“Forests For Our Future”

Management Plan for the County Forests

Recommendations for Tree Cover Enhancement

November 2014

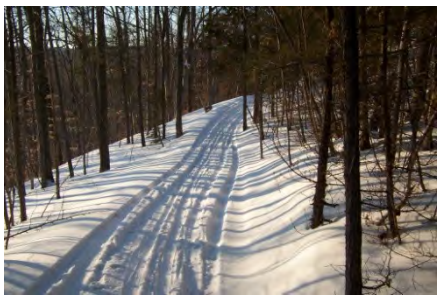
HURON COUNTY

Executive Summary

Forest cover makes up approximately fifteen percent of the land base in Huron County. The conservation and management of these 126,900 acres of forest is a high priority for property owners and for all residents of the County. With the growing frequency of extreme weather events, the ecological services provided by woodlands are increasingly valuable. The protection of soils from erosion and protection of water sources resulting from the conservation of forest cover are critical for the County's agricultural and tourism-based economy. At the same time, woodland benefits such as stormwater management, water and air quality are important for the quality of life and health of the County's approximately 60,000 residents. The County's woodlands also provide direct economic benefits through the sale of forest products by property owners while providing local employment opportunities for residents and value-added products for local industry.

The thirteen Huron County forest tracts are a legacy of the massive reforestation effort across southern Ontario that was undertaken by municipalities in partnership with the province starting in the early 1900's. Totaling over 1500 acres, the County forests are symbolic of a province-wide effort to reverse serious problems including soil erosion, flooding and water pollution, resulting from non-strategic clearing and lack of forest management by the early settlers of Ontario. With proper management and community partnerships, these forest tracts can serve as valuable sources of environmental protection, education and recreation for current and future generations in Huron County.





This Strategic Plan for the County Forests and the Forest Cover of Huron County makes recommendations for management and utilization of the Huron County forest tracts over the next twenty years. The plan addresses the topics of third party forest certification, silvicultural management strategies including the utilization of leading edge GIS technology, recreation policy and citizen engagement.

A key original objective of the establishment of County forests in Ontario was to provide leadership and inspiration for the management of private woodlands. This leadership has been severely affected by successive provincial cuts to the Ministry of Natural Resources starting in the early 1990's. Private forest owners in Huron County face similar challenges to those faced by community forest managers. This plan explores current challenges and potential opportunities for the County forests and for privately owned forest cover throughout the County. Topics include forest management, forest product marketing, climate change, invasive species, and declining biodiversity.

The plan will also offer some strategies for increasing the County's tree cover through means of roadside tree planting, living snow fences, windbreaks and agroforestry.

Key Recommendations for the Huron County Forest Tracts and County-Wide Tree Cover Enhancement

1. To develop a "Friends of the County Forests" group comprised of user group representatives and residents to assist with the development of detailed recreation policies for the County forest tracts.

2. To develop detailed forest inventory and operating plans for each County forest tract using the guidelines of the Silvicultural Guide to Managing Southern Ontario Forests (OMNR, 2000)

3. To develop County forest management and operating plans that conform to Forest Stewardship Council (FSC) certification standards, and that County staff continue to research FSC certification logistics.

4. To pursue the proposed harvesting schedule of County forest tracts in accordance with this plan.

5. To encourage and facilitate research and education partnerships and projects in County forest tracts that are of benefit to students, educators, researchers, and the general public.

6. To explore collaboration between the Planning & Development and Public Works Departments on the development of County forest tract signage and trail maintenance.

7. To further enhance partnerships among County departments, the Huron County Health Unit, community organizations and conservation authorities to increase the accessibility and utilization of trails and recreation activities in community owned forests.

8. To research value added market opportunities for forest products from County forest tracts and to promote beneficial relationships between local forest product producers and manufacturers.

9. To continue participation in community tree planting partnerships (i.e. "Trees Beyond Goderich") that assist woodland owners to restore woodlands damaged by natural impacts.

10. To research carbon credits and other climate change related funding opportunities that may benefit Huron County woodland owners.

11. To continue to assist Huron County woodland owners with extension advice and funding programs that support the use of professional foresters and "Good Forestry Practices".

12. To support partnerships with agricultural organizations and tree planting agencies to facilitate demonstrations of innovative, income-producing agricultural windbreak and hedgerow designs.

13. To expand and increase the success rate of roadside tree planting through collaboration between County departments, lower tier municipalities, community partnerships and external funding sources.

14. To research the development of "living snow fences" in areas of high winter maintenance concern along municipal and county roads in partnership with adjacent property owners.

15. To support and encourage demonstrations of profitable agroforestry and permaculture cropping systems through partnerships with agricultural innovators.

Acknowledgements and Special Thanks

The County of Huron thanks woodland owners, past and present, for their efforts to maintain and protect forest cover for the multiple benefits of all those who live, work and play in the County. Since the beginning of local reforestation efforts in the 1930's, and the introduction of the County's first bylaw to protect trees in 1947, the forest cover has rebounded from critical depletion in the early 1900's, to become stable at approximately 15%. The foresight of community leaders in the 1940's and 50's was critical to this effort, and needs to be acknowledged.

This document is the beginning of further community engagement on the future of the County's forest and tree cover. County staff would like to thank all agricultural organizations, conservation authorities, community groups and numerous other individuals and organizations for their past and future input into forest management activity in the County.

Figure 1: Volunteers with the "Trees Beyond Goderich" project restoring forest cover near Benmiller following the 2011 tornado. Photo Courtesy of the Huron Stewardship Council

Forests For Our Future

Management Plan for the County Forests

and Recommendations for Tree Cover Enhancement

Huron County Planning and Development, November 2014

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1.0 The Forest Cover of Southwestern Ontario and Huron County.....Past and Present

Figure 2: Planting Trees at Norfolk "Wastelands" ca.1912 Photo credit E.J. Zavitz

In less than 100 years starting in the 1830's, the forest cover in much of Southwestern Ontario was reduced by over 90% (McConkey, 1952). By the 1870's, concern was already growing that forests were being cleared without regard for the future timber supply or for the increasing impacts on agriculture and the environment. Another half century would pass before political will, combined with catastrophic ecological and agricultural degradation, would lead to the massive reforestation of what were once known as the "wastelands" of southern Ontario. Much of our modern day forest cover, including the County forests, are a legacy of that effort. The development of conservation authorities and forest conservation by-laws starting in the 1940's were also part of the strategy to reverse the impacts of excessive deforestation which included soil erosion, flooding and desertification. The recent book "Two Billion Trees and Counting" (Bacher, 2011) fully documents the loss and partial recovery of southern Ontario's forest cover. The book has been described by various reviewers and historians as "required reading" for land managers, natural resource students and government policy makers.

Figure 3: Former Agricultural Land Turned to "Wastelands" by Excessive Deforestation Photo by E.J. Zavitz ca.1909

1.1 Forest Cover and Physical Features

The Huron County landscape is an incredible blend of natural features and topography. This diversity is reflected in the variable percentage forest cover found throughout the County. (Figure 6)

Figure 4 & 5: Productive fields and forests are found side by side in Huron County

Huron County's forests are part of the Great Lakes-St. Lawrence Forest Region of Ontario. Prime agricultural soils are abundant throughout the County, and varying topography influenced both original clearing patterns and remnant forest cover. A high proportion of the County's present day forest cover is associated with areas of low relief and poor drainage, and major watercourses are mostly wooded. A high proportion of the County's forest cover is located in the Bayfield and Maitland river valleys and wetland complexes including the Hay and Saratoga "swamps", Hullett Wildlife Management Area and the headwaters of the Maitland River.

The "Huron Ridge" is an ancient shoreline landform several miles inland from Lake Huron that extends forty miles from Grand Bend in the south to Port Albert in the north. Historically this local microclimate supported tender fruit production including peaches and apricots. Research has now demonstrated that this area has the potential to become Ontario's newest wine region, and the forest cover on it will again help to provide important protection for tender fruit production.

Huron County's favourable climate and excellent soils produce rapid forest growth rates and a diversity of species. With proper management, hard maple timber produced in Huron County forests is considered to be some of the best in the world.

In the south and east parts of the County, where flat topography allowed for more rapid agricultural land clearing in the 1800's, forest cover falls as low as seven to eight percent in the former townships of Usborne and McKillop. In the more rolling areas and headwaters of the north, where watercourses predominate, forest cover ranges from fourteen to thirty-one percent in the former townships of Ashfield and West Wawanosh. A growing body of science suggests that a minimum of thirty percent forest cover is ideal for optimal ecosystem health.

Forest cover percentages (Figures 6 & 7) were calculated using woodland communities from 2006 aerial photography. These communities included coniferous and deciduous woodlands, connecting hedgerows, plantations and shrub thickets.

