

Rare, Threatened, or Endangered Trees
In
Niagara Region

A Publication of the Ecological and Environmental Advisory Committee
(EEAC)
Niagara Region

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**DEDICATED
TO
THE MEMORY OF**

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**On
Rare Trees in Niagara**

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INTRODUCTION

Canada's Natural heritage is perhaps our most priceless possession. Our country is blessed with great natural beauty, and a vast diversity of marine and wildlife species, many of them unique to Canada. We are stewards of approximately 20% of the world's remaining natural areas, 25% of world's wetlands, 9% of the world's renewable freshwater, and 15% of forests. Canadians have a duty to the world and to future generations to protect this inheritance.

The diversity of the Earth's species is essential to the quality of life, and even to the survival of life on this planet. The loss of one species has effects – sometimes unpredictable or incalculable – on all of the others. The biological diversity of the environment is the essential support network for all human existence – it is the foundation on which our economies, societies, states and cultures are built.

Habitat loss is the greatest factor affecting the wellbeing of wild species in Canada. Committee on the Status of Endangered Wildlife in Canada (COSEWIC) has identified habitat issues as an important threat for about 75% of the species currently listed as threatened or endangered in Canada. Habitat is disappearing or becoming degraded at an unacceptable rate in Canada. [Ref: CANADA'S PLAN for PROTECTING species at RISK, AN UPDATE, Environment Canada, December 1999.]

IMPORTANCE

Rare species are important for many reasons. They increase biological diversity and contribute to the stability of ecosystems. They provide food and shelter for wildlife. Although these trees are sufficiently rare to be of little value to the commercial logging operator, they represent northern genetic stocks better adapted to our weather conditions than populations to the south. Therefore it is important to conserve reproducing stands for the benefit of future generations and to retain our natural heritage.

DEFINITIONS

TREES: A woody perennial self-supporting plant, which is of a species with one main stem or trunk which develops many branches, usually at some height above the ground. Most trees reach a height of at least 4.6 meters (15 feet) at physiological maturity and have diameter over 15 cm (about 6 inches) at a height of about 1.5 meters (about 5 feet).

WOODLAND: Woodland means a complex ecosystem of different tree species, vegetation, and other wildlife together with the non-living components of their environment such as air, soil, water, and related ecological processes.

WOOD-LOT: Wood-lot means an area on one parcel of land or any number of adjoining parcel of land, having a density of not less than:

- (i) 400 trees of any size per acre (988 trees of any size per hectare).
- (ii) 300 trees measuring more than 5 cm (2 inches) dbh [diameter of the tree stem of a tree measured at a point that is 1.4 meter (4.5 feet) above the ground].

- (iii) 200 trees measuring more than 13 cms (5 inches) dbh per acre (247 trees measuring more than 13 cms per hectare).
- (iv) 100 trees measuring more than 20.3 cms (8 inches) dbh per acre (247 trees measuring more than 20.3 cms dbh per hectre).

WILDLIFE: Wildlife means all wild mammals, birds, reptiles, amphibians. Fish, invertebrates, plants, fungi, algae, bacteria, and other wild organisms.

[Ref: "TREE CONSERVATION BY – LAW NO. 8541 – 96", The Regional Municipality of NIAGARA, Planning and Development Department, P. O. Box 2042, 2201 St. David's Road, Thorold, ON L2V 4T7]

HOW TO IDENTIFY A TREE

In this manual trees are described in two broad categories, the **CONIFERS** and the **BROADLEAF** trees. Within these two categories, the trees are organized into 12 identification groups, based mainly on the shape and arrangement of their leaves, features that are easily observed.

CLASSIFICATION OF TREES

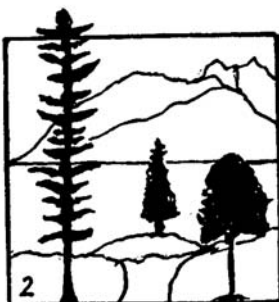
[Ref: TREES in CANADA, by John Laird Farrar, Published by Fitzhenry & Whitwside Ltd. and Canadian Forest Service, Natural Resources Canada, 1995, 502pp.]

CONIFERS – Groups 1 to 7.

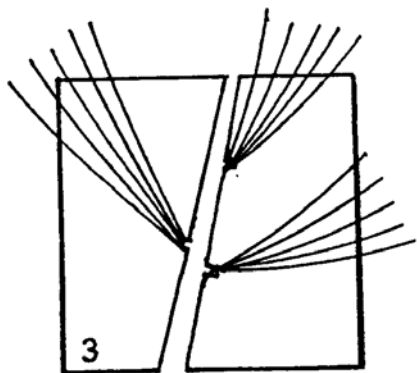


GROUP 1: The trees in Group 1 belong to tree genera of the Cypress family (Cupressaceae): junipers (Juniperus), Cedars/aborvitae/thujas (Thuja), and false cypress/cedars/cypress (Chamaecyparis).

Short needles or scales, evergreen; closely spaced in opposite pairs or whorls of 3, often overlapping in obscuring the stem; seeds in cones, some cones berry-like.



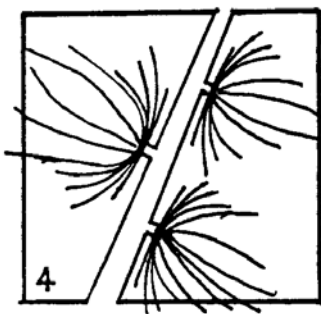
GROUP 2: Group 2 comprises seven species, all from different Genera, with little in common, except that they are non-native, hardy only in the warmer parts of British Columbia (and in sheltered locations in other mild parts of Canada), and have seeds in cones; most lack scaly winter buds. With the exception of umbrella-pine and monkey-puzzle, species in this group belong to genera in the cypress family.



Introduced species, hardy in southwestern British Columbia; leaves various shapes, seeds in cones.

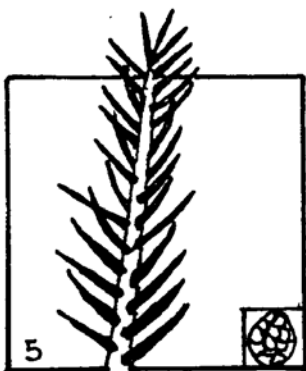
GROUP 3: Group 3 contains one genus, the pines (*Pinus*). Pines are characterized by evergreen needles in bundles at the tips of micro-shoots; each twig has many such bundles of needles. Other genera in the pine family are described in Group 4 and 5.

Needles evergreen, in bundles of 2, 3, or 5; seeds in cones.



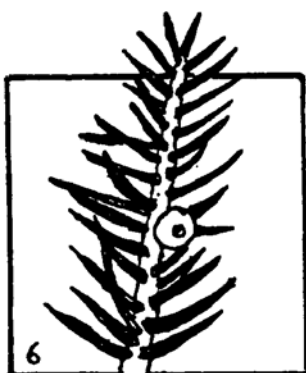
GROUP 4: Group 4 contains two genera of the pine family – the larches or tamaracks (*Larix*) and the “true” cedars (*Cedrus*). Species in both genera are characterized by the presence of dwarf shoots bearing a tuft of 10-60 needles, they also have needles on the long (extension) shoots, singly placed as in spruce and fir. The cones are borne on the dwarf shoots.

Needles deciduous (or evergreen), in tufts of 10 or more on dwarf shoots, also single on long shoots; seeds in cones.



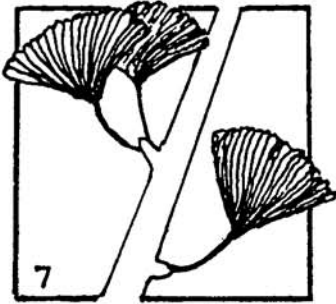
GROUP 5: Group 5 comprises four genera of the pine family: fir (*Abies*), spruce (*Picea*), Douglas-fir (*Pseudotsuga*), and hemlock (*Tsuga*).

Needles evergreen, single, flat or 4-sided; seeds in cone.



GROUP 6: Group 6 consists of one genus, yew (*Taxus*). Yews are distinguished by green twigs and buds and a single seed in a red fleshy cup-shaped arill. Their needles are similar to those of species in Group 5; however, the tip is drawn out to an abrupt point, the base narrows to a definite stalk, the edges are somewhat rolled under, and the lines of white dots are lacking.

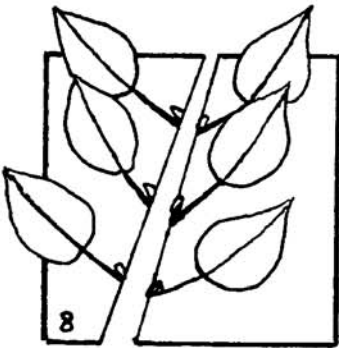
Needles evergreen, single, flat; twigs and buds green; single seed in a fleshy cup.



GROUP 7: The only species in Group 7 is ginkgo. Although its leaves are broad and deciduous, ginkgo is classified as a member of the division Pinophyta because its ovules are borne naked on stalks, not within the pistils of a flower.

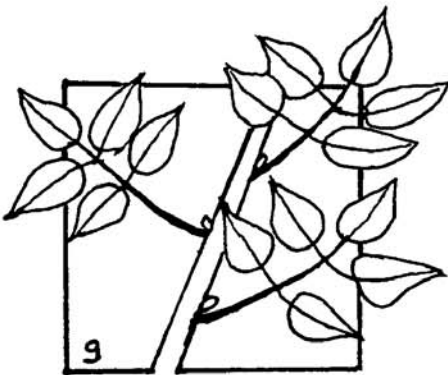
Leaves fan-shaped, thin, notched; veins parallel, no mid-vein; seeds plum-like.

BROADLEAF TREES – Groups 8 to 12.



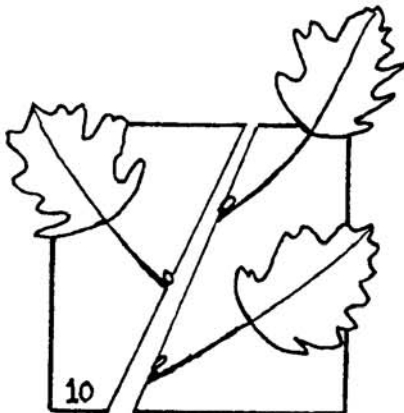
GROUP 8: The opposite arrangement of leaves and buds is one of the best criteria for distinguishing different kinds of trees. It is unmistakable and holds true during any season, any day of the year, and can be recognized even when all branches are cut out of reach.

Leaves in opposite pairs (or sub-opposite or whorled); blade simple or compound; edges lobed, toothed, or smooth.



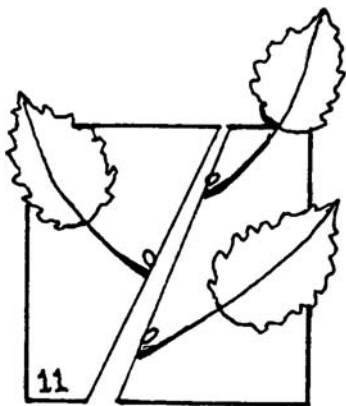
Group 9: The alternate arrangement of leaves is by far the most common. Species with alternate leaves occupy the rest of the Groups. These leaves are usually arranged in a spiral, but for a few species they are in two ranks or rows on opposite sides of the stem.

Leaves alternate, compound (divided into 3 or more leaflets).



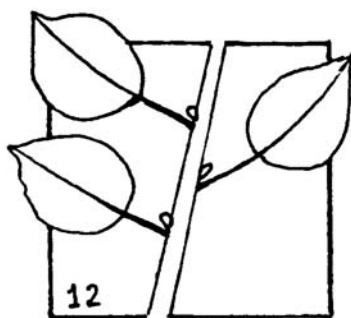
GROUP 10: The alternate arrangement of leaves is the most common. Alternate leaves are usually arranged spirally, but in a few cases they are in two ranks (rows) on opposite sides of the stem. All trees in Group 10 are deciduous with simple leaves (blade not divided into leaflets) alternately arranged.

