multiple purposes:

- Supporting the Forest Resource Inventory with long-term data
- Enabling ongoing monitoring of forest growth, carbon storage, and sequestration
- Informing future asset management decisions

Additional monitoring plots can be installed in harvested areas to track regeneration and ecological succession post-harvest. These assessments will provide valuable data to guide and inform future Forest Management Plans and adaptive management strategies.

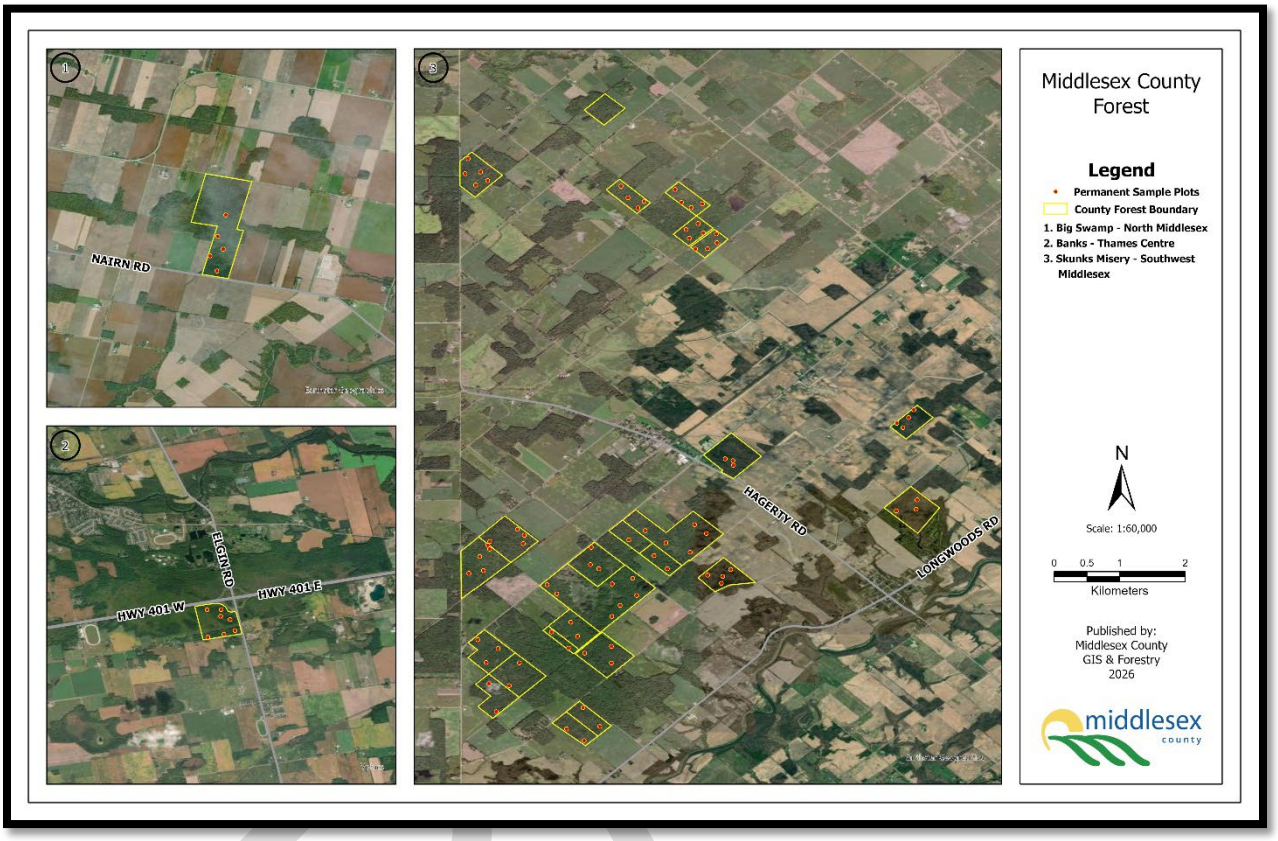

Figure 12 Installation of permanent sample plots has increased our knowledge of the current forest conditions.

5.5 Carbon Sequestration/Storage

The 2025 comprehensive forest inventory assessment and subsequent iTree Eco analysis estimates that the County forests are providing the following quantifiable benefits from the 1025 hectares.

Carbon storage – 312,700 metric tonnes

Annual Carbon Sequestration – 7,686 metric tonnes

Annual Pollution Absorption – 194 metric tonnes

Annual Oxygen Production – 19,860 metric tonnes

6.0 Public Access/Use

6.1 Recreation

Middlesex County forests are accessed by several user groups which can be broadly identified as follows:

- Passive recreation users including, hiking, mountain biking, trail running, horse back riding.
- Nature recreation, birdwatching, naturalist, wildlife and native plant photography, native forest interest groups.
- Wilderness sports activities such as trail running, orienteering and geo-caching have become more popular in recent years.

6.2 Hunting

When Middlesex County Forests were managed by the MNR they were opened to the licensed hunting community for all-season hunting activities and this wildlife management activity was mainly targeted at controlling populations of wildlife such as white-tailed deer to prevent excessive browsing damage to trees planted in newly established plantations of both coniferous and deciduous species. When Middlesex County assumed direct management of the forests in circa 2000 the practice of allowing hunting was continued on the same basis. Two forest tracts (McLaren and Banks) are regulated for Bow hunting only, the proximity of the 401 and the Three Counties Hospital prohibits the use of firearms.

6.3 Foraging for wild plants/fungi

It has been observed that in recent years the practice of foraging for edible and rare species of wild plants and fungi has become more popular among interest groups. The County has also been approached by for profit individuals/organisations wishing to conduct regular foraging and harvesting activities in the County forests.

This activity including harvest of medicinal plants was sustainably practiced by First Nations peoples for generations.

6.4 Vision

Middlesex County Forests will provide safe, inclusive, and sustainable opportunities for public enjoyment and education while preserving ecological integrity. Through balanced management, the County will support diverse recreational activities, cultural traditions, and nature-based experiences that foster community engagement and environmental stewardship, ensuring that public use enhances, rather than compromises, the health and resilience of County forests for future generations.

6.5 Guidelines for Sustainable Forest Recreation

1. Protect Ecological Integrity

Users will be encouraged to:

- Stay on designated trails to prevent soil erosion and damage sensitive habitats.
- Avoid disturbing wildlife, nesting areas, and rare plant species.
- Not remove plants, fungi, or natural materials unless permitted under approved foraging guidelines.

2. Promote Low-Impact Activities

- Encourage passive recreation such as hiking, birdwatching, and photography through the interactive trail initiative.
- Limit high-impact activities (e.g., mountain biking, horseback riding) to designated areas with appropriate infrastructure (gravel surface and dry well drained soils).
- Prohibit motorized vehicles except for authorized maintenance or emergency use.