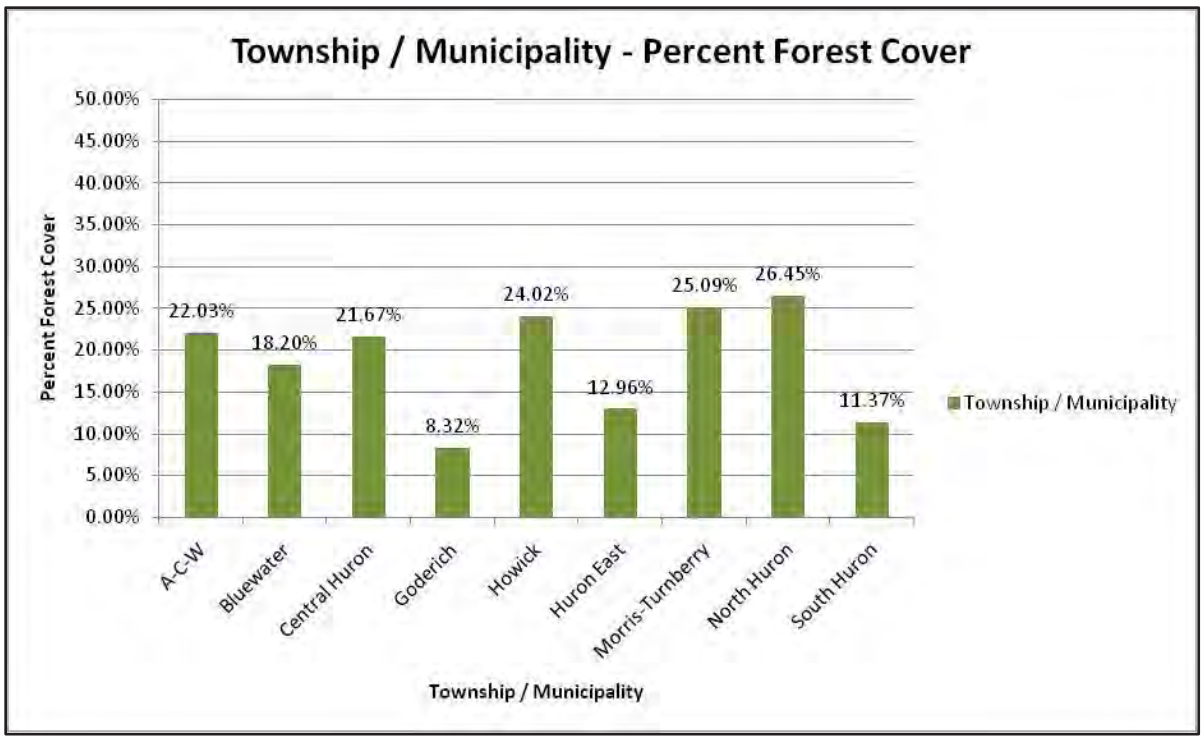

Figure 6: Percent Forest Cover for each Township/Municipality

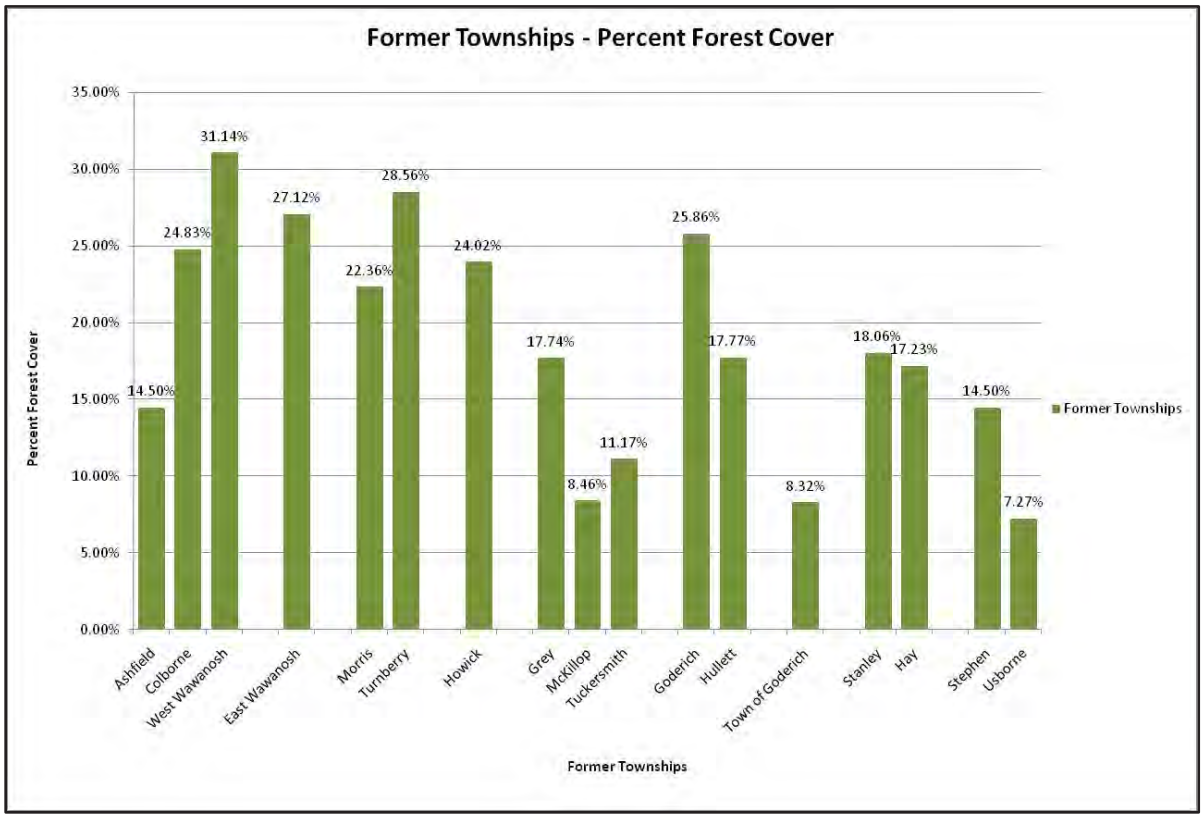

Figure 7: Percent Forest Cover for each former Township

1.2 Forest Ownership

Woodlands in Huron County have diverse ownership. Approximately 87% of the woodlands in the County are privately owned with the remaining 13% ownership combined between provincial and municipal governments and the Ausable-Bayfield and Maitland Valley Conservation Authorities. The County forest tracts total approximately 1521 acres (616 ha) and make up 1.2% of the total forest cover in the County. An additional 512 acres (207 ha) of environmentally significant woodlands are owned by the Nature Conservancy of Canada (N.C.C.), including the Morris Tract provincial nature reserve which was formerly owned by the County.

Table 1 : Forest Cover and Ownership

Forest Cover Ownership and Other Landuse			
	Area (Acres)	Area (Hectares)	Percent Contributing
Huron County - Total Area	843,117.71	341,530.57	
Huron County Tracts - Woodlands	1,521.06	615.55	0.18%
Township / Municipalities	1,485.10	601.00	0.18%
ABCA Woodlands	4,080.99	1,651.52	0.48%
MVCA Woodlands	3,590.26	1,452.93	0.43%
NCC Woodlands	512.27	207.31	0.06%
Province of Ontario Woodlands	4,806.41	1,945.09	0.57%
Privately Owned Woodlands	110,904.61	44,881.54	13.15%
Total Forested Land	**126,900.70**	**51,354.94**	**15.05%**
Urban Areas	21,171.61	8,567.85	2.51%
Agricultural Areas	695,074.78	281,287.03	82.44%
Total	**126,900.70**	**51,354.94**	**100.00%**

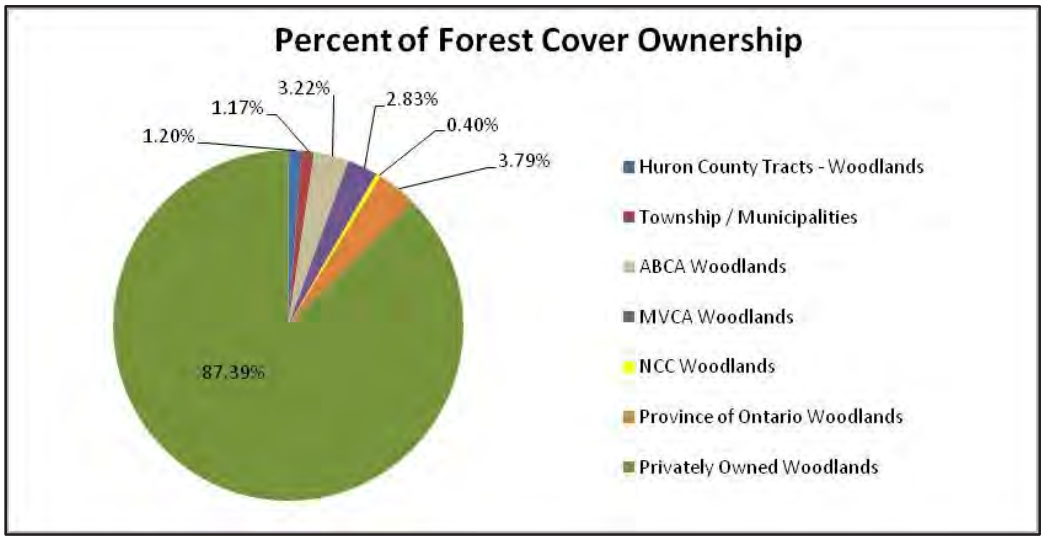

Figure 8: Forest Cover Ownership

2.0 Forest Cover and the Huron County Economy

2.1 Forest Cover and Agriculture

Agriculture is the largest industry in Huron County with gross receipts surpassing the individual agriculture revenues of each of Canada's Maritime provinces (Figure 10). The success and sustainability of the agricultural industry is of great importance to the County's economy. With the increasing intensity of adverse and extreme weather events, the benefits provided by maintaining a balance of agricultural and forested land are becoming more evident. Woodlands and windbreaks reduce topsoil erosion caused by wind and water. Woodland soils and associated wetlands recharge groundwater aquifers and help to equalize increasingly volatile water flow patterns in streams and rivers. Studies in Ontario and around the world have also demonstrated crop yield increases by strategic placement of windbreaks and forest cover.