Leaves alternate, simple; edges lobed.



Group 11: With 21 genera and about 110 species (over 75% native) Group 11 is the largest group; the species are among the most difficult to identify. Most trees in Group 11 are deciduous with simple leaves (blade not divided into leaflets).

Leaves alternate, simple; edges toothed.



GROUP 12: The alternate arrangement of leaves is by far the most common; alternate leaves are usually arranged spirally, but in a few cases they are in two ranks (rows) on opposite sides of the stem. Most trees in Group 12 are deciduous with simple leaves (blades not divided into leaflets); arbutus and rhododendron have evergreen leaves.

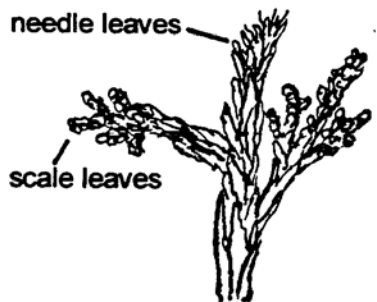
Leaves alternate, simple; edges smooth; deciduous (or evergreen).

IDENTIFICATION IN THE FIELD

Experienced observers can sometimes identify a tree from surprising distances. However, sure identification is only possible at close range. A 10x hand-lens (15x for the oaks) is often useful for examining buds, flowers, and other small parts. A pair of field glasses of the type used by bird watchers is useful in examining leaves, fruits, or cones that are out of reach on the tree. Also, look on the ground: the leaves, fruits, cones, and other parts found there probably came from the tree you want to identify

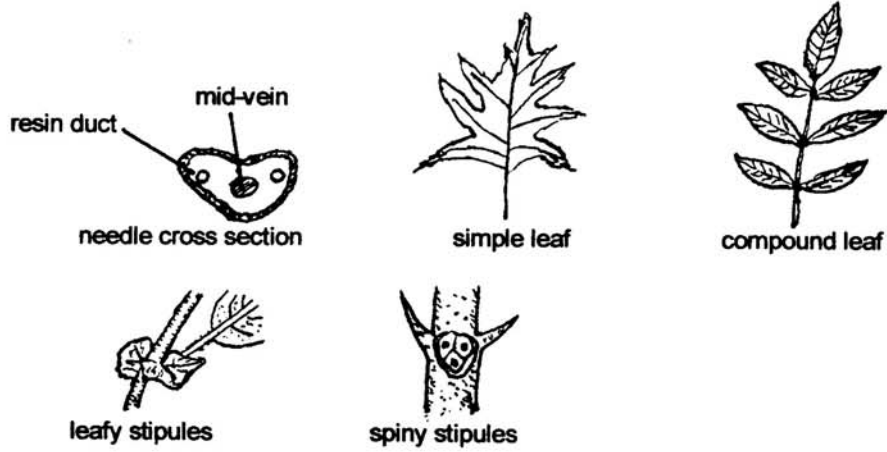
DESCRIPTIONS

LEAVES: The leaf is the part of a tree that at first to look at when identifying a tree. Certain features may require special attention for identification.

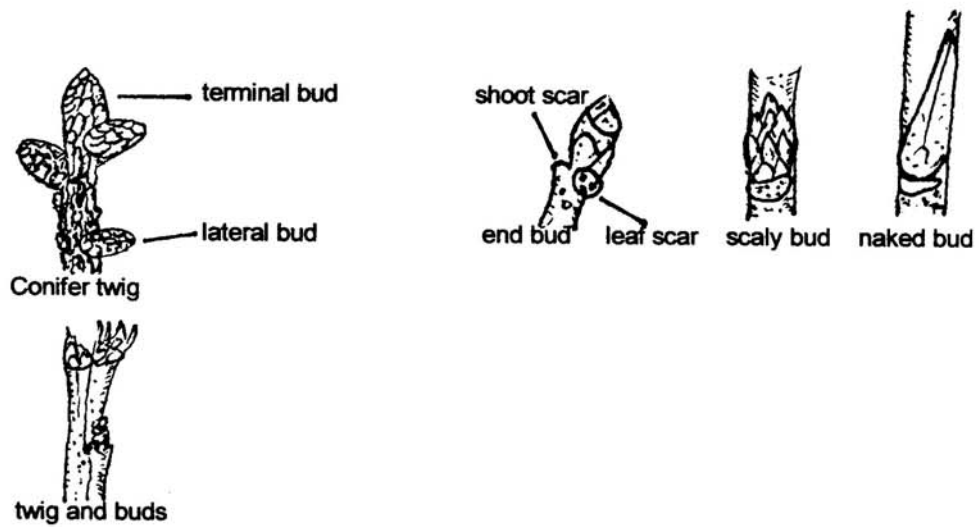


Conifer leaves are evergreen on most species. They vary from small scales that completely cover the shoot as in juniper, to pine needles that may be 20 cm long.

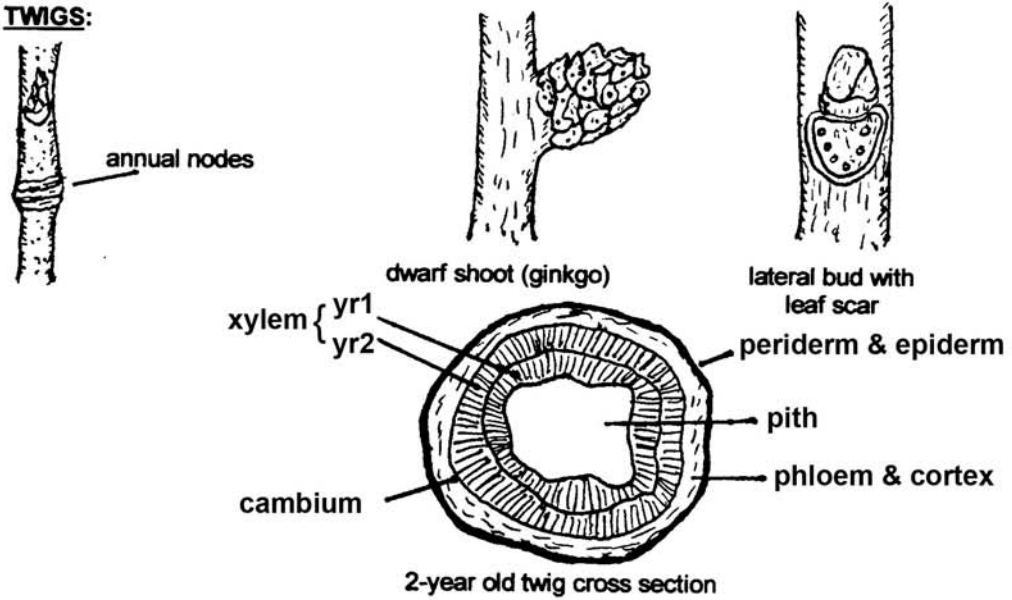
Leaves of most broadleaf species may vary considerably in shape on the same tree. Many broadleaf species have a pair of **stipules**, ear-shaped structures, attached to the stem beside the base of each leaf. Some stipules are green, leaf-like, and persistent (remaining attached to the stem); others are straw-coloured and dry, and fall off soon after the leaves appear in spring.

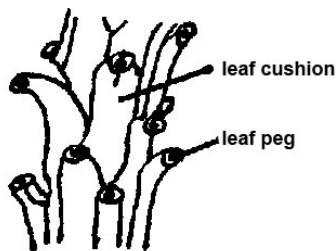


BUDS:



TWIGS:





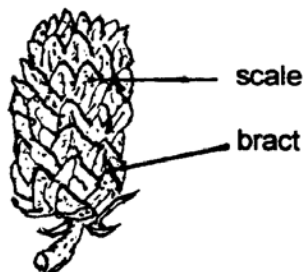
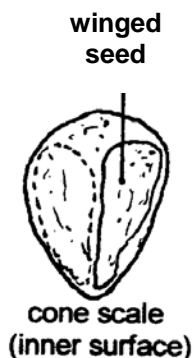
Spruce twig

CONES: Conifers bear two kinds of cones, called **pollen cones** and **seed cones**; they are sometimes referred to as male and female cones because of their roles in reproduction. Pollen cones and seed cones may occur on separate trees or the same tree.

Pollen cones are small catkin-like structure. They have a central axis bearing a number of **sporophylls**, which produce pollen to fertilize the seed cones. Pollen cones release their mature pollen grains, then wither away soon afterwards.

Seed cones, unlike pollen cones, are a helpful means of identification because they persist on the tree or on the ground around it. Immature seed cones, called **conelets**, are ready for pollination at the time the pollen cones shed their pollen.

Seed cones are composed of **scales** arranged around a central axis. Just below the scale in many species is a **bract**, which is often oblivious in spring but may be covered by enlarged scales as the cone matures.

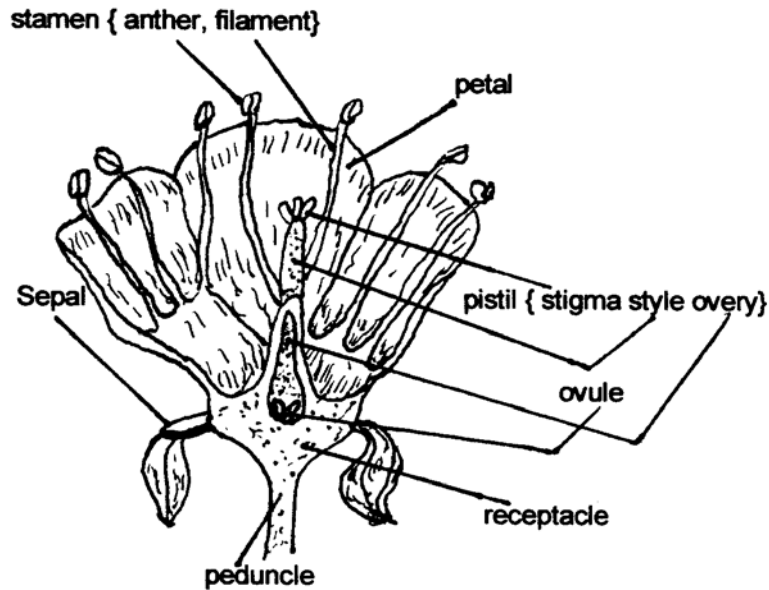
pollen cones
(pine)seed cone
(larch)winged seed
cone scale
(inner surface)

bract

The yews and ginkgo are related to the conifers, but they do not have seed cones. Instead, they bear one or two ovules on stalks in the axil of a leaf, and each seed is partly or wholly enclosed in a flashy **aril**. The pollen, however, is produced in catkin-like cones.

Aril
(yew)

FLOWERS: Flowers are the basis of classification for broadleaf trees, as for other flowering plants. The typical flower consists of a **calyx** composed of **sepals**, usually green; a **corolla** composed of **petals**, usually white or coloured; a number of **stamens** which bear **pollen** for fertilization; and a **pistil** containing one or more **ovules**, which become seeds when fertilized. In some flowers called **seed flowers** only the pistils are functional; in others, the **pollen flowers** only stamens are functional. More often, both pistil and stamens function in the same flower, and such flowers are said to be **perfect**.



FRUITS: Fruits are second only to flowers in providing a sure means of identification of broadleaf trees. Mature or immature fruits can be found on or under the tree during much of the growing season, and even into winter.



Ash (winged)



sassafras
(berry-like, on a stalk)



red mulberry
(fruit aggregate)

RARE TREE SPECIES IN NIAGARA

**COSEWIC: Committee On the Status of Endangered Wildlife
In Canada.**

MNR : Ministry of Natural Resources.

NHIC: National Heritage Information Centre.