3. Hunting and Foraging

- Hunting must remain regulated under provincial licensing and seasonal
- restrictions, select forests may be closed to hunting where conflicts with other user groups and activities are identified.
- Foraging for wild plants and fungi should follow sustainable harvest
- practices:
    - No commercial harvesting within the County Forests.

    - Avoid species at risk and maintain ecosystem balance.
- Provide educational resources on traditional and sustainable practices.

4. Infrastructure and Access

- Maintain and improve trails, signage, and gates to support safe access.
- Decommission unauthorized or redundant trails to reduce habitat fragmentation.
- Use the interactive trail software and interpretive signage to promote awareness of ecological values.

5. Community Engagement and Education

- Promote cultural and historical connections to the forests, including First Nations knowledge.

Figure 13 Hikers enjoying the County Forest Bayne Tract Trail system

7.0 Forest Health

7.1 Forest Health Monitoring Program

Maintaining the ecological integrity of Middlesex County Forests requires a proactive and adaptive approach to forest health monitoring. The Forest Health Monitoring Program (FHMP) is designed to systematically assess the condition of forest ecosystems, detect emerging threats, and guide timely management interventions.

7.11 Objectives

- Track forest health trends over time using standardized indicators.
- Identify and respond to biotic and abiotic stressors, including invasive species, pests, diseases, drought, and storm damage.
- Support sustainable forest management by integrating health data into planning and operational decisions.
- Engage interest holders through transparent reporting and collaborative monitoring efforts.

7.12 Monitoring Framework

The FHMP will use a combination of field surveys, remote sensing, and citizen science to collect data on:

- Tree vitality (crown condition, dieback, discoloration)
- Regeneration success and species composition
- Presence and impact of invasive species (e.g., buckthorn, garlic mustard,
- Phragmites, Oak wilt)
- Soil and water quality indicators
- Wildlife habitat condition and biodiversity metrics

Monitoring plots will be established across representative forest types and age classes. Data will be collected annually or biennially, depending on the indicator and risk level.

7.13 Reporting and Response

Findings from the FHMP will be summarized in a periodic State of the Forest Report, which will:

- Highlight key trends and emerging issues
- Recommend management actions (e.g., targeted removals, restoration planting, pest control)
- Inform updates to the Forest Management Plan and operational schedules

Where significant threats are identified, rapid response protocols will be activated in coordination with the Ontario Ministry of Natural Resources and Forestry, Canadian Food Inspection Agency (CFIA) and other partners.

7.14 Integration with Other Programs

The FHMP will inform and guide the decision making process for initiatives such as:

- Invasive Species Management
- Silvicultural Planning and Timber Harvest Scheduling
- Biodiversity Conservation and reintroduction of rare species

Together, these integrated resource management decisions will ensure that Middlesex County Forests remain resilient, productive, and ecologically diverse for generations to come.

Figure 14 Drone surveillance of the County Forests may be used more often when resources are available.

8.0 Wildfire Preparedness Plan

8.1 Wildfire Preparedness Plan

As climate conditions shift and wildfire risks increase across Ontario, proactive wildfire preparedness is essential to protect Middlesex County Forests, surrounding communities, and ecological values. This Wildfire Preparedness Plan outlines strategies to reduce fire risk, improve response capacity, and ensure public safety.

8.2 Objectives

- Minimize the likelihood and impact of wildfires through prevention and
- mitigation.
- Enhance readiness for wildfire detection, response, and recovery.
- Protect forest infrastructure, biodiversity, and adjacent properties.

- Coordinate with provincial and municipal emergency services.

8.3 Risk Assessment and Prevention

Wildfire risk will be assessed using factors such as fuel load, forest type, topography, access routes, and proximity to residential areas. Key prevention measures where appropriate should include:

- Fuel Management:
  - Thinning overstocked stands and removing deadwood in high-risk zones, these operations will be integrated into regular stand silviculture operations.
  - Maintaining defensible space around infrastructure and forest edges.
- Access Improvements:
  - Upgrading forest roads and trails to ensure emergency vehicle access.
  - Installing fire gates and signage where appropriate.
- Public Education and Outreach:
  - Promoting fire-safe practices among forest users.
  - Posting seasonal fire risk alerts and restrictions.
- Monitoring and Surveillance:
  - Using regular field inspections to detect early signs of fire.
  - Collaborating with conservation authorities and fire services for real-time updates.

8.4 Response Planning

A coordinated response framework will be developed in partnership with the Ontario Ministry of Natural Resources and Forestry (MNRF), local fire departments, and emergency management agencies. Key components include:

- Emergency Access Maps for all County Forest tracts including 911 addressing.
- Designated Staging Areas for firefighting equipment and personnel.
- Communication Protocols for rapid reporting and dispatch.
- Training and Drills for County staff and partners.

8.5 Recovery and Restoration

Post-fire recovery will focus on:

- Assessing ecological damage and soil stability.
- Replanting native species where necessary.
- Monitoring regeneration and invasive species encroachment.
- Updating management plans based on lessons learned.

8.6 Integration with Other Programs

This plan complements the County's Forest Health Monitoring Program, Biodiversity Conservation Strategy, and Infrastructure Improvement Schedule. Together, these initiatives support a resilient and adaptive forest management system.

9.0 Silvicultural Systems and Forest Development

Mid-tolerant tree species such as oak, hickory (Carya spp.), sassafras, tulip tree, American chestnut and hackberry often require larger canopy openings to successfully regenerate and develop. While regeneration is generally strong across most County Forests, these mid-tolerant species are notably underrepresented in the seedling and sapling layers.

To address this, group selection has been proposed as a more suitable silvicultural system for managing mid-tolerant forest communities. This method involves removing trees in small groups, typically two or more creating larger canopy gaps than those produced by single-tree selection. Although Ontario has limited experience with group selection, successful examples exist in the central Appalachian hardwood forests of the United States (Elliott et al., 1997; Miller et al., 1995; Law and Lorimer, 1989). More Ontario-based research is needed to determine optimal gap sizes. Middlesex County could take a leadership role by participating in studies to refine silvicultural systems for mid-tolerant hardwoods.

9.1 Mature Forests and Late Seral Characteristics

66% of trees in the County Forests are 80 years or older, and 16% exceed 100 years. While these stands may not qualify as “old growth,” they exhibit many features typical of late seral forests, such as large-diameter trees, cavity trees, and snags. Silvicultural practices can be adapted to promote these characteristics and allow forests to mature further.

