

## Society of Irish Foresters study tour to Ontario 6 - 13 September 2011

On Tuesday, 6<sup>th</sup> September, 31 members of the Society of Irish Foresters departed Dublin for Pearson International Airport, Toronto to begin the 68<sup>th</sup> Annual Study Tour. The group was welcomed at Toronto Airport by our guide for the week, Mr. David Milton, Ontario Professional Foresters Association and President of the Ontario Lumber Manufacturers Association.

The province of Ontario has 71 million ha of forests (65% of its land area), of which 52 million ha is classified as productive forest. Although annual yields are much lower than in Ireland, Ontario's forests produce approximately 62 million m<sup>3</sup> annually. The current value of Ontario's forest products sector is €15.3 billion per annum.

Crown forests comprise 81% of the forested area, parks and protected areas 9% and other lands 10%. Forest types range from the deciduous forest of the Niagara Peninsula area, through the mixed forest of the Great Lakes-Saint Lawrence region in central and northwestern Ontario, to the conifer dominated boreal forest of the north. Ontario's most common tree species are black spruce (*Picea mariana* (Mill.) Brit.) (37.3%), poplar (*Populus* spp.) (20.8%), jack pine (*Pinus banksiana* Lamb.) (11.7%), white birch (*Betula* spp.) (7%), balsam fir (*Abies balsamea* (L.) Mill.) (4%), white pine (*Pinus strobus* L.) (3%); while sugar maple (*Acer saccharum* Marsh.), the species most associated with Canada, comprises just 4% of the total.

This was the Society's fifth tour in North America. Inevitably, comparisons will be made with Oregon/Washington (1992), British Columbia (2000), New England (2004) and California (2008). The defining quality of this year's tour was the confident professionalism of the foresters we met during our 2,770 km journey through southern Ontario. These foresters displayed great pride in their profession and an in-depth knowledge of silviculture and of the many issues currently confronting forestry in Ontario.

David Milton was the perfect tour guide. He selected interesting forests to visit and excellent foresters to meet us. Throughout the tour he worked tirelessly to ensure we got a fascinating insight into Ontario's forests and related industries. The Society is deeply indebted to him.

*Pat O'Sullivan, Tour Convenor*

### **Tuesday, 6<sup>th</sup> September**

The most striking difference between forestry in Ireland and Ontario is scale. The land area of the province of Ontario is 107.6 million ha in extent, whereas Ireland is only 7.1 million ha. Close to two-thirds of its land area is forested; it has 17.5% of Canada's forests and more than 2% of the world's forests. The extent of forest cover soon became apparent as we headed past Caledon, through a landscape similar to that described by the acclaimed Canadian writer Alice Munro (see *Trees, Woods and*

Literature). A native of Wingham – approximately 95 km to the west – the forests and landscape of southwest Ontario are ever-present in her short stories.

The group headed north from Pearson International Airport to visit a demonstration plot in Dufferin Forest, one of 12 tracts in this 1,050 ha forest. This demonstration area has a variety of thinning selection systems, mainly in mixed-age red pine (*Pinus resinosa* Ait.) plantations, which are designed to encourage natural understorey development. Caroline Mach, our leader for the afternoon, explained the different selection thinning trials being studied there.

While recreation and non-wood forestry are extremely important in Ontario, approximately 68% of the province's forests are managed intensively; the remainder comprises mainly sparse areas of non-commercial forests. The commercially managed forests comprise conifers (28%) and deciduous woodlands (10%), while 28% are classed as mixed species forests.

Dufferin Forest was a wonderful introduction to Ontario's forest philosophy. Here the public is invited to walk through the trial plots and view the various thinning methods – a confident gesture by the county foresters who are not afraid to engage with stakeholders. Dufferin County began its afforestation programme after purchasing the first tracts of land in 1930. Its forest management regime is highly regarded and has received a number of national awards, including the Forest Stewardship Recognition Programme award.

The first stop featured red pine, a species similar to Corsican pine (*Pinus nigra* Arnold), which was planted in 1967 at 1.8 m spacing and received a first thinning after 30 years, followed by a thinning every 10 to 15 years thereafter. Maple (*Acer* spp.) and ash (*Fraxinus* spp.) regeneration is also encouraged.

The second stop also featured red pine with a similar thinning regime but there the white pine (often called Weymouth pine) 'dotted' around the plantation was being encouraged to regenerate. The white pine was heavily exploited by Ontario's early settlers for use as ships masts, and now only a few groves remain, so Dufferin's foresters are giving this species a "helping hand" to regenerate. It tolerates a mix of shade and sunlight so it should regenerate well here.