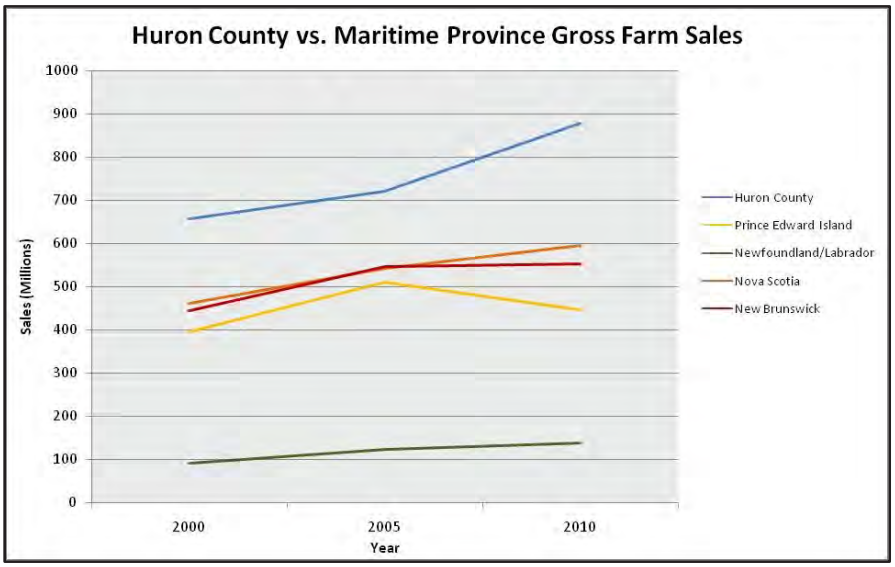

Figure 9: Gross Farm Sales Comparison (Statistics Canada Census of Agriculture 2001, 2006, 2011)

Recommendation: To continue to facilitate partnerships between agricultural organizations, rural landowners, conservation authorities, stewardship groups and the County to provide extension advice and funding for projects that enhance forest cover and benefit agricultural production.

"…promote production agriculture and forestry in harmony with the environment" Excerpt from Strategy 4.3, (County of Huron, Strategic Plan 2013)

3.0 Forest Cover and Tourism

Tourism is critical to the County's economy, and much of the attraction to "Ontario's West Coast" is based on the natural environment. Many Huron County destinations are associated with forest cover, including the Lake Huron shoreline, the Maitland Trail, the Hullett Wildlife Management Area, Point Farms Provincial Park and the conservation areas managed by the Ausable-Bayfield and Maitland Valley Conservation Authorities. With increased management and oversight, the County forests have great potential to be an integral part of future tourism promotions as diverse destinations for various recreational activities.

3.1 The Forest Products Industry

Huron County is home to a thriving forest products industry. While woodland owners generate millions of dollars annually from timber and firewood sales, the County also supports over a dozen commercial sawmill operations. In addition, numerous local manufacturers, woodworkers and other artisans utilize forest products from both local sources and sources outside of the County.

Figure 10: Ministry of Natural Resources, Ontario Wood program logo (Government of Ontario, 2014)

"Ontario Wood" is a provincial program that supports the connections between local wood products, sustainable forest management and a strong economy.

http://www.ontario.ca/business-and-economy/ontario-wood

Ottawa Valley Wood is an award winning program in Renfrew County to promote local businesses in the forest product and wood industries.

http://www.ottawavalleywood.com/

Recommendations:

Using existing County economic development strategies, increase promotion of forest products and wood related manufacturers, artisans and retailers with targeted promotional programs similar to "Ottawa Valley Wood.com"

Promote the use of provincial awareness programs like "Ontario Wood" to local forest industry partners.

Facilitate the development of value added markets for local forest products and to promote beneficial relationships between local wood producers and manufacturers.

3.2 Forest Cover, Health and Quality of Life

Nearly every resident of Huron County lives within a ten minute drive of an accessible woodland whether it be a County forest tract, conservation area, or community trail. These natural areas provide invaluable sources of fresh air, fitness opportunity and relaxing environments. In most cases there is no cost for accessing these areas. Creating more opportunity for people of all ages, abilities and income levels to access these areas has the potential to be extremely beneficial for the physical and psychological health of Huron County residents and visitors. This in turn has great potential to reduce health care costs at all levels of government.

> "Almost half of Huron County residents reported they have at least one chronic condition in 2009 and 2010. The top three chronic health conditions in Huron County are high blood pressure, arthritis and heart disease (Huron County Health Unit, 2013)."

Japan is a world leader in research around "shinrin-yoku" which translates to "forest bathing" (shinrin yoku). In simple terms, "forest bathing" involves walking in woodlands at one's own pace and experiencing the forest through the five senses of sight, sound, smell, touch and taste. A growing body of evidence suggests that this scientifically validated therapy boosts immune function and mood and provides legitimate therapy for preventing hypertension, depression, stress and even cancer (Nature & Health, 2014).


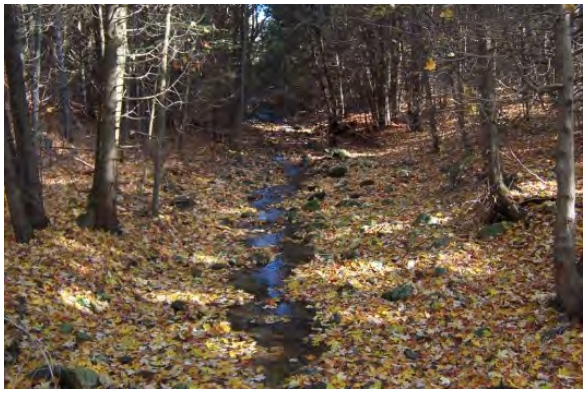

Figure 11 & 12: Woodlands provide many health services from recreational opportunities to clean water

Recommendation: To further enhance partnerships among County departments and the Huron County Health Unit, community organizations and conservation authorities to increase the accessibility and utilization of trails and fitness activities in community owned forests and on nature trails throughout the County.

4.0 The Huron County Forest Tracts

4.1 History - A Legacy of Ontario Wide Environmental Restoration

In the 1940's, Huron County joined a province wide effort to acquire and reforest marginal or ecologically sensitive lands. This local effort followed a roving, multi-township council tour of severely degraded land which was attended by Edmund Zavitz, now known as the "Father of Reforestation" in Ontario (Bacher, 2011). Based on Zavitz's advice to community leaders, an ambitious campaign of land acquisition, reforestation and forest conservation was started. It is interesting to note that advice for much of the land acquisition listed in Table 2, was provided by agricultural experts from the Ontario Agricultural College.

> "The lands of the Huron County Forest, by and large, have one feature in common. They are unsuitable to agriculture (Department of Lands and Forests, 1961)."

By late 1950, Huron County had entered into a fifty year agreement with the Ministry of Natural Resources (then known as the "Lands and Forests" Department). These agreements, under the auspices of the Forestry Act, allowed MNR to develop and manage County lands for forestry purposes including wood production, flood protection and tourism activities. Across southern Ontario, these County properties were known as the "Agreement Forests". In a period from 1945 to 1966, over 1.2 million trees were planted on the Huron County properties. In the early 1990's, provincial cutbacks to the MNR severely curtailed management activities in the agreement forests and responsibilities were transferred back to the local counties.

Figure 13: C.M. Robertson, co-donor of the Robertson Tract, overlooking the Maitland River Valley with Lands and Forests staff (Department of Lands and Forests, 1961)
Figure 14: Picture taken from the same location (Steve Bowers, Ministry of Natural Resources, 1982)
Figure 15: County staff in same locations as people in 1961 photo (Scott Currie, County of Huron, 2014)

Table 2 : Huron County Forest Tract History

Huron County Forest Tract History							
Tract Name	Area (Ac)	Area (Hec)	Purchase Date	Purchase Amount	Township/Municipality	Years Planted	Trees Planted
Adams Tract	100.0	40.5	1949	$1,350.00	Howick	1951 - 1967	99,100
Collins Tract	101.0	40.9	1949	$1,500.00	Huron East	1951 - 1967	115,600
Hays Tract	6.6	2.7	1946	$1,966.00	Central Huron	1947 - 1949	4,300
Moreland Tract	100.0	40.5	1962	$2,000.00	A-C-W	1947 - 1955	66, 800
O'Connor Tract	51.0	20.6	1947	$1,000.00	A-C-W	1948 - 1955	41,750
Rea Tract	26.0	10.5	1962	$1.00	Huron East	1965 -1980	3,175
Redmond Tract	151.0	61.1	1971	$10,500.00	North Huron	1958 - 1965	47,100
Robertson Tract	198.0	80.1	1947	$450.00	A-C-W	1936 - 1954	205,175
Rodgers Tract	98.0	39.7	1949	$1,500.00	North Huron	1950 - 1962	66,600
Sheppardton Tract	278.0	112.5	1946	$3,300.00	A-C-W	1946 - 1954	395,300
Stevenson Tract	200.0	80.9	1950	$3,000.00	Morris-Turnberry	1952 - 1966	141,600
Stingel Tract	100.0	40.5	1948	$1,200.00	A-C-W	1949 - 1962	95,300
Taylor Tract	115.0	46.5	1949	$1,500.00	Howick	1950 - 1957	33,700
Total	**1524.6**	**617.0**		**$29,267.00**			**1,248,700**

4.2 Forest Communities and Ecological Land Classification of the Huron County Tracts

The Huron County tracts have diverse forest types that are representative of many of the forest types found throughout the County and the Great Lakes-St. Lawrence Forest Region. By total area, fifty-five percent of the County tracts are upland coniferous plantations which will eventually evolve to upland deciduous forests with continued silvicultural management.

Classification of different forest types is critical to determine appropriate management strategies. Figure 16 provides a general breakdown of forest types found within the Huron County forest tracts, while Table 3 provides a more detailed breakdown of Ecological Land Classes in the same tracts.

