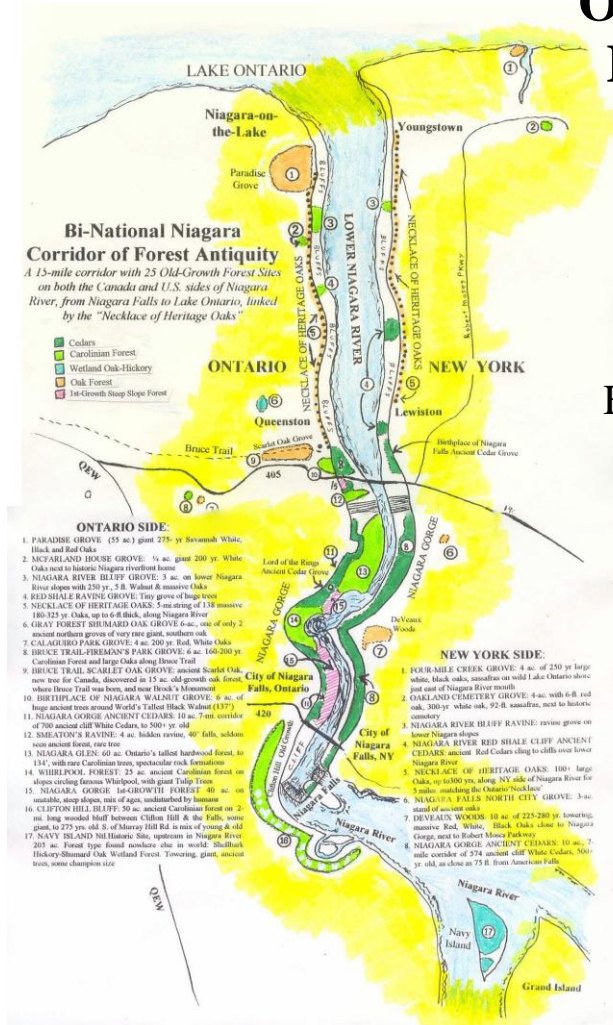


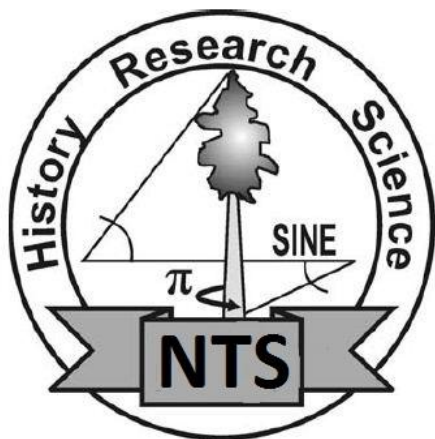
# Old Growth Forest Survey of Eastern Niagara Peninsula Phase 2/ Final Report

By Bruce Kershner

Project of Bert Miller Nature Club  
Final Report to Trillium Foundation  
October 2004

*Native Tree Society Special Publication  
Series: Report #13*





**Old Growth Forest Survey of  
Eastern Niagara Peninsula  
Phase 2/ Final Report  
by Bruce Kershner**

**Native Tree Society  
Special Publication Series:  
Report #13**

<http://www.nativetreesociety.org>  
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The Native Tree Society (NTS) is a cyberspace interest groups devoted to the documentation and celebration of trees and forests of the eastern North America and around the world, through art, poetry, music, mythology, science, medicine, wood crafts, and collecting research data for a variety of purposes. Our discussion forum is for people who view trees and forests not just as a crop to be harvested, but also as something of value in their own right. Membership in the Native Tree Society and its regional chapters is free and open to anyone with an interest in trees living anywhere in the world.

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# Introduction

Bruce Kershner's investigation of old growth sites in the eastern Niagara Peninsula was conducted in two phases as a Project of the Bert Miller Nature Club <http://www.bertmillernatureclub.org> with funding provided by the Trillium Foundation <http://www.trilliumfoundation.org/en/index.asp>. The Phase 1 research was completed and a report was submitted to the club and foundation in October 2003.

“Old Growth Forest Survey of Niagara Peninsula, Project of Bert Miller Nature Club, First Phase Report to Trillium Foundation, October 2003”

This document is available for download as a pdf file on the Bert Miller Nature website (42 MB) at:

<http://www.bertmillernatureclub.org/assets/docs/library/OLD%20GROWTH%20FOREST%20SURVEY%20OCTOBER%202003.pdf>

The Bert Miller Nature Club webmaster indicated that this would be a stable web address for downloading the Phase 1 document for the foreseeable future.

A copy of this current document: “Old Growth Forest Survey of Eastern Niagara Peninsula, Phase 2/ Final Report” was among the papers given to Dale Luthringer just prior to Bruce Kershner's untimely death. It does not appear that this document was ever completed and submitted to the Bert Miller Nature Club or to the Trillium Foundation. We contacted the Bert Miller Nature Club in September 2011 for permission to publish this document. They agreed to allow the Native Tree Society to publish these as part of our Special Reports series. Mr. Kershner's widow had previously given her consent for publication of these materials.

The basic content of this Phase 2/ Final Report are as they were written without modification, aside from some minor typographical errors, however the formatting has been changed from the original document. Bruce Kershner wrote with a flamboyant format style using a wide range of font faces, font sizes, bold, italics, underlines, and multiple levels of nested lists. These were toned down for easier reading and the document was reformatted into a more generic two column format.

The original document was incomplete. One section listed in Bruce Kershner's draft table of contents was “A detailed description of Phase 1 Survey Sites.” This section was not included in the materials given to Mr. Luthringer. Since these detailed descriptions were previously published in the Phase 1 report and available at the link above, I opted to not republish these detailed Phase 1 descriptions. For the sake of completeness, I chose instead to use the short descriptions of these sites from one of the tables as a summary description for these sites, and included it as a comparable section in the phase 2/final document. Bruce Kershner did include in his papers several maps and photographs from the phase 1 sites. I used these maps and photographs to illustrate the summary descriptions in the section I created.

Another variation found within this document that differs from the Phase 1 report lies in how the maps and photos are incorporated into the report. In the Phase 1 report all of maps and all of the photos were included as separate sections at the end of the document. In this Phase 2/ Final Report the maps and photographs are embedded within the body of the text in conjunction with related text.

Edward Frank

## General Background

This document is one of a series of Special Reports being published by the Native Tree Society consisting of reports on several old growth sites written by Bruce Kershner just prior to his untimely death from esophageal cancer in February 2007. Bruce S. Kershner (April 17, 1950 - February 16, 2007) was an environmentalist, author, and forest ecologist. He served as a University of Buffalo adjunct faculty member. He earned a Master of Science Degree in Botany-ecology from University of Connecticut. He was widely acclaimed as an authority on old growth forests, documenting hundreds of ancient trees and forests in eastern North America, where previously no one thought they had existed. He is an author of a dozen books on natural history, including: *The Sierra Club Guide to the Ancient Forests of the Northeast* by Bruce Kershner and Robert T. Leverett (May 1, 2004); *National Wildlife Federation Field Guide to Trees of North America* by Bruce Kershner, Craig Tufts, Daniel Mathews and Gil Nelson (May 9, 2008); and *Secret Places: Scenic Treasures of Western New York and Southern Ontario* by Bruce Kershner (Aug 1994).

Bruce Kershner won numerous awards for his environmental activism. These included 'Environmentalist of the Year' in 1987 and 1988 from the Sierra Club (Niagara Group) and the Adirondack Mountain Club, and 'Environmentalist of the Year in New York State' in 1996 from Environmental Advocates of New York. Robert Leverett, a co-author and colleague of Bruce described him as a "a buzz-saw and indefatigable. His role often was one of calling attention to forests in danger, leading the charge to get them protected, and in being an inspiration to others."

These documents were given to his friend and colleague Dale Luthringer prior to his death with the goal of seeing them eventually published. The Native Tree Society has received permission from his widow to do so. The text and tables were reformatted to better fit the NTS Special Report format, but the content presented is as written by Bruce Kershner and has not been otherwise edited or altered.

Additional information relating to these reports and updates on the current state of affairs at the described sites have been compiled and are presented as separate articles within each individual report. A final document includes biographical information, miscellaneous smaller reports written by Bruce Kershner, listings and excerpts from articles talking about Bruce and his work, tributes and eulogies written upon his passing, and other materials in a similar vein.

## Disclaimer

Bruce Kershner has argued in these documents that based upon extensive experience by the researchers, through using a series of physical characteristics that the ages of individual trees could be estimated to within 10 to 15% of their true ages. It is the position of the Native Tree Society that tree age estimates based only on physical characteristics cannot be made to this degree of accuracy. Based upon physical characteristics alone, the age of an individual tree may be greatly underestimated or over-estimated even by an experienced researcher. Where permitted, in order to obtain accurate tree age information, dendrochronological methods, including taking cores from select standing trees and counting the rings present in fallen trees, should be used to provide baseline chronological data and to serve as a calibration for the apparent ages as indicated by physical characteristics.