Guidelines from Stabb (1996) and the Ministry of Natural Resources (MNR, 1996) support management strategies that retain or restore late seral features. Many of these practices are already embedded in the County’s current silvicultural methods, including:

- Creating canopy gaps 10–50 metres wide to encourage mid-tolerant species
- Retaining cavity trees and snags, and increasing coarse woody debris
- Leaving at least three trees per hectare with diameters over 50 cm
- Maintaining higher basal areas in the largest diameter classes

- Extending harvest cycles to allow longer periods between cuts

9.2 Recommended Actions

The County should continue to actively participate in research to identify appropriate silvicultural systems and management guidelines that support the persistence of mid-tolerant forest communities and promote the development of forests with late seral characteristics.

9.3 Theme: Sustainable Forest Management

County council have consistently voiced strong support for active, responsible stewardship of the Middlesex County Forests. The County has demonstrated its commitment to sustainable forestry through:

- The implementation of the 2001-2021 Forest Management Plan
- Updating and generating a GIS based forest resource inventory
- Participation in natural heritage studies and scientific research
- A review of appropriate forest uses

9.4 Sustainable Forest Management Practices

Middlesex County follows forest management standards and guidelines established by the Ministry of Natural Resources (MNR 2000a, 2001). Recent research, including ongoing studies within the County Forests, supports the use of silvicultural systems that promote multi-aged forest structures. These systems, such as single-tree and small group selection, help regenerate native species, maintain forest health, and conserve ecological integrity.

In some cases, management approaches may need to be adapted to:

- Conserve biodiversity
- Conserve Core Forest areas
- Minimize site disturbance

The County's long-term timber supply has been estimated using the latest available growth and yield forecasting techniques. These projections are reflected in the accompanying 5-year silvicultural schedule (2026–2031) within this 20-year Forest Management Plan.

While timber harvesting generates revenue, it should not be the primary motivation. Instead, harvesting should serve broader silvicultural and ecological goals. Revenue from timber sales is expected to offset direct costs such as:

- Silvicultural prescriptions
- Tree marking
- Harvest supervision

However, these revenues may not fully cover other management needs, including:

- Road rehabilitation
- Installation of gates
- Property boundary marking

A concern in southwestern Ontario is the common use of two-pass harvesting in hardwood stands. This method removing veneer and sawlogs first, then returning later for fuelwood results in repeated site disturbance and prolonged disruption for other forest users. Contractors should be encouraged to remove all harvestable material in a single pass to reduce impacts.

9.5 Recommended Actions

- Implement the 5-year forest management schedule outlined in this Plan.
- Reinvest timber sale revenues into forest management and enhancement activities.
- Allocate sufficient County funds to support full implementation of the management plan.
- Collaborate with harvesting contractors to develop timber utilization standards and harvesting systems that protect forest ecology and accommodate other users.
- Prepare a forest management prescription for each stand scheduled for activity.

10.0 Sustainable Timber Management

10.1 Background

Long-term sustainable timber management for the Middlesex County Forests is guided by “A Silvicultural Guide to Managing Southwestern Ontario Forests” version 1.1 (MNR 2000). This system evaluates management alternatives using forest inventory data, silvicultural systems, yield tables, and policy scenarios.

The County Forests’ deciduous stands are primarily (66%) aged between 80 and 110 years, while conifer plantations are younger, ranging from 40 to 70 years (see Figure 6). Areas of three forest tracts, Bayne (22.4 ha), Leech (18.5 ha), and Miller (34.4 ha), have been identified as particularly ecologically sensitive forest stands and are therefore excluded from timber production under this plan. With these exclusions, approximately 965 hectares remain available for timber management, though further reductions may be assessed as prescriptions are developed due to site sensitivity, species at risk, adjacency rules, wildlife habitat needs, or other operational constraints.

Figure 15 Mechanized harvesting in conifer stands can reduce residual tree and ground disturbance.

10.2 Forest Age Class Distribution (ha)

Table 3 Age Class Distribution:

Age Class Distribution		
Age Class	**Area (Ha)**	**Percent of Total**
0-19	80	8
20-29	60	6
30-39	48	4
40-49	52	5
50-59	25	2
60-69	57	5
70-79	41	4
80-89	251	25
90-99	251	25
100+	160	16
Total	1025	100

Average Stocking (Basal Area at Age 50 / Normal Basal Area at Age 50, Site Class 1): Soft Maple-Oak: 0.92 | Soft Maple: 0.84 | Oak: 0.81 | Mixed Deciduous: 1.0 | White Pine: 0.91 | Spruce: 0.75 | Red Pine: 1.0 | Mixed Coniferous: 1.0

10.3 Silvicultural Systems and Forest Yield

Timber management in the County Forests will primarily use uniform shelterwood and uneven-aged single tree/group selection systems, as outlined in the *Silvicultural Guide to Managing Southern Ontario Forests* (MNR, 2000).

Yield tables were adjusted for average stocking levels and used to estimate gross merchantable volumes under proposed silvicultural regimes.

Table 4 Silvicultural systems and management criteria:

Forest Type	System	Thinning Schedule	% Basal Area Cut	Growth Factor (m²/ha/yr)
Red Pine Plantation	Uniform Shelterwood	Age 30, 40, 50, 60, 70, 90 → mixed stand	25%, 20%, final 75%	0.85 → 0.70

Forest Type	System	Thinning Schedule	% Basal Area Cut	Growth Factor (m²/ha/yr)
Spruce Plantation	Uniform Shelterwood	Age 40, 70, 90 → mixed stand	50%, 50%, final 72%	0.65
White Pine Plantation	Uniform Shelterwood	Age 40, 70, 90 → mixed stand	50%, 50%, final 72%	0.70
Soft Maple	Selection (single/group)	First at age 70, then every 15 years	20–30%	0.32
Soft Maple-Oak	Selection (single/group)	First at age 70, then every 15 years	20–30%	0.32
Oak	Selection (single/group)	First at age 70, then every 15 years	20–30%	0.25
Mixed Deciduous	Selection (single/group)	First at age 70, then every 15 years	20–30%	0.40

10.4 Sustainable Timber Management Area Projections

Table 5 Maximum sustainable harvest area by planning period

Allowable Harvest 10-year period timeline		
Period	**Total Area (Ha)**	**Annual Area (Ha/yr)**
2026-2035	529	53
2036-2045	494	49
2046-2055	481	48
2056-2065	445	44
2066-2075	423	42

Table 6 Sustainable Harvest Area by Forest Stand Type

Forest Community	2026–2031	2032–2036	2037–2046
Soft Maple	56	50	92
Upland Hardwoods	135	145	300
Mixed Deciduous	31	27	52
Mixed Wood (Deciduous/Coniferous)	6	6	25
White Pine Plantation	8	5	4
Spruce Plantation	3	2	0
Red Pine Plantation	2	1	0
Mixed Coniferous	9	9	12
Total Area (ha)	250	245	485