Further along the walk we stopped at a plot which contained predominantly hardwood species. Here, red oak (*Quercus rubra* L.) – now the official tree of Dufferin County – forms 60% of the crop with a good mix of white ash, American beech and sugar maple.

Red oak, unlike Irish oak (*Quercus robur* L. and *Q. petraea* L.) is semi shade tolerant, but according to our guide has difficulty in competing under the canopy of maple, beech, and ash. Fire is often the regenerative catalyst if nature or man intervenes. Wildfire removes the leaf litter layer and the acorns then germinate in the exposed soil condition, whereas maple, ash and beech fail to naturally generate under such conditions.

The forest management objectives here are to provide Dufferin County with a positive financial return, to create and enhance recreation facilities, heritage protection, wildlife habitat, biodiversity and water control.

In Ontario foresters discuss yields and growth performance in terms of basal area (BA) rather than yield class (YC). BA averaged around 10 m<sup>2</sup> ha<sup>-1</sup> in some of the red

pine plots at year 30, which would suggest a YC of little more than 2.

It was interesting to hear Dufferin foresters discuss the economic, social and ecological benefits of these low yield class plantations, as well as their role in climate change mitigation. This contrasts with forest policy in Ireland which precludes planting conifers on most unenclosed sites and all sites with less than YC 14 potential. After exploring further trial plots and tree species as well as ground vegetation – including trillium, wild columbine, star flower and the noxious and dangerous weed, poison ivy – the group then headed to Gravenhurst.

*Overnight - Marriott Residence Inn, Gravenhurst.*

*Donal Magner*

### **Wednesday, 7<sup>th</sup> September**

From Gravenhurst, we headed northeast for 70 km to enter Algonquin Provincial Park, which covers an area of 763,555 ha including water – almost equivalent in size to Ireland's entire forest estate. Since 1974 the park has been managed by the Algonquin Forestry Authority (AFA), which is the Crown agency responsible for multipurpose forestry including silviculture, wildlife and fish management, research and wilderness management. Our guides for the Algonquin tour were Keith Fletcher, Karl Corbett and Chief Forester, Paul Cummins.



**Figure 1:** *Caroline Mach (right) explains the thinning regime in a red pine demonstration plot, Dufferin Forest.*

While harvesting appears to be low key, the AFA has a commercial mandate and is required to be self-sufficient, so production forestry is a key objective of the AFA. The revenue generated pays for the running costs of the AFA, in addition to all operations including forest regeneration, tending and associated operations. Not all logging companies and wood processors agree with the AFA approach. When the NPA was established, a master plan called for the 18 existing timber licences. The AFA has a sustainable forest management policy and the park's forests are certified to Canada's national forest certification standard (CSA). We entered the park at the western section, which contains maple (*Acer* spp.), beech, yellow birch (*Betula alleghaniensis* Brit.) and eastern hemlock (*Tsuga canadensis* (L.) Carr.). The eastern section contains white and red pine, poplar and white birch.

The hardwoods are managed according to the selection system whereas the uniform shelterwood system is used to manage the conifers in the eastern section of the park. Certified tree markers select the trees, which are conspicuously marked with paint, so that harvesting operators can easily identify them. Trees are removed so that ground cover is maintained at all times. Interestingly, there is no evidence of clearcutting, except in small areas when species like jack pine, white birch and poplars (*Populus* spp.) dominate.

Our visit included a number of stops at thinning treatment and harvesting sites although we missed a harvesting operation on the Rock Lake Road, where a sequence of harvesting treatments have been in operation over a number of decades.

The results of silvicultural treatments where shelterwood systems were in operation with both shade tolerant and intolerant species were shown at the first stop. Less than a third of the park is available for forest harvesting on a periodic basis, with activity on approximately 1.5% of the area in any one year.

As the tour progressed from west to east, the three silvicultural systems practised in the Algonquin were discussed. Selection and shelterwood methods are applied to 95% of all harvested areas with small-scale clearcuts in only 5% of the park's forests.

Shade intolerant species such as poplar, red pine, jack pine and white birch are best suited to a partial clearcut as they need plenty of sunlight. White pine, yellow birch and red oak need a mixture of shade and sunlight so they can be managed according to the uniform shelterwood system. This allows a series of two or more cuts over a period of 10 to 30 years in a maturing stand and thus ensures continuous cover.

Maple, beech and hemlock on the other hand are managed using the selection system. This "uneven-aged" system allows the retention of a largely intact canopy suited for shade tolerant species which are capable of germinating and developing to maturity in the shade of larger trees.

Both silvicultural systems require intensive management. The tree markers select trees not only to ensure correct volume removal but also they must think ahead to allow the next layer or tree storey to emerge. The harvester must fell and remove trees with minimal damage to young saplings, which will form the next rotation crop.