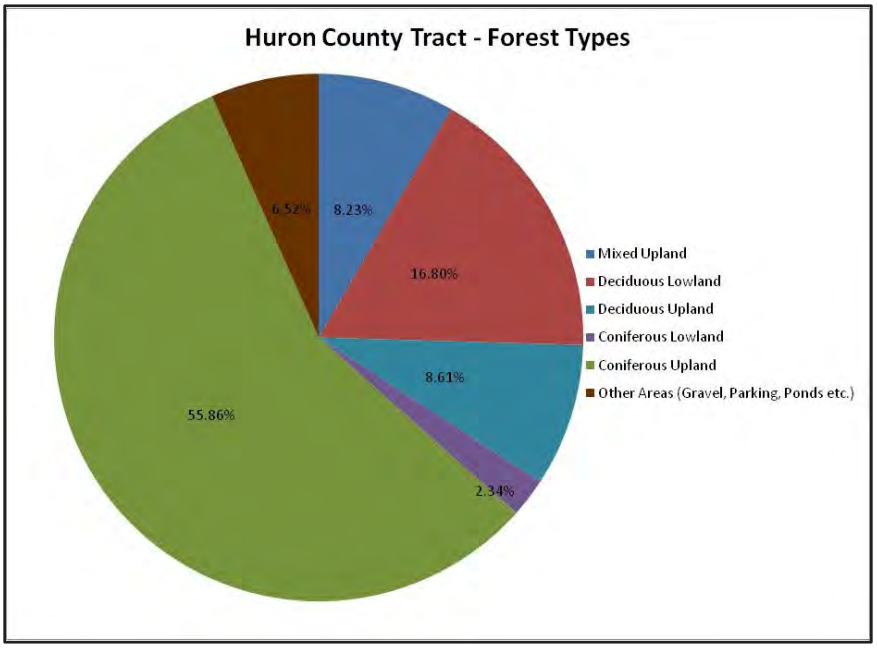

Figure 16: Huron County Tracts Forest Types

Table 3: Huron County Tracts - ELC Communities

Huron County Tracts - Ecological Land Classification Communities					
	ELC Community Unit	ELC Code	Area (Acres)	Area (Hectares)	Percent of Total Area
All Tracts			1524.6	617.0	
	Plantation - Black Walnut Deciduous Plantation Type	CUP1-3	1.36	0.6	0.1%
	Plantation - Red Pine Coniferous Plantation Type	CUP3-1	121.36	49.1	8.0%
	Plantation - White Pine Coniferous Plantation Type	CUP3-2	747.01	302.3	49.0%
	Plantation - Coniferous Plantation - White Spruce - European Larch Coniferous Plantation Type	CUP3-8	104.65	42.4	6.9%
	Coniferous Forest - Fresh White Cedar Coniferous Forest Type	FOC2-2	11.16	4.5	0.7%
	Coniferous Forest - Fresh - Moist White Cedar Coniferous Forest Ecosite	FOC4	0.3	0.1	0.0%
	Deciduous Forest - Moist Ash Lowland Deciduous Forest Type	FOD	35.3	14.3	2.3%
	Deciduous Forest - Dry - Fresh Sugar Maple - Beech Deciduous Forest Type	FOD5-2	66.89	27.1	4.4%
	Deciduous Forest - Dry - Fresh Sugar Maple - Black Cherry Deciduous Forest Type	FOD5-7	50.26	20.3	3.3%
	Decidous Forest - Fresh - Moist Sugar Maple - Lowland Ash Decidous Forest Type	FOD6-1	9.92	4.0	0.7%
	Deciduous Forest - Moist Lowland Deciduous Forest Ecosite	FOD7	49.1	19.9	3.2%
	Deciduous Forest - Moist Ash Lowland Deciduous Forest Type	FOD7-2	9.87	4.0	0.6%
	Mixed Forest - Fresh - Moist White Cedar - Hardwood Mixed Forest Type	FOM7	40.09	16.2	2.6%
	Mixed Forest - Moist White Cedar - Sugar Maple Mixed Forest Type	FOM7-1	13.12	5.3	0.9%
	Deciduous Swamp - Silver Maple Organic Deciduous Swamp Type	SWD6-2	112.37	45.5	7.4%
	Thicket Swamp - Willow Mineral Thicket Swamp Type	SWT2-2	90.19	36.5	5.9%

4.2.1 Wetland Areas

Wetlands are often associated with woodlands, and the Huron County forest tracts are no exception. Not only are wetlands critical for rural stormwater management and replenishment of ground water aquifers, but they are also important sources of biodiversity. The County forest tracts contain over 250 acres of locally significant wetlands. The largest wetland areas are found in the Taylor, Sheppardton and Adams Tracts. The Moreland Tract contains a small acreage of the provincially significant wetland complex associated with the "Saratoga swamp".

An area of particular concern for wetlands is the onset of Phragmites (Common Reed Grass), now thought to be one of the worst invasive plants in Canada. Phragmites quickly out competes native wetland plants and habitats. Through community engagement and partnerships, it will be important to monitor this and other invasive species and develop control strategies.

Figure 17: Phragmites (Common Reed) (Royal Horticultural Society, 2014)

Table 4: Wetland Areas

County Tracts Wetland Areas				
			Wetland Area (Acres)	
Tract Name	Area (Acres)	Area (Hectares)	Locally Significant	Provincially Significant
Adams Tract	100.0	39.7	33 Acres	
Collins Tract	101.0	40.9		
Hays Tract	6.6	2.7	6 Acres	
Moreland Tract	100.0	40.5		3 Acres
O'Connor Tract	51.0	20.6	9 Acres	
Rea Tract	26.0	10.5		
Redmond Tract	151.0	61.1	6.5 Acres	
Robertson Tract	198.0	80.1	25.5 Acres	
Rodgers Tract	98.0	39.7	22 Acres	
Sheppardton Tract	278.0	112.5	55 Acres	
Stevenson Tract	200.0	80.9		0.5 Acres
Stingel Tract	100.0	40.5	26 Acres	
Taylor Tract	115.0	46.5	74 Acres	
Total	**1524.6**	**616.2**	**257 Acres**	**3.5 Acres**

Recommendation: Develop community partnerships to monitor and control invasive species such as Phragmites and European Buckthorn in County Forest Tracts

4.3 Sustainable Management Plan – 2014 to 2033

> "Sustainable forest management practices will be promoted and supported through forest management plans for County-owned forests. Forestry initiatives will maintain long-term forest health, soil quality, a diversity of wildlife habitats and forest types, water quality and ecological communities, while allowing for selective harvesting and compatible recreational activities" (County of Huron: Planning and Development, Official Plan 2013)

4.3.1 Forest Certification

Forest Stewardship Council (FSC) Certification is a worldwide, third party verification system to ensure *Environmentally Appropriate, Socially Beneficial, and Economically Viable* management of forests (Forest Stewardship Council, 2014).

One of three international forest certification bodies, FSC has the most certified forest acreage in Canada. With regard to forest management, the guiding principles of FSC align with the Huron County Official Plan and Sustainable Huron's "Take Action" report objectives.

A number of southern Ontario County forests have become FSC certified in the past few years, and some of the benefits include the potential to access new markets, price premiums and public assurance that forests are being properly managed for all values.

Simcoe County, owner of over 30,000 acres of working forest, hold their own FSC certificate. In the past it was difficult for smaller forest holdings to become FSC certified. It is now feasible for both small private and community forest owners to certify under "group certificates" held by either the Southern Ontario Working Group of the Eastern Ontario Model Forest (EOMF) or under the private certificate held by Silva-Con. Several private Huron County forest owners have had their forests FSC certified in this manner in the past three years. The Southern Ontario Working Group of EOMF now has 55,000 hectares of certified forest under their FSC certificate including 135 private landowners and 9 community forests.

Figure 18: FSC Logo (Forest Stewardship Council) **Figure 19: Rainforest Alliance Logo (Rainforest Alliance, 2014)**

Recommendation: That County forest inventory and operating plans be developed to conform to FSC standards, and that County staff continue to explore the logistics of FSC certification for the County forest tracts in 2015.

4.3.2 Silvicultural Management

Management of the County Forests will conform to the Silvicultural Guide to Managing Southern Ontario Forests (OMNR, 2000) Management activity will always conform to "Good Forestry Practices" prescribed under direction of a member of the Ontario Professional Foresters

Association (OPFA). In the past, silvicultural management planning including tree inventory has been contracted out to an outside professional forester.

The County's forester, David Pullen, is now a full member of the OPFA, and both he and Nick Courtney from the GIS services team are licensed as Ontario Certified Tree Markers by Ministry of Natural Resources. Responding to County Councils desire to increase management activity in the County forests, County staff analyzed the time and labour requirements required for the complete inventory of over 1500 acres of County forest property required to prepare detailed management plans for each of the thirteen forest tracts.

Figure 20 & 21: Forge GPS Unit collecting data in the field (F4 Devices)

The analysis led to further collaboration between the County's forester and the GIS Services team, and has resulted in the introduction of the first Forge Echo GPS device in Canada. This world class unit combines the most precise GPS technology under tree canopy with a built in clinometer that measures tree heights and merchantable log potential. Paired with echo-distance technology and sophisticated silvicultural data collection software, this unit allows the County to collect tree inventory and produce silvicultural management plans more effectively and efficiently than any other method.

This inter-departmental collaboration has allowed for the completion of inventory and detailed ten year management plans for eight of the thirteen County forest properties in Year 1 of this plan using existing staff and resources. Two of the tracts, Robertson and Stevenson, are still operating under 10 year plans developed by GWG Resources Services in 2006. The remaining three tracts, Taylor, Adams and Collins, will be inventoried and detailed management plans developed in 2015.

