



MONITORING the MORaine

TREES OF THE OAK RIDGES MORaine

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INTRODUCTION

Monitoring the Moraine (MTM) is a community-based project that enables those who are concerned about the health of the Oak Ridges Moraine to contribute to its protection. It is designed to engage and sustain community volunteers in science, stewardship, monitoring and decision-making on the Oak Ridges Moraine. It is a collaborative project between EcoSpark and STORM Coalition (Save the Oak Ridges Moraine).

EcoSpark is working with community members to monitor tree health in forests of the Oak Ridges Moraine. When monitoring tree health, it is essential that trees are identified to the species level. This guide was created as a resource for volunteers to take with them in the field for tree identification. We also hope it will be used by Moraine hikers interested in learning about trees of the Oak Ridges Moraine.

To learn about other species that may be found on the Oak Ridges Moraine, we recommend *Trees in Canada* by John Laird Farrar (1995).

Monitoring the Moraine Project Partners:



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TERMINOLOGY

NATIVE naturally occurring

NON-NATIVE not naturally occurring; often brought in for horticultural purposes

NATURALIZED a non-native species that successfully grows and reproduces itself

INVASIVE any species, native or non-native, that adversely affects its habitat



Opposite Arrangement



Alternate Arrangement

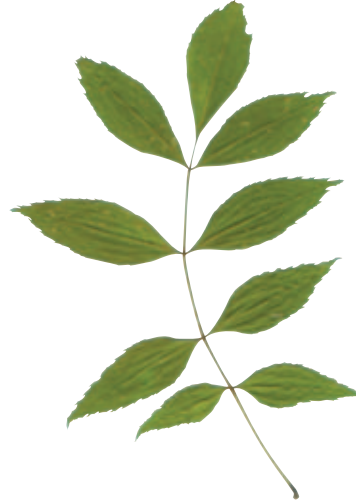


Lenticels - slightly raised pores on root, trunk, or branch bark

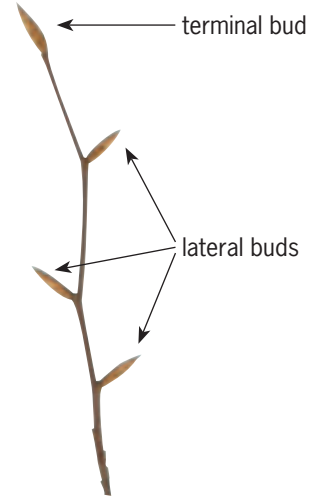
TERMINOLOGY



Simple Leaves



Compound Leaf



Terminal and Lateral Buds

NEEDLE-LIKE
OR SCALE-LIKE LEAVES

Thuja occidentalis / EASTERN WHITE CEDAR



OTHER COMMON NAMES white cedar, northern white cedar

LEAVES scale-like; overlapping, oppositely arranged in 4 rows around the twig; resin gland usually visible; 1-2 mm long; twigs and leaves form a characteristic flat spray

TWIGS flattened, hidden by leaves

BUDS very small, protected by leaves

YOUNG BARK shiny reddish-brown

MATURE BARK grey; shredding into long, narrow, flat strips

SEED CONES leathery; ovoid; 7-12 mm long

SIZE up to 15 m tall and 30 cm in diameter; occasionally larger

Pinus strobus / EASTERN WHITE PINE

The tallest tree in eastern Canada and the only 5-needled pine native to eastern North America.

LEAVES needle-like; bluish-green with lines of white dots; in clusters of 5, each cluster surrounded at the base with a sheath that falls off early; slender, straight, flexible, 3-sided; edges finely toothed; 5-15 cm long

TWIGS flexible; green and hairy when young, orange-brown and hairless after first year

BUDS reddish-brown; slender, pointed; overlapping scales; up to 15 mm long

YOUNG BARK greyish-green, smooth

MATURE BARK dark greyish-brown; deeply furrowed with broad, thick ridges; inner bark pinkish-red

SEED CONES light brown, woody; slender, cylindrical, curved, tapering; stalk 2 cm long; open in early September; 8-20 cm long

SIZE AND SHAPE up to 30 m tall and 100 cm in diameter; in forests, trunk is often branch-free for lower two-thirds of its height



Pinus resinosa / RED PINE



Similar to Scots pine (*Pinus sylvestris*) and Austrian pine (*Pinus nigra*).