NHIC RANKING (SRANK)

**S1 = Extremely rare - usually 5 or fewer occurrences in Ontario
or very few remaining individual trees.**

**S2 = VERY RARE - usually between 5 and 20 occurrences in the
province or many individuals in few
occurrences.**

S3 = RARE TO UNCOMMON – usually between 20 and 100

**Occurrences in the province, many
have fewer occurrences, but with
a large number of individuals in
some populations; may be
susceptible to large-scale
disturbances.**

PAWPAW (*Asimina triloba*) Group 12, Rarity: S3

Common Names: Indiana Banana; Hoosier Banana; Poor Man's Banana.

Rare in Canada, occurs in Ontario north of Lake Erie. Sometimes planted for its unusual fruit. The pawpaw genus occurs only in North America; *Asimina triloba* is the only tree-size species.

QUICK RECOGNITION: Leaves large, pendulous, widest above the middle, tapered toward the base; with looped veins and short stalks. Terminal bud flattened, flower buds globular, all with reddish hairs. No scales cover the immature leaves that form the bud.

Size and Form: Very small tree, up to 10 m high, often in thickets. Crown broad, with straight, spreading branches.

Bark: Thin, smooth, shiny dark brown with grayish blotches when young; becoming rough with age.

Twigs: Slender, zigzag, becoming hairless; brownish, streaked with fine, whitish, shallow grooves, Pith whitish, solid, banded.

Leaves: Deciduous, alternate, simple; 15-30 cm long, widest above the middle, thin; upper surface green, paler beneath; with reddish-brown hairs when young; pendulous; unpleasant odour when bruised. Principal veins prominent, looped together near the margin, about 15 per side, reddish-brown on undersurface. Stalks short, grooved.

Buds: Terminal bud elongated, flattened, without scales; the exposed immature leaves covered with reddish-brown hair. Lateral buds similar, smaller, pressed against the twig; often 2 together, the lowermost very small. Flower buds larger, globular, on a stalk. Leaf scars crescent-shaped, almost encircling the bud; covered with a membrane for a short time after leaf fall; 5-7 vein scars.

Seeds: Dark brown, flattened, several per fruit. Cotyledons raised above the surface.

Fruits: Fleshy, with edible pulp; irregular cylindrical, up to 12 cm long; pale greenish-yellow becoming yellow to brownish when ripe; solitary or in clusters.

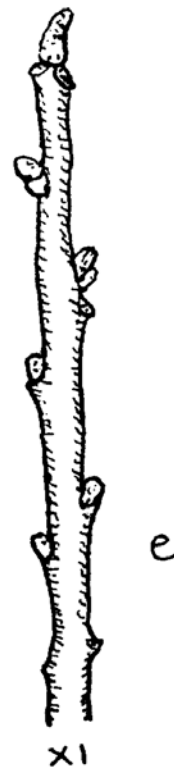
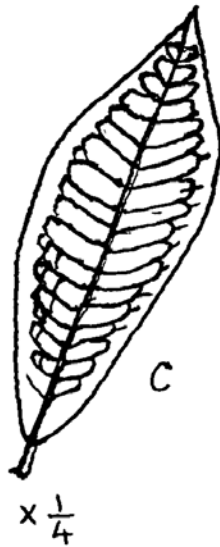
Vegetative Reproduction: By root sprouts; can be propagated by root cuttings.

Habitat: Occurs on the rich moist soils of floodplains and wet woods; in colonies as an understory tree shade-tolerant. The species is not a long lived one.

Notes: Eaten in-hand as a fresh fruit or processed into desserts. Twigs are a source of annonaceous acetogenins which are being used in the development of anti-cancer drugs and botanical pesticides.

References: 1. Trees in Canada by John Laird Farrar, Fitzhenry & Whiteside Ltd., 1995.
 2. Rare, Threatened, or Endangered Trees in Haldimand-Norfolk, A Norfolk Field Naturalists Publication, 1990, Simcoe, Ontario.
 3. New Crop FactSHEET, Purdue University, Center for New Crops & Plant Products, Contributor: Desmond R. Layne, 1995.
<http://www.hort.purdue.edu/newcrop/crops/cropFactSheets/pawpaw.htm>

PAWPAW



- Fruit (left); seed (right).
- Longitudinal section through fruit showing seeds.
- Leaf.
- Lateral bud and leaf scar.
- Winter twig.

CHERRY BIRCH (*Betula lenta* L.) Group 11, Rarity: S1

Common Names: Sweet Birch or Black Birch

Closely resembles yellow birch. A small tree seldom reaching 20 m high. Yellow birch frequently reaches over 20 m.

QUICK RECOGNITION: During any season by their papery bark and dwarf shoots, and when present, by their pollen catkins and seed catkins.

Size and Form: Seldom reaches 20 m height.

Bark: Dark cherry red to almost black, becoming grayish with age.

Buds: Mostly hairless diverging from the twig.

Fruit scales: 6-12 mm long, hairless.

Flowering and Fruiting: Sweet birch flowers are monoecious and borne in catkins. Staminate catkins are formed in late summer or autumn and open in the spring after elongating to about 20 mm. Pistillate catkins appear with the leaves and are borne terminally on short, spur-like branches. Flowers open in April and May. Seeds ripen from about mid-August through mid-September and are contained in erect strobili.

Seed Production and Dissemination: Seed fall is during mid-September through November. Seed dispersal is normally by wind and seed may be blown some distance over crusted snow. Nothing is known about quantities of seeds produced or how far they are spread. Seed production begins when trees are about 40 years old; large seed crops are produced every 1 or 2 years.

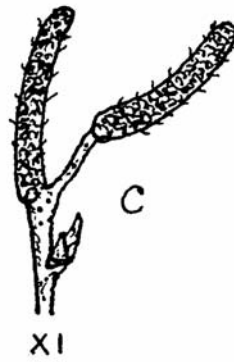
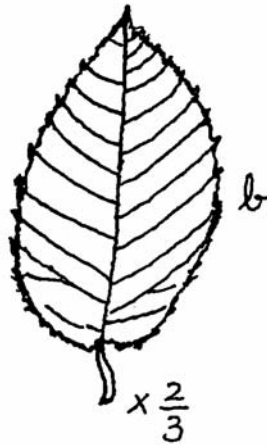
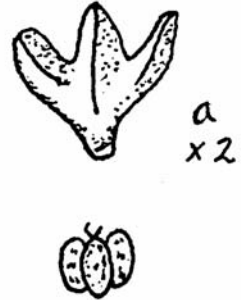
Habitat: Sweet birch grows primarily on three soil orders: Spodosols, Incetisols, and Utisols. It grows best on moist, well-drained soils but is found on a variety of less favourable sites with rocky coarse-textured or shallow soils. Canadian range limited to one confirmed site in southern Ontario, at **Port Dalhousie near St. Catharines**, on the south shore of Lake Ontario.

Notes: Sweet birch is quite similar to yellow birch. Lumber and veneer of the two species often are not separated in the market, although production of yellow birch far exceeds that of sweet birch. Sweet birch is used for furniture, cabinets, boxes, wooden-ware, handles, and millwork, such as interior finish and flush doors. Paper pulp made from sweet birch is used in various amounts with other pulps to produce such products as box-boards, book and news print paper, paper toweling, and corrugated paper. Birch oil has been produced commercially from sweet birch bark, but its use has declined with the introduction of synthetic products.

Efforts to cross Sweet Birch with Yellow Birch have been successful, but the F₁ hybrids have low vigour and seed germination rates. No natural hybrids have been verified.

References: 1. Trees In Canada by John Laird Farrar, Fitzhenry & Whiteside Ltd. , 1995.
2. Neil I. Lamson:
<http://willow.ncfes.umn.edu/silvics-manual/volume-2/betula/lenta.htm>

CHERRY BIRCH



- a. Fruit scale (above); winged nutlet (bellow)
- b. Leaf.
- c. Twig terminal with pollen catkins in winter condition.
- d. Lateral bud and leaf scar

SWEET PIGNUT HICKORY (*Carya glabra*) Group 9, Rarity: S3

Common Names: Pignut; Sweet pignut; Coast Pignut Hickory; Smooth-bark Hickory; Swamp Hickory; and Boom Hickory.

Rare in Canada; occurs in scattered locations in southern Ontario.

QUICK RECOGNITION: leaflets hairless, 5-7. Terminal bud small. Fruits pear-shaped; husk splitting to the base; nuts flattened.

Size and Form: Small trees, up to 20 m high, 50 cm in diameter, and 200 years old. Trunk often branch-free and with little taper. Crown irregularly narrow, with short crooked branches. Branch tips and lower branchlets often bending downwards; the longest, heaviest branches often near the top.

Bark: Thin, gray, becoming scaly and shallowly fissured, resulting in narrow intersecting ridges.

Twigs: Slender, often with long ridges, shiny, gray to reddish-brown, hairless.

Leaves: 5-7 leaflets on a central stalk 15-25 cm long. Leaflets dark yellowish-green above, paler and hairy on the main veins beneath; tip narrow-pointed, base wedge-shaped; margin finely toothed, usually hairless on mature leaves (in any case hair not in tufts).

Buds: Terminal bud variable in shape, 6-9 mm long, somewhat pointed; outer scales shed in early autumn leaving a stout, densely hairy bud. Lateral buds smaller, broad, blunt-tipped.

Seed Production and Dissemination: Pignut hickory begins to bear seed in quantity in 30 years, with optimum production between 75 and 200 years. The maximum age for seed production is about 300 years. Good seed crops occur every year or two with light crops in other years; frost can seriously hinder seed production. Usually less than half of the seeds are sound, but 50 to 75 percent of these will germinate. The hickory shuck-worm (*Laspeyresia caryana*) can seriously reduce germination. The nuts are disseminated by gravity, but the range of seeding is extended by squirrels and chipmunks.

Fruits: Somewhat pear-shaped, 25-50 mm long, in small clusters. Husk thin, smooth, glossy, friable, 4-ridged, splitting readily from the top to the base. Nut 20-25 mm long, slightly flattened. Shell moderately thick. Kernel bitter, not edible.

Habitat: An upland species; occurs on well-drained sites; mixed with other broadleaf trees. Intolerant of shade.

Vegetative Reproduction: Hickories sprout readily from stumps and roots. Stump sprouting is not as prolific as in other deciduous tree species but the sprouts that are produced are vigorous and grow fairly rapidly in height. Root sprouts also are vigorous and probably more numerous than stump sprouts in cut-over areas. Small stumps sprout more frequently than large ones. Sprouts that originate at or below ground level from small stumps are less likely to develop heartwood decay. Pignut hickory is difficult to reproduce from cuttings.

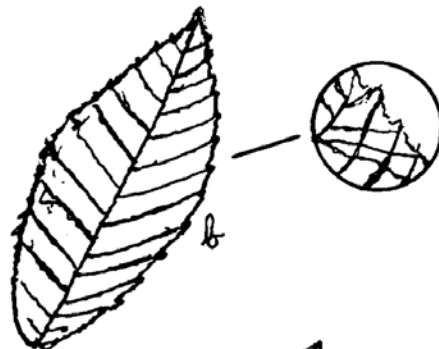
Notes: The pear-shaped nut ripens in September and October and is an important part of the diet of many wild animals. The wood is used for a variety of products, including fuel for house heating. The hard wood is ideal for tool handles.

References: 1. Trees in Canada by John Laird Farrar, Fitzhenry & Whiteside Ltd., 1995.
2. Glendon W. Smalley:
<http://willow.ncfes.umn.edu/silvics-manual/volume-2/carya/glabra.htm>

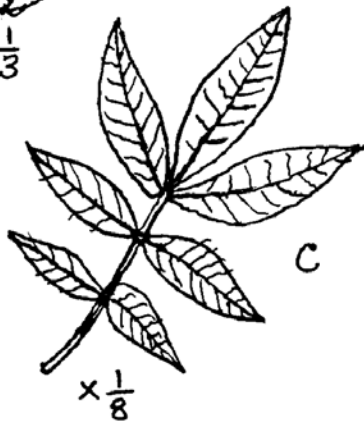
SWEET PIGNUT HICKORY



a
x $\frac{1}{2}$



x $\frac{1}{3}$



c

x $\frac{1}{8}$



d

x 2



e

x 1

- Fruit (above: nut (below))
- Leaflet with detail of hairless margin
- Typical leaf.
- Lateral bud and leaf scar.
- Winter twig.