These systems, together with the AFA's conservation policy, demonstrate the rationale behind the enforcement of a strict logging licencing system. There was heavy exploitation of the forests particularly during the 1920s and 1930s and even up to the 1960s when many logging companies adopted a "fell the best, leave the rest"



**Figure 2:** Taking the Hardwood Lookout Trail, overlooking Smoke Lake, Algonquin Provincial Park: Izabela Witkowska, John Guinan, Pacelli Breathnach and Donal Magner.

approach.

The group took a break for a pleasant lunch in the Arrowhoun Pines Resort before continuing through Algonquin and finally taking a stroll through the Hardwood Lookout Trail, overlooking the beautiful Smoke Lake.

Traversing undulating terrain, this 1 km walk has several numbered posts which explain the species and the ecology of the hardwood forest with its rich variety of maples – striped, red and sugar – yellow birch, black cherry (*Prunus serotina* Ehr.) and beech. Some conifers, such as eastern hemlock, remain but the once plentiful white pine has virtually disappeared over the years. The Hardwood Lookout Trail is just one of 14 interpretive trails in the park and along with its other activities, AFA's foresters demonstrate clearly that economic, environmental and social forestry can be compatible.

*Overnight - Marriott Residence Inn.*

*Donal Magner*

### **Thursday, 8<sup>th</sup> September**

The party departed Gravenhurst and headed for the Haliburton Forest and Wildlife Reserve, a 40,000 ha privately owned forest in Ontario's cottage country which combines private forest ownership and management, recreation, forest research and

value added wood products. The forest was acquired 53 years ago by the father of the present owner, Peter Schleifenbaum. The forest soil is sandy with a low water holding capacity; in summer the trees occasionally suffer stress as a result. Frost may commence towards late August and is often followed by snow, which can last until April.

Forest management and output are dictated to a large extent by the demands of the sawmill and in turn, the secure supply of logs from the forest to meet the mill's responses to ever changing market demands increases the profitability of the mill. The sawmill has a through-put of 40,000 t year<sup>-1</sup> and employs 16 men working a 10-hour shift four days per week for 50 weeks. In the forest 60% of the trees are suitable for processing at the mill which operates a 45% recovery rate. On arrival at the mill, the bark is removed from the logs and converted to mulch which is sold to amenity and horticultural businesses throughout Ontario. The market is volatile and tree species can quickly gain or lose popularity. Dave Bishop, the general manager at the mill explained that eastern hemlock was almost discarded some time ago and now it is the most profitable species processed.

Innovation and research is encouraged at Haliburton, an enterprise which receives no government support. Product innovation is driven by market demands. New products are tested in the market and if they are not well received then production is quickly abandoned. We were introduced to Jon Schorman a Ph.D. student from the University of Toronto, who is working on biochar - a charcoal created by pyrolysis of tree biomass. It is hoped that this research will lead to future earnings from carbon credits in agriculture when the biochar is spread at the rate of 1 to 1.5 t ha<sup>-1</sup>.

The wildlife reserve section of the enterprise operates a large multi-user recreation and resource management facility. There is a network of 300 km of trails which vary from wide, level, hard-packed and rolled pathways, to rocky muddy paths for the more adventurous. Five shelter cabins spaced over the reserve provide a place to rest or view the scenery. As this is a wilderness area, visitors are given instruction in map reading prior to setting out.

Almost 65% of the profit at the Haliburton Forest and Wildlife Reserve comes from the recreation section and the remaining 35% is returned by timber processing. The business plan aims to increase the profit contribution from the timber processing to 70% of group profits by 2017.

The party then left Haliburton Forest and travelled to Fortune Farms demonstration forest, one of the many partnership forests in the Eastern Ontario Model Forest. We were welcomed to this maple syrup producing forest by the owners Ray and Ruth Fortune and general manager Mark Richardson. The Fortunes purchased the farm in 1972 and have successfully managed their enterprise to improve maple sap production. Their careful efforts have also created a healthier and more diverse forest that provides wood for fuel, a habitat for wildlife and numerous recreation trails.

Since the late 1800's, settlers have tapped the maples in the mixed hardwood forests on this farm. Good forest management has enabled the Fortunes to double their sap production since 1992. They now produce 5,100 L of syrup per annum. It requires almost 40 L of maple sap to produce one litre of syrup. Their management regime is centered on the conversion of fields and conifer plantations back to native, mixed

hardwood forest. Forest restoration in the area provides many benefits to landowners as it increases species diversity and filters pollutants from the air.