Each individual tract management plan will conform with the guidelines of the Silvicultural Guide to Managing Southern Ontario Forests (Ontario Ministry of Natural Resources, 2000). Plan components found in a typical Managed Forest Tax Incentive Plan for Ontario will also be used.

Recommendation: That detailed forest inventory and operating plans that follow the guidelines of the Silvicultural Guide to Managing Southern Ontario Forests (OMNR, 2000) be developed for each of the County forest tracts.

Appendix 3 shows the detailed forest compartment mapping and inventory plot locations for the Sheppardton Tract near Point Farms. This is the County's largest forest tract at 275 acres. With each

tract, plot locations were precisely mapped using silvicultural software and located using the Forge GPS Unit. This allows for extremely accurate and efficient sampling of forest type, basal area, tree species, and regeneration. A major advantage to this system is the ability to relocate and monitor the exact plot locations to track the actual inventory changes over time and following harvest operations.

Appendix 3 shows the Sheppardton Tract broken into its 17 Compartments. Each compartment has a specific number of plots relative to its overall acreage. When all inventory is collected, each compartment will have detailed information regarding characteristics, inventory, regeneration, wildlife habitat and natural heritage, short / long term objectives, stand and stocking analysis, board footage estimates and projected growth analysis charts.

Appendix 4 shows a map of the Sheppardton Tract and its potential harvest areas. Each section is broken into its major species component to prioritize harvests.

Appendix 5 shows the Proposed 10 year activities for the Sheppardton Tract which includes a potential harvest schedule for each compartment including current and target BA's as well as acreage.

4.3.3 Recreation

Recreation policy is a critical element of the twenty year strategy for the County forest tracts. This policy development requires careful consultation with diverse user groups and development of partnerships to maintain trails and monitor user activities. Passive recreational activities permitted in the County forests include hiking, birding, nature appreciation, and skiing. Fishing and hunting are permitted on the condition that there is compliance with all provincial legislation. Snowmobile trails go through the Redmond and Robertson Tracts.

Past efforts have been made to develop a more extensive recreation policy that addresses potential conflicts between user groups, specific uses of certain tracts, and challenging issues around higher impact uses including all terrain vehicles.

(Ontario Federation of Snowmobile Clubs)

Over the years, interest in the County tracts has been shown by a number of recreational groups, environmental organizations, and also by neighbours of the County tracts.

Recommendation: To develop a "Friends of the County Forests" group comprised of user group representatives and neighbouring residents to assist with the development of detailed recreation policies for the County tracts over the next three years.

4.3.4 Education and Research


Figure 22 & 23: Huron County Bioblitz Event (Devin Sturgeon, Dynamic Images)

> "Environment-based education produces student gains in social studies, science, language arts, and math; improves standardized test scores and grade-point averages; and develops skills in problem-solving, critical thinking, and decision-making." Richard Louv - Last Child in the Woods

New life has been injected into the education and research potential of the County forests by the partnership of the County and the Huron Stewardship Council (HSC). In 2014, the HSC and Ontario Nature hosted a highly successful "Bioblitz" in the Rodgers and Redmond Forest Tracts. The event drew participants from across the County and visitors from throughout southwestern Ontario. It combined education with "citizen science" to learn, document, and develop appreciation for the numerous species found on these properties.

The County tracts have been used over the years for a number of interesting research projects ranging from acid rain studies by Environment Canada to the development of a genetically superior Norway Spruce seed source. Future opportunities to host research projects will be evaluated by County staff for their compatibility with other uses, and partnerships with applicable research organizations will be welcomed and encouraged.

Recommendation: To encourage and facilitate research and education partnerships on County forest properties that are of benefit to students, researchers, educators and the general public.

4.3.5 Community Engagement

Community engagement in the County forest tracts and other community forests is essential for developing appreciation and awareness of natural areas and assisting property managers with emerging challenges. The 2014 "Bio-blitz" in the County tracts, and the "Trees Beyond Goderich" project to assist landowners affected by the 2011 tornado, are examples of win-win community engagement programs.

Recommendation: To continue to facilitate the development of partnerships around projects and events such as "Trees Beyond Goderich" and "Bio-blitz" that are of benefit to the County forests, private woodland owners, students, and the community as a whole.

Figure 24: Trees Beyond Goderich Event Figure 25: BioBlitz Event (Devon Sturgeon, Dynamic Images)

4.3.6 Revenue Generation from the County Tracts

The County forest tracts will be managed on a revenue neutral basis. Revenues from timber sales will continue to be placed in the Forest Conservation Reserve for use in signage, trail maintenance and forest management activities.

Revenue expectations from timber sales will not be high over the next twenty years, in part due to a delay in management activities due to provincial cutbacks that delayed growth in some of the tracts. There are also large areas in the County properties that do not support commercial harvest due to presence of wetlands and other conservation values.

The revenues should be sufficient to perform required management practices, provided interdepartmental co-operation on signage and trail maintenance is encouraged and existing staff are maintained. Forest certification, development of local value added markets and timing of harvests with stronger market prices are all factors that can positively affect revenues from these properties.

Recommendation: The harvesting schedule for the 13 County tracts is based on the detailed management plans, beginning with the Sheppardton Tract in 2015. Refer to the detailed Workplan in Appendix 2 for the full harvest schedule.

Figure 26 & 27: Conifer Thinning Operations, Photos Courtesy of ABCA

5.0 Challenges and Opportunities for the County Tracts and Private Forest Owners

5.1 Insects and Disease



Figure 28: Red Pine Decline Figure 29: Emerald Ash Borer (Canadian Food Inspection Agency, 2014)
Figure 30: Beech Bark Disease (Government of Ontario, 2014)

Emerald Ash Borer is a serious threat to forest cover across southern Ontario. Red pine decline and the onset beech bark disease are two other examples of natural pressures being exerted on the biodiversity of our forests. These emerging problems make decisions on forest management more important than ever. Extension advice and assistance for private landowners will be critical to ensure the future of forest cover.

Opportunity: Large openings created by excessive loss of ash or other species, creates an opportunity to establish "shade intolerant" species such as Black Cherry and Oaks. Through natural regeneration and interplanting where necessary, establishment of alternative native tree species can help to offset the loss of others. The Huron Stewardship Council's "Trees Beyond Goderich" project to assist landowners affected by the 2011 tornado has been an opportunity to experiment with interplanting of diverse species to restore woodlands. Research and experience with this work will help to inform the restoration of woodlands severely affected by insects and disease. Community partnerships with volunteers and public-private partnerships of planting agencies and local service providers have the potential to assist landowners with the work that will be required to restore severely affected woodlands.

Recommendation: To continue the development of community partnerships similar to "Trees Beyond Goderich" to assist woodland owners affected by insects, disease and other natural impacts.

5.2 Climate Change

Figure 31: Tulip Tree (Ohio Public Library Infomation Network, 2014)

Climate change is predicted to gradually change the species make-up of woodlands in southern Ontario. Huron County is in a unique position to host research around climate change and tree species, in part because of climatic variations in the County created by the effect of Lake Huron and landforms like the "Huron Ridge". The Maitland Valley Conservation Authority is taking a lead role in strategies to build watershed resiliency for communities and ecosystems in the face of changing climate. MVCA is advocating for financial partnerships with private industry and projects that include strategic tree planting, especially in riparian areas and lands identified as being marginal for agriculture. Part of the strategy also includes new forms of agroforestry and perennial cropping to protect sensitive lands and watercourses.

Opportunity: For property owners and economic developers to work in partnership with existing organizations and new partners to develop income producing fruit, nut and timber crops in agroforestry and permaculture systems. These systems have the potential to increase forest cover while creating new and diverse economic opportunities. Property owners who are managing woodlots and agroforestry systems may also be well positioned to participate in carbon offset funding programs and income as climate change policies develop in the next twenty years.

Recommendation: To research carbon credits and other climate change related funding opportunities that may benefit Huron County woodland owners.

5.3 Forest Management History


Figure 32: "Highgrading", a.k.a. "take the best and leave the rest" Figure 33: Mature Ash marked for removal ahead of E.A.B. infestation

All too many woodlands in Huron County have been "highgraded" using diameter limit harvest operations that have no regard for future income potential or genetics. While it can take many years to reverse the effects of poor management, professional forestry advice and use of "Good Forestry Practices" can prevent or start to reverse past mistakes.

Opportunity: The Huron Clean Water Project "Forest Management and Enhancement Category" provides significant funding to private woodland owners who wish to retain professional advisors to develop plans to improve their woodlands. County staff are also available to provide general advice.

Recommendation: To continue to assist Huron County woodland owners with extension advice and funding programs that encourage the use of "Good Forestry Practices".

6.0 Marketing and Management

Well managed woodlands in Huron County have the potential to produce more income per acre per year than conventional field crops. The greatest challenge to this fact is lack of previous forest management and lack of planning for marketing. Most property owners only market timber from a woodlot three or four times in their lifetime. In addition, the rapid specialization and expansion of farm operations often leaves woodlots as an afterthought to the overall management plan of a farm. More than ever, support from knowledgeable professionals and peers is critical for long term success.

Opportunity: The Huron-Perth Woodlot Association is a strong organization that provides members with peer support and exposure to professional foresters and knowledgeable woodland owners. Membership rates are very affordable for any woodlot owner. The parent group, the Ontario Woodlot Association, provides invaluable information on their website.