BIG SHELLBARK HICKORY (*Carya laciniosa*) Group 9, Rarity: S3

Common Names: Shellbark Hickory; Kingnut.

Rare in Canada; thinly scattered in the area north of Lake Erie in southern Ontario. Similar to shagbark hickory, but with larger leaves, buds, twigs, and nuts.

QUICK RECOGNITION: Resembles shagbark hickory but is a larger tree, with larger leaves, often 2 more leaflets, larger buds, larger nuts with thicker shells. Hair on the edges of the leaflets not in tufts; central stalk often remaining attached to the twig after leaflets are shed. Orange-cinnamon of twigs is distinctive, but not always present. Grows on moist to wet sites.

Size and Form: Medium-sized trees, up to 30 m high, 90 cm in diameter, and 200 years old. Trunk branch-free for more than one-half its length, often strongly tapered from the base upward. Crown narrow, open, with short, sturdy, ascending branches that spread out toward the top. Taproot deep, strong, except in swamps.

Bark: Dark gray; with age, separating into long, shaggy plates free at their lower ends or at both ends, giving the trunk a shaggy look.

Twigs: Dull yellowish-brown to dark orange-cinnamon, slightly hairy.

Leaves: 7 (sometimes 9) leaflets on a central stalk 25-30 cm long. Leaflets widest near the middle; margin finely toothed, hairy but not in tufts; upper surface dark, yellowish-green, paler and hairy beneath. Central stalk often remain on twig after leaflets are shed.

Buds: Terminal bud 20-25 mm long; 10-12 scales. Lateral buds diverge slightly from the twig.

Fruits: Globular, 5-7 cm long, in small clusters. Husk 6-12 mm thick, woody, splitting along 4 lines to the base when the fruit is ripe. Shell of nut moderately thick, hard. Kernel sweet, edible.

Habitat: Occurs on moist to wet sites, in valley and along streams banks; mixed with other broadleaf trees.

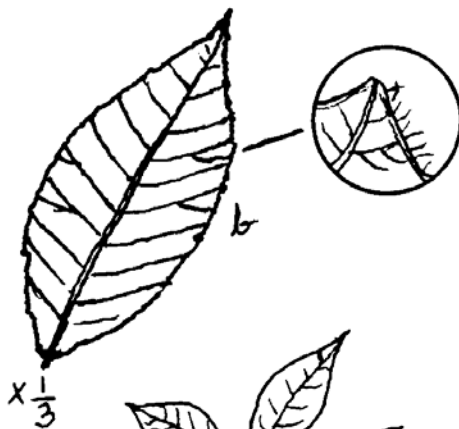
Notes: In Canada, Big Shellbark Hickory occurs in Ontario in Essex, Lambton, Kent and Elgin Counties, with a few scattered population occurring in Niagara and Haldimand-Norfolk. Big Shellbark is a forest tree. It prefers damp, rich woods. It may grow in association with Shagbark, Bitternut and Pignut Hickories. Like other hickories, the Big Shellbark takes up to 200 years to reach maturity. The nuts are much in demand by man and wildlife. As with other hickories, the wood is very heavy, hard, and strong with very high shock resistance, and is principally used for tool handles.

References: 1. Trees in Canada by John Laird Farrar, Fitzhenry & Whiteside Ltd., 1995.
2. Rare, Threatened, or Endangered Trees in Haldimand-Norfolk, A Norfolk Field Naturalists Publication, 1990, Norfolk Field Naturalists, Simcoe, Ontario.
3. Shellbark Hickory:
<http://www.dcnr.state.pa.us/forestry/commontr/shellbar.htm>

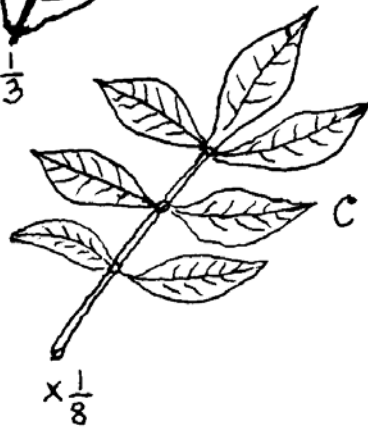
BIG SHELLBARK HICKORY



a
x 1/2



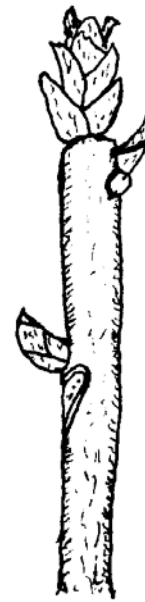
x 1/3



x 1/8



x 2



e

x 1

- a. Fruit (above); nut (below).
- b. Leaflets with detail of single hair along margin.
- c. Typical leaf.
- d. Lateral bud and leaf scar.
- e. Winter twig.

AMERICAN CHESTNUT (*Castanea dentata*) Group 11, Rarity S3

The chestnut genus comprises about 14 species of trees and shrubs; 5 are native to North America. American chestnut, the only species native to Canada, was once a prominent tree in the broadleaf forests of southern Ontario and the eastern United States; it is now rare due to the chestnut blight. **COSEWG RANKING: Threatened.**

QUICK RECOGNITION: Leaves alternate, long, narrow, with straight veins and large bristle-tipped teeth; fruit a larger bur.

Size and Form: Before the chestnut blight, large trees up to 35 m high and 100 cm in diameter; now seldom reaching a height of 10 m, although a few specimens exceeding 50 cm in diameter exist in Ontario.

Bark: Smooth, dark brown, separating into broad flat-topped ridges with age.

Twigs: Stout, shiny, reddish-brown, numerous light-coloured lenticels. Pith 5-pointed.

Leaves: Deciduous, alternate, simple, 15-28 cm long, gradually tapering to both ends, short-stalked, yellowish-green; veins straight, parallel, 15-20 per side, each leading to a prominent tooth and extending beyond it to form a short curved bristle.

Buds: Ovoid, 5-8 mm long, pointed, greenish-brown, with 2 or 3 hairless scales; end bud similar to the lateral buds. Leaf scars semi-oval, somewhat raised, with numerous vein scars.

Seeds: Cotyledons white, fleshy, remaining in the seed coat under the surface.

Fruits: Edible nut; in small clusters of 1-5 within a spiny bur-like husk 5-8 cm across that splits into 4 parts; each nut ovoid, flat on 1 side, pointed, dull, brownish, smooth.

Vegetative Reproduction: By stump sprouts.

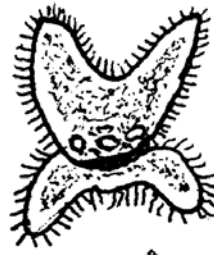
Habitat: Occurs on a variety of sites, grows best on well-drained sands and gravels; usually found mixed with other broadleaf trees.

Notes: American Chestnut was formerly a dominant tree in some areas of Carolinian Zone of southern Ontario. It was almost completely wiped out by the chestnut blight, a fungus introduced from Asia. Presently, very few trees reach maturity before being killed by the blight. Both the nut and the wood are potentially of commercial significance. The nut is superior in quality to the Eurasian species. The bark and wood contain high amounts of tannin and the high quality lumber is very resistant to rot.

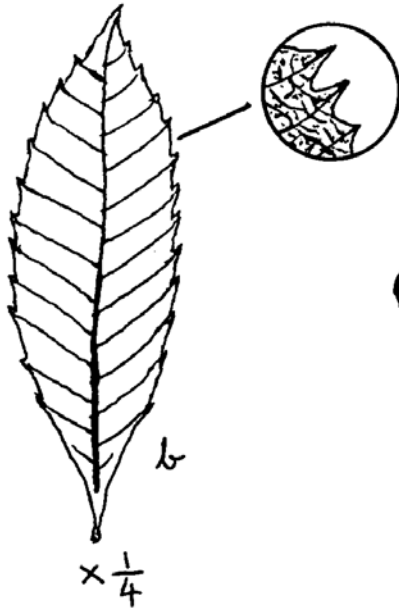
There is new interest in bringing back the American Chestnut. Chestnuts in Southern Ontario have a better chance of survival than their counterpart in the United States, because the chestnut blight's alternative host, the Scarlet Oak, does not occur in Ontario. Mature trees may provide disease-resistant seed stock in the future.

References: 1. Trees in Canada by John Laird Farrar, Fitzhenry & Whiteside Ltd., 1995
 2. Rare, Threatened, or Endangered Trees in Haldimand-Norfolk, A Norfolk Field Naturalists Publication, 1990, Simcoe, Ontario.
 3. American Chestnut:
<http://www.dcnr.state.pa.us/forestry/commontr/amerches.htm>

AMERICAN CHESTNUT



a
x $\frac{1}{2}$



b
x $\frac{1}{4}$



c



d

x3



e

x1

- a. Fruit husk (above); nut (below).
- b. Leaf with detail of bristle-tipped teeth.
- c. Twig cross section.
- d. Lateral bud and leaf scar.
- e. Winter twig.

HONEY-LOCUST (*Gleditsia triacanthos* L.) Group 9, Rarity: S2

Common Names: Common Honey-locust; Thorny-locust.

Rare in Canada; occurs in southwestern Ontario. The genus *Gleditsia* consists of about 12 species occurring in temperate and tropical regions; 2 species are native to North America, 1 to Canada.

QUICK RECOGNITION: Leaves singly and doubly compound. Thorns branches and sub-branched. Fruit a pod, large, curved, twisted.

Size and Form: Medium –sized trees, up to 30 m high, 90 cm in diameter, and 120 years old. Trunk typically short, often bearing long branched thorns and sprouts. Crown broad, open, flat-topped. Root system deep, wide-spreading; one of the few tree species that has root hair.

Bark: Smooth, brownish, with horizontal lenticels; with age becoming deeply furrowed with scaly ridges.

Twigs: Long shoots zigzag, brownish; short shoots (scarcely projecting beyond the bark) bear leaves and flowers. Thorns smooth, sharp, reddish, 3-branched or more, occurring on the trunk and stems.

Leaves: Deciduous, alternate, singly or doubly pinnately compound. Those singly compound form early on dwarf shoots or toward the base of long shoots; bear 14-30 leaflets (no terminal leaflet) on a central stalk 15-20 cm long; preformed in buds. Those doubly compound bear 4-7 pairs of branches each resembling a singly compound leaf; neoformed during the growing season. Leaflets 25-40 mm long, widest near the base, tip rounded, often with a small point; sometimes minutely toothed.

Buds: No terminal bud; twig ends in a withered stub. Lateral buds small, in vertical rows, mostly hidden beneath the bark. Leaf scars U-shaped, with 3 vein scars.

Seeds: Bean-like; with a hard, impermeable seed coat. Viable for many years in cool dry conditions. Seed coat can be rendered permeable to water by cool, moist chilling, dipping in boiling water or strong acid.

Seedlings: Cotyledons fleshy; released from the seed coat and turning green during germination. First true leaves preformed in the seed.

Fruits: Pods 15-40 cm long, flat, curved, twisted, brownish; husk leathery; falling in winter without opening.

Habitat: Occurs on moist, rich bottomlands, as scattered individuals mixed with other broadleaf trees. Intolerant of shade.