SCOTS PINE needles light green and 4-8 cm long; orange upper bark

AUSTRIAN PINE needles in bundles of 2 and 8-16 cm long but very sharp, stiff and bend without breaking in half; mature bark dark, deeply furrowed

OTHER COMMON NAMES Norway pine

LEAVES needle-like; shiny dark green; in bundles of 2, each cluster with a persistent bundle sheath at the base; edges finely sharp-toothed; pointed; brittle, easily breaking when bent; 10-16 cm long

BUDS reddish-brown; sharp-pointed with white-fringed scales; resinous; 15-20 mm long

TWIGS orange to reddish-brown; stout, rigid

YOUNG BARK reddish to pinkish-brown, scaly

MATURE BARK reddish to pinkish-brown with broad, scaly plates

SEED CONES light brown; almost stalkless; scales concave; 4-7 cm long

SIZE up to 25 m tall and 75 cm in diameter

Larix laricina / TAMARACK

Similar to the non-native European larch (*Larix deciduas*).

EUROPEAN LARCH leaves are longer; twigs are more stout and yellow; bark in large plates

OTHER COMMON NAMES American larch, larch

LEAVES needle-like; light bluish-green; arranged in 2 ways: singly in a spiral manner along the twig and in clusters of 15-60 from short, spur-like lateral branchlets; 2-5 cm long

BUDS brown or dark red; smooth; hairless or ringed by hairs

TWIGS orange-brown to pinkish, hairless

YOUNG BARK grey, smooth

MATURE BARK reddish-brown with reddish-purple inner bark; scaly

SEED CONES yellow-greenish or reddish when young, light brown when mature; on short, curved stalks at the tips of branches; 10-20 smooth scales; begin to open mid-august; 1-2 cm long

SIZE up to 25 m tall and 40 cm in diameter



Picea glauca / WHITE SPRUCE



LEAVES needle-like; bluish-green with lines of white dots on each side; straight, stiff, 4-sided, tip pointed; spirally arranged along the twig; 15-22 mm long

BUDS blunt, scales curling outward; 6 mm long

TWIGS light yellowish-grey to orangish-brown or greenish-grey; stout, rough with leaf-bearing bumps

YOUNG BARK light grey, smooth

MATURE BARK dark grey, with thin, scaly plates; newly exposed bark pinkish

SEED CONES light brown when mature; narrow, cylindrical, blunt tipped, stalkless; open in late summer; 3-6 cm long

SIZE up to 25 m tall and 60 cm in diameter

Tsuga canadensis / EASTERN HEMLOCK

Similar to balsam fir (*Abies balsamea*).

BALSAM FIR twigs are smooth when leaves are removed.

LEAVES needle-like; dark to yellowish green above, whitened beneath with 2 rows of white dots alongside the midvein; flat with a rounded tip; edges very finely toothed; flexible; grow spirally along the twig, falling in two flattened rows; 1-2 cm long

BUDS brownish; hairy; 2 mm long

TWIGS slender, yellowish-brown, hairy; rough after leaves are removed

YOUNG BARK reddish-brown, scaly

MATURE BARK dark brown to reddish-purple, inner bark bright reddish-purple; deeply furrowed, with broad, flat-topped ridges

SEED CONES mature cones light brown with thin scales; stalked; 12-20 mm long; shed autumn to early winter

SIZE up to 30 m tall and 100 cm in diameter



OPPOSITE LEAVES

Acer saccharum / SUGAR MAPLE

Similar to black maple (*Acer nigrum*); hybrids are common.

BLACK MAPLE leaf undersurface covered with dense, brown, velvety hairs.

Similar to Norway maple (*Acer platanoides*).

NORWAY MAPLE a milky juice exudes from cut leaf stalks, bud scales and twigs.