The trees are tapped and connected by a network of tubes and pipes which carry the sap to the automated storage and evaporator system. The sap flows continuously into the evaporator. As water evaporates, sap with a higher sugar content is produced and this is then pumped along until it reaches the finishing pan where the maple syrup is collected and drawn off at regular intervals. In the forest we were shown how mixed hardwood stands comprising trees of all ages can be thinned to improve syrup production as well as timber and wildlife production. The thinning opens up a stand, thus reducing competition for light and nutrients and creating space for the maples to develop large crowns. Trees with large crowns produce a sweeter sap than trees with poorly developed crowns.

The owner, Ray Fortune, believes the best time to begin thinning a sugar maple stand is when the maples are between 2.5 cm - 9.0 cm DBH. At this stage the optimum spacing is 2.5 m. Twenty years later, when the trees have reached polewood stage (10 cm to 25 cm DBH), a further thinning is carried out which leaves healthy maple trees approximately 5 m apart. The third and final thinning takes place when the trees are mature and at 10 m spacing; this is considered the ideal spacing for sap production. Trees are tapped for sap when they reach 25 cm DBH.

The initial investment to start up a sugar maple enterprise is substantial. The Fortune's farm has 57 km of tubing and 14 km of pipeline, in addition to the buildings and evaporators. In this part of Ontario the threat of severe weather is ever present. In 1998 an "ice storm" almost destroyed the entire enterprise. All the tubes and piping were buried under several feet of ice by a storm just before the start of the annual tapping season, which is a mere four- to five-week window in early spring. A huge effort by the entire family working day and night cleared the ice so that sap collection could commence on time!

This visit covered two quite different but profitable business enterprises, which were based entirely on land and its produce and which created no environmental damage. This provided a memorable day for foresters who were all too familiar with the concept of trying to use land for economic gain while preserving it for future generations.

*Overnight - Lord Elgin Hotel, Ottawa.*

*Frank Nugent*

### **Friday, 9<sup>th</sup> September**

We departed our hotel in downtown Ottawa and travelled north-westwards through the Ottawa Valley on Highway 17 to North Bay, a distance of 350 km. The Ottawa Valley follows the Ottawa River and forms the boundary between eastern Ontario and western Québec. The first stop was at Renfrew County Forest where we met our hosts Jeff Muzzi, Head of Forestry Services, and Lacey Rose, County Forester. Renfrew County Forest consists of 6,400 ha in 51 different tracts. The County Forests are considered working forests where forest management activities take precedent over other activities. Interestingly, Renfrew County was settled by Irish settlers in the 19<sup>th</sup> century. Jeff Muzzi lives between the towns of Tramore and Killaloe, while names

like Meath and Connaught are also to be found!

The theme throughout our visit to Renfrew County was forest restoration. The forests of Renfrew were cleared by earlier settlers to create land for agriculture. However, due to the sandy nature of the soil the land soon degraded and many homesteads were abandoned. The county began acquiring these lands in the 1950's and set about improving soil conditions and reducing erosion through reforestation. Renfrew County Forest has both plantation and natural forests.

The tract we visited was a plantation of red pine with some white pine which was planted for regeneration purposes between 1950 and 1953. Spacing was approx 1.8 m  $\times$  1.8 m. It was thinned in 1980, 1992, 2010. There will be two further thinnings. The first thinning involved removal of every 5<sup>th</sup> line with selection between the lines. The current stocking is 300 stems ha<sup>-1</sup>. The management objective is to convert the forest from red pine to white pine using the continuous cover uniform shelterwood management system. Red pine would have to be replanted whereas white pine, being more shade bearing, will regenerate naturally under the red pine. The plan is to open the canopy by one third at each thinning. Thinning begins when the basal area of the crop reaches 36 m<sup>2</sup> ha<sup>-1</sup>. Each thinning aims to reduce the basal area to 24 – 26 m<sup>2</sup> ha<sup>-1</sup>. This regime strikes a good balance between a sufficient opening up of the crown to allow white pine to germinate while allowing sufficient growing space to the remaining crop. The red pine crop is used mainly for transmission pole production. Up to 25 years ago hardwood management consisted of taking the biggest and the best, while this has now changed to leaving the better growing trees for regeneration. Market conditions also determine whether to thin in a particular year. The poles are currently making €50.00 (CAN\$65) m<sup>-3</sup> delivered. For later thinning the price will rise to €116.50 (CAN\$150) m<sup>-3</sup> delivered. Approximately 75% of the produce from the next thinning will be poles. Harvesting must take place before snow and heavy frost as the pine becomes too brittle when the timber is frozen. Some mechanical ground preparation is carried out after thinning to improve natural regeneration. Although the forest is FSC certified, some chemical control of vegetation is used to remove woody weed competition.