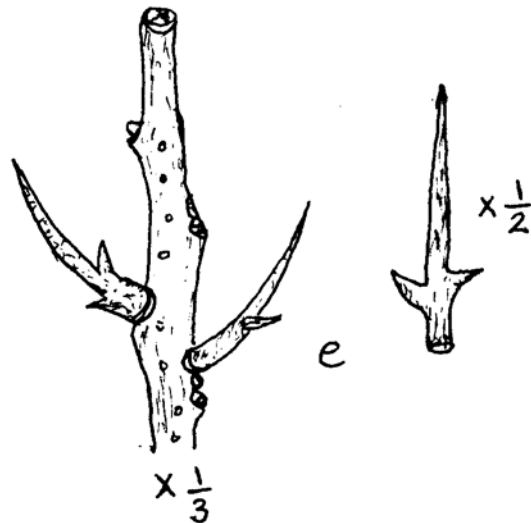
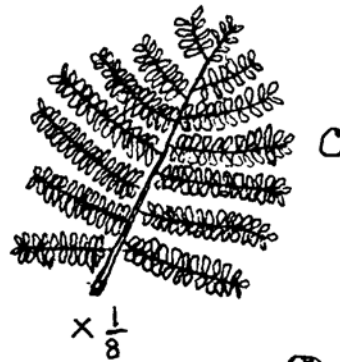
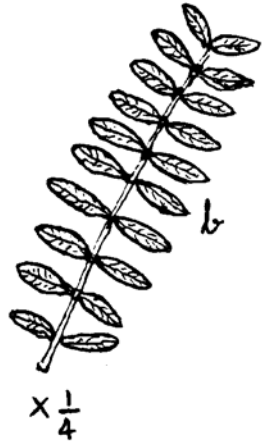
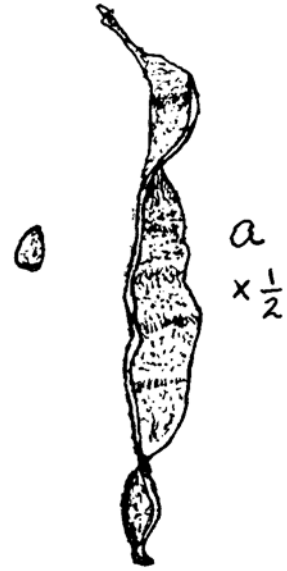
Notes: Seeds and pods are a source of food for mammals and birds. Scions or cuttings from branches with only pollen flowers will develop into trees with such flowers, but will not bear fruit. Most cultivars used in landscaping have neither thorns nor fruits; one common cultivar has yellow leaves A superior lawn tree because it casts a light shade. The strong hard wood is used for fence posts and general construction, but it is not widely available.

References: 1. Trees in Canada by John Laird Farrar, Fitzhenry & Whiteside Ltd., 1995.

2. Common Honeylocust:

<http://www.dcnr.state.pa.us/forestry/commontr/Honeylo.htm>

HONEY- LOCUST



- a. Seed (left); fruit (right).
- b. Singly compound preformed leaf.
- c. Doubly compound neo-formed leaf.
- d. Lateral bud and leaf scar.
- e. Winter twig and detail of 3-branched thorn.

KENTUCKY COFFEETREE (*Gymnocladus dioicus*) Group 9,

Rarity: S2

The species is officially recognized in Canada by COSEWIC as “Threatened”. The genus *Gymnocladus* has only 2 species; the other occurs in China.

QUICK RECOGNITION: Leaves doubly compound; central stalk long, with 3-7 pairs of branches. No terminal bud; Lateral buds in a group of 2 or 3, above a prominent leaf scar. Twigs very coarse, widely spaced. Fruit a pod, large, thick, persisting through the winter. Bark with out-curving scales.

Size and Form: Medium-sized trees, up to 25 m high, 60 cm in diameter, and 75 years old. Principal branches ascending, forming a narrow crown.

Bark: Dark gray, hard, firm, with thin scaly ridges curling outward along their edges.

Twigs: Very stout, grayish-brown, widely spaced. Pith large, deep orange-red.

Leaves: Deciduous, Alternate, doubly pinnately compound; composed of about 70 leaflets on 3-7 pairs of branches from a central stalk 30-90 cm long; central stalk easily mistaken for a stem. Leaflets ovate, about 5 cm long, smooth-margined, bluish-green, short-stalked; seldom opposite each other; no terminal leaflet. Tree is leafless more than half the year.

Buds: No terminal bud; tip of the twig tapered to a blunt point. Lateral buds small, 6-9 mm long, blunt, with several scales, covered with dark hair; 2 or 3 in a group above the leaf scar, the upper one larger. Leaf scars large, inversely heart-shaped, with many vein scars.

Seeds: Large, about 2 cm long, rounded, slightly flattened, hard-shelled, dark brown; only a few in each pod, imbedded in a sweet, sticky pulp. Viable for several years in cool dry conditions. Seed coat must be rendered permeable to water for germination.

Seedlings: Cotyledons remain within the seed coat as germination proceeds.

Fruits: Pods 12-20 cm long; husk hard, dark reddish-brown, leathery, usually with a powdered appearance; hanging on a stout stalk 2-3 cm long; remaining on the tree through the winter.

Vegetative Reproduction: Frequently by root sprouts forming colonies.

Habitat: Occurs mainly on deep rich soils, mixed with other broadleaf trees.

Notes: Seeds and husks bitter, seldom eaten by wildlife. Roasted seed are thought to have been used by early settlers as a substitute for coffee beans; however, due to their toxic properties this practice is not recommended. The sexes are found on separate trees. Wood moderately heavy, hard, decay-resistant, reddish-brown. Ring-porous; rays scarcely visible.

References: 1. Trees in Canada by John Laird Farrar, Fitzhenry & Whiteside Ltd., 1995.
2. Rare, Threatened, or Endangered Trees in Haldimand-Norfolk, A Norfolk Field Naturalists Publication, 1990, Simcoe, Ontario.

KENTUCKY COFFEETREE



- a. Sees (left); fruit pod (right).
- b. Leaflet.
- c. Doubly compound leaf.
- d. Lateral bud group and leaf scar.
- e. Winter twig.

CUCUMBER MAGNOLIA (*Magnolia acuminata*) Group 12,

Rarity : S2

Common Names: Yellow cucumber-tree; Yellow-flower magnolia; Mountain magnolia.

The magnolia genus comprises about 80 species; 8 are native to North America; only cucumber magnolia is native to Canada. Rare in Canada, occurs only in southern parts of Ontario north of Lake Erie. An endangered species, threatened with imminent extirpation throughout its Canadian range. Known populations, including their immediate habitat, are now legally protected in Ontario under the Endangered Species Act. **COSEWIC RANKING: Threatened.**

QUICK RECOGNITION: Leaves large, pointed, smooth-margined. Flowers large, bell-shaped, at the end of the shoots. Fruits cucumber-like when immature; later splitting to expose large orange seeds. Terminal bud large, with 1 hairy bud scale.

Size and Form: Medium-sized trees, up to 25 m high and 75 cm in diameter; larger farther south. Crown broadly pyramidal with upper branches curved upward; lower branches droop. Root system deep.

Bark: Grayish-brown, furrowed into long, narrow, flattish, scaly ridges.

Twigs: Stout, reddish-brown to grayish, aromatic. Pith white, round in cross section. Dwarf shoots present on the branchlets.

Leaves: Deciduous, alternate, simple; 10-25 cm long; widest near the middle, abruptly tapered to a short, sharp tip; rounded to slightly tapered at the base; slightly hairy on the undersurface; very thin; smooth-margined; principal veins prominent, branches, widely spaced, about 10 per side. Stalk flattened and split toward the base. Stipules shed soon after bud burst.

Buds: Terminal bud 15-20 mm long; the remnant of an aborted leaf can be seen at the base of the solitary hairy bud scale. Lateral buds much smaller, with a tuft of hair at the tip. Leaf scars horseshoe-shaped, with 5-9 vein scars.

Fruits: Cone-like, composed of small fleshy pod-like follicles spirally arranged on a stout stalk, green until mature and somewhat resembling a cucumber; 5-8 cm long. Each follicle turns reddish at maturity and splits along one side releasing 1 or 2 large shiny orange or scarlet seeds which hang for a time on slender white threads. Dispersed by seed-eating birds and animals. Some fruit each year, with good crops every 3-5 years.

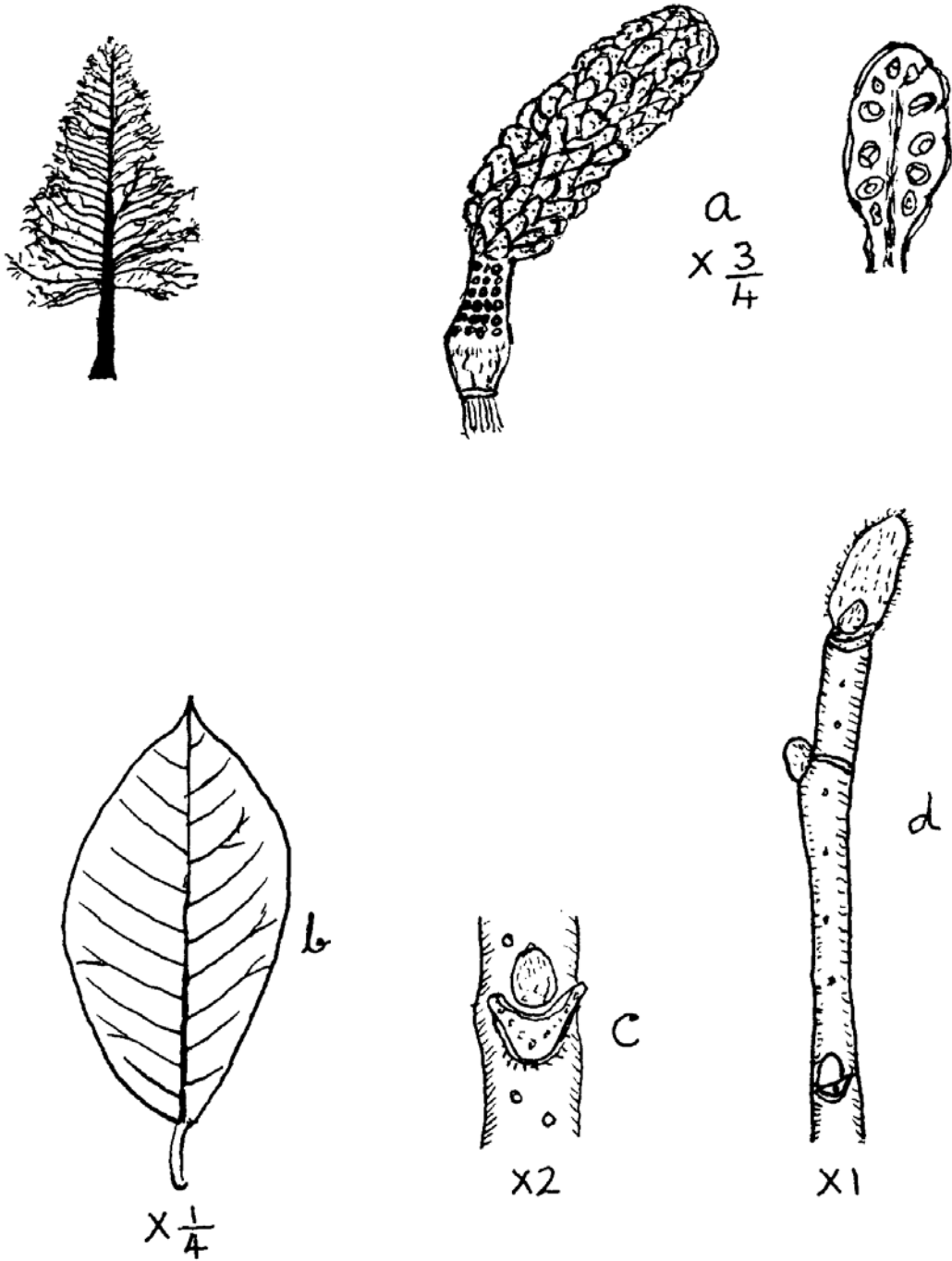
Flowers: Large, bell-shaped with petals 5-8 cm long, greenish-yellow; less conspicuous than other magnolias. Appear as the leaves reach full size. The flowers close at night and do not last longer than 2 to 4 days. Pollination is largely by insects.

Habitat: Occurs on rich soils in moist to wet sites; singly or in small groups mixed with other broadleaf trees such as oak, ash, tulip-tree, maple and beech. Intolerant of shade.