10.5 5-Year Sustainable Timber Harvest Plan (2026–2031)

Table 7 Five Year Sustainable Timber Harvest Plan

Year 1								
Tract	**Forest Type**	**Age**	**Harvest Type**	**Silvicultural System**	**Area (Ha)**	**BA**	**Volume**	**Comments**
Bayne	White Pine Plantation	73	Improvement Thinning (2)	Shelterwood	6.4	44	690 m3	Marked and ready for harvest
McMaster	White Pine Plantation	68	Improvement Thinning (2)	Shelterwood	8.4	36	656 m3	Marked and ready for harvest
Squire	Hardwoods	88	Selection	Single Tree Selection	19	30	207,650 fbm	BA within range for selection cycle
Year 2								
Tract	**Forest Type**	**Age**	**Harvest Type**	**Silvicultural System**	**Area (Ha)**	**BA**	**Volume**	**Comments**
Banks	Red Pine Plantation	78	Improvement Thinning (2)	Shelterwood	3.5	38	400 m3	High BA and past timing of second thinning based on 2001 WMP
Big Swamp	Spruce Plantation	41	Improvement Thinning (1)	Shelterwood	10.4	38	400 m3	High BA and past timing of first thinning based on 2001 WMP
Big Swamp	Lowland Hardwoods	88	Selection	Single Tree Selection	30	30	326,300 fbm	Approaching 20 years since last harvest and BA within range for selection cycle

Year 3								
Tract	**Forest Type**	**Age**	**Harvest Type**	**Silvicultural System**	**Area (Ha)**	**BA**	**Volume**	**Comments**
Miller	Red Pine Plantation	47	Improvement Thinning (1)	Shelterwood	3.5	46	450 m3	High BA and past timing of first thinning based on 2001 WMP
Miller	White Pine Plantation	52	Improvement Thinning (2)	Shelterwood	1.3	40	150 m3	High BA and past timing of second thinning based on 2001 WMP
Newbury	Upland Hardwoods	98	Selection	Single Tree Selection	30	26	237,314	Over 20 years since last harvest and BA approaching range for selection cycle

Appendices

Appendix A:

Forest Types/Communities of Middlesex County Forest

ELC Classification	ELC Code	Number of Stands	Area (Ha)	% of Total
Fresh-Moist Oak-Maple Deciduous	FOD9-2	113	318.25	31
Dry-Fresh Oak-Red Maple Deciduous	FOD2-1	53	210.42	20.7
Dry-Fresh Oak-Hardwood Deciduous	FOD2-4	40	131.96	12.9
White Pine Coniferous Plantation	CUP3-2	22	30.73	3
Dry-Fresh White Pine-Maple-Oak Mixed	FOM2	16	34.74	3.4
Dry-Fresh Mixed Oak Deciduous	FOD1-4	11	51.58	5
Norway Spruce-European Larch Coniferous Plantation	CUP3-9	9	19.48	1.9
Dry-Fresh Sugar Maple Deciduous	FOD5	7	49.96	4.8
Dry-Fresh Sugar Maple-Beech Deciduous	FOD5-2	7	31	3.1
Red Pine Coniferous Plantation	CUP3-1	7	6.86	0.7
Dry-Fresh Sugar Maple-Oak Deciduous	FOD5-3	6	29.49	2.9
Maple Organic Deciduous Swamp	SWD6	4	26.02	2.6
Fresh-Moist Sugar Maple-Lowland Ash Deciduous	FOD6-1	4	19.33	1.9
Fresh-Moist Oak-Sugar Maple Deciduous	FOD9-1	4	8.14	0.8
Cultural Meadow	CUM	3	3.4	0.1
Dry-Fresh Pine Coniferous	FOC1	2	1.95	0.2
Dry-Fresh White Oak Deciduous	FOD1-2	1	26.06	2.5
Dry-Fresh Sugar Maple-Red Maple Deciduous	FOD5-9	1	11.06	1
Fresh-Moist White Cedar-Hardwood Mixed	FOM7-2	1	9.52	0.9
Mineral Cultural Meadow	CUM1	1	4.32	0.4
Buttonbush Mineral Thicket Swamp	SWT2-4	1	0.61	0.1

Dry-Fresh White Pine-Oak Mixed	FOM2-1	1	0.36	0.1
Total		314	1025.24	100

Appendix B:

Forest Inventory

Tract	Description	Forest Type	Area (Ha)	Species Composition	Age	Height (m)	Crown Closure (%)	DBH (cm)	BA (m2/Ha)	Harvest System
Atkinson	Dry-Fresh White Pine-Oak Mixed	FOM2-1	0.4	Pw6 Ms2 Or1 (Hb Tul Mh Cb)1	63	29	60	34	30	Shelterwood
Atkinson	Fresh-Moist Oak-Maple Deciduous	FOD9-2	7	Ms8 Ow1 Ew1	90	30	70	38	24	Selection
Atkinson	Dry-Fresh Oak-Hardwood Deciduous	FOD2-4	33.5	Ow2 Ms2 Mh1 Or1 Tul1 (Po Cb Be Sas Hi Ew Wn Ba)3	90	32	70	40	24	Selection
Banks	Dry-Fresh White Pine-Maple-Oak Mixed	FOM2	2.4	Pw6 Po1 Cb1 (Hi Ag Bb Wn Bn Buc)2	78	31	75	46	34	Shelterwood
Banks	Red Pine Coniferous Plantation	CUP3-1	1.9	Pr10	78	30	70	34	38	Shelterwood
Banks	Norway Spruce-European Larch Coniferous Plantation	CUP3-9	1.2	Sn6 Ms2 Cb1 (Dog Buc Ag)1	78	31	80	45	32	Shelterwood
Banks	Fresh-Moist White Cedar-Hardwood Mixed	FOM7-2	9.5	Ce3 He2 Ms2 Ta1 By1 (Ew Po Ba)1	83	19	50	27	36	Selection
Banks	Fresh-Moist Sugar Maple-Lowland Ash Deciduous	FOD6-1	19.3	Ms4 Tul1 By1 Cb1 Po1 Ce1 (He Pr Ew Ag)1	80	24	80	23	30	Selection
Banks	Mineral Cultural Meadow	CUM1	4.3	Gold9 (Pr Pw Phrag La Buc Wi)1		2.5	0	3	0	
Bayne	White Pine Coniferous Plantation	CUP3-2	16.4	Pw7 Wn1 Sas1 Ms1	73	32	60	44	44	Shelterwood
Bayne	Fresh-Moist Oak-Maple Deciduous	FOD9-2	5.3	Ms8 Ew1 (Ow Tul)1	113	32	85	45	26	Selection
Bayne	Dry-Fresh Sugar Maple Deciduous	FOD5	22	Mh2 Ms2 Or2 Ow1 Be1 Tul1 (Cb By Ba Hi Sas)1	113	32	85	47	26	Selection