Following lunch in Pembroke we headed towards the Canadian Institute of Forestry in Mattawa. Fortunately, we were joined on the bus by Al Stenson, Scott McPherson and Fred Pinto from the Institute as further up the highway we were delayed two hours by a major truck fire. As a result we had to cancel our field visits to Nipissing Forest to see examples of the uniform shelterwood system and single tree selection system. Nevertheless we enjoyed a wide ranging discussion with our host on the work of Institute. Their research work aims to provide scientific underpinning of the forest management practices in the area with the objective of improving stand quality.

Their main research objective is to assess the impact of natural forces on the forest and then to try to replicate these results through management practices. Examples are the age distribution of the forest as a result of the impact of fire. Three silvicultural systems are practiced – hardwood selection/shelterwood, pine shelterwood and clear-cut with standards. Approximately one third of harvesting is carried out using each of these systems. The allowable harvest in Nipissing Forest is approximately 707,000 m<sup>3</sup>. However, due to weak market demand for low grade hardwood pulp, the actual



cut is only 420,000 m<sup>3</sup>. In addition to supplying timber, forest management practices must also provide for the fauna of the forest with particular reference to the feeding conditions of a large range of animals such as black bears. A forest management company, Nipissing Forest Resource Management Inc., manages the forest. It is a partnership of local forest industries. It has been issued a Sustainable Forest Licence and is charged with implementing the forest management plan which is prepared every 10 years. It costs approximately €750,000 to prepare and complete an extensive public consultation.

Our hosts also gave us a comprehensive overview of forest fire problems in Nipissing Forest where up to 40,000 ha is burned each year. Judicious use of ‘water bombing helps to “break the back” of larger fires, but the real work of controlling fires is carried out by ground-based fire crews of four. These crews are employed fulltime on a seasonal basis and are highly trained professionals. They can be deployed to other parts of Canada if the fire season is quiet in Ontario.

*Overnight - Hilton Hampton Inn, North Bay.*

*Pacelli Breathnach*

### **Saturday, 10<sup>th</sup> September**

Early on Saturday morning our coach headed north-west for Sudbury Forest near



**Figure 3:** Lacey Rose (centre), Renfrew County Forester and Jeff Muzzi, Head of Forestry Services outline the advantages of the Uniform Shelterwood Management System in Renfrew Forest, Ottawa Valley.

Sturgeon Falls. Here we were welcomed by Mr. Ron Luopa, Operations Manager at the Vermillion Forest Management Company, who took us further west to see some natural regeneration of fire origin pine on an outwash plain. This area, which lies north-west of Sturgeon Falls, is the heart of the “transition forest zone” where the species mix changes from mixed deciduous and conifer to the boreal species, such as white pine.

Sudbury Forest has a forested area of almost 75 km<sup>2</sup> growing, for the most part on fertile, heavy textured soils. The annual cut is 22 million m<sup>3</sup>. However, less than 60% of this is harvested as the demand for timber in the USA, their main market, is extremely depressed at the moment.

The system of tenure in Sudbury Forest is interesting. These are Crown Lands which are licensed to eight separate logging companies. The licences are generally granted for a period of five years, although 10-year licences are now becoming popular. The licensees have established a co-operative called Vermillion Forest Management Company (VFM), which is responsible for the management and silviculture of the crops on the entire forest area. VFM prepares a 10-year management plan for Sudbury Forest. During this process it engages in extensive consultation with the public, as the forest is heavily used for recreation, and with the licensees. The plan is then submitted to Ontario’s Department of Natural Resources for approval and generally, following some tweaking and further consultation, the plan is approved. This entire process usually takes two years to complete.

When the management plan is approved, VFM then monitors how the licensees have performed and can impose non-compliance fines for breaches of the conditions attached to the management plan. An independent auditing company, which has the power to renew or revoke licences, oversees the entire operation and every five years it adjudicates on compliance levels. In addition, VFM must work closely with the local Citizens Committees. These stakeholder groups do not have a veto on VFM’s operations but they do exercise a powerful influence over the day to day management of the forest. Overall, the current system is a far cry from the early days when loggers worked on the principle of - “take the best and leave the rest”.

In Sudbury Forest, fire is the main determinant of the type of crop which has developed there. White pine, which has very thick bark and grows very tall, is dependent on forest fires for regeneration. Lesser trees, such as poplars, aspens and birch, are scorched and killed whereas a sufficient number of the tall white pine are left to produce seeds for the next rotation.