Notes: A drug now widely used in heart surgery was first isolated from the bark of this tree. Over 40% of our modern medicines have been derived from wild plants. Wood soft, weak, close-grained; durable and easily worked. Diffuse-porous. The wood is used in furniture, fixtures, venetian blinds, sliding, interior trim, sashes, doors, boxes, and crates. Cucumber tree is not as desirable for fuel wood as the denser hardwood. Compared with hickory, which has a fuel value of 100, cucumber tree has a fuel value of 57 (on a volume basis).

- References:**
1. Trees in Canada by John Laird Farrar, Fitzhenry & Whiteside Ltd., 1995.
 2. Rare, Threatened, or Endangered Trees in Haldimand-Norfolk, A Norfolk Field Naturalists Publication, 1990, Simcoe, Ontario.
 3. H. Clay Smith:
<http://willow.ncfes.umn.edu/silvics-manual-2/magnolia/accuminata.htm>

CUCUMBER MAGNOLIA



- a. Fruit (left); seed (center); longitudinal section through fruit (right).
- b. Leaf
- c. Lateral bud and leaf scar.
- d. Winter twig.

RED MULBERRY (*Morus rubra* L.) Group 10, Rarity: S2

COSEWIC RANKING: Endangered.

Rare in Canada; scattered throughout southern Ontario. The mulberry genus contains about 10 species; 2 are native to North America, 1 to Canada.

QUICK RECOGNITION: Leaves large, long-tapered, very rough above, unlobed to variously lobed (2-3) on the same branch; base asymmetrical. Twigs grayish-brown, exuding a milky juice when cut. Bark grayish-brown.

Size and Form: Very small tree, usually up to 9 m high and 40 cm in diameter; forest-grown tree sometimes up to 20 m high and 76 cm in diameter. Trunk short, soon dividing into stout, spreading branches. Crown dense, rounded.

Bark: Reddish-brown, separating into long flaky plates.

Twigs: Slender, green becoming light brown; exuding a milky juice when cut.

Leaves: Deciduous, alternate, simple; ovate, various shapes on the same tree, 8-24 cm long; tip long-tapered; base broad, heart-shaped, asymmetrical, prominently 3-veined; coarsely toothed; upper surface yellowish-green and rough like fine sandpaper, soft hairy beneath; yellow in autumn.

Buds: Ovoid, asymmetrical, plump, brown, in 2 rows on the twig; 6-8 scales in 2 rows. No terminal bud; end bud originates as a lateral bud. Leaf scars raised, with 5 or more vein scars.

Flowers: Small, yellowish- to reddish-green. Pollen flowers and seed flowers occasionally in mixed catkins; usually in separate catkins on the same tree or on separate trees; borne in the leaf axils. Appear before and with the leaves.

Fruits: Small, fleshy; in compact aggregates (resembling a blackberry), 22-30 mm long, red to dark purple, sweet, juicy, edible. Ripen in midsummer. Dispersed by birds and small mammals.

Vegetative Reproduction: Occasionally by stump sprouts.

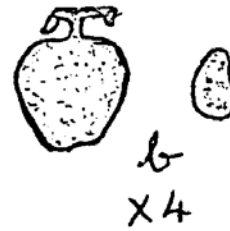
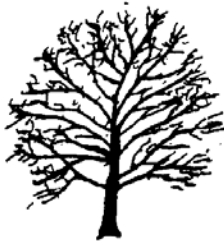
Habitat: Grows rapidly on deep moist soils, forested floodplains and valleys; as scattered individuals mixed with other broadleaf trees. Shade-tolerant.

References: 1. Trees in Canada by John Laird Rarrar, Fitzhenry & Whitside Ltd., 1995.

2. Lisa Samuelson:

<http://sofserv.forestry.auburn.edu/samuelsong/dendrology/moraceae-pg/red-mulberry.htm>

RED MULBERRY



- a. Fruit aggregate.
- b. Fruit (left); seed (right).
- c. Lobed leaf.
- d. Unlobed leaf.
- e. Lateral bud and leaf scar.
- f. Winter twig.

BLACK GUM (*Nyssa sylvatica* Marsh) Group 12, Rarity: S3

Common Names: Black tupelo; Sour-gum; Pepperidge.

Rare in Canada; occurs in Ontario north of Lake Erie; planted as an ornamental for its attractive form and scarlet autumn leaves. Black-gum is the only species of *Nyssa* native to Canada.

QUICK RECOGNITION: Leaves shiny dark green, clustered on dwarf branches and at the end of the major shoots; margin smooth, wavy. Fruits in long-stalked clusters in leaf axils. Terminal bud pointed; lateral buds diverging from the twig.

Size and Form: Small tree, up to 20 m high, larger farther south. Trunk distinct into the upper part of the crown. Crown broad, flat-topped, with crooked, horizontal branches.

Bark: Gray, flaky when young; becoming dark gray, with thick irregular ridges broken into block-like segments.

Twigs: Moderately slender, reddish-brown with a grayish skin. Pith with hard, greenish crossbars. Dwarf branches present.

Leaves: Deciduous, alternate. Simple; 5-12 cm long, variable in shape but usually widest above the middle; in clusters on dwarf branches and at the end of major shoots; upper surface shiny dark green, whitened beneath; sparsely hairy on the vein; margin smooth, wavy. Stalk reddish.

Buds: Terminal bud 7 mm long, curved, pointed; 5 scales, yellowish-brown to dark reddish-brown, hairy at tips. Lateral buds somewhat smaller, diverging widely from the twig. Leaf scars broadly crescent-shaped, with 3 sunken whitish vein scars.

Flowers: Small, inconspicuous, greenish-white; on long hairy stalks in small clusters in the leaf axils, especially on the dwarf branches. Pollen flowers and seed flowers on separate trees; some flowers may bear both pollen and ovules. Appear in late spring after the leaves are full size.

Fruits: Plum-like, 1-3 cm long, blue-black; flesh thin, oily, sour; stone indistinctly ribbed; solitary or in clusters at the ends of long stalks.

Vegetative Reproduction: By root sprouts.

Habitat: Occurs as an under-story tree on low, wet ground along streams or in swamps. Moderately shade-tolerant.

Notes: A variety exists that has gray twigs and thin, almost translucent leaves with many clear dots on the undersurface. Wood brownish-gray, close-grained, moderately heavy, hard, and strong; resistant to abrasion. Diffuse-porous. Wood Hardness in Zone 3-9. In most years, survival of seedlings is very poor, their success depends on exactly the right moisture conditions. The sexes are found on separate trees, a wood-lot needs to contain mature males and females for the species to renew itself. The Black Gum occurs in forested swamps and along the margins of woodland ponds.

References: 1. Trees in Canada by John Laird Farrar, Fitzhenry & Whiteside Ltd., 1995.
 2. Rare, Threatened, or Endangered Trees in Haldimand-Norfolk, A Norfolk Field Naturalists Publication, 1990, Simcoe, Ontario.
 3. Web site:
<http://bluehen.ags.udel.edu/udbg/trees/descriptions/n-sylvatica.html>

BLACK GUM



- Fruit cluster (left); seed (right).
- Leaf forms.
- Longitudinal section through twig showing banded pith.
- Lateral bud and leaf scar.
- Winter twig.

HOP TREE (*Ptelea trifoliata* L.) Group 9, Rarity: S3

Common Names: Water-ash; Stinking-ash; Wafer-ash; Ptelea; Wing-seed; Shrubby trefoil; Swamp dogwood; Three-leaved hop tree; Ague bark; Prairie-grub; Quinine tree; Stinking prairie-bush; Sang-tree; Pickaway-anise.

COSEWIC RANKING: Vulnerable.

Rare in Canada; occurs in southwestern Ontario on the north shore of Lake Erie; occasionally planted as an ornamental beyond its range. Of the 2 species reaching tree size, only common hop tree is found in Canada

QUICK RECOGNITION: Leaves compound, 3 leaflets with translucent dots. Buds small, partly buried. Twigs reddish-brown. Fruit flat, with an encircling wing. Strong citrus odour when bruised.

Size and Form: Very small tree, up to 8 m height and 15 cm in diameter. Trunk often branched. Crown irregular, rounded, with many short ascending branches.

Bark: Reddish-brown, smooth becoming rough with age.

Twigs: Slender, yellowish- to reddish-brown. Pith large, white. Pungent citrus odour when bruised.

Leaves: Deciduous, alternate, compound; composed of 3 leaflets on a central stalk 10-15 cm long. Leaflets 10-15 cm long, sharp-pointed, narrowing below the middle to a wedge-shaped base, nearly stalk-less; margin smooth or with shallow irregular teeth; upper surface shiny dark green; much paler which can be seen by holding the leaf against a strong light. Pungent citrus odour when bruised.

Buds: No terminal bud. Lateral buds very small, sunken, erupting through the leaf scar in spring. Leaf scars with 3 vein scars.

Flowers: Small, greenish-white, in clusters at the tips of shoots. Pollen flowers and seed flowers usually on separate trees. Perfect flowers occasionally present.

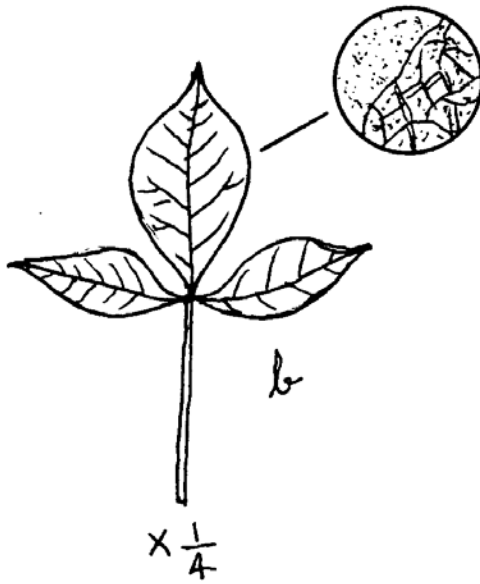
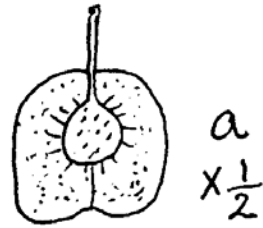
Fruits: Flat, 1- or 2-seeded; central seed-case surrounded by a veined wing, about 25 mm across; in dense clusters; remaining on the tree through most of the winter.

Habitat: Occurs along shorelines, on dry, rocky soils bordering wooded areas, and in open woodlands. Tolerant of partial shade, but flowers only in full sunlight.

Notes: The fruits have been used as a substitute for hops in flavouring beer, hence the name hop-tree. Wood moderately heavy, hard, medium strength, yellowish-brown.

References: 1. Trees in Canada by John Laird Farrar, Fitzhenry & Whiteside Ltd., 1995.
2. Web site:
<http://metalab.unc.edu/unc-biology/herbarium/gallery/ptelea.html>

HOP Tree



- Fruit.
- Leaf with detail of shallow irregular teeth along margin.
- Lateral bud and leaf scar.
- Winter twig.

PIN OAK (*Quercus palustris*) Group 10, Rarity: S3

Common Name: Swamp oak.

Occurs in southern Ontario at the east and west ends of Lake Erie; locally abundant. Frequently planted as an ornamental because of its symmetrical shape and attractive leaves; tolerant of urban conditions; easily transplanted. Small stiff dead branch-lets often project like pins from the trunk and larger branches; hence the name "pin".

QUICK RECOGNITION: Leaves with 5-7 lobes; each lobe 3 times as long as the width of the constricted part of the leaf; notches wide, U-shaped; leaf stalks slender. Buds 2-4 mm long, light reddish-brown, almost hairless. Twigs slender, reddish-brown. Acorns 9-13 mm long; cup shallow, enclosing one-quarter of the nut; scales thin, tight-fitting, hairy. Bark smooth, grooves inconspicuous even on older trees.