Figure 34 & 35: 2014 Forest Harvest Operation in the Moreland Tract

7.0 Additional Strategies to Improve Tree Cover in Huron County

The following are non-forest concepts that could help to increase tree cover in the County for the benefit of the economy, the environment, society and culture. Each of these categories could be made successful by expanded partnerships between the County, property owners, private industry, conservation authorities, agricultural groups and community organizations. Resulting tree cover projects and partnerships would fulfill some of the objectives of Huron County's 2013 Strategic Plan and the Sustainable Huron "Take Action Report".

Figure 36: Sustainable Lens ((County of Huron, 2013)

7.1 Windbreaks and "Fencerows"

Windbreaks provide direct and indirect benefits to agricultural production. Over thirty years ago, Dr. Charles Baldwin, Ontario's pioneer of agricultural windbreak research, demonstrated the strong correlation between increased crop yields and properly designed windbreaks. This research has now been replicated numerous times around the world with positive results. Many windbreaks are single species, but they can be designed to include diverse species such as pollinator trees and shrubs as well as income generating timber or nut producing species.

"Fencerows" are increasingly being removed as farm sizes expand. With proper management these fencerows can benefit crop yields, produce income, and be valuable refuges for pollinator species. Property line "fencerows" or strategically planted tree lines can also have the effect of managing agricultural run-off, potentially reducing the need for expensive berm construction.

Recommendation: Expand partnerships with farm organizations, conservation authorities, the Huron Stewardship Council and the County to facilitate demonstrations and expert extension advice for leading edge, income-producing agricultural windbreak designs and fencerow management techniques.

7.2 Roadside Tree Planting

The quality and quantity of Huron County's roadside trees has a major potential for improvement. The original roadside trees, many of them sugar maples, were planted as one of the first efforts to replace tree cover in the late 19th century. Many have now reached maturity. In recent decades, two species of choice for roadside planting were Ash and non-native Norway Maple. Ash species are now starting to succumb to Emerald Ash Borer, and Norway Maple is now regarded as a poor ecological choice.

Figure 37: Roadside Trees

There are a number of external funding programs available to assist property owners and municipalities with roadside tree planting. With the upcoming 2017 International Plowing Match in Walton, there is an excellent opportunity to showcase diverse roadside tree planting projects. The County road allowances in Morris-Turnberry and Huron East would be an ideal location for a pilot roadside tree project in an area with some of the County's lowest tree cover.

Recommendation: To investigate external funding sources, community partnerships, and inter-departmental partnerships within the County that would allow for the development of a pilot project for roadside tree planting on County roads in the vicinity of the 2017 International Plowing Match.

7.3 Living Snow Fences

A fifteen year study in Wyoming found that properly designed "living snow fences" reduced snow removal expenditures by one third to one half and collisions in blowing snow conditions were reduced by 60% (Tabler, 2003).

The Ontario Ministry of Transport has been developing partnerships with conservation authorities and the Ontario Soil and Crop Improvement Assc. (OSCIA) to develop living snow fences that also act as beneficial farm windbreaks. The Ausable-Bayfield Conservation Authority has been involved in a partnership with MTO for the planting and design of strategic living snow fences on provincial highways in the County.

Figure 38: Living Snow Fence (Grand River, 2013)

Several years ago, Wellington County asked road managers to identify areas with major snow drifting issues for possible "living snow fence" development. The program, partnered with adjacent landowners and the County's tree nursery, has been very successful.

While agricultural land values and required road setbacks provide challenges for this concept, benefits include increased winter driving safety, winter maintenance savings, and potential for increased crop yields.

Recommendation: Explore the merits of a pilot project to develop "living snow fences" in areas of high winter maintenance concern along County roads.

7.4 Agroforestry and Permaculture Cropping Systems

There is renewed interest in perennial cropping systems that utilize income-producing trees and shrubs. These systems are designed to mimic nature in form and function while producing food, building materials, fuel and other needs. (Shepard, M. 2013) Expansion of agroforestry and permaculture on sensitive lands has the potential to produce farm income, prevent soil erosion and provide more resiliency to deal with extreme weather events. There is also potential to reduce external input costs associated with annual cropping systems. Mark Shepard, Wisconsin farmer and author of the recent book "Restoration Agriculture", is currently advising a Huron County farm operator on the development of a large scale permaculture system using trees and shrubs.

Recommendation: To support and encourage demonstrations of profitable agroforestry and permaculture cropping systems through partnerships with agricultural innovators.

8.0 Conclusion

The forest cover of Huron County was reduced to critical levels in the century following settlement. In the 1940's community leaders, organizations and property owners played a key role in establishment of County forests and the reforestation of private lands that were unsuitable for agriculture. Over seventy years later, community partnerships and leadership will again be vital to face the challenges of changing climate, invasive species, and proper forest management.

This report provides historical and economic context for the importance of the County forests and the tree cover throughout the county. Recommendations in the report are designed to provide ideas and inspiration for renewed partnerships that ensure the future of our forests and tree cover. Forest cover is critical for the health of the environment. A healthy environment is the foundation for quality of life and a prosperous economy. The community effort to conserve and manage forests and tree cover will continue to benefit all who live, work and play in the County of Huron on "Ontario's West Coast".

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County of Huron

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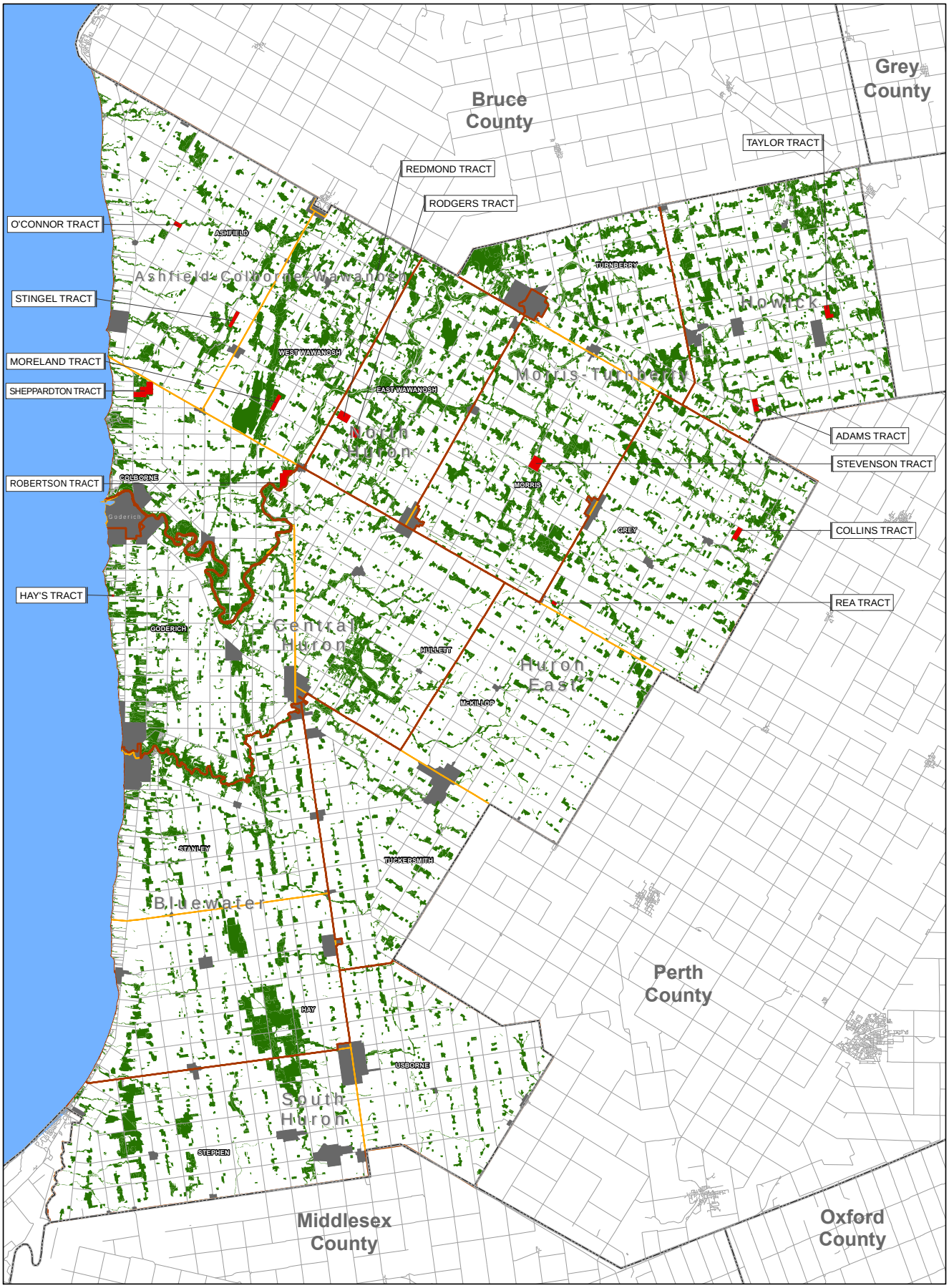
"People cannot continue to lead healthy lives without sufficient farmland to produce local food, forests to help purify the air, and protected watersheds to provide safe drinking water."
Report on Public Health and Urban Sprawl in Ontario. – Ontario College of Family Physicians 2005

Stress reduction, greater physical health, a deeper sense of spirit, more creativity, a sense of play, even a safer life—these are the rewards that await a family then it invites more nature into children's lives. Richard Louv - *Last Child in the Woods*

Appendix 1

County of Huron Tracts



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October, 2014

Date: 10/31/2014

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- Huron County Tracts
- County Boundaries
- Municipal/Township Boundaries
- Former Township Boundaries
- Urban Area
- Woodland Area
- Roads

Appendix 2

County of Huron Water Features

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October, 2014

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Wetland Area
Body of Water
Watercourse
Roads
Urban Area
Woodland Area
County Boundaries
Municipal/Township Boundaries
Old Ward Boundaries