Physical characteristics are commonly used by dendrochronologists to determine which trees in a stand or area are likely the oldest and to help select which trees to sample. Listings of characteristics found in old trees very similar to the one written by Kershner have been produced by the dendrochronology community. Dr. Neil Pederson recently published the article "External Characteristics of Old Trees in the Eastern Deciduous Forest (Volume 30

(4), 2010 Natural Areas Journal, pp. 296-307)." A similar article "Identification of Old Ponderosa Pine Trees in the Front Range(18 USDA Forest Service Gen. Tech. Rep. RMRS-GTR-110. 2003)," deals with the characteristics of this conifer. Physical characteristics are a valuable tool for old growth researchers, but for determining the age of as specific tree, an accurate age can only be determined through coring and similar dendrochronological techniques.

The above qualifications should not be misapplied to Kershner's old-growth designations. Old growth forest is essentially an anthropogenic designation with no distinct ecological boundary. As such there have been hundreds of old growth definitions that have been applied in different situations and by different individuals. Kershner has provided one such definition. He has explicitly defined an old tree as one of a certain age or one which has certain physical characteristics he characterizes as an indication of old age. He further has explicitly defined an old growth forest as one which has certain specific criteria, including old trees, and is lacking in other characteristics. Therefore by definition, if a forested site has these characteristics it is an old growth forest. He has used this definition to many old growth forest sites in the northeastern United States and Canada. In contrast, such as in the Niagara Gorge for example, he has also used these criteria to exclude potential sites as old growth. Other researchers can argue the merits of the criteria used for this definition, but it appears to have been fairly and equitably applied by Kershner in these reports.

# **Old Growth Forest Survey of Eastern Niagara Peninsula**

**Project of Bert Miller Nature Club**

## **Phase 2/ Final Report** **to Trillium Foundation** **Oct. 2004**

**By Bruce Kershner**  
**Principal Investigator**



# **Old Growth Forest Survey of Eastern Niagara Peninsula Phase 2/ Final Report to Trillium Foundation**

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# Old Growth Forest Survey of Eastern Niagara Peninsula

Project of Bert Miller Nature Club  
Second Phase Report to Trillium Foundation  
October 2004

## Introduction

When the Old Growth Forest Survey of Eastern Niagara Peninsula began, discoveries of Old growth Forest sites was fully expected. After two years of extensive surveying, the findings have gone far beyond the goals.

If only one of the significant results had occurred, such as discovery of a new tree previously not known to be native to Canada (Scarlet Oak), this project would be called a great success. Instead, a long list of additional achievements were made by this project, such as discovery of the largest Old growth Broadleaf Forest on the Canada-U.S. international boundary; a large population of ancient cedars in the Niagara Gorge; Ontario's tallest forest; world's tallest Black Walnut; the Niagara Bi-national Corridor of Forest Antiquity; a major new kind of Old growth Forest covering the Niagara Escarpment; and many more.

**A total of 55 Old growth Forest sites were discovered, totaling 839 acres. These are distributed over 11 cities and towns within Niagara Regional Municipality, from the Niagara River west to as far as Grimsby. The largest is 210 acres (Navy Island), and 5 others are 40 acres or larger. One site, the Niagara Gorge, is filled with, or lined with, 8 different Old growth Forests totaling 195 acres (Ontario side only).**

## Goal of This Project

The goal of this research project was, for the first time, to search for, discover and document Old growth Forests in the eastern half of Ontario's Niagara Peninsula. Therefore, this was an *extensive, not intensive*, survey. This meant that a large (extensive) geographic area was surveyed, a kind of screening process. As a result, the numerous sites that were identified as old growth could only receive brief, not intensive or detailed, descriptions. Spending the time to study and describe each site in detail would prevent the survey goal from being accomplished, to visit and assess many sites as possible

over the 900 square-mile area covered by both Phase 1 and Phase 2.

## Benefit of This Project

Old growth Forests are extremely rare, comprising only 0.14 % of the research area, and considerably less in the larger region. Old growth Forests continue to be lost due to logging and development, based on experience locally and throughout eastern Canada and U.S. If we don't know they exist, there is no chance to preserve them. Only by searching for, discovering, and documenting Old growth forests can we enable property owners, governments, non-profits and environmental groups the opportunity to work to protect them.

Unfortunately, the threats to Old Growth were realized during this project. Of the 55 Old Growth sites discovered in this project's first year phase, one was subsequently destroyed by logging, and a globally important site became threatened by development. The benefit of discovering and documenting that Marcy's Woods is the last Old growth Black Maple forest in the world was used as one of the two primary justifications for the Province to order a moratorium on development of the site while they seek to resolve the issue. In addition, identification of five sites in public parks has led to those park agencies to initiate plans to strengthen their protection.

Of the 30 Old growth sites discovered in this project's 2<sup>nd</sup> year phase, the public owner of one site had recently destroyed a portion of it, including Nationally Rare species. Serious degradation from uncontrolled illegal ATV use was occurring to one private site (and increasing for another), and realistic reason for concern about future cutting and destruction development was identified for 4 other sites.

The discovery that several sites were Old Growth led to another benefit. This was the fostering of collaboration for research and education at several Old growth sites. This researcher gave lectures, and taught Fort Erie High School students about Old growth Forest at Erie Beach Park; gave lectures and conducted field research with Niagara College classes at Paradise Grove; conducted



field research with Hamilton Naturalist Club botanists and the Ontario Field Botanists Society; presented a university-sponsored lecture and field trip at University of Guelph (where the Homer Watson Park, Crawford Lake, and Rockwood Conservation Area Old growth sites were investigated and confirmed).

As others learned about this project, many people expressed interest in learning more about Old Growth Forest across Southern Ontario. The Lambdon Naturalist Club arranged for me to conduct Old growth exploration field trips with them, and they and the Southern Ontario Woodlot Owners Association invited me to present lectures on ancient forests. Intense interest in the Scarlet Oak discovery recently led to major joint field trips, partly coordinated by this project's investigator, that brought together botanists from across southern Ontario to visit the Scarlet Oak sites to confirm their identification. It also brought together Ontario Ministry of Natural Resources, Parks Canada, Niagara Regional Conservation Authority scientists, and area botanists for a joint expedition to Navy Island to study its remarkable Old growth Forest. All of the benefits and values of Old growth Forests are described in Chart 1. Because the Old Growth sites that were discovered during Phase 1 were already reported, the Phase 2 discoveries will be described first.

## Methodology

Three methods were used to identify potential or likely old growth forests prior to field survey work. These were used to create the basic list of sites to visit for the field survey work. They included 1) contacting and interviewing forest experts, 2) aerial photo analysis, and 3) identifying likely landforms and property categories where past experience has shown old growth forests are most likely to be found. *These techniques are detailed in Chart 1.*

Using the techniques below, 55 potential Old growth sites were identified for Phase 1. During dozens of field trips, 51 of them were visited, surveyed and determined if they were Old growth Forest or not. For Phase 2, 63 potential Old growth sites were identified, 53 were visited, surveyed and determined if they were Old growth Forest or not. Not all of the potential sites were visited because some of the sources did not provide sufficient data to precisely determine their location. To confirm if it is Old growth Forest, the techniques and criteria described below are used.



Fort Erie students counting the annual rings on a tree core



Close-up of a tree core showing approximately 100 rings of 220 total



Fort Erie student measuring the girth of an old growth red maple



Counting the annual rings of log of an ancient tree cut when it fell across the trail

## Chart 1. Ancient Forests Their Unique Values and Benefits

- They contain the oldest, tallest and largest living things, attributes worthy in their own right
- They are a unique scientific, research and educational resource. They provide pristine outdoor laboratories where natural process can be studied and taught, free of the conflicts of human disturbance. They are among the only places for us to learn what the maximum longevity, height, and size that trees can attain, and where to find and study the rarest species.
- They provide habitats for numerous rare and endangered animals and plants, many of which have few other places to live. There are Eastern U.S. 56 species of wildlife that prefer, or thrive best in, very mature or old growth forests. They are the home for the highest proportion of threatened and rare species. At least 60 species of plants are found nowhere else except in Eastern ancient forests.
- They serve as irreplaceable genetic banks, saving examples of life forms that may have value for the future because their genes enabled them to survive under severe conditions and to achieve great longevity, or the greatest height or size; or are examples of genetic attributes from past ages, still surviving in our times.

- They are living historic monuments since they preserve the original landscape. They are the only place where you can see (and walk through!) the last surviving landscapes of the pre-European era when only Native People lived here. They are part of our irreplaceable legacy.
- They are a source of enduring beauty and aesthetics, and are sought after as a source or model for art, photography, poetry and literature. Ancient Forests are one of the top five most admired Nature scenes, according to national surveys of the public. Old Growth Forests are one of the most popular nature scenes to appear on calendars, post cards, and photographs.
- Their forest cathedral settings and hushed primeval forest create places for inspiration and communing with the Creator. They teach lessons of wisdom about recycling, life and death, symbiosis, timelessness and the Eternal. They are indeed majestic examples of the “Lord’s Creation.”
- They provide pristine places for people to renew themselves and receive therapeutic benefits by getting away from the stresses of daily life
- They can benefit the local or tourism economy. Large and ancient trees are always rated at the top of the list of admired natural features by the tourism public. Because they are so highly valued, people will spend money to visit them. By protecting and publicizing our local old growth forests, local communities can benefit financially, and can enhance their reputation. (Possessing a primeval forest is a “classy” asset to showcase.) Some foresters dismiss Old growth Forest, claiming they have no economic value while uncut, or they call them “wasted timber.” Wood products are not the only economic value of magnificent and primeval forests. Ancient forest possesses economic value in the uncut, unmanaged condition, as a permanent, long-term tourist and recreation-business resource. Cutting down “Heritage Forest” or Historic or Champion Trees for the short-term profit is a skewed and destructive way to treat an irreplaceable treasure.