Tract	Description	Forest Type	Area (Ha)	Species Composition	Age	Height (m)	Crown Closure (%)	DBH (cm)	BA (m2/Ha)	Harvest System
Big Swamp	Norway Spruce-European Larch Coniferous Plantation	CUP3-9	10.4	Sn10	41	20	75	17	38	Shelterwood
Big Swamp	White Pine Coniferous Plantation	CUP3-2	0.7	Pw6 Ms3 (Ew Ag)1	38	23	70	25	44	Shelterwood
Big Swamp	Fresh-Moist Oak-Maple Deciduous	FOD9-2	103	Ms8 Ew1 (Ow Po By Sas Bw)1	88	35	87	47	30	Selection
Clark	Fresh-Moist Oak-Maple Deciduous	FOD9-2	8.6	Ms7 Ew2 (Ow Cb Bb Ag)1	98	31	90	43	28	Selection
Clark	Dry-Fresh Oak-Red Maple Deciduous	FOD2-1	12.1	Or2 Ms2 Be2 Mh1 Ow1 (Cb Po Hi Iw Dog Bb Ag)2	98	26	87	31	28	Selection
Gardiner	Fresh-Moist Oak-Maple Deciduous	FOD9-2	6.1	Ms7 Ew2 (Cb Ow Ag Po Sas)1	88	33	80	44	26	Selection
Gardiner	Dry-Fresh Sugar Maple-Oak Deciduous	FOD5-3	14.6	Ms3 Ow2 Sas1 Cb1 Ew1 (Bb Po Ag)2	88	26	80	29	24	Selection
Hurdle	Fresh-Moist Oak-Maple Deciduous	FOD9-2	29.8	Ms8 Ew1 (Or Cb Sas Dog Iw)1	80	32	70	39	24	Selection
Hurdle	Dry-Fresh Oak-Red Maple Deciduous	FOD2-1	49.6	Or2 Ow2 Ms2 Mh1 Cb1 (Dog Iw Sas)2	80	31	87	41	30	Selection
Leech	Fresh-Moist Oak-Maple Deciduous	FOD9-2	6	Ms8 Ew2	93	30	90	42	28	Selection
Leech	Dry-Fresh Oak-Red Maple Deciduous	FOD2-1	13.8	Ms3 Or2 Ow2 Be2 (Sas Ag Cb Dog)1	90	30	90	40	28	Selection
Livingston	Fresh-Moist Oak-Sugar Maple Deciduous	FOD9-1	8.2	Ms6 Mh1 Or1 Ew1 (Ag Cb Ow Ba Be Hi)1	103					Selection
Livingston	Dry-Fresh Oak-Red Maple Deciduous	FOD2-1	12.8	Ms3 Or2 Be2 Ow1 (Cb Ag Ba Hi Ew)2	103					Selection

Tract	Description	Forest Type	Area (Ha)	Species Composition	Age	Height (m)	Crown Closure (%)	DBH (cm)	BA (m2/Ha)	Harvest System
Lockwood	Norway Spruce-European Larch Coniferous Plantation	CUP3-9	2.3	Sn3 Sw3 Po2 Ps1 (Ow Ms)1	60	25	70	47	16	Shelterwood
Lockwood	Fresh-Moist Oak-Maple Deciduous	FOD9-2	2.8	Ms7 Ew2 Ob1	98	30	80	33	24	Selection
Lockwood	Dry-Fresh Sugar Maple-Beech Deciduous	FOD5-2	15.3	Be3 Mh2 Tul1 Ms1 Ow1 Or1 (Ag Cb Wn Bb Ew Iw Po Ob)1	98	32	80	43	24	Selection
McLaren	Norway Spruce-European Larch Coniferous Plantation	CUP3-9	5.6	Sn6 Le1 Ps1 Sw1 (Ow Wn Hb Cb Po Ms)1	63	27	80	22	16	Shelterwood
McLaren	Fresh-Moist Oak-Maple Deciduous	FOD9-2	8.5	Ms8 Ew1 (Ag Ow Ob Cb)1	105	32	70	43	20	Selection
McLaren	Dry-Fresh Sugar Maple Deciduous	FOD5	27	Ms2 Ew2 Po2 Ow1 Sas1 (Ag Wn Ps Sn Or Mh Dog Cb)2	63	29	80	46	22	Selection
McMaster	Dry-Fresh White Pine-Maple-Oak Mixed	FOM2	7	Pw5 Ms2 Sw1 Ps1 (Po Ew)1	68	32	50	36	36	Shelterwood
McMaster	Fresh-Moist Oak-Maple Deciduous	FOD9-2	20.4	Ms8 Ew1 (Ag Cb Ab Ba)1	80	31	75	32	26	Selection
McMaster	Dry-Fresh Oak-Red Maple Deciduous	FOD2-1	22.4	Ms3 Cb2 Or1 Ow1 Po1 (Ag Hi Sas Bb Dog Ew Be Mh Ab Ba)2	80	32	70	40	28	Selection
Miller	Red Pine Coniferous Plantation	CUP3-1	3.5	Pr10	47	24	40	23	46	Shelterwood
Miller	White Pine Coniferous Plantation	CUP3-2	1.3	Pw8 Ms1 Ow1	52	30	80	36	40	Shelterwood
Miller	Fresh-Moist Oak-Maple Deciduous	FOD9-2	14.2	Ms7 Ow1 Ew1 Cb1	92	26	70	24	22	Selection