In establishing crops on these fertile soils, the foresters try to mimic nature by using a range of tools including prescribed burning (to a limited extent) and chemical site preparation with skidder mounted sprayers which apply 8 L ha<sup>-1</sup> of Roundup in year two. During year four there is usually a further “chemical tending” in order to control competition from poplar, red maple, raspberry and other herbaceous plants. In year six, areas of weak regeneration are in-filled with red pine.

Given the rather intensive herbicide treatment regime employed in this forest, there was some surprise that it was FSC certified. The foresters defence is that, on these fertile, heavy soils it is not possible to re-establish white pine crops in the absence of some chemical intervention during the early stages of the rotation. Mechanical site

preparation is not widely practised here as the resultant soil disturbance encourages excessive growth of grasses and woody weeds. Currently, the market for pine is quite weak, whereas poplar and birch are increasing in popularity due to demand from the particle board industry.

*Overnight - Stone Gate Inn, Orillia.*

*Pat O'Sullivan*

### **Sunday, 11<sup>th</sup> September**

Following a free morning in the lakeside town of Orillia, we headed west to Simcoe County Forest. There we were met by the Chief Forester, Graeme Davis who explained that the Oro moraine was once heavily forested, but after logging in the 19<sup>th</sup> century the area had turned into a dust bowl as the top soil dried up and was blown away. There were problems with flash floods, water erosion and ground water contamination. The site became an "Agreement Forest" in 1922 and has been managed through an agreement with the Ontario Ministry of Natural Resources since 1996.

The Council continues to acquire poor land with profits from the sale of timber. Land costs €2,500 to €3,000 ha<sup>-1</sup> and in the past five years it has purchased almost 1,000 ha. Simcoe County Forest is the largest and most productive municipally owned forest in Ontario. The total area of the forest is now 12,500 ha, of which 50% is plantation, 80% of the forest is productive and 20% is wetland. The annual revenue is €775,000.

The area we visited was the Hendrie Tract, which was named after the family that once lived there. It was planted with red pine in 1962. The current basal area of the crop is 40 m<sup>2</sup> and it is proposed to thin to reduce the basal area to 30 m<sup>2</sup>. The thinnings will be sold for transmission poles. The rotation length here is 90 years. As areas are clear felled, it is hoped that they will revert to natural forests and that white pine and oak will regenerate. White pine was the major component of the original forest because the native people used fire to clear areas for agriculture and white pine regenerates quicker than red pine after fire. Honey fungus (*Armillaria mellea*) is also a major problem on the site.

The public is very supportive of the forest and profits from the forest are ring-fenced for reinvestment in the forest and to improve recreational facilities. The forest is popular with a wide range of users, from mountain bikers to hunters, but there is little conflict between the different groups. Simcoe County Forest was awarded FSC status in 2010.

As we drove through Ontario we often noticed lakes which had been created by beavers. The tell-tale sign was the presence of the beaver lodge. It is built above the water level so that the beaver can enter unseen from under the water, while at the same time providing a dry home for the family. The beaver is the national animal of Canada. It was once an important element of the economy, as it was hunted for its fur, but it is now protected and a much loved species.

Late in the evening we headed south for the town of Orangeville and dinner in the Greystones Inn. We then continued on towards our overnight accommodation in the university city of Guelph, where the internationally acclaimed economist J.K. Galbraith began his career studying agricultural economics.



**Figure 4:** The “Coillte group” in Simcoe County Forest, near Orillia, Ontario.

*Overnight - Best Western Royal Brock Hotel, Guelph*

*John McLoughlin*

### **Monday, 12<sup>th</sup> September**

The Arboretum of the University of Guelph was the first stop of the day. The group explored the well laid out arboretum on a self-guided tour. The arboretum was established in 1970 and features tree species which are native to southern Ontario as well as non-natives tree species. It also features old growth forest, protected wetlands and some beautiful sculptures, including a two piece metallic sculpture, called ‘A Tribute to Nahneebahweequay’, one part of which takes the distinctive form of Queen Victoria.

Mr Martin Neumann, Supervisor of Terrestrial Resources with the Grand River Conservation Authority (GRCA) joined the group at the arboretum. The Grand River flows from Dundalk, Ontario to enter Lake Erie at Port Maitland, a 300 km journey in a catchment of approximately 7,000 km<sup>2</sup>. Close to one million people live in this catchment area and they depend on the Grand River and its tributaries for their water supply and to attenuate the need for waste water treatment plants. The GRCA manages water and other natural resources on behalf of the municipalities in the Grand River catchment.