## Determining if a Site is Old Growth

Each time a site was visited, a professional, scientific judgment was made as to whether the forest was old growth or not. ***The general definition of Old growth Forest is provided in Chart 2.*** This determination is based on 30 criteria and techniques, ***described in Chart 3.*** Many of these are original, having been developed by this researcher based field research over the last 20 years. However, in most cases, the project researcher’s field experience enables him to confirm or reject sites as old growth forest in a relatively short time. This avoids the need to analyze all the criteria or

use the increment borer to core the trees each time. The project researcher's experience also enables him to visually estimate the age of trees within a 10% accuracy rate.

### **Documentation**

When a site is identified as Old Growth, the following data is recorded:

- Primary old growth tree species that comprise the forest.
- Old growth tree diameters, ages and relevant Old Growth characteristics
- Assessment of category of Old Growth and determination of its disturbance and ecological quality
- Acreage and shape of Old growth Forest tracks
- Information about the land use history and ownership
- Landforms, geological information, route taken
- Observed other species such as shrubs, herbaceous species, fauna, rare species
- Tree heights are measured only when it is determined that a tree is exceptionally tall, or a possible "champion tree." For this, the Bausch and Lomb Laser-Ranger Finder with Clinometer and trigonometry calculator are used. This state-of-the-science method is nearly error-free when used correctly, in contrast, the previously used height estimation methods are highly prone to error, typically +/-25%. Note that exceptional tree heights are supplemental data, and do not decide if a site is or is not OG. However, the tallest forests are almost always Old Growth or very mature second growth forests, minimally affected by human management, that is, requiring Old Growth or very mature 2<sup>nd</sup> growth forests, Minimally affected by human management, that is, requiring a long period of time free of human disturbance, and especially a condition in natural selection processes led to the genetically strongest and tallest individuals to survive. Human management and commercial exploitation rarely is capable of accomplishing this.
- These data are later put on formal data forms (example in Appendix). In addition, photos are taken for nearly every site (including slides).

## **Chart 2: Generic Definition of Old Growth Forest**

**Old growth Forest** has two parts to its definition:

1) a natural community that has been *continuously forested* since before European settlement, AND 2) that forest's canopy must be dominated by trees with ages of 150 years or older. Most old growth forests have 8 or more trees per acre that are 150 years old or greater. The 150-year figure is based on easily observed and well-documented changes that appear in trees around the 150-year mark. These include dramatic changes in bark, shape of trunk and canopy branches. It is not a randomly-derived figure.

**Old growth Grove:** A small stand of Old Growth Forest, 20 acres or smaller

**Old growth Forest Synonyms:** Ancient Forest, Pre-settlement Forest. Primeval Forest; *or related terms:* Primary Forest, Original Forest, First-Growth Forest.

**Virgin Old Growth:** an ancient forest that has had NO intentional disturbance by humans. A "**virgin**" old growth forest is the rarest of all. Most other old growth forests, in the past 200 years, have had a minor to moderate amount of human disturbance (selective logging, thinning, firewood cutting, fire, cattle grazing, etc.) (Part of Marcy's Woods and Niagara Cedars are Virgin Old Growth.)

**Secondary Old Growth:** A rare kind of Second-growth Forest that has been largely free of disturbance for 150 or more years since its original cutting or clearing, so that it is now again dominated by 150 to 300 year old trees. While the forest is not original or pre-settlement, and may have significant differences from the original tree composition, it still has many of the qualities of "First-Growth" Forests. Secondary Old growth Forests are only found where settlement was earliest, such as the Philadelphia-NY City-Boston corridor. In some sites, forests were cleared in the 1600s, but left alone since the 1700s or early 1800s and allowed to return to become impressive forest. Because Secondary Old growth is also rare, it should not be dismissed, as many scientists do. While of lower ecological value than Original Old Growth, their trees can be as great a size, height and age as Original Old Growth. Their aesthetic, historic and cultural values are often as great as Original Old Growth. For example, Connecticut's Cathedral Pines, partly an old Second-Growth stand, was long-famous as the finest old growth stand in all of New England.

## Visual Categories of Old Growth:

**“Big-Tree Old Growth”** – ancient forest of impressive, large-diameter trees. This is the classic image that people have of ancient forests, the most famous being Big-Tree White Pine stands. (Paradise Grove is our best example.)

**“Dwarf Old growth”** – charismatic ancient forest comprised of small trees that are typically bonsai-like, twisted, and bizarre in growth form. They include the most ancient of all forests and grow on severe habitats such as cliffs, talus, mountain tops, sand dunes and barrens, bogs. Cedars, hemlocks, birches, black gum, sassafras, holly, pitch pines, and certain oak species comprise them. (Many of the Niagara Gorge Cedars are Dwarf Old Growth.)

**“Medium-Stature Old growth”** – unimpressive, average-size trunks whose non-descript appearance gives little hint of their ancientness. They are hardest to recognize and are least appreciated. Because their age is rarely recognizable by visual clues, labor-intensive tree coring and intensive research is required to identify them. Found in swamps, upper mountain slopes, alvars, sand barrens, savannahs. (Example: some upper dune parts of Marcy’s Woods.)

**Champion & Historic Trees** – Individual trees of record large size or age for their species, or of historic remarkability. Many Champion Trees grow in Ancient Forests. However, others are single trees in yards, road sides, meadows and parks, sometimes in young forests. Some are exotic species and were planted, not natural. (Our examples: Niagara River Heritage Oaks, Erie Beach, Paradise Grove, Niagara Glen)

*People regularly get Champion Trees mixed up with Ancient Forests, even though they are as different as an individual human is from a neighborhood.*

## Chart 3. Techniques to Identify Old Growth Forests

### Prior to Conducting Field Work, to Identify Potential Old Growth Sites:

- **Contact Forest Experts** – People who are authorities or very knowledgeable about local forests were asked to identify sites they thought were good candidates for old growth forests. In

some cases, they were extensively interviewed. These included naturalists associated with Bert Miller Nature Club, Niagara Falls Nature Club and Hamilton Naturalists Club, area botanists and foresters, as well as knowledgeable people in local and provincial government and park staffs. About 28 sites were discovered by this method.

- **Aerial Photo Analysis** – The Map Library of Brock University was visited numerous times to analyze aerial photos. The earliest aerial photos from the 1930s were compared to aerial photos from 1996 to 2000 for the Towns of Fort Erie and Niagara-on-the-Lake and City of Niagara Falls. Mature forest areas with unbroken, undisturbed canopies that looked essentially the same on both early and current photos were copied and marked for field visits. Five sites were discovered by this method.
- **Identify Likely Landform and Property Categories** – Extensive experience over the last 20 years of old growth research has demonstrated that nearly all old growth forests are found on 5 types of landforms or properties. These were identified within the research area. They are: a) old public parks or other publicly owned properties purchased 50 to 100 years ago or earlier, b) old wealthy estates continuously maintained since the 1930s or earlier, c) old scenic zones and recreation areas (including lake cottage areas) popular with the public and continuously used since the 1920s or earlier, d) steep slopes, cliffs, extensive wetlands and other inaccessible landscapes, e) old rural properties owned continuously for many generations by families who have adopted preservation traditions for their woodlot. Eighteen sites were discovered by this method.

### Prior to Field Work, though can also be done after field work:

- **Contact and interview people knowledgeable about the land use history of the area.** Determine the decade when earliest settlement for this area began, when extensive forest clearing extended away from human settlement zones (this decade marks the dividing line between “Presettlement forest” and “post-settlement forest” (which can still contain Secondary Old Growth Forest).
- **Contact owner or other people knowledgeable about the land use history of the specific property’s forest.** Go back in time as early as



possible. Did the farmer use his forest for selective cutting on an ongoing basis, only once and never again, only for firewood, sugarbush, grazing? Is there any knowledge of any natural disturbance, fire, major blowdown, clearing of “underbrush”, planting of trees?

## Techniques Used in Forest Field Work:

### Measurement of Tree Ages.

- **Increment Borer** – used only when necessary. Very accurate, but invasive, laborious, time consuming
- **Counting rings of trees with exposed inner surfaces:** blown down trees, trees cut when fallen across trails, stumps, hollow trees
- **Estimating tree ages by experienced researchers** – a forest of small and less mature trees is easy to recognize as non-old growth without need of any other method. Old growth experts can quickly distinguish very mature forests from old growth forests using experience and visual observation of physical indicators without needing to measure tree ages.