Tract	Description	Forest Type	Area (Ha)	Species Composition	Age	Height (m)	Crown Closure (%)	DBH (cm)	BA (m2/Ha)	Harvest System
Miller	Dry-Fresh Mixed Oak Decicuous	FOD1-4	21.4	Ow3 Ms2 Or2 Cb1 Ew1 Ag1	92	33	70	27	26	Selection
Misery	Dry-Fresh White Pine-Maple-Oak Mixed	FOM2	9	Pw7 Sw1 Pt1 Ms1	68	29	50	39	32	Shelterwood
Misery	Fresh-Moist Oak-Maple Deciduous	FOD9-2	5.1	Ms9 (Bb Ew)1	93	20	80	32	30	Selection
Misery	Dry-Fresh Sugar Maple-Oak Deciduous	FOD5-3	15.3	Ms2 Mh2 Or2 Ow1 Be1 Cb1 (Iw Ag By Hs)1	93	30	80	47	26	Selection
Moore	Fresh-Moist Oak-Maple Deciduous	FOD9-2	2.7	Ms9 (Ew Ag)1	73	27	80	32	30	Selection
Moore	Dry-Fresh Mixed Oak Decicuous	FOD1-4	5.4	Ow3 Or2 Ms2 Cb1 Ew1 (Po Ag)1	73	28	80	40	30	Selection
Newbury	Dry-Fresh Pine Coniferous	FOC1	1.9	Pw4 Sw4 Cb1 Po1	61	32	60	40	32	Shelterwood
Newbury	Fresh-Moist Oak-Maple Deciduous	FOD9-2	28.9	Ms8 Ew1 (Ag Cb Ab)1	98	32	70	37	26	Selection
Newbury	Dry-Fresh Oak-Hardwood Deciduous	FOD2-4	68.2	Or2 Be2 Ms2 Cb1 Ow1 (Ag Bb Sas Ew)2	98	30	87	31	28	Selection
Newbury	Maple Organic Deciduous Swamp	SWD6	25.9	Ms9 (Ew Ow)1		23	20	18	6	
Patterson	Dry-Fresh White Pine-Maple-Oak Mixed	FOM2	7.6	Pw5 Ms2 Sw1 Pr1 Ew1	75	28	40	43	22	Shelterwood
Patterson	Fresh-Moist Oak-Maple Deciduous	FOD9-2	3.5	Ms8 Ow1 (Ew Ag)1	83	28	80	38	18	Selection
Patterson	Dry-Fresh Oak-Red Maple Deciduous	FOD2-1	18.7	Ms4 Ow2 Or2 Cb1 (Ag Po Ba Ew)1	83	32	80	30	18	Selection
Plaine	White Pine Coniferous Plantation	CUP3-2	4.1	Pw6 Ms2 Sn1 (Or Cb Ew Po Sw)1	70	31	70	45	36	Shelterwood

Tract	Description	Forest Type	Area (Ha)	Species Composition	Age	Height (m)	Crown Closure (%)	DBH (cm)	BA (m2/Ha)	Harvest System
Plaine	Fresh-Moist Oak-Maple Deciduous	FOD9-2	11.6	Ms9 (Ew Ag)1	93	28	90	31	34	Selection
Plaine	Dry-Fresh Oak-Hardwood Deciduous	FOD2-4	18	Be2 Mh2 Ms1 By1 Or1 Cb1 (Ag Tul Ew)1	93	33	87	37	24	Selection
Plaine	Maple Organic Deciduous Swamp	SWD6	1.6	Ms8 (Ew Or By)2		23	40	27	16	
Purdy	White Pine Coniferous Plantation	CUP3-2	3.3	Pw8 Ms1 Wn1	61	30	75	37	30	Shelterwood
Purdy	Fresh-Moist Oak-Maple Deciduous	FOD9-2	5.8	Ms7 Or1 Hi1 (Ew Bb)1	93	27	80	34	26	Selection
Purdy	Dry-Fresh Oak-Hardwood Deciduous	FOD2-4	12	Or3 Mh2 Ms1 Ow1 Cb1 Wn1 (Iw Ew Ag Po)1	93	32	80	36	30	Selection
Ritchie	White Pine Coniferous Plantation	CUP3-2	2	Pw9 (Pr Or Ms Cb)1	63	28	70	37	32	Shelterwood
Ritchie	Red Pine Coniferous Plantation	CUP3-1	1.5	Pr10	58	24	40	26	32	Shelterwood
Ritchie	Fresh-Moist Oak-Maple Deciduous	FOD9-2	1.3	Ms7 Ew1 Cb1 Buc1	58	32	60	28	14	Selection
Ritchie	Dry-Fresh Oak-Red Maple Deciduous	FOD2-1	30.1	Ms3 Or2 Cb1 Or1 Dog1 Ew1	58	23	80	34	26	Selection
Robinson	Fresh-Moist Oak-Maple Deciduous	FOD9-2	2.7	Ms8 Ew1 Po1	88	28	90	27	36	Selection
Robinson	Dry-Fresh Sugar Maple-Beech Deciduous	FOD5-2	15.6	Mh2 Be2 Tul1 Or1 Ms1 Cb1 (Ow Ag Iw Ew Po)2	88	28	80	28	28	Selection
Sayler	Dry-Fresh White Pine-Maple-Oak Mixed	FOM2	6.1	Pw7 Ms2 Pt1	66	30	60	38	24	Shelterwood

Tract	Description	Forest Type	Area (Ha)	Species Composition	Age	Height (m)	Crown Closure (%)	DBH (cm)	BA (m2/Ha)	Harvest System
Sayler	Fresh-Moist Oak-Maple Deciduous	FOD9-2	8	Ms8 Ew1 (Ow Ag)1	113	23	70	21	22	Selection
Sayler	Dry-Fresh Oak-Red Maple Deciduous	FOD2-1	26.1	Or2 Ow2 Ms2 Cb2 (Po Ew Hb Sas By)2	113	30	70	40	28	Selection
Squire	Fresh-Moist Oak-Maple Deciduous	FOD9-2	6.9	Ms8 Ew1 Ag1	88	28	80	36	34	Selection
Squire	Dry-Fresh Oak-Red Maple Deciduous	FOD2-1	12.1	Ow2 Or2 Ms2 Mh1 Cb1 (Ew Be Dog Ag)2	88	28	85	33	28	Selection
Steele	Fresh-Moist Oak-Maple Deciduous	FOD9-2	4.6	Ms8 Ew1 Ag1	103	30	70	29	20	Selection
Steele	Dry-Fresh Sugar Maple-Red Maple Deciduous	FOD5-9	11.1	Mh2 Ms2 Or2 Cb1 Tul1 (Ag Be Bb Ew Po Dog)2	103	29	90	31	30	Selection
Taylor	Dry-Fresh White Pine-Maple-Oak Mixed	FOM2	2.6	Pw7 Ms2 Po1	57	29	50	37	32	Shelterwood
Taylor	Fresh-Moist Oak-Maple Deciduous	FOD9-2	6.2	Ms7 Ew1 Cb1 Ag1	113	28	70	38	28	Selection
Taylor	Dry-Fresh Oak-Red Maple Deciduous	FOD2-1	11.8	Ms4 Or2 Cb1 (Syc Tulip Ew Ag Iw Sas)3	113	32	80	38	20	Selection
Tunks	White Pine Coniferous Plantation	CUP3-2	3	Pw9 (Ms Or Po Cb)1	62	30	70	39	32	Shelterwood
Tunks	Fresh-Moist Oak-Maple Deciduous	FOD9-2	11.1	Ms7 Or1 Ow1 Ew1	98	27	80	31	28	Selection
Tunks	Dry-Fresh White Oak Deciduous	FOD1-2	26.1	Ow3 Ms2 Po1 Or1 Ew1 Cb1 (Ag Bw)1	98	29	70	41	28	Selection
Vey	Fresh-Moist Oak-Maple Deciduous	FOD9-2	6.7	Ms7 Mh1 Be1 Ew1	113	29	70	22	36	Selection
Vey	Dry-Fresh Mixed Oak Decicuous	FOD1-4	24.8	Ow3 Ms2 Or2 Mh1 Cb1 (Be Po Ag Hi)1	113	24	60	29	34	Selection