LEAVES opposite, simple; 3-5 lobes (usually 5) separated by wide, rounded notches; long blunt tips; a few irregular teeth; 8-20 cm long

BUDS brown, faintly hairy, sharply pointed; 6-12 mm long

TWIGS shiny reddish-brown to green, hairless

YOUNG BARK grey, smooth

MATURE BARK dark grey, long, thick vertical ridges curl outward along one side, sometimes scaly

FRUITS hang in clusters of paired keys; slightly divergent, U-shaped; fall in autumn

SIZE up to 35 m tall, usually 50-90 cm in diameter but can reach up to 150 cm



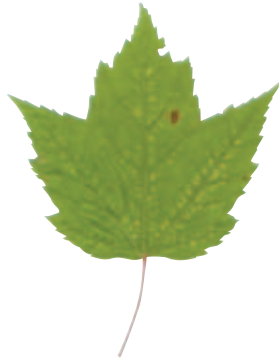
Sugar maple
(*Acer saccharum*)



Black maple
(*Acer nigrum*)



Acer rubrum / RED MAPLE



Hybridizes with silver maple; intermediate forms often occur.

LEAVES opposite, simple; 3-5 lobes with sharp, irregular teeth; sides of central lobe almost parallel to midvein; lobes separated by v-shaped notches nearly at right angles; whitened beneath; 5-15 cm long

BUDS blunt, smooth, shiny-reddish brown; 3-4 mm long

TWIGS shiny red to greyish-brown

YOUNG BARK smooth, light grey

MATURE BARK dark greyish-brown; scaly ridges peeling at ends

FRUITS keys mature and are shed in early summer

SIZE AND SHAPE up to 25 m tall, usually reach 60 cm in diameter but can reach up to 130 cm

Acer saccharinum / SILVER MAPLE

Hybridizes with red maple; intermediate forms often occur.

LEAVES opposite, simple; 5-7 lobes with coarse, sharp, irregular teeth; lobes separated by deep, narrow notches; silvery-white beneath; 8-20 cm long

BUDS blunt, shiny, reddish; 3-4 mm long

TWIGS shiny, hairless

YOUNG BARK smooth, light grey; slightly darker than that of red maple

MATURE BARK grey, shaggy, with long narrow strips that are loose at ends

FRUITS keys mature and are shed in late spring

SIZE AND SHAPE up to 35 m tall and 100 cm in diameter



Acer negundo / MANITOBA MAPLE



The only maple with compound leaves; sometimes mistaken for ash. Naturalized beyond its natural range and considered invasive in some areas.

OTHER COMMON NAMES box-elder, ashleaf maple

LEAVES opposite, compound with 3-9 leaflets; leaflet shape variable, often asymmetrical with irregular, coarse teeth or shallow lobes; leaflets 5-12 cm long

BUDS blunt with white hairs; hidden by leaf stalk; 3-8 mm long

TWIGS purple-green to brown, shiny; often covered with a whitish waxy powder that is easily rubbed off

YOUNG BARK light greyish-brown, smooth

MATURE BARK darker greyish-brown, narrowly furrowed

FRUITS hang in clusters of paired keys, incurved, usually spread less than 45° apart, wrinkled seedcases; mature September to October

SIZE AND SHAPE up to 20 m tall and 75 cm in diameter; trunk often dividing near the ground; in forests, the undivided portion of the trunk may be long and straight



Acer platanoides / NORWAY MAPLE

Similar to sugar maple (*Acer saccharum*).

NORWAY MAPLE a milky juice exudes from cut leaf stalks, bud scales and twigs.

Non-native to Canada; naturalized in many areas and considered invasive in some.

LEAVES opposite, simple; 5-7 lobes with a few large bristle-tipped teeth, dark green; long stalks; 8-16 cm long

BUDS large, blunt, reddish-purple or purplish-green; 3-4 mm long

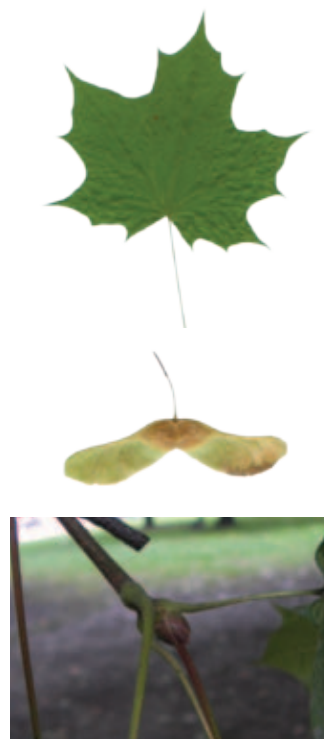
TWIGS stout, straight, purplish to reddish

YOUNG BARK light grey, ridges beginning to form appear as vertical, orange-coloured stripes

MATURE BARK dark grey with narrow, intersecting ridges in a regular pattern

FRUITS hang in clusters of paired keys, widely spread in a coat hanger-like shape; mature in autumn, often persisting through winter

SIZE commonly 20 m tall but can reach up to 30 m tall and 150 cm in diameter



Fraxinus americana / WHITE ASH



Similar to red ash (*Fraxinus pennsylvanica*).