Martin Neumann guided the bus south from Guelph to Brantford via Paris,

Ontario through the centre of the Grand River watershed. Before leaving Guelph, the tour group took a quick look at an intercropping research plot at the Agroforestry Department of the University of Guelph. Annual crops, such as corn, are inter-planted with black walnut (*Juglans nigra* L.) and ash when the trees are small. As the trees mature the annual crops of corn are replaced with grass for hay production. Results to date show a net gain for both the annual crop and the trees but there has been no uptake by farmers as yet.

The bus stopped briefly at Guelph Lake Reservoir which is known locally as “fake lake”. The annual precipitation in the catchment is 84 cm (33”) and mostly falls as snow during the winter months. This reservoir is one of the watershed’s network of reservoirs which are designed to capture snow to augment water supplies during the drier summer months. The reservoirs also serve to prevent flood events. As part of flood control measures, the GRCA has a network of water gauges through the system which collect real time water level information. These real time data are available to the public on [www.grandriver.ca](http://www.grandriver.ca) [Accessed July 2012] and are widely used by fishermen and canoeists.

En route to lunch at the Olde School Restaurant in Brantford, we passed the Rotary Forest. The planting of this 40 ha green field site by volunteers was sponsored by Guelph Rotary Club. The Rotary Forest is one of a number of partnership projects that the GRCA organises to encourage tree planting within the watershed. Another popular scheme is the *Trees for Guelph* project aimed at getting students to plant trees in their school yards and on public lands. To date almost 100,000 trees have been planted under this scheme.

As the bus travelled south, Mr Neumann described a number of projects that the GRCA has developed with the aim of improving water quality in the watershed. Grants are available to farmers to create livestock exclusion zones along streams in order to protect and enhance cold-water trout habitats. He described how, in the past, planting stopped 10-15 m back from rivers but now most of the planting is done in this 10-15 m corridor to ensure that stream water temperatures stay at a level suitable for the cold-water trout. The GRCA also provides workshops for landowners and a free extension service of forestry and pasture management.

South of Cambridge, Ontario the bus entered the Carolinian forest zone. Typical Carolinian forest tree species are oak, hickory (*Carya* spp.), walnut, butternut (*Juglans cinerea* L.), sassafras (*Sassafras albidum* (Nutt.) Nees), blackgum (*Nyssa sylvatica* Marsh.), and the tulip tree (*Liriodendron tulipifera* L.). The GRCA has purchased remnants of Carolinian forest and now owns the largest continuous Carolinian forest in the watershed. Whenever funding is available the GRCA purchases additional conservation land but only after proving that the land can be maintained by the GRCA in perpetuity. The authority aims to maximise biodiversity from its 19,800 ha of reservoirs, park and reserve.

After lunch the group visited a black oak (*Quercus velutina* Lam.) savanna restoration project in Brant County. Savannas are generally tall grass prairie communities with 10-35% tree cover. These communities are now very rare in



**Figure 5:** *Journey's end - Frank Nugent, Willie McKenna, Michael Doyle and Gerhardt Gallagher at Niagara Falls, Ontario.*

southern Ontario as a result of European settlements. Savanna is an anthropogenic habitat having originally been influenced by First Nation people<sup>1</sup>. These habitats are fire dependent. Martin and his colleague Kevin Tupman, Natural Heritage Specialist with the GRCA, described the restoration project and related that the aim of the project was to recreate a 20 ha black oak savanna.

The restoration site had been used for Scots pine (*Pinus sylvestris* L.) Christmas tree production. The remaining Scots pine trees on site had prevented the oak savanna from re-establishing itself. The project involved the removal of invasive exotics such as the Scots pine, European buckthorn (*Rhamnus cathartica* L.), Tartarian honeysuckle (*Lonicera tatarica* L.) together with a regime of prescribed burns. Black oak, a Carolinian species, is the quintessential savanna tree in Ontario. Typical savanna plant species include; butterfly weed (*Asclepias tuberosa* L.), sky blue aster (*Symphyotrichum oolentangiense* (Riddell) Nesom), heath aster (*Symphyotrichum ericoides* (L.) Nesom), wild bergamot (*Monarda fistulosa* L.), and Canada golden rod (*Solidago canadensis* L.). Animal species typically found in savanna habitat include; red headed woodpecker (*Melanerpes erythrocephalus*), hog nose snake (*Heterodon nasicus*), racoon (*Procyon lotor*), red squirrel (*Sciurus vulgaris*), coyote (*Canis latrans*), red fox (*Vulpes vulpes*), rabbits (*Sylvilagus* spp.), European hare (*Lepus Europaeus*), eastern chipmunk (*Tamias striatus*) and flying squirrels (*Glaucomys sabrinus*). Very little wildlife is lost in the prescribed burns fire, which have been successful in encouraging savanna plants to appear in the under storey.