Tract	Description	Forest Type	Area (Ha)	Species Composition	Age	Height (m)	Crown Closure (%)	DBH (cm)	BA (m2/Ha)	Harvest System
Vey	Buttonbush Mineral Thicket Swamp	SWT2-4	0.6	Button10		5	0	8	0	

Appendix C:

Forest Type Silviculture System

ELC Classification	ELC Code	Harvest System	Thinning Schedule	% BA Cut	Growth Factor (m3/ha/yr)
Fresh-Moist Oak-Maple Deciduous	FOD9-2	Selection (single/group)	First at age 70, then every 15 years	20-30%	1.0-1.4
Dry-Fresh Oak-Red Maple Deciduous	FOD2-1	Selection (single/group)	First at age 70, then every 15 years	20-30%	1.2-2.0
Dry-Fresh Oak-Hardwood Deciduous	FOD2-4	Selection (single/group)	First at age 70, then every 15 years	20-30%	1.2-2.0
White Pine Coniferous Plantation	CUP3-2	Uniform Shelterwood	Age 40, 70, 90; mixed stand	50%, 50%, final 72%	1.5-2.5
Dry-Fresh White Pine-Maple-Oak Mixed	FOM2	Selection (single/group)	Every 15 years	20-30%	1.0-2.5
Dry-Fresh Mixed Oak Deciduous	FOD1-4	Selection (single/group)	First at age 70, then every 15 years	20-30%	1.2-2.0
Norway Spruce-European Larch Coniferous Plantation	CUP3-9	Uniform Shelterwood	Age 40, 70, 90; mixed stand	50%, 50%, 72%	2.0-4.0
Dry-Fresh Sugar Maple Deciduous	FOD5	Selection (single/group)	First at age 70, then every 15 years	20-30%	1.2-2.0
Dry-Fresh Sugar Maple-Beech Deciduous	FOD5-2	Selection (single/group)	First at age 70, then every 15 years	20-30%	1.2-2.0
Red Pine Coniferous Plantation	CUP3-1	Uniform Shelterwood	Age 30, 40, 50, 60, 70, 90; mixed stand	25%, 20%, final 75%	2.0-4.0

ELC Classification	ELC Code	Harvest System	Thinning Schedule	% BA Cut	Growth Factor (m3/ha/yr)
Dry-Fresh Sugar Maple-Oak Deciduous	FOD5-3	Selection (single/group)	First at age 70, then every 15 years	20-30%	1.2-2.0
Maple Organic Deciduous Swamp	SWD6	Drainage/Regeneration			
Fresh-Moist Sugar Maple-Lowland Ash Deciduous	FOD6-1	Selection (single/group)	First at age 70, then every 15 years	20-30%	1.0-1.4
Fresh-Moist Oak-Sugar Maple Deciduous	FOD9-1	Selection (single/group)	First at age 70, then every 15 years	20-30%	1.2-2.0
Dry-Fresh Pine Coniferous	FOC1	Selection (single/group)	Every 15 years	20-30%	1.0-2.5
Dry-Fresh White Oak Deciduous	FOD1-2	Selection (single/group)	First at age 70, then every 15 years	20-30%	1.2-2.0
Dry-Fresh Sugar Maple-Red Maple Deciduous	FOD5-9	Selection (single/group)	First at age 70, then every 15 years	20-30%	1.2-2.0
Fresh-Moist White Cedar-Hardwood Mixed	FOM7-2	Selection (single/group)	First at age 70, then every 15 years	20-30%	0.5-1.5
Mineral Cultural Meadow	CUM1	Hydro ROW	Maintained by Hydro		
Buttonbush Mineral Thicket Swamp	SWT2-4	Drainage/Regeneration			
Dry-Fresh White Pine-Oak Mixed	FOM2-1	Selection (single/group)	Every 15 years	20-30%	1.0-2.5
Cultural Meadow	CUM	Reforest			

Appendix D:

\Tree Species

Species Code	Common Name	Latin Name
Ab	Black Ash	*Fraxinus nigra*
Ag	Green Ash	*Fraxinus pennsylvanica*
Ar	Red Ash	*Fraxinus pennsylvanica*
Aw	White Ash	*Fraxinus americana*
Ba	Basswood	*Tilia americana*
Bb	Blue Beech	*Carpinus caroliniana*
Be	American Beech	*Fagus grandifolia*
Bgum	Black Gum	*Nyssa sylvatica*
Bw	White Birch	*Betula papyrifera*
By	Yellow Birch	*Betula alleghaniensis*
Cb	Black Cherry	*Prunus serotina*
Ce	Eastern White Cedar	*Thuja occidentalis*
Dog	Eastern Flowering Dogwood	*Cornus florida*
Ew	White Elm	*Ulmus americana*
Hk	Hackberry	*Celtis occidentalis*
Hb	Bitternut Hickory	*Carya cordiformis*
Hs	Shagback Hickory	*Carya ovata*
He	Eastern Hemlock	*Tsuga canadensis*
Ht	Hawthorn	*Crataegus*
Iw	Ironwood	*Ostrya virginiana*

Species Code	Common Name	Latin Name
Lb	Black Locust	*Robinia pseudoacacia*
Le	European Larch	*Larix decidua*
Mh	Sugar (Hard) Maple	*Acer saccharum*
Mr	Red (Soft) Maple	*Acer rubrum*
Ms	Silver (Soft) Maple	*Acer saccharinum*
Ob	Bur Oak	*Quercus macrocarpa*
Or	Northern Red Oak	*Quercus rubra*
Os	Swamp White Oak	*Quercus bicolor*
Ow	White Oak	*Quercus alba*
Pb	Balsam Poplar	*Populus balsamifera*
Pc	Carolina Poplar	*Populus canadensis*
Pd	Eastern Cottonwood	*Populus deltoides*
Pg	Largetooth Aspen	*Populus grandidentata*
Pt	Trembling Aspen	*Populus tremuloides*
Pr	Red Pine	*Pinus resinosa*
Ps	Scots Pine	*Pinus sylvestris*
Pw	Eastern White Pine	*Pinus strobus*
Pj	Jack Pine	*Pinus banksiana*
Sas	Sassafras	*Sassafras albidum*
Sb	Black Spruce	*Picea mariana*
Sn	Norway Spruce	*Picea abies*
Sw	White Spruce	*Picea glauce*