Size and Form: Small tree, up to 20 m height, 60 cm in diameter, and 100 years old. Trunk straight, with a gradual taper, distinct well into the crown. Principal branches slender (for an oak), ascending in the upper crown, horizontal in the center of the crown, and curving downward in the lower crown. Root system shallow.

Bark: Grayish-brown, thin, smooth; with age, dividing into narrow inconspicuous ridges. Inner bark reddish.

Twigs: Slender, hairless, reddish-brown.

Leaves: 7-15 cm long, base wedge-shaped, 5-7 lobes, with a few bristle-tipped teeth on the large lobes, wide-spreading, separated by deep wide U-shaped notches; upper edge of lobes often re-curved; central lobe 3 times as long as the width of the leaf between opposite notches; upper surface shiny dark green, paler beneath, with a few tufts of hair in the vein axils. Stalk slender, 2-5 cm long.

Buds: Terminal bud ovoid, small, 2-4 mm long, sharp-pointed, light chestnut-brown, almost hairless.

Flowers: One of the first oaks to bloom.

Fruits: Acorns small, 9-13 mm long, almost as wide, short-beaked at the tip. Cup shallow, saucer-shaped, 12-16 mm across, enclosing one-quarter of the nut; scales tight-fitting, thin, pointed, hairy, reddish-brown.

Habitat: Occurs mainly on poorly drained soils, in swamps and along streams, yet flourishes on well-drained loamy soils; mixed with other oaks, elms, and willows. Early height growth rapid; intolerant of shade. Natural community is found in floodplain forest, flatwoods, and wetlands.

Notes: Wood hardness Zones 4-8. Acorn matures in two years. Iron chlorosis is a severe problem.

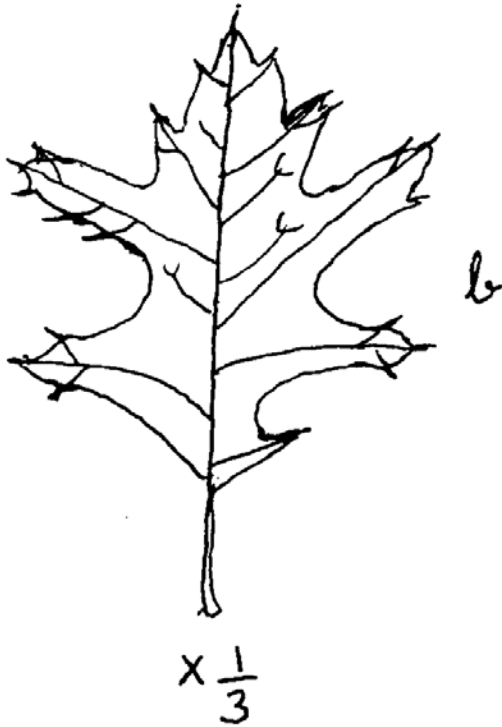
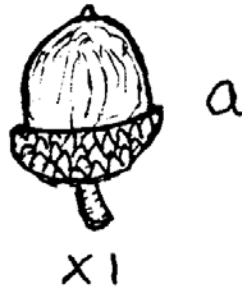
References:1. Trees in Canada by John Laird Farrar, Fitzhenry & Whiteside Ltd., 1995.

2. Web sites:

<http://bluehen.ags.udel.edu/gopher-data2/.trees/.descriptions/q-palustris.html>

<http://www.inhs.uiuc.edu/~kompere/quercus/species/palustris.html>

PIN OAK



- a. Acorn.
- b. Leaf.
- c. Lateral bud and leaf scar.
- d. Winter twig.

SHUMARD OAK (*Quercus shumardii* Buckl.) Group 10,

Rarity: S3

COSEWIC RANKING: Vulnerable.

Common Name: Swamp red oak.

QUICK RECOGNITION: Pistillate flowers 1-3 in a group; leaves are toothed and bristle-tipped lobed; sinuses are broadly rounded; shiny leaves.

Occurs in a few locations in southern Ontario north of Lake Erie; on lowlands, along streams, on poorly drained, heavy soils. Resembles black oak.

Size and Form: Medium-sized to large trees.

Bark: Dark gray, deeply furrowed.

Leaves: Large, 12-20 cm long, base rounded; 7-11 toothed lobes, separated by deep narrow notches; dark shiny green above, paler beneath; remaining green after those of other oaks have turned brown; rich red in autumn. Leaf stalk 5-7 cm long.

Buds: 6 mm long, very pale grayish-brown.

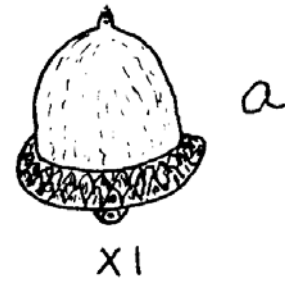
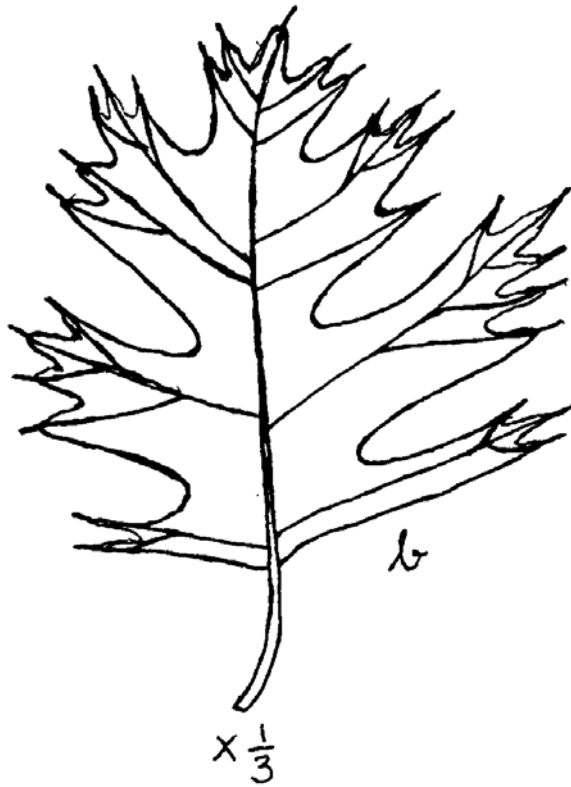
Acorns: Large, 15-30 mm long; cup shallow, saucer-shaped, 15-30 mm across, gray, slightly hairy, enclosing about one-third of the nut.

Trunk: Buttressed.

Crown: Open, wide-spreading with massive branches.

References: 1. [Trees in Canada](#) by John Laird Farrar, Fitzhenry & Whiteside Ltd., 1995
 2. Janet Sullivan:
<http://svinet2.fs.fed.us/database/feis/plants/tree/qeshu/introductory.html>

SHUMARD OAK



- a. Acorn.
- b. Leaf.
- c. Lateral bud and leaf scar.
- d. Winter twig.

GENUS CRATAEGUS (HAWTHORNS)

The difficulties of identifying hawthorns are not imaginary, they are attested to by both expert and neophyte. With over 1000 permanently field marked specimens in southern Ontario it is possible to ensure that fruiting, flowering, and cytological material is properly matched.

Several hawthorns taxa are, by any standards, very similar to one another and are only reliably separable when there is access to collections of excellent quality. Species easily separated in the field, where colour and habit are visible, many appear very similar in herbarium. Several species pairs are only easily distinguished either in fruit or flower.

In general, Ontario *Crataegus* flower in the second half of May and the first half of June although this month-long season may be compressed or extended, delayed, or started earlier according to the prevailing weather conditions of a particular spring.

Species of the genus *Crataegus* occur principally in areas affected by human being. Such areas would include, particularly, poorly managed or abandoned pastured, fence-lines, roadsides, waste ground, and the like. These sites have in common a high light level and absence of soil disturbance. It is noticeable that at least stages in the succession, when shading by tree assumes greater significance, hawthorns become weaker, cease flowering, and eventually die. By order of frequency it would appear that poorly managed or abandoned pastures are the most abundant site type, with fence-lines, and field and right-of-way margins following. As a result, by far the greatest abundance of *Crataegus*, as individuals, lies in the agricultural regions of Ontario.

Regarding soil types, *Crataegus* may be found on a substantial variety, though humic soils and permanently waterlogged soils are usually free of *Crataegus*. The great majority of Ontario hawthorns are found in the Carolinian zone and most are more or less restricted to it.

Reference: "A taxonomic revision of *Crataegus* (Rosaceae) in Ontario" by J.B. Phipps and M. Muniyamma. 1980. *Canadian Journal of Botany*, 58:1621-1699

HAWTHORNS (Genus *Crataegus*) Group 11

Hawthorns comprise a very large genus of small trees and coarse shrubs distributed throughout the North Temperate Zone; over 100 species are native to North America; about 30 to Canada, most occurring from southern Ontario eastward to Nova Scotia.

QUICK RECOGNITION: Smooth shiny sharp thorns; showy 5-petaled flowers in flat-topped clusters; broad rounded terminal buds; small apple-like fruits, often persisting in winter.

Size and Form: Shrubs to small trees up to 12 m high and 30 cm in diameter. Often with a distinct, crooked trunk; sometimes multi-stemmed and shrubby. Crown low, wide-spreading, somewhat rounded or flat topped.

Bark: Evenly separated into firm shreds that become loose at both ends.

Twigs: Shoots of 2 kinds; long shoots straight or zigzag, lustrous, pale-gray to orange-brown, with smooth, shiny, rigid, very sharp thorns that are sometimes branched; dwarf shoots often bearing terminal flower clusters and fruit.

Leaves: Deciduous, simple, alternate; small, 4-10 cm long; with sharp teeth of 2 sizes, sometimes lobed especially on vigorous shoots; base tapering in most species, but sometimes broadly wedge-shaped or rounded; often with 2 toothed leaf-like stipules at the base of the leaf stalk. Larger leaves on short shoots most useful in species identification.

Buds: Terminal bud broad, rounded, smooth, shiny reddish-brown, with 5-10 scales. Lateral buds similar, somewhat smaller, often 2 or 3 side by side, one developing into a thorn, the other into a new shoot bearing leaves or flowers or both. Leaf scars narrow, somewhat elevated, with 3 vein scars.

Seeds: Germinate after cool moist stratification.

Seedlings: Bear 2 small leaf-like cotyledons that are raised above the ground.

Flowers: Arranged in flat-topped clusters on the ends of dwarf shoots, each flower with 5 greenish sepals, 5 white or occasionally pink petals, 5-25 stamens, and 1-5 pistils; 1-2 cm across; often very showy like apple blossoms but blooming a few weeks later, with the leaves. Odour sweet, fetid.

Fruits: Similar to a small apple (a pome) with a thin flesh and 1-5 seeds, often called a haw; usually red, but may be orange, yellow, blue, or black; edible; often remaining on the tree during winter. Dispersed by fruit-eating birds and mammals.

Habitat: Occurring on abandoned farmland, along streams, and in forest openings, especially on soils high in calcium. Moderately shade-tolerant. Often forming thickets of several different species.

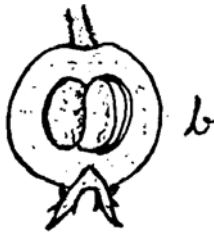
Notes: Wood, hard, heavy and is suitable for carving and turnery. Hawthorn thickets provide protected habitats and a food source in edible fruit, bark, and twigs for many small birds and mammals. Frequently planted for landscape purposes.

References: (1) Trees in Canada by John Laird Farrar, Fitzhenry & Whiteside Ltd., 1995
 (2) The New Britton and Brown Illustrated Flora of the Northeastern U. S. and Adjacent Canada, Vol. 2, by Henry A. Gleason, Hafner Publishing Co. N.Y. 1963, 655pp.