### Assessment of Growing Conditions for that Site:

- Is it poor growing conditions (slow growth)? If so, small diameters could still mean very old for that size tree.
- Is it rich growing conditions (rapid growth)? If so, large diameters could mean trees are not as old as they look, not necessarily old at all. Matching with type of tree species (trees fall into fast, medium, or slow growing categories) and presence of old growth indicators below will determine answer.

### Large Diameter Trunks (30 inches diameter or greater)

- Several “Big-Trees” per acre, preferably 8 or more per acre, are an excellent indicator. Most common “Big-Tree” species: *oaks, maples, hemlock, pines, hemlock, ash, birch, beech, basswood, walnut, sycamore, black cherry*
- The Big-Tree Rule does NOT apply to fast growing trees that rarely grow in Old Growth Forests: *willows, aspens, cottonwood, paper and gray birch*
- Lack of Big-Trees does NOT mean “not old growth.” Small-tree Old Growth is found in harsh environments such as rocky slopes, hill-tops, cliffs, wetlands

### Presence of Long-lived or Shade-tolerant Trees

- Best indicators are *hemlock, sugar maple, white and red oak, yellow and black birch, tulip tree, beech, black gum, white cedar, white ash, walnut*
- Trees that indicate it is NOT old growth (if numerous): *willows, aspens, cottonwood, paper and gray birch, sumac, black locust*

### Presence of Commercially Very Valuable Species

- Include medium to large black walnut, cedar, black cherry, white pine –excellent sign!

**Old Growth Bark (“Antique Bark”)** When trees reach 150 years old, the bark changes on most species, which looks very different from bark of younger trees

- Excellent sign!: Balding bark, shaggy bark (separating or curling strips), craggy bark (deeply grooved, fissured bark), platy bark
- Trees that display this: pines, maples, birches, oaks, tulip tree, sycamore, black gum, cottonwood, cucumber magnolia. Hemlocks get rusty-hued

### Buttressed Trunk Bases

- Trunk bases and roots flare out or swell at the base

### Soaring Branchless Trunks with Lowest Bough at Great Height

- Lowest bough starts at 25 to 40 feet up, or even as high as 60 to 90 feet!

### “Stagheaded” Crown

- Thick trunk ends in horizontally radiating short, craggy boughs bent at right angles - caused by centuries of damage and healing from ice and wind storms, lightning

### Moss Grows Up the Trunk

- The higher up a trunk that moss grows, the more confident that the tree is of great age. Reason: moss grows very slowly, and starts growing from the base (in *our* region – does not apply down upper mountain elevations, South, Pacific states or Tropics). Best moss-growers: *yellow birch, sugar maple, white ash, cucumber magnolia, white oak*. Do not get moss mixed up with lichens, which can be light green

**Bizarre Growth Forms** The older a tree is, the more likely it is to grow into bizarre shapes. Others don’t become bizarre, but may just grow straight and towering

**Knotty, Knobby, Gnarly, Burly**, picturesque, charismatic, “misshapen” trunks

**Spiral-Grain** visible swirling up the trunk

**Crooked Trunks** Trunks growing at an angle “Leaners”, “Zigzag” trunks, trees growing on Stilt-Roots (hemlock, yellow birch) or trees with fused or intertwined trunks, branches or roots, including “Lover Trees” and “Window Trees, Dwarf Trees and trees whose shape deserves them to be nicknamed “Bonsai” Trees. These grow on cliffs or mountain summits

**Cliff Trees** Ancient trees associated with cliffs attain fantastic shapes, designated by nicknames such as “**Daredevil**” trees (trunks project horizontally out over cliffs, as much as 40 feet out), “**Upside-down**” Trees (trunks hang down cliffs), “**Root Ladder**” trees. These are primarily cedars, hemlock, yellow and black birch

**Pit and Mound Shapes on the Forest Floor.**

- Depressions and mounds, 2 to 4 foot deep and high, are only caused by toppling of *large* trees in the long-ago past, which then decayed away to leave “grave monuments” as reminders they were there. If large trees grow among pits-and-mounds, it ensures a continuous time period of many centuries that large trees have made up this forest.
- Past logging eliminates big trees (that can create pit-and-mounds, and agriculture flattens out pit-and-mounds. *Absence* of pit-and-mounds, however, does not mean much.

**Many Large Logs in Different Stages of Decay**

- Created by large standing trees that fall here and there over a long period of time, with the older logs reaching greater stages of decay. In contrast, logging (actually “de-logging”) in the past removes large trees that would otherwise contribute to the supply of older logs. *Absence* of logs, however, does not always imply anything.
- Includes abundant “coarse woody debris” which means fallen branches, especially common in mountain and Northwoods forests. Lush moss layers often carpet the logs

**Abundant and Diverse Populations of Fungi, Mushrooms, Lichens, Mosses and Ferns**

- Old Growth Forests are the best place to find the most mushrooms, lichens, and primitive plants. Reason: large, continuous supplies of decaying logs; thick carpets of decaying leaves and rich organic soil; millennia of relatively stable conditions for soil colonies of fungi to grow undisturbed, and no shocks from the introduction of bright light or drying conditions caused by logging or natural disasters. 51 species of lichen grow only in Old Growth Forests. Scarce fungi, moss or ferns does not imply much.

**Absence or Minor Evidence of Logging or Human Disturbance**

- A few, scattered stumps or minor signs of the above disturbance-indicators does NOT rule out an Old Growth Forest. It just indicates that it had some past disturbance.

**Indicators that a Site May Not Be Old Growth**

When disturbance-indicators are regular and common (and Old growth Indicators are rare or absent), it is definitely not old growth. **The following signs indicate a site may NOT be Old Growth:**

**Numerous stumps**

**Logging road corridors through the forests**

**“Open-Grown” trees with branches that start 5 to 15 feet from the ground**, spreading horizontally out (indicating the trees started in a sun-lit field or clearcut)

**Trees that prefer to grow in young and disturbed forests**, such as *aspen, black locust, white and gray birch, Manitoba maple (ash-leaf maple or box-elder), willow, hawthorn, Norway maple*

**Presence of planted or non-native trees**, such as *Norway spruce, Scotch pine, tree of heaven, Norway maple.*

**Certain trees with multiple trunks from their base (“coppiced trees”)**, which means they sprouted from a stump. Applies to *red and black oak, red maple, birches*

**Old stone walls** running through the forest

## SECTION 2: INVESTIGATION SUMMARY TABLES

### Summary of Old Growth Discoveries For Phase 2

For Phase 2 of the Eastern Niagara Peninsula Old Growth Forest Survey, **33 were confirmed as Old Growth Forest (or Old Growth Tree) sites (559 acres)**. A total of 55 sites were surveyed, which means that 22 surveyed sites were found not to be Old Growth. They are briefly described in the Appendix.

The Phase One survey reported, “highly significant discoveries were made [22 sites totaling 275.25 acres], and the magnitude of these discoveries far surpassed all expectations.” The survey’s Phase 2 discoveries were *equally high in significance and also far surpassed all expectations*:

**1) Discovery of the largest known Old Growth Broadleaf (“Hardwood”) Forest on the Canada-U.S. boundary line** in Eastern (and probably all of ) North America: the roughly 205-acre Old Growth forest on Navy Island, in the middle of the Niagara River, just upstream from the Great Falls of Niagara. In fact, it is surpassed in size only by the vast primeval pine forest on the Minnesota-Western Ontario boundary, and is the only known old growth-covered island in the three eastern Great Lakes.

**a) it has the greatest Old growth tree diversity in Northeast North America** (25 species of Old growth trees), including several trees never before found as Old Growth in this part of the continent: Red Ash, Downy Juneberry, Shellbark Hickory, Pin Oak.

**b) much of it is covered by a never previously recorded category of ancient forest: Old Growth Shumard Oak-Pin Oak-Swamp Oak-Bur Oak-Shellbark Hickory Wetland Forest.** If preliminary data is confirmed by upcoming expeditions, this type of forest is not only exceedingly rare in mature form, but it would be the **world’s only known example in old growth status**, new to the annals of science.

**c) also contains numerous trees of record size**, some of which are the largest for their species in North America, Canada, or Ontario. Some are normally shrub species which, in this remarkable old growth forest, grow to tree size here.

**2) Discovery of what could be Canada’s largest forest-grown** (rather than field or yard-grown) **Black Walnut** (212 in. (538 cm.) circumference). Its significance is enhanced by the fact that it:

a) grows in **one of North America’s few surviving Old growth Black Walnut Forests**,

b) located on the rim of the Niagara Gorge at its mouth, where the **ancestral Niagara Falls was born** (hence its name “**Birthplace of Niagara Falls Walnut Grove**”), and

c) **across from the Brocks Monument Old Growth Scarlet Oak Grove**, which contains the **tree species that is the new addition to Canada’s national tree flora**.

**3) Discovery of 25 acres of high quality old growth at the most surprising and unexpected location of all: starting within 75 feet of Niagara Falls’ commercial tourist district, Clifton Hill.** It runs for a half-mile along the hill slope beneath its hotel, casino and observation tower skyline, within the roar and mist zone of Horseshoe Falls which lies near its base. This ancient forest of 11 tree species, up to 4.3 feet diameter and 275 years old, has for centuries formed the scenic backdrop for the world’s largest waterfall and most famous nature tourist attraction. Now it can be appreciated as a natural, scenic and historic treasure in its own right.