Species Code	Common Name	Latin Name
Syc	Sycamore	*Planatus occidentalis*
Ta	Tamarack	*Larix laricina*
Tul	Tulip Tree	*Liriodendron tulipifera*
Wi	Willow	*Salix spp.*
Wn	Black Walnut	*Juglans nigra*
Jc	Butternut	*Juglans cinerea*
Cd	American Chestnut	*Castanea dentata*
Gd	Kentucky Coffee-Tree	*Gymnocladus dioicus*

Appendix E:

Rare Species

List of Provincially and Regionally rare species in the Middlesex County Forests at Skunk's Misery (Bowles 2002). Column headings include S- RANK = Status in Ontario [S1 = extremely rare, S2 = very rare, s3 = rare to uncommon] (Oldham, 1994), MIDD = Status in Middlesex County [R1 to R5 indicates the number of known locations for the species] (Bowles, 2002), P/S = prairie or savanna indicator (Rodger, 1998).

SP_CODE	SCIENTIFIC NAME	COMMON NAME	S-RANK	MIDD	P/S
DIGCOGN	Digitaria cognata	Fall Witch Grass	S1	R3	X
VITLABR	Vitis labrusca	Fox Grape	S1S2	R3	
ARILONG	Aristida longespica	Three-Awned Grass	S2	R?	
ARINECO	Aristida necopina	Three-Awned Grass	S2	R1	
PASSETA	Paspalum setaceum	Hairy Lens Grass	S2	R1	X
PANDICH	Panicum dichotomum	Panic Grass	S2	R3	X
SPIOCHR	Spiranthes ochroleuca	Yellow Ladies'-Tresses	S2	VU	X
LUDPALU	Ludwigia palustris	Water-Purslane	S2	X	
ASITRIL	Asimina triloba	Pawpaw	S3	R2	
NYSSYLV	Nyssa sylvatica	Black Gum; Sour-Gum	S3	R2	

SP_CODE	SCIENTIFIC NAME	COMMON NAME	S-RANK	MIDD	P/S
GALPILO	Galium pilosum	Hairy Bedstraw	S3	R3	X
PANSPHA	Panicum sphaerocarpon	Round-Fruited Panic Grass	S3	R3	X
PHEHEXA	Phegopteris hexagonoptera	Broad Beech-Fern	S3	R4	
EUPPURP	Eupatorium purpureum	Purple Joe-Pye Weed	S3	VU	X
JUNACUM	Juncus acuminatus	Sharp-Fruited Rush	S3S4	R1	X
BOTONEI	Botrychium oneidense	Blunt-Leaved Grape-Fern	S3S4	R2	
LIRTULI	Liriodendron tulipifera	Tulip Tree	S3S4	U	
CASDENT	Castanea dentata	American Chestnut	S3S4	VU	
JUGCINE	Juglans cinerea	Butternut	S3S4	X	
DESPANI	Desmodium paniculatum var. paniculatum	Panicled Tick-Trefoil		R?	
CIRDISC	Cirsium discolor	Pasture-Thistle		R1	X
GRANEGL	Gratiola neglecta	Clammy Hedge Hyssop		R1	
LYCTRIS	Lycopodium tristachyum	Ground-Cedar		R1	

SP_CODE	SCIENTIFIC NAME	COMMON NAME	S-RANK	MIDD	P/S
PANBORE	Panicum boreale	Northern Panic Grass		R1	
SOLBICO	Solidago bicolor	Silverrod, White Goldenrod		R1	
BOTMATR	Botrychium matricariaefolium	Daisy-Leaved Moonwort		R2	
CAMAMER	Campanula americana	Tall Bellflower		R2	
ECHMURI	Echinochloa muricata	Barnyard Grass		R2	
ORTSECU	Orthilia secunda	One-Sided Pyrola		R2	
POLBIFL	Polygonatum biflorum	Solomon-Seal		R2	
RUBCANA	Rubus canadensis	Bramble;Dewberry		R2	
VERSCUT	Veronica scutellata	Marsh Speedwell		R2	
VIOMACL	Viola macloskeyi	Smooth White Violet		R2	
ANAMARG	Anaphalis margaritacea	Pearly Everlasting		R3	
ARAGLAB	Arabis glabra	Tower Mustard		R3	
BROPUBE	Bromus pubescens	Canada Brome		R3	
CENLONG	Cenchrus longispinus	Sandbur;Sandspur		R3	

SP_CODE	SCIENTIFIC NAME	COMMON NAME	S-RANK	MIDD	P/S
HEDPULE	Hedeoma pulegioides	American Pennyroyal		R3	
HYPMAJU	Hypericum majus	Larger Canada St. John's-Wort		R3	
HYPMUTI	Hypericum mutilum ssp. mutilum	Weak St. John's-Wort		R3	
LYCINUN	Lycopodium inundatum	Bog Clubmoss		R3	
MELLINE	Melampyrum lineare	Cow-Wheat		R3	
PYRAMER	Pyrola americana	Round-Leaved Pyrola		R3	
RANFASC	Ranunculus fascicularis	Early Buttercup		R3	X
UVUSESS	Uvularia sessilifolia	Merrybells		R3	
AGANEPE	Agastache nepetoides	Yellow Giant Hyssop		R4	
ELEELLI	Eleocharis elliptica	Golden-Seeded Spike Rush		R4	
EQUPALU	Equisetum palustre	Marsh-Horsetail		R4	
ERAHYPN	Eragrostis hypnoides	Creeping Love Grass		R4	
LEPVIRG	Lepidium virginicum	Common Peppergrass		R4	
OENBIEN	Oenothera biennis	Common Evening-Primrose		R4	

SP_CODE	SCIENTIFIC NAME	COMMON NAME	S-RANK	MIDD	P/S
RHUVERN	Rhus vernix	Poison Sumac		R4	
RUBHISP	Rubus hispidus	Swamp Dewberry		R4	
SANCACA	Sanicula canadensis var. canadensis	Black Snakeroot		R4	
SISANGU	Sisyrinchium angustifolium	Stout Blue-Eyed-Grass		R4	
CONAMER	Conopholis americana	Squawroot		R5	
LOBSPIC	Lobelia spicata	Pale Spiked Lobelia		R5	X
RUBFLAG	Rubus flagellaris	Northern Dewberry		R5	
VACMYRT	Vaccinium myrtilloides	Canada Blueberry		R5	

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