Appendix 3 – Huron County Tracts Workplan 2014 – 2020

Work Plan 2014 - 2020				
Tract(s)	**Activity**	**Time / Year**	**Description**	**Department(s)**
Sheppardton, Rodgers, Redmond, Moreland, Stingel, O'Connor, Hay's Tracts	Inventory	Completed (Summer 2014)	Collect detailed silvicultural and asset inventory for each compartment with tract	Planning & Development
Sheppardton, Rodgers, Redmond, Moreland, Stingel, O'Connor, Hay's Tracts	Management Plan	Completed (Fall 2014)	Complete detailed 20 year management plan for the entire tract incorporating inventory collected summer/fall of 2014	Planning & Development
Rea Tract	Inventory	Fall 2014	Collect detailed silvicultural and asset inventory for each compartment	Planning & Development
Redmond, Stingel, Moreland, Rea, Hay's Tract	Management Plan	Winter 2014	Complete detailed 20 year management plan for the entire tract incorporating inventory collected summer/fall of 2014	Planning & Development
All Tracts	Signage	Winter 2014	Design & purchase new signage for each tract outlining permitted uses, forest rules, etiquette and map of the property with trail system.	Planning & Development & Public Works
All Tracts	Mail-out	Winter 2014	Mail letter and Management Plan to all property owners abutting the County Tracts. Survey interest in joining a "Friends of the County Tracts" working group	Planning & Development
Collins, Taylor, Adams, Stevenson, Robertson Tracts	Inventory	Spring 2015	Collect detailed silvicultural and asset inventory for each compartment	Planning & Development
Sheppardton Tract	Trail Maintenance	Spring / Fall 2015	Perform general trail maintenance and upgrades including hazard tree removal, culvert installation & gravel installation to prepare tract for fall/winter harvest	Public Works & Planning & Development
All Tracts	Signage Installation	Spring 2015	Install new signage at each of the Tracts	Public Works & Planning & Development
Sheppardton Tract	Tree Marking / Tender	Summer 2015	Perform selective thinning marking to align with prescription. Prepare tender for sale of marked trees	Planning & Development
Priority Areas in Selected Tracts	Invasive Species Control	Fall 2015	Chemical and mechanical control of invasive species including buckthorn (common & glossy) and Grape vine in priority areas to prevent further spread	Public Works & Planning & Development
Collins, Taylor, Adams, Stevenson, Robertson Tracts	Management Plan	Fall 2015	Complete detailed 20 year management plan for the entire tract incorporating inventory collected summer/fall of 2014	Planning & Development
Sheppardton Tract	Tree Harvest	Fall/Winter 2015	Perform harvest of tendered trees	Contractor
All Tracts	Certification	Winter 2015	Explore FSC Certification for all Tracts	Planning & Development
Rodgers & Redmond Tract	Tree Marking / Tender	Spring 2016	Perform selective thinning marking to align with prescription. Prepare tender for sale of marked trees	Planning & Development
Rodgers & Redmond Tract	Trail Maintenance	Spring / Fall 2016	Perform general trail maintenance and upgrades including hazard tree removal, culvert installation & gravel	Public Works & Planning & Development

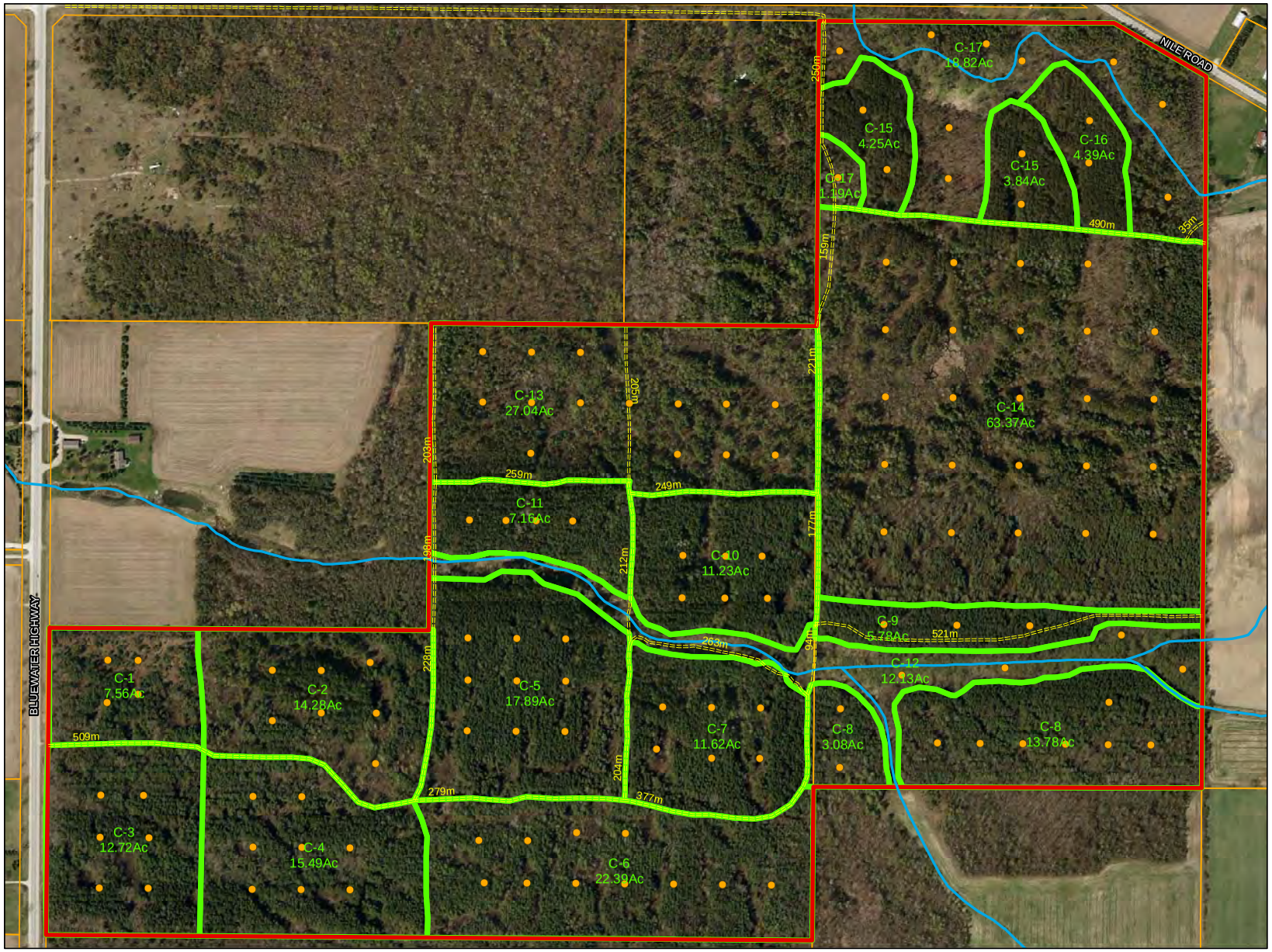
Appendix 3 – Huron County Tracts Workplan 2014 – 2020

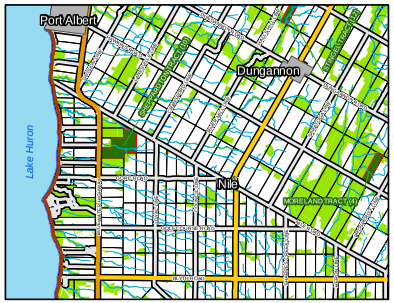
			installation to prepare tract for fall/winter harvest	
Rodgers & Redmond Tract	Tree Harvest	Fall/Winter 2016	Perform harvest of tendered trees	Contractor
All Tracts	Gates	Winter 2016	Design and order gates for all Tracts	Planning & Development
Moreland, Stingel & O'Connor Tracts	Tree Marking / Tender	Spring 2017	Perform selective thinning marking (Conifers) to align with prescription. Prepare tender for sale of marked trees	Planning & Development
All Tracts	Gates	Spring / Fall 2017	Install gates at each of the Tracts	Public Works & Planning & Development
Moreland, Stingel & O'Connor Tracts	Tree Harvest	Fall/Winter 2017	Perform harvest of tendered trees	Contractor
Robertson Tract	Interpretive Trail	Winter 2017	Develop information for the creation of an interpretive trail through the Robertson Tract. Create and order trail signage	Planning & Development
Rodgers & Redmond Tracts	Tree Marking / Tender	Spring 2018	Perform selective thinning marking (Hardwoods) to align with prescription. Prepare tender for sale of marked trees	Planning & Development
Redmond Tract	Interpretive Trail	Spring 2018	Develop the interpretive trail by installing trail signage and information stations along the trail. General trail maintenance may be required.	Planning & Development & Public Works
Rodgers & Redmond Tracts	Tree Harvest	Fall/Winter 2018	Perform harvest of tendered trees	Contractor
Stevenson & Robertson Tracts	Tree Marking / Tender	Spring 2019	Perform selective thinning marking (Conifers) to align with prescription. Prepare tender for sale of marked trees	Planning & Development
Stevenson & Robertson Tracts	Trail Maintenance	Spring / Fall 2019	Perform general trail maintenance and upgrades including hazard tree removal, culvert installation & gravel installation to prepare tract for fall/winter harvest	Public Works & Planning & Development
Stevenson & Robertson Tracts	Tree Harvest	Fall/Winter 2019	Perform harvest of tendered trees	Contractor
Taylor, Collins & Adams Tracts	Tree Marking / Tender	Spring 2020	Perform selective thinning marking (Conifers) to align with prescription. Prepare tender for sale of marked trees	Planning & Development
Taylor, Collins & Adams Tracts	Trail Maintenance	Spring / Fall 2020	Perform general trail maintenance and upgrades including hazard tree removal, culvert installation & gravel installation to prepare tract for fall/winter harvest	Public Works & Planning & Development
Taylor, Collins & Adams Tracts	Tree Harvest	Fall/Winter 2020	Perform harvest of tendered trees	Contractor