**4) Assembling of a previously unrecognized, remarkable “Bi-national Niagara Corridor of Forest Antiquity”:** a 15-mile long belt of 20 Old growth sites (501 ac.) linked by the “Necklace of Heritage Oaks,” running nearly continuously from Niagara-on-the-Lake’s Paradise Grove through and along the Niagara Gorge, ending at the southern municipal boundary of Niagara Falls (Bowman’s Black Gum Grove). This is matched by a parallel belt of 7 Old growth sites (29 ac.) of the same length on the New York side. **Bi-national Total = 27 sites with 533 acres.** *Publicizing this is an ideal opportunity to benefit the ecotourism economy and develop a partnership to grow appreciation for the bi-national area’s natural and historic heritage by promoting a concept that is growing in popularity, but new to this region: “Ancient Forests,” “Champion Trees” and “Heritage Trees.”* It can emphasize that Niagara Falls, Ont. has the greatest amount of Old Growth of any eastern North American city, Ontario’s tallest broadleaf forest, the largest broadleaf ancient forest on the international boundary, and all of this surrounding the world’s largest waterfall and most famous natural tourist attraction. \*In addition, 5 additional Old growth Forests (totaling ~54 acres) were discovered in areas neighboring the Niagara Peninsula, because other botanists or University of



Guelph heard of the success of this project in finding Old Growth, and requested my expertise to come to identify Old Growth in their area.

**5) The addition of a major type of Old Growth Forest not previously recorded along the Niagara Escarpment.** Prior to this survey, the Escarpment was world-famous for its ancient cliff-dwelling Northern White Cedars. **We now realize the Niagara Escarpment also harbours outstanding, diverse Broadleaf Old growth Forests within its waterfall gorges, and at several points on its rim.** All of it is physically accessible and connected by the Bruce Trail and its associated trails. The Phase 2 new sites are: Balls Falls Gorge (~50 ac.), Grimsby Point (10 ac.), Rockway Gorge (12 ac.), Beamers Gorge (1 ac.), Decew Gorge (27 ac.), Swayze Falls Ravine (7 ac.), Terrace Creek Gorge (3 ac.); the Phase 1 sites are Brocks Monument Scarlet Oak Grove (where the Bruce Trail was “born”), as well as 5 Old growth Broadleaf sites on the Niagara River’s Escarpment, all connected by trail to the Bruce Trail. Surveys of the Niagara Escarpment to the west of the study area are needed because they will reveal additional Broadleaf Old Growth. The value of these Broadleaf Old growth Forests is high because, unlike the cliff cedars, people, including Bruce Trail users, can obtain the rare, intimate and inspiring experience of knowing they are walking through Ontario’s pre-settlement landscape, an experience not previously available.

**a) another type of Old Growth cliff community previously undocumented along this part of the Escarpment: ancient Eastern Red Cedars** on the cliff face and rim of Rockway and Balls Falls Gorges, with ages up to 500 years, possibly more.

**6) Confirmation of Lake Erie’s easternmost lakeshore Savannah Grove,** located at Morgan’s Point, containing trees up to 73” diameter and 300 years old, including Old Growth Black Walnuts, and 4 other ancient tree species.

**7) Documentation of a site tied for the second highest Old Growth tree species diversity in Northeast North America.** The Lathrop Preserve, near Fonthill, has **16 species of trees** that attain Old Growth status within its 12 acres of exceptionally high quality ancient forest.

**a) Discovery of a second site for Scarlet Oak, the tree species that is a new addition to the flora of Canada.** (first discovered during Phase 1). They are Old Growth, up to 34.5-inch diameter.

**8) Addition of two coastal dune sites covered with Old growth Forest, Sugar Loaf Hill (4 ac.)**

**and Holloway Bay Dunes (10 ac.).** Marcy’s Woods, discovered during Phase 1, was the first such dune site. Old Growth sites along the project area’s 25-mile long Lake Erie shore now total 5.

**9) Establishment of Short Hills Provincial Park as a de facto “Old Growth Forest Reserve,” with 5 Old growth Forest sites:** St. Johns Woodland Centre Ravine (12 ac.), Hemlock Valley (12 ac.), Swayze Falls Ravine (7 ac.), Terrace Creek Gorge (3 ac.), and Twelve-Mile Creek Floodplain (4-ac.). Supplementing these are numerous individual Heritage Trees of very large dimensions in meadows, including Ontario’s Champion Butternut tree. Several other areas have very mature second-growth forests that will succeed into Secondary Old Growth in a couple of decades.

**10) Identification of the Fonthill Kame Ridge and Ravine Formation (south of Short Hills) as a “Nucleus for Old Growth Carolinian Forest Survival.”** Six sites are documented with 43 acres of exceptional diverse Carolinian Old Growth Forest. Three are public/non-profit natural areas, St. Johns Cons. Area (5 ac.), Lathrop Preserve (12 ac.), and Hamilton Naturalists Club Preserve (6 ac.); the 3 private sites total 22+ acres.

**11) Discovery of an additional 65 acres of Old growth Forest to the Niagara Gorge:** 6-acre “Birthplace of Niagara Falls” Walnut Grove, 25-acre Whirlpool Basin Slope Forest, 4-acre Smeaton’s Ravine, and ~40 acres of First-Growth Steep Slope Broadleaf Forest. **Updated Total:** Ontario side of Niagara Gorge = **8 Old Growth sites with 195 acres.**

**12) Discovery of numerous record-sized (“champion”) trees that are among the tallest or largest diameter (for their species) on a national, provincial, or regional basis.** Selected Phase 2 examples are: World’s largest Black Walnut; Canada’s largest Hill’s Oak; probable Canada’s largest Shellbark Hickory, Canada Plum, and Spicebush (as a tree); possibly Ontario’s tallest Bitternut, Pignut, Chinkapin Oak, White Ash, Pin Oak, Black Maple, Black Gum, Pear tree, Mazzard Cherry, Downy Serviceberry.

**13) A total of 11 Nationally or Provincially Threatened and Rare trees or wildflowers were documented.** Besides the Scarlet Oak, this include new sites for the threatened Red Mulberry, American Chestnut, and Shumard Oak.

**14) The data base of forest science was significantly expanded in the areas of maximum**

**longevity and height of trees. The maximum age or height was obtained for the first time or extended for 12 tree species.** This directly benefits the field of ecology and tree genetics, and understanding of tree survival under severe conditions. This in turn can benefit forest management with the aim of obtaining genetically taller, stronger, and longer-lived trees. In addition, 11 tree species were found that had never previously been formally documented or measured in Canada as Old growth trees or as integral members of Old growth Forests: Shellbark Hickory, Hill's Oak, Hop Hornbeam, Butternut, Chinkapin Oak, Bitternut, Pignut, Pin Oak, Sassafras, Flowering Dogwood, Downy Junberry. Also, several new types of Old growth Forests were recorded that have never been recorded elsewhere in Eastern North America.

## **Other Phase 2 Survey Statistics:**

### **ACREAGE**

- 3 large Old growth Forests (40 to 205 acres each)
- 17 small groves (0.5-acre to 8 acres)
- 10 medium-sized sites (10 – 30 acres)
- 3 assemblages of ancient champion-size and historic trees

### **FOREST TYPES**

- 18 Carolinian Oak-Sugar Maple-Tulip Tree Forests
- 2 Carolinian Oak Wetland Forests (one a unique type with Old growth Shumard Oak-Pin Oak- Swamp Oak-Bur Oak-Shellbark Hickory Wetland Forest)
- 2 Carolinian Maple forests (on sand dunes)
- 1 Carolinian Black Walnut-Sugar Maple Forest
- 1 Savannah Oak-Black Walnut woodland
- 2 Hemlock-Northern Hardwood Forest
- 1 First-Growth Steep Slope Forest – mix of Carolinian, Hemlock, Cedar, Pioneer Trees, & Invasive Exotics
- 1 Northern White Cedar cliff community
- 2 Eastern Red Cedar cliff communities
- 3 assemblages of very large diameter ancient “Heritage Trees”

### **OWNERSHIP**

- **8 sites (and part of one) in PRIVATE ownership**
- **25 PUBLIC or NON-PROFIT owned:**
  - 12 Provincial or Regional Parks
  - 5 Conservation Areas
  - 1 National Historic Site (Parks Canada)
  - 2 Town Parks
  - 2 non-profit Nature Preserves
  - 2 School-owned
  - 1 Cemetery

### **PROTECTION STATUS**

Of the 8 **PRIVATE** sites, none have protection, with:

- the private portion of one site potentially threatened by development, which recently destroyed the adjoining section
- 2 sites threatened by recent logging
- 1 site being damaged by severe, erosive, uncontrolled ATV use
- For the 4 other sites, no immediate threats apparent

Of the 25 **PUBLIC**-owned and **NON-PROFIT** sites:

- 21 appear completely protected
- 1 has realistic potential for abuse
- 1 is threatened with partial clearing with Town Board approval
- 1 is generally protected but major individual trees unexplainably cut down by staff along trail
- 1 has no protection, one portion with rare plants was destroyed by public owner; potential for future abuse exists

### **MUNICIPALITY**

- 7 sites in City of Thorold (70 ac. total)
- 3 sites in City of St. Catharines (14 ac. total)
- 2 sites in City of Port Colbourne (14 acre total)
- 5 sites in Town of Pelham (41 ac. total)
- 2 sites in Town of Lincoln (62 acre total)
- 7 sites in City of Niagara Falls (325 ac. total)
- 4 sites in T. of Grimsby (11.5 ac. total)
- 1 site in Town of Wainfleet (8 acres)
- 1 site in T. of Niagara-on-the-Lake (Heritage Trees)
- 1 site in Town of Fort Erie (14 ac.)