We departed Brant County and headed east to Niagara Falls. A highlight of the tour was viewing the floodlit American and Horseshoe falls.

*Overnight - Skyline Inn Hotel, Niagara Falls.*

*Clodagh Duffy*

<sup>1</sup> The collective term First Nation people describes various aboriginal peoples in Canada, apart from the Inuit or the Métis. It came into common usage during the 1970s and 1980s to avoid use of the word "Indian" which as well as being considered offensive was recognised as being a misnomer.

## Tuesday, 13<sup>th</sup> September

The group departed Niagara and travelled along the Niagara River Parkway, the tree-lined parkway which contours the Niagara Gorge. We crossed the Beamsville Bench and entered Fruitland County, which is dotted with apple (*Malus domestica* Borkh.), peach (*Prunus persica* (L.) Batsch) and grape (*Vitis vinifera* L.) orchards and is home to many well known vineyards.

Our first stop was at Woodend, located just south of the town of Niagara on the Lake. Here we were met by our guide Dan Drennan, a forester with the Niagara Peninsula Conservation Authority (NPCA). He explained that the NPCA's main focus is on environmental protection and preservation and watershed management. It includes community outreach activities and the restoration/extension of forest areas through land acquisition and public ownership.

His job is to oversee woodland management plans to ensure they comply with standard practice and to supervise the implementation of these plans. His main challenge is to encourage native trees and shrubs and to protect endangered species such as Sassafras, oak species, ash, and other light demanders which are being threatened by the more freely regenerating shade bearing species. This site is classified as a Carolinian Forest<sup>2</sup> and is typical of the many small, fragmented woodland blocks in this part of southern Ontario. It forms part of a trail network and is managed almost entirely for public recreation.

The deep, moist fertile soil supports a very diverse habitat of trees, flora and fauna. The forest canopy is composed of sugar maple, white ash, bitternut hickory, ash, red oak, white swamp oak, pin oak, bur oak, sassafras, aspen, cotton wood, tulip tree.

Single tree selection, at 10- to 20-year intervals, is the approved silvicultural system in the management plan. The plan also encourages the retention of old growth trees. Local interested groups favour low intensity management and oppose any tree felling. As a result the woodland has a dense canopy containing a high percentage of dead wood. Regeneration of light demanding species is very restricted and ground flora is sparse. Foresters are concerned that if they are not allowed to implement tree selection and felling plans, then light demanders such as the oaks, ash, hickory and aspen will soon be replaced by beech and maple species.

The main threats faced by the Carolinian forests are:-

- the fertility of the soil results in pressure from agricultural development which threatens the survival of the woodlands and its associated flora and fauna;
- the emerald ash borer, from China, if left uncontrolled may kill all ash trees;
- the extinction of rare plants, trees, and birds by a lack of protection measures.

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<sup>2</sup> Carolinian Forest is a name given to woodlands in a zone south of a line from Toronto to Grand Bend on Lake Huron. Deciduous hardwoods are the main tree species, consisting mainly of oaks, maples, beech, cotton wood, ash, sassafras, aspen, tulip tree and many more. This zone is species rich both in trees and ground flora, 40% of the national list of endangered species occurs in this zone. The soils are fertile and agricultural and residential pressures have threatened the natural woodlands' wildlife habitats. Only 10% of the original forests remain. Conservation is now a top priority in this zone.

A trail through the centre of the woodland stimulated a discussion on trail specifications and safety. The trail was quite rugged with many obstacles such as surface roots, boulders and deep depressions. At a number of locations it overlooked very steep drops. The forester explained that this trail would be classified in the “low to moderate usage” category and was used mainly by experienced walkers. If the trail was classified as “high usage” it would be upgraded and the danger spots would have protective barriers.

At the end of the trail we boarded our bus for lunch in the historic town of Niagara on the Lake and then headed north to Toronto’s Pearson International Airport and our overnight flight back to Dublin.

Michael Doyle

**Tour Participants**

Pacelli Breathnach, P.J. Bruton, Richard Clear, James Crowley, Bob Dagg, Michael Doyle, Clodagh Duffy, Ken Ellis, Jerry Fleming, Gerhardt Gallagher, Tony Gallinagh, Sean Galvin, John Guinan, Mark Hogan, Kevin Kenny, Donal Magner, Tony Mannion, Willie McKenna, John McLoughlin, Kieran Moloney, Stephen Moore, Liam Murphy, Frank Nugent, Dermot O’Brien, Michael O’Brien, Paddy O’Kelly, Tim O’Regan, Denis O’Sullivan, Pat O’Sullivan, Trevor Wilson, Izabela Witkowska.