RED ASH twig and leaf undersurface densely hairy.

OTHER COMMON NAMES American ash

LEAVES opposite, compound with 5-9 stalked leaflets (usually 7); end leaflet often largest, basal leaflets smallest; leaflets oval to lance-shaped, tapering to a point; edges smooth or with few, rounded teeth; central stalk 15-25 cm long; leaflets 6-15 cm long

BUDS reddish-brown, pointed, soft; uppermost pair of lateral buds very close to terminal bud; terminal bud 5-14 mm long

TWIGS hairless, stout, shiny purple-grey

YOUNG BARK light grey, smooth

MATURE BARK light grey, narrowly furrowed; thin, intersecting ridges form a regular diamond pattern

SIZE up to 30 m tall and 150 cm in diameter

Fraxinus nigra / BLACK ASH

Similar to European ash (*Fraxinus excelsior*).

EUROPEAN ASH buds are black and hairy; leaves are hairy on the midvein but not at the base; bark is firm, ridged.

OTHER COMMON NAMES swamp ash, hoop ash

LEAVES opposite, pinnately compound with 7-11 leaflets; leaflets elongated-oval, stalkless, finely sharp-toothed, hairless except for tufts of reddish-brown hairs where leaflets meet central stalk; central stalk 10-30 cm long; leaflets 10-14 cm long

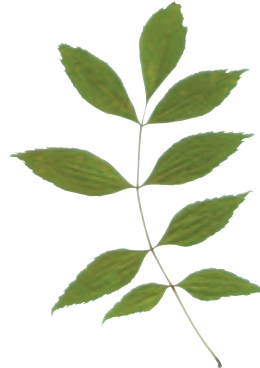
BUDS dark brown to black, pointed, soft; uppermost pair of lateral buds set below terminal bud; terminal bud 4-10 mm long

TWIGS hairless, very stout, dull grey

YOUNG BARK light grey, corky, soft, easily rubbed off

MATURE BARK light grey, corky, soft, easily rubbed off; becoming scaly

SIZE up to 20 m tall and 50 cm in diameter



ALTERNATE LEAVES

Juglans nigra / BLACK WALNUT

Similar to butternut (*Juglans cinera*).

BUTTERNUT terminal leaflet always present; underside of leaflets, leaf-stalk and twigs densely hairy; bark ridges are flat-topped; buds pale yellow.

OTHER COMMON NAMES American walnut

LEAVES alternate, compound with 14-23 leaflets; terminal leaflet missing or smaller than lateral leaflets; middle leaflets largest; leaflets slightly hairy beneath, finely toothed, short-stalked; central stalk 20-60 cm long; leaflets 5-9 cm long

BUDS slightly hairy, pale grey-brown; terminal bud largest, slightly flattened, 8-10 mm long

TWIGS faintly hairy, stout, orange-brown

YOUNG BARK brown, scaly

MATURE BARK dark with rounded intersecting ridges

SIZE up to 30 m tall and 120 cm in diameter



Quercus alba / WHITE OAK



Similar to bur oak (*Quercus macrocarpa*).

BUR OAK leaves have a hairy undersurface while white oak leaves are hairless when mature

LEAVES alternate, simple; 5-9 rounded, narrow lobes separated by deep notches; lobes sometimes with 1-2 blunt, rounded teeth; may be somewhat whitened beneath; 10-20 cm long

BUDS reddish-brown; rounded; sometimes slightly hairy; clustered end buds; diverging side buds; 3-5 mm long

TWIGS greenish to reddish, becoming grey; smooth; moderately stout

YOUNG BARK scaly

MATURE BARK light grey; shallowly furrowed to scaly

FRUIT acorns with warty cup covering about one-quarter of the nut; 12-20 mm long

SIZE up to 35 m tall and 120 cm in diameter

Quercus rubra / RED OAK

Similar to black oak (*Quercus velutina*); Hybridizes with black oak.