## Summary Of Old Growth Discoveries For Phase 1

1) **Discovery of the world's last Old growth Black Maple Forest, Marcy's Woods.** It is also only the second site in North America where mature (as well as Old Growth) Eastern Hemlock grows on sand dunes.

2) **The tree species, Scarlet Oak, was discovered for the first time in Canada.** Its official range map in all future tree guides must be adjusted as the newest addition to Canada's flora. The site where Scarlet Oak was found is in the **Brocks Monument Oak Grove**. It is also the only "big-tree" **Old growth** Scarlet Oak grove recorded in North America, outside of the southern Appalachians.

3) **Discovery of Canada's only Old growth Shumard Oak forest (Gray Family Forest), and the only OldGrowth Shumard Oak forest outside of the U.S. Deep South.** (Phase 2 added Navy Island as the second site.)

4) **The largest Old growth Forest within the city limits of any city in eastern North America.** This is **Niagara Glen** (60 acres) plus the **Niagara Gorge ancient cedar zone** (10 acres) that lies within the City of Niagara Falls, Ontario, with a combined total of 70 acres. (Phase 2 discoveries increased this acreage to 395.4 acres.)

5) **Original discovery of ultra-ancient cedars in the Niagara Gorge.** Although the gorge has been studied over 200 years by hundreds of scientists, until now, no one had realized that it had cedars that attained ages over 500 years, possibly to 700 years.

6) **Discovery of possibly the tallest broadleaf ("hardwood") forest in the Province of Ontario: Niagara Glen's Old growth Forest.** Its tallest Tulip Tree (Canada's tallest) has a champion height of 134 feet. The Glen also has Canada's tallest Sassafras and Chinkapin Oak.

7) **Ultra-ancient Black Gums, 300 to 500 years old, in Bowmans Archery Club Black Gum Grove. This makes this the oldest known hardwood forest in the Niagara Peninsula.**

8) **Discovery of some of the largest diameter trees (for their species) in Ontario.** These include a 6-foot diameter Red Oak, 4-foot Shumard Oak (Canadian champion), 42-inch diameter Scarlet Oak (probable Canadian champion); Canada's national champion

Cockspur Hawthorn (34 inch thick) and Sweet Pignut Hickory; and a 4.65 foot diameter forest-grown Black Walnut.

## Other Phase 1 Survey Statistics:

### ACREAGE

- 3 large Old growth Forests (55 to 60 acres each)
- 15 small groves (1/4-acre to 6 acres)
- 2 medium-sized sites (10 – 15 acres)
- 2 assemblages of ancient champion-size and historic trees

### FOREST TYPES

- 8 Carolinian Oak Forests
- 5 Carolinian Oak-Tulip Tree forests
- 1 Carolinian Black Maple forest (on sand dunes)
- Sugar Maple forests
- 1 Swamp Oak-Black Gum-Red Maple forest
- 1 Northern White Cedar cliff community
- 2 assemblages of very large diameter ancient "Heritage Trees"  
(oaks, maples and other trees)

### OWNERSHIP

- **12 sites in PRIVATE ownership**
- **10 PUBLIC owned:**
- 5 Regional Parks
- 1 Regional Park Nature Preserve
- 4 Municipal Parks

### PROTECTION STATUS

Of the 12 **PRIVATE** sites, none have protection, with:

- 1 being destroyed as of this writing
- 1 destroyed after discovery
- 1 threatened by development and already damaged after discovery
- For the 8 other sites, no immediate threats apparent

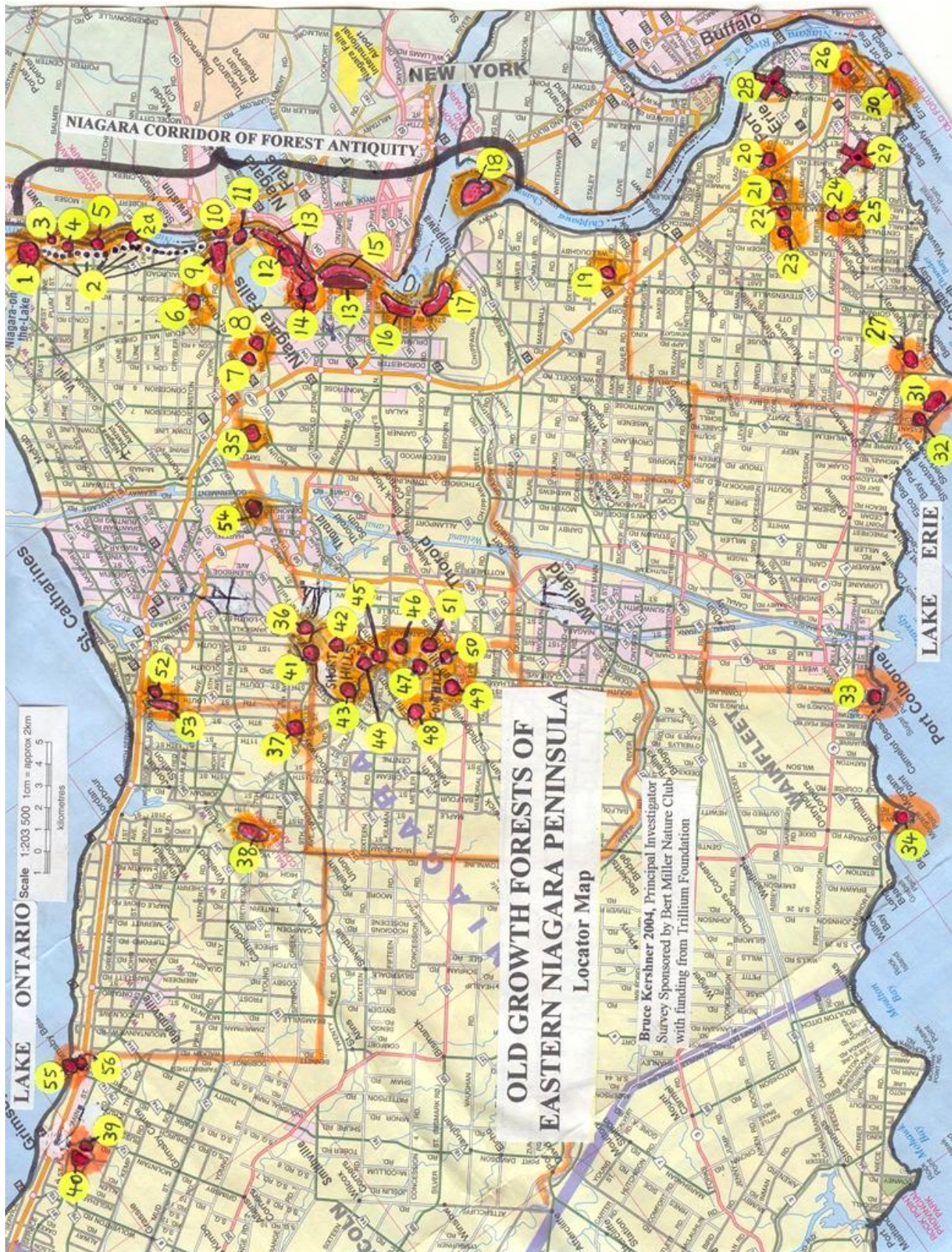
Of the 9 **PUBLIC**-owned sites:

- 3 appear completely protected
- 5 are officially protected but abuse potential exists
- 1 is generally protected but major individual trees unexplainably cut down by staff along trail

### MUNICIPALITY

- 5 sites in City of Niagara Falls (90.4 acre total)
- 12 sites in Town of Fort Erie (104.35 acre total)
- 5 sites in Town of Niagara-on-the-Lake (80.5 acre total + Heritage Trees)







# EASTERN NIAGARA PENINSULA OLD GROWTH FOREST SITES

## INDEX TO MAP

### Niagara Corridor of Forest Antiquity

1. Paradise Grove
2. Necklace of Heritage Oaks
- 2a. Browns Point & Heritage Trees
3. Niagara River Bluff Slope Grove
4. McFarland House Grove
5. Red Shale Ravine Grove
6. Gray Forest Shumard Oak Grove
7. Bruce Trail-Fireman's Park Grove
8. Calaguiro Park Grove
9. Bruce Trail Scarlet Oak Grove
10. Birthplace of Niagara Walnut Grove
11. Smeaton's Ravine
12. Niagara Glen
13. Niagara Gorge Ancient Cedars
14. Whirlpool Basin Forest
15. Niagara Gorge 1st-Growth Slope Forest
16. Clifton Hill Bluff
17. Queen Victoria Park Bluff
18. Navy Island