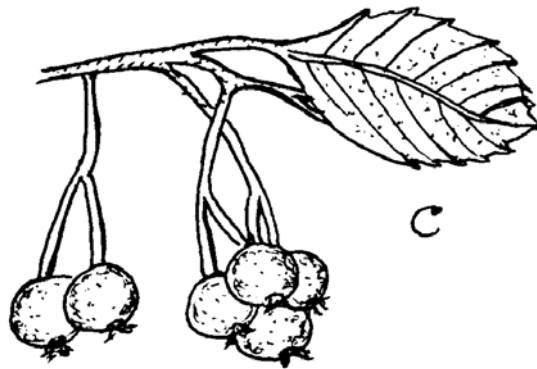
HAWTHORNS



a



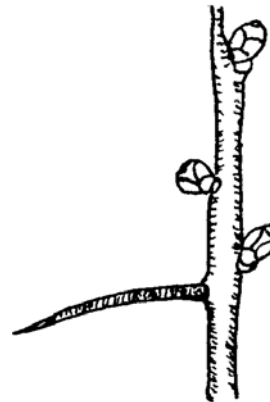
b



c



d



e

- a. Flower; side view (left). Radial view (right).
- b. Longitudinal section through fruit.
- c. Fruit cluster and typical leaf.
- d. Lateral bud and leaf scar.
- e. Winter twig and thorn.

HAWTHORN – *Crataegus Compta*, Group 11, Rarity: S2?

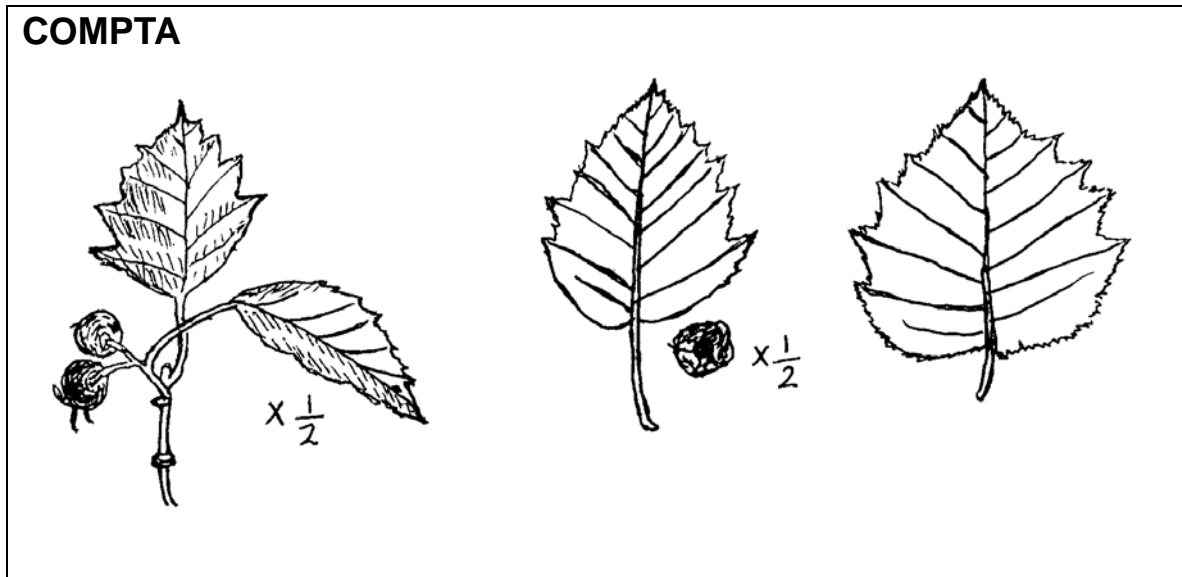
Arborescent shrub or tree up to 6-7 m tall. Leaves ovate or oblong-ovate, abruptly narrowed, rounded, or subcordate, at base, finely serrate and indented with 5-6 pairs of acute, spreading, lateral lobes, 4-6 cm long, 3-5 cm wide, or larger and more coarsely serrate on vegetative shoots, glabrous or nearly so, dark dull green, thick at maturity. Petioles usually glandular.

Flowers 1.5-2 cm wide, in many flowered, compound, glabrous corymbs, with 10 stamens or less and red anthers. Sepals glandular-serrate.

Fruit obovoid or oblong, bright red, slightly pruinose, 1-1.3 cm thick, with firm or mellow flesh and 3-4 nutlets.

Thickets and open woods, usually in moist soil along streams, southern Ontario and New York to Pennsylvania and Michigan.

May; fruit ripe October.



HAWTHORN – *Crataegus Dissona* , Group 11, Rarity: S3

Tree up to 7-8 m tall or arborescent shrub, with thorny intricate branches and dark gray scaly bark. Leaves prevailing ovate, rounded or abruptly narrowed at base, 3-5 cm long, 2.5-4 cm wide, or larger and sometimes truncate or rarely sub-cordate at base on vegetative shoots, glabrous, bluish green, firm or thick at maturity. Petioles slender, a third to two-thirds as long as the blades, or relatively shorter and stouter on shoots, sometimes slightly glandular.

Flowers in slightly branched, stamens about 10, mostly 5-10 flowered, glabrous corymbs.

Fruit with dry flesh, a broad prominent calyx, and 3-5 relatively large nutlets deeply grooved and ridged on the back. Calyx of fruit broad but nearly sessile.

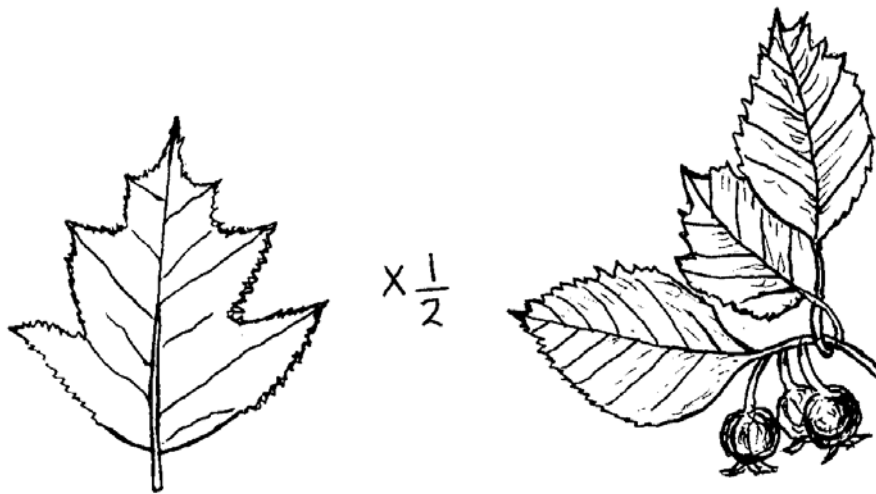
Thickets and rocky woods, usually in dry or well –drained ground.

May; fruit ripe October.

This typical variety found throughout the northern part of the range.

This Hawthorn is one of the pruinosa series

DISSONA



HAWTHORN – *Crataegus Formosa*, Group 11, Rarity: S2

Leaves ovate or oblong-ovate, more or less divided above the middle into 3-4 pairs of acute spreading lobes, glabrous or nearly so from the first, firm or thick, dull dark green at maturity.

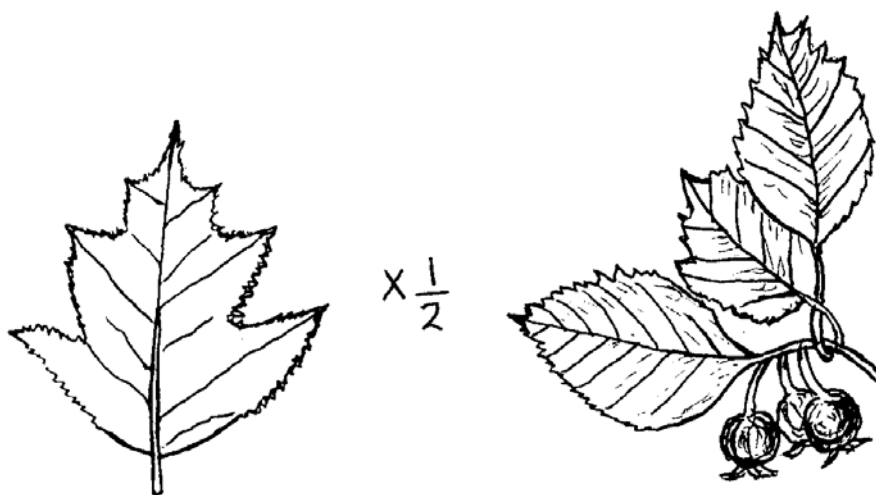
Flowers 1.8-2.2 cm wide in usually 4-10-flowered glabrous corymbs, with 15-20 stamens and white anthers.

Fruit oblong or nearly globose, sometimes slightly narrowed at base, 0.9-1 cm thick, with a broad nearly sessile calyx, thin flesh and 5 nutlets.

North and central New York.

Perhaps a hybrid between a species of the Pruinosae and one of the Silvicolae series.

FORMOSA



HAWTHORN – *Crataegus Persimilis*, Group 11, Rarity: S1

Tree 6.6m tall or stout shrub, with slender, pale, thorny branchlets. Leaves obovate or elliptic, acute or rarely rounded at apex, narrowed at base, yellowish green, glabrous, firm to subcoriaceous at maturity, the veins distinctly impressed above, 2.5-4 cm long, 2-3 cm wide, up to 6 cm wide on vegetative shoots. Vegetative leaves usually slightly lobed, glabrous.

Flowers 1.4-1.6 cm wide, in loose, glabrous, compound corymbs, with about 15-20 stamens and pink anthers. Sepals lanceolate, entire or nearly so, usually persistent and reflexed on fruit.

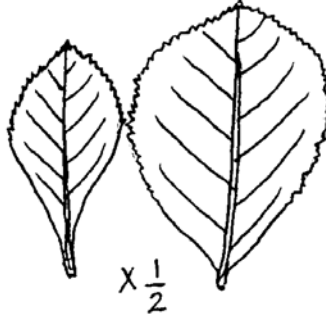
Fruit sub-globose or short-oblong, or slightly ovoid, 7-8 mm thick and slightly longer, green or dull red, with thin dry flesh and with 2-3, usually 2, nutlets.

Thickets and borders of woods, in fertile limestone soil.

May; fruit ripe October.

Possibly a hybrid between a species of the *Crus-galli* series and *C. succulenta*.

PERSIMILIS



HAWTHORN – *Crataegus Conspecta*, Group 11, Rarity S1

Small tree or large bush to 6 m tall in our area, usually with main trunk: thorns slender, ± straight, shiny blackish, to 5 cm long; leaves ovate, long-petiolate, blades 6-8 cm long at maturity, scabrous-villous; pedicels 2-4 cm long, slender, glandular; blades five or six lobed, not deeply, but sharply, also serrate, apex acute to acuminate, base broad-cuneate to truncate, scabrous above, ± glabrous below. Inflorescence early-midseason, five to eight flowered, pedicels villous. Flowers very large, 2.2-3.0 cm in diameter; calyx lobes coarsely glandular-serrate; stamens 20, anthers cream; styles three or four. Fruit about 1 cm thick, ± orbicular, strongly pruinose, mauve, ripening later to amore shiny cerise, and less pruinose; calyx persistent, slightly elevated, spreading, nutlets four or five, dorsally grooved.

Niagara Peninsula to the Toronto area. New York to Missouri.

Very striking and handsome species with easily the largest flowers of any Ontario hawthorn. In general facies, pruinosity, and colour of *C.consepcta* resembles *C. pruinosa*, but in leaf shape, indumentum, and fruit size it resembles *Coccineae*.

Reference: "A taxonomic revision of *Crataegus* (Rosaceae) in Ontario" by J. B. Phipps and M. Muniyamma. 1980. *Can. J. Bot.* 58; p.1692.

ACKNOWLEDGEMENTS

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2. Mr. Rob W. Guthrie, Coordinator, Ontario Tree Atlas Project, University of Guelph, Guelph, Ontario.
3. Mr. N. A. Smith, Niagara Wood-lot Association.
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