** This plan covers one full harvest cycle for each of the County Tracts **

Appendix 4

Huron County - Sheppardton Tract





Legend

- Township/Municipal Boundaries
- Urban Areas
- Lake Huron
- Huron County Tracts
- Wooded Areas
- Sheppardton Tract
- Huron County Lots
- Property Assessment
- County Highway
- Provincial Highway
- Municipal Road
- Trail System
- Water Systems
- Forest Compartments
- Inventory Plots

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HURON COUNTY

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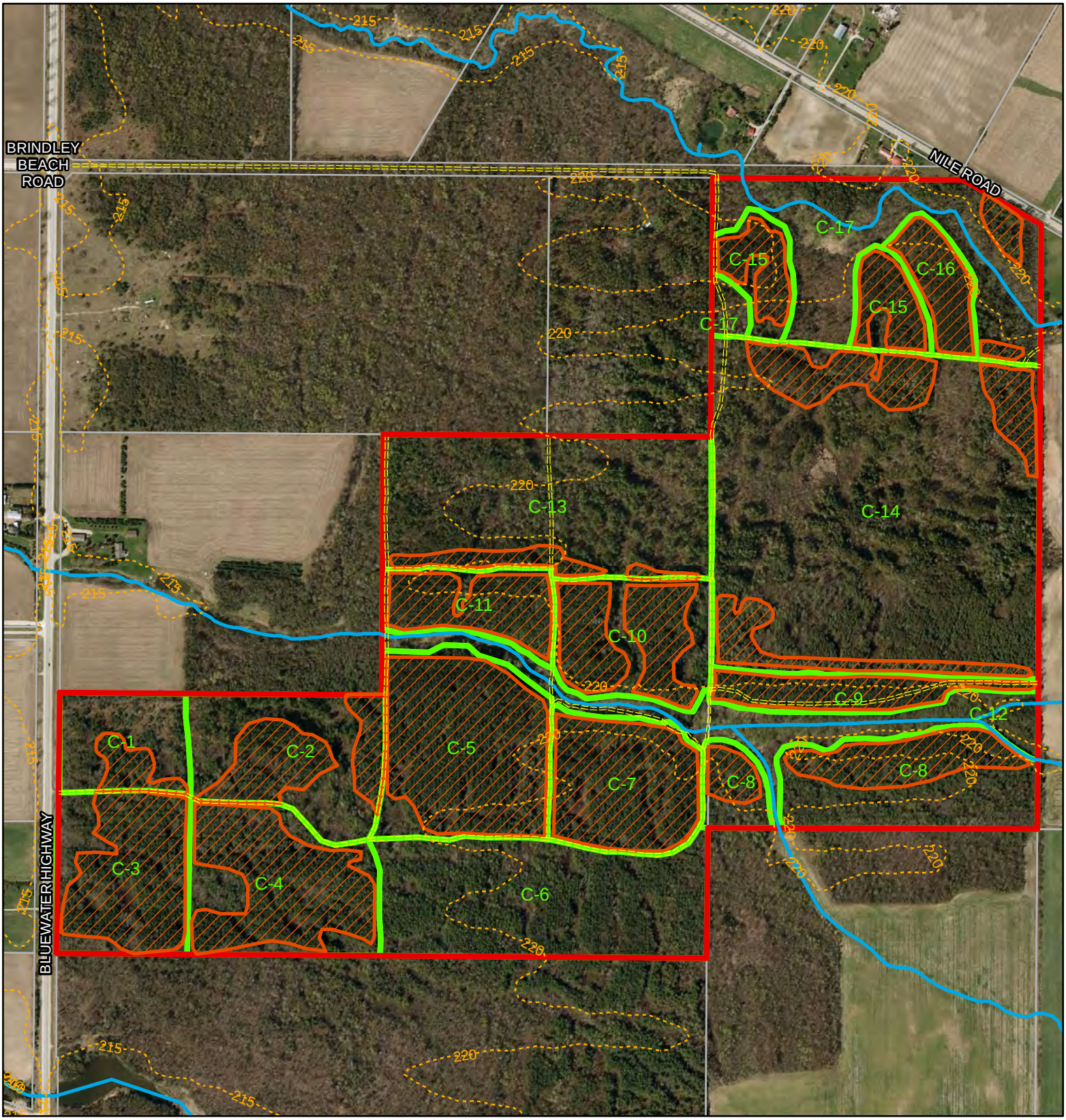
Appendix 5

Harvest Areas



HURON COUNTY

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Contours
Trails
Water Systems
Harvest Areas
Sheppardton Tract
Parcel Fabric

Appendix 6 – Sheppardton Tract Proposed 10 Year Activities Table

Proposed 10 Year Activities (2015 - 2024)				
Compartment	**Activity**	**Area (acres)**	**Year**	**Comments**
#1	Stand Improvement Thinning	1.7	2015 - 2016	Light stand improvement along south side of compartment to remove diseased and poor formed trees.
#2	Selection Thinning & Stand Improvement. Reduce B.A. to approx 19-21m^2/ha.	1.7	2015 - 2016	Selectively manage the Red Pine along trail to retain crop trees and release their crowns. Light stand improvement in White Pine to remove diseased and poor formed trees.
#3	Selection Thinning & Stand Improvement. Reduce B.A. to approx 21-23m2/ha.	3.83	2015 - 2016	Selectively thin the area to release crowns of White Spruce and White Pine sawlogs. Remove diseased and poor formed trees down to 8cm.
#4	Selection Thinning & Stand Improvement. Reduce B.A. to approx 20-22m2/ha.	10.87	2015 - 2016	Selectively thin the area to release crowns of White Spruce and White Pine sawlogs. Remove diseased and poor formed trees down to 8cm.
#5	Selection Thinning & Stand Improvement. Reduce B.A. to approx 20-22m2/ha.	15.23	2015 - 2016	Selectively thin the area to release crowns of White Spruce and White Pine sawlogs. Remove diseased and poor formed trees down to 8cm.
#7	Selection & Row Thinning. Reduce B.A. to approx 21-23m2/ha.	10.17	2015 - 2016	Remove every 4th row where required. Selectively thin to release White Pine and White Spruce to remove diseased and poor formed trees.
#8	Selection Thinning & Stand Improvement. Reduce B.A. to approx 19-21m2/ha.	6.49	2015 - 2016	Selectively thin the area to release crowns of White Spruce and White Pine sawlogs. Remove diseased and poor formed trees down to 8cm.
#9	Selection & Row Thinning. Reduce B.A. to approx 22-24m2/ha.	4.51	2015 - 2016	Remove every 4th row where required. Selectively thin to release White Spruce sawlogs to remove diseased and poor formed trees, target removal of White Pine.
#10	Selection & Row Thinning. Reduce B.A. to approx 20-22m2/ha.	7.06	2015 - 2016	Remove every 4th row where required. Selectively thin to release White Pine and White Spruce to remove diseased and poor formed trees.
#11	Selection Thinning & Stand Improvement. Reduce B.A. to approx 23-25m2/ha.	5.45	2015 - 2016	Selectively thin the area to release crowns of White Spruce and White Pine sawlogs. Remove diseased and poor formed trees down to 8cm.
#13	Selection Thinning & Stand Improvement. Reduce B.A. to approx 23-25m2/ha.	1.15	2015 - 2016	Selectively thin the area along compartment boundary to release crowns of White Spruce and White Pine sawlogs. Remove diseased and poor formed trees down to 8cm.
#14	Selection Thinning & Stand Improvement. Reduce B.A. to approx 23-25m2/ha.	3.31	2015 - 2016	Selectively thin the area to release crowns of European Larch and White Pine. Remove diseased and poor formed trees down to 8cm.
#14	Selection & Row Thinning. Reduce B.A. to approx 23-25m2/ha.	2.21	2015 - 2016	Remove every 4th row where required. Selectively thin to release White Spruce sawlogs to remove diseased and poor formed trees.

Appendix 6 – Sheppardton Tract Proposed 10 Year Activities Table

#14	Selection Thinning & Stand Improvement. Reduce B.A. to approx 20-22m2/ha.	4.67	2015 - 2016	Selectively thin the area to release crowns of Red Pine Sawlogs. Remove diseased and poor formed trees down to 8cm.
#15	Selection Thinning & Stand Improvement. Reduce B.A. to approx 23-25m2/ha.	5.14	2015 - 2016	Selectively thin the area to release crowns of Red Pine Sawlogs. Remove diseased and poor formed trees down to 8cm.
#16	Selection Thinning & Stand Improvement. Reduce B.A. to approx 24-26m2/ha.	3.46	2015 - 2016	Selectively thin the area to release crowns of Red Pine Sawlogs. Remove diseased and poor formed trees down to 8cm.
#17	Selection Thinning & Stand Improvement. Reduce B.A. to approx 23-25m2/ha.	1	2015 - 2016	Light stand improvement along north-east side of compartment to release crowns of White Pine sawlogs. Remove diseased and poor formed trees down to 8cm.
All	Re-assess for next thinning operation	278	2025	Inventory should be conducted in the calendar year of 2025
All	Annually inspect for invasive species, insects, diseases, vandalism and encroachment	278	2015 - 2025	
All	Maintain and improve all trails, culverts, bridges and signs		2015 - 2025	