### Upper Niagara River & Fort Erie Sites

19. Bowmans Archery Park Black Gum Grove
20. Bowens Road Grove
21. Ridgemont Road Swamp Oak Grove
22. Skarrett Maple Grove
23. Split Rock Grove
24. Ridgemont Road Hybrid Oaks
25. 6-Mile Creek Oak Grove
26. Walden Blvd. Oak Grove
27. Phillips Sugarbush
28. Frenchmans Creek Grove (destroyed-logged)
29. Olivers Bush Grove (destroyed by logging)

### Lake Erie Shore Sites

30. Erie Beach Park Grove
31. Marcy's Woods
32. Holloway Bay Dunes
33. Sugar Loaf Hill Dune
34. Morgan's Point Savannah

### Niagara Escarpment Sites (W. of Falls Corridor)

35. Higenell Grove
36. Decew Falls Gorge
37. Rockway Falls Gorge Forest & Cedars
38. Balls Falls Gorge Forest & Cedars
39. Beamers Falls Gorge Forest
40. Grimsby Point

### Short Hills - Fonthill Ridges Sites

41. 12-Mile Creek Floodplain Forest
42. Terrace Creek Gorge Forest
43. Swayze Falls Ravine
44. Hemlock Valley
45. St. Johns Woodland Centre Ravine
46. North Fonthill Kame Ravine-Ridge Area
47. St. Johns Conservation Area Ravines
48. Hamilton Naturalists Club Short Hills Preserve
49. Lathrop Preserve
50. South Fonthill Kame Ravine-Ridge Area
51. Central Fonthill Kame Ravine-Ridge Area

### Lake Ontario Coastal Plain Sites

52. Woodland Elem. School Oak Grove
53. 15-Mile Pond Shore Bluff
54. Victoria Lawn Heritage Trees
55. Grimsby Beach Grove
56. Grimsby School Grove

<b>NIAGARA PENINSULA OLD GROWTH FOREST SURVEY</b>					
<b>OLD GROWTH FORESTS DISCOVERED DURING PHASE 1</b>					
SITE	Acres	FOREST TYPE	LOCATION	OWNER	UNIQUE FEATURES, COMMENTS
NIAGARA GLEN	60	CAROLINIAN MAPLE-Tulip	Niagara Falls	public preserve	World-class nature preserve, one of Ontario's tallest forests, rare species, spectacular rock formations, gorge, Devils Hole Rapids, 130-foot Tulip Trees, rare Chinkapin Oak, Red Mulberry, towering Sassafras, 400 yr old Cedars
NIAGARA GORGE CEDARS	10	Cliff-Dwelling CEDARS	Niagara Falls	public preserve, part utility	650 ancient orthern White Cedars along 7 mile of Niagara Gorge, pos. up to 600-800 yrs. old, extremely gnarled, bizarre growth forms, same number on NY State side, get to within 75 feet of the Falls
PARADISE GROVE	55	White-Red OAK (former savannah)	Niag-on-Lake	public preserve	Greatest concentration of large trees of any forest found in Niag. Peninsula. Formerly an oak savannah, oaks up to 310 yrs old, 4.5 feet diameter
MARCY'S WOODS	65	CAROLINIAN Black MAPLE	Fort Erie	private	World's last old growth Black Maple forest, threatened by development. Contains more rare species than any site in Ontario. Incl. threatened hop tree, 300 yr old Black Maple, all Trillium species
BROCKS MONUMENT SCARLET OAK GROVE	15	White-Red-Scarlet OAK FOREST	Niag-on-Lake	public park	Canada's only Scarlet Oak forest; Canada's first National Trail, Bruce Trail, begins here next to Brocks Monument, follows Niagara Escarpment heading west from Niagara Gorge
BOWMANS ARCHERY CLUB BLACK GUM WOODS	6	Lowland Swamp Oak-Red Maple-Black Gum	Niagara Falls	private?	Ultra-old Black Gums, 300-450 yrs. old, possibly oldest hardwood forest in Niagara Peninsula. Protection status unknown.
GRAY FOREST SHUMARD	6	CAROLINIAN OAK-TULIP	Niag-on-Lake	private	North America's one of only (and Canada's) two old growth Shumard Oak forests, outside U.S. Deep South. Grove is filled with rare tree species, very high biodiversity. Protection status uncertain
NIAGARA RIVER BLUFF WOODS (4 separate groves)	5	White-Red OAK-Black Walnut	Niag-on-Lake	public preserve	Ancient woods along slopes or ravines of Niagara River, some containing giant oaks, incl. 4.5 foot diameter Black Walnut, oaks as old as 280 yrs. Old
NIAGARA RIVER HERITAGE OAKS	125 trees	White-Red Oak	Niag-on-Lake	public park	"Necklace' or continuous line of 125 giant, ancient oaks & some Walnuts, up to 320 years old & 6 feet diameter, running 7 miles from Paradise Grove to Queenston
ERIE BEACH GROVE	15	Oak, Maple, Cottonwood	Fort Erie	public park	Assemblage of enormous trees once part of amusement park (closed 1933), new forest has grown up around them, many giant trees were part of original old growth forest

OLIVER'S BUSH GROVE	3	Sugar MAPLE	Fort Erie	private	Very old Sugar Maples once part of large forest, now a backyard residential grove. <b>NOW PLANNED TO BE LOGGED</b>
SPLIT ROCK GROVE	1	Sugar MAPLE	Fort Erie	private	Ancient Sugar Maples grow along Onondaga Escarpment ledge; historic Split Rock crevice is adjacent. Protection status uncertain.
PHILIPS SUGAR BUSH GROVE	5	Sugar MAPLE	Fort Erie	private	300-400 year old Sugar Maples once part of sugar bush. Protection status uncertain.
BRUCE TRAIL-FIREMANS PARK GROVE	6	CAROLINIAN OAK-TULIP	Niagara Falls	public?	Canada's first National Trail, Bruce Trail passes through this grove of secondary old growth oak forest
CALAJUIRO PARK	4	Red-Black OAK	Niagara Falls	public park	Impressive large oaks fill this small suburban park
BOWEN ROAD-QEW GROVE	5	OAK-MAPLE	Fort Erie	private	Large ancient oaks and maples along QEW. Protection status uncertain.
SKARRETT MAPLE GROVE	7	Sugar MAPLE	Fort Erie	private	Ancient Sugar Maples grow along Onondaga Escarpment. Protection status unknown
SIX MILE CREEK OAK GROVE	0.65	Red-Swamp OAK	Fort Erie	private	Tiny remnant ancient oak grove on upland island. Protection status uncertain. Surrounding woods regularly logged.
RIDGEMOUNT ROAD HYBRID OAK GROVE	0.6	Hybrid Bur-White OAK	Fort Erie	private?	Very unusual because of hybrid Bur Oak-White Oak trees. Has value as scenic buffer along Highway 3. Protection status uncertain.
WALDEN BLVD. OAK GROVE	0.75	Bur-White OAK	Fort Erie	private?	Ancient woodland corridor separates homes from businesses in downtown Fort Erie. Protection status uncertain.
HIGENELL OAK GROVE	4	Red-White OAK	Niagara Falls	private	Attractive secondary oak and maple grove near Bruce Trail and Niagara Escarpment. Protection status uncertain.
FRENCHMAN'S CREEK OAK GROVE	5 logged	Red-White- & Swamp OAK	Fort Erie	private	Formerly had impressive ancient oaks. <b>OWNER LOGGED ENTIRE PROPERTY, INCLUDING OLD GROWTH, summer 2003</b>
TOTAL ACRES	279	6 Forest Types	9 public, 13 private		



NIAGARA PENINSULA OLD GROWTH FOREST SURVEY										
RANKING OF PHASE 1 OLD GROWTH FORESTS ACCORDING TO 8 VALUES										
3 = Highest value, 2 = medium, 1 = low value, 0 = none										
Site	Status of Protection	Uniqueness Value	Scientific & Ecological Value	Historic Value	Scenic and Inspirational Value	Wildlife Habitat Value	Rare Species Value	Ecotourism and Economic Potential Benefit	Educational Value	Total Points
NIAGARA GLEN	High	3	3	3	3	3	3	3	3	24
NIAGARA GORGE CEDARS	High	3	3	3	3	3	3	2.5	3	23.5
PARADISE GROVE	High	3	3	3	3	3	2.5	2.5	3	23
MARCY'S WOODS	Threatened	3	3	3	3	3	3	2	3	23
BROCKS MONUMENT SCARLET OAK GROVE	Med-High	3	3	3	2.5	3	3	2	3	22.5
GRAY FOREST SHUMARD OAK GROVE	None	3	3	3	2.5	2.5	3	1	3	21
NIAGARA RIVER BLUFF WOODS	High	3	2.5	3	3	2.5	1	1.5	3	20.5
NIAGARA RIVER HERITAGE OAKS	Med-High	2	2.5	3	3	2	2	3	3	20.5
BOWMANS ARCHERY CLUB BLACK GUM WOODS	None?	2.5	2.5	3	2	2.5	2	1	3	18.5
ERIE BEACH GROVE	High	0	2.5	3	3	2	0	2.5	3	16
BRUCE TRAIL-FIREMANS PARK GROVE	Medium?	1	1	2	2	2	2.5	1	2	13.5
CALAJUIRO PARK	Med-High	1	1	1.5	2	2	2.5	0.5	2	12.5
RIDGEMOUNT ROAD HYBRID OAK GROVE	None	1.5	2	1.5	2	1	2.5	0	2	12.5
SPLIT ROCK GROVE	None	1	2	2.5	2.5	1.5	0	0	1	11.5
PHILIPS SUGAR BUSH GROVE	None	1	2	2	2	2	0	0	1	10
SKARRETT OAK GROVE	None	1.5?	2	2	2	2.5	0	0	0	10
BOWEN ROAD-QEW GROVE	None	1	1	1.5	2	2	0	0	1	8.5
HIGENELL OAK GROVE	None	0.5	0	1	2	2	0	0	0	5.5
SIX MILE CREEK OAK GROVE	None	0.5	0.5	0.5	2	1.5	0	0	0	5
WALDEN BLVD. OAK GROVE	Low-None	0.5	0	1	1.5	1	0	0	0	4
OLIVER'S BUSH GROVE	Being logged (2004)	0	0	0	0	0	0	0	0	0
FRENCHMAN'S CREEK OAK GROVE	Destroyed in 2003 (9ac)	0	0	0	0	0	0	0	0	0

## NIAGARA PENINSULA OLD GROWTH FOREST SURVEY

### OLD GROWTH FORESTS DISCOVERED DURING PHASE 2

SITE	Acres	FOREST TYPE	LOCATION & OWNER	UNIQUE FEATURES, COMMENTS
NAVY ISLAND	205	Rare CAROLINIAN Wetland Oak-Hickory	Middle of Niagara River; National Park Historic Site	Largest old growth broadleaf forest on entire Canada-US boundary; only known example of Old Growth Shumard Oak-Shellbark Hickory-Pin Oak-Bur Oak-Swamp rare Pawpaw, champion trees, archeological sites, 1837 rebellion site, historic 1700s naval site Oak Wetland Forest.
BALLS FALLS GORGE	~50	1)Hemlock-No.Hardwd; 2) Carolinian Forest; 3)Cliff Red Cedars	Conservation Area Niagara Escarpment, Town of Lincoln	Towering, inspiring, pristine forest in spectacular gorge carved by 88' tall Balls Falls. Bruce Trail takes visitors on easy route through much of it past beautiful cascades & pools. Gnarled 500 yr. Red Cedars cling to upper cliffs. One of finest forests in Niagara Peninsula.
Birthplace of Niagara Falls Walnut Grove	6	CAROLINIAN (Black Walnut-Maple)	Regional Park; Rim of Niagara Gorge	Canada's largest forest-grown Black Walnut soars over other giant Walnuts in stunning forest on rim of Niagara Gorge where ancestral Niagara Falls was born; 80' falls drops out of forest. Right next to Queenston Bridge, Brocks Monument & its Old Growth Scarlet Oak Grove.
ST. JOHNS WOODLAND CENTER RAVINE	18	CAROLINIAN Forest (Ash, Maple, Beech, Hickory, Walnut)	Short Hills Provincial Park, City of Thorold	Exquisite, towering forest with 10 ancient tree species including huge 240 yr. old Black Cherry, Bitternut, Pignut, Black Walnut, just behind popular enviro. education center on south edge of Short Hills Prov. Park. Its discovery will greatly enhance enviro. programs at the center.
Whirlpool Slope Forest	25	CAROLINIAN Forest (Sugar Maple, Tulip Tree, Beech, Wh.Ash, Red Oak)	Regional Park; Slope of Niagara Gorge	Contains among largest Tulip trees in the region, including 350 yr. old giant. Most trees are medium diameter, but very tall, on this very steep slope overlooking the great Whirlpool 275' below. Ancient Cedar-lined cliffs develop upstream, where 240' Cole Creek Falls plunges off.
LATHROP PRESERVE	12	CAROLINIAN Forest (Sugar Maple, Tulip Tree, Beech, Wh.Ash, Hickory)	Nature Conservancy Preserve; Town of Pelham	Forest tied with 2nd greatest diversity of Old Growth tree species (16) recorded in Northeast North America. Site of Canada's 2nd only site for Old Growth Scarlet Oak trees. Sizable Amer. Chestnut, Nationally Threatened, grows here in this hushed primeval forest of deep ravines.
GRIMSBY POINT	10	CAROLINIAN Forest (Maple, Oaks, Hickories, Beech, Ash, cliff Cedar)	Conservation Area Niagara Escarpment; Town of Grimsby	Famed for its great cliff-top vista & ultra-ancient cliff cedars, no one recognized its hardwood forest is also ancient, with 14 trees up to 300 yrs. old, plus very rare trees & shrubs. With Beamers Falls & its gorge below, the old growth is one more jewel in the crown of one of Ontario's greatest scenic treasures.

SWAYZE FALLS RAVINE	6	CAROLINIAN Forest (Maple, Bitternut, Black Walnut, White Ash, Beech)	Short Hills Provincial Park; Town of Pelham	Few people who marvel at 60-foot Swayze Falls & its narrow gorge realize that ancient walnuts twice its height reside in its ravine below. The Maples (up to 240 yrs), Hickories & Ashes soar almost as high, in what is one of Ontario's tallest broadleaf forests. A Bitternut is 28" diameter.
HEMLOCK VALLEY	12	Hemlock-Northern Hardwoods (sugar, Maple, Beech)	Short Hills Provincial Park; Town of Pelham	This deep Hemlock ravine was always considered special, but now it is clear it is filled with old growth forest. Besides Hemlock (to 280 yrs. old), 6 broadleaf trees also are ancient, clinging to steep deeply shaded slopes overlooking cascades in one of the region's most secluded places.
CLIFTON HILL BLUFF	25	CAROLINIAN Forest (Sugar Maple, Tulip Tree, Walnut, Wh.Ash, Oaks)	Regional Park ;between Horseshoe Falls and Niagara Falls City	What has been the anonymous wooded backdrop between the Great Falls of Niagara and Clifton Hill tourist district, can now be applauded as a historic and natural treasure, with 11 ancient tree species, up to 4.3 ft. diameter & 275 yrs. old. It survived for 200 yrs. without being cut, but its upper slopes are private owned.
ST. JOHNS Conservation Area	5	CAROLINIAN Forest (Sugar Maple, Tulip Tree, Beech, Hemlock)	Conservation Area; Fonthill Kame of Town of Pelham	One secluded set of ravines in this beautiful Conservation Area turned out to be original forest, with very tall Hemlock, Tulip Tree, maples, oaks, hickory, ash and other Carolinian species.
Hamilton Naturalists Club Short Hills Wilderness Preserve	6	CAROLINIAN Forest (Sugar Maple, Tulip Tree, Oaks, Beech, Hemlock)	Non-Profit; Fonthill Kame of Town of Pelham	This site harbors a great diversity of rare wildflowers and Carolinian trees, including the Nationally Threatened Cucumber Magnolia. This survey now adds Old Growth Forest to its natural attributes, with at least 6 species of trees between 150 to 275 years old.
Northern Fonthill Ridge-Ravine Area	6	CAROLINIAN Forest (Oak, Tulip Tree, Beech)	private; City of Thorold	Lying just south of Short Hills Provincial Park, this deeply dissected landscape harbours scattered patches of old growth 150-210 yr. old trees. Selective cutting the past removed walnuts & cherries.
ROCKWAY FALLS GORGE	6	CAROLINIAN Forest (Sugar Maple, Hemlock, Ash, Basswood, Walnut)	Conservation Area Niagara Escarpment; Town of Lincoln	The Bruce Trail passes around the rim of this yawning abyss but hikers have no idea that 7 kinds of old growth trees line the gorge bottom, including ancient Black Walnut, Basswood, Hemlock, Sugar and Red Maple, White Ash, even 250-yr. old Sycamore. Rare Maidenhair Spleenwort fern grows here.
12-MILE CREEK FLOODPLAIN	4	CAROLINIAN Forest (Oak, Beech, Walnut, Bitternut)	Short Hills Provincial Park; City of St. Catharines	Our region's only example of Old Growth in a floodplain forest, specifically a mix of Old Growth & mature 2nd Growth trees. 10 types of Old growth trees up to 250 yrs old, incl. very large Black Walnut, White Pine, Bitternut, White Ash, grow along 1/4-mile stretch of 12-Mile Creek, & a side trail of the Bruce Trail.
SUGAR LOAF HILL	4	SAND DUNE - CAROLINIAN Forest (Oak, Sugar Maple)	private; Lake Erie coastal dune; City Point Colbourne	One of Lake Erie's 3 coastal dunes covered by Old Growth & one of its tallest, steepest dunes. Yet some of its trees get large, incl. Red Oak, Sugar Maple. Besides rare species, ancient Hemlock grow here, extremely rare habitat for this species. Protection status tenuous; neighboring dunes have been mined away.