OTHER COMMON NAMES northern red oak

LEAVES alternate, simple; 7-9 lobes with a few bristle-tipped teeth; lobes slightly tapered; tufts of hair in vein axils; 10-20 cm long

BUDS shiny reddish-brown; pointed; a few hairs at the tip; terminal buds clustered; 6-8 mm long

TWIGS reddish-brown; stout

YOUNG BARK grey, smooth

MATURE BARK shallowly furrowed into long ridges; inner bark reddish-pink

FRUITS acorns variable in shape with cup usually covering one-quarter to one-third the nut; 12-25 mm long

SIZE up to 25 m tall and 90 cm in diameter



Quercus velutina / BLACK OAK



Similar to red oak (*Quercus rubra*); Hybridizes with red oak.

LEAVES alternate, simple; 5-7 deeply cut lobes with a few coarse, bristle-tipped teeth; dark glossy above; tufts of hair in vein axils; 10-20 cm long

BUDS sharp-pointed, angled; densely grey- to white-wooly; terminal buds clustered; 6-10 mm long

TWIGS dark reddish-brown; stout; becoming hairless

YOUNG BARK dark grey, smooth

MATURE BARK dark greyish-brown to black; rough, deeply furrowed into thick squarish ridges; yellowish-orange inner bark

FRUITS acorns variable in shape with hairy cup usually covering half the acorn; 12-20 mm long

SIZE up to 20 m tall and 100 cm in diameter

Fagus grandifolia / AMERICAN BEECH

LEAVES alternate, simple; narrowly oval, tip long-pointed; 9-14 parallel veins per side, each ending in a tooth; 6-14 cm long

BUDS slender, long, diverging from the twig; brownish-grey with many scales; 15-25 mm long

TWIGS slender, slightly zigzag, shiny light brown

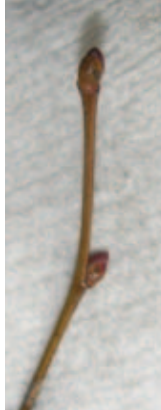
YOUNG BARK light grey, smooth

MATURE BARK dark grey, smooth

SIZE up to 25 m tall and 100 cm in diameter



Tilia americana / AMERICAN BASSWOOD



OTHER COMMON NAMES basswood, American linden

LEAVES alternate, simple; heart-shaped with an uneven base and short, sharp-pointed tip; edges sharp toothed; tufts of hair in vein axils; 12-15 cm long

BUDS reddish to yellowish-brown; shiny; plump, lopsided, pointed; 5-7 mm long

TWIGS yellowish-brown to reddish, zigzagged

YOUNG BARK light grey, smooth

MATURE BARK greyish-brown; shallowly grooved into narrow, flat, scaly ridges; upper bark often smooth

FRUITS brown; woody, hairy, nutlet-like capsules; found in clusters hanging on long stalks from a long, narrow, leaf-like bract; 6-12 mm; mature in September to October, persist through winter

SIZE up to 35 m tall and 100 cm in diameter



Betula papyrifera / WHITE BIRCH

Young trees similar to young yellow birch (*Betula alleghaniensis*).

OTHER COMMON NAMES paper birch

LEAVES alternate, simple, ovate or triangular; tip pointed, base shape variable; 9 or fewer parallel veins per side, each ending in a tooth, with 3-5 small intervening teeth; 5-10 cm long

BUDS slender, tapering to a blunt point; resinous; green and brown scales on each; 5-7 mm long

TWIGS slender, reddish-brown with resin glands

YOUNG BARK shiny reddish; thin, smooth; with lenticels

MATURE BARK white; peeling in thin, large sheets; sometimes with rough sections

SIZE up to 25 m tall and 60 cm in diameter



Betula alleghaniensis / YELLOW BIRCH



Young trees similar to young white birch (*Betula papyrifera*).

OTHER COMMON NAMES swamp birch

LEAVES alternate, simple; deep yellowish-green; tip slender, sharp pointed; base rounded, sometimes indented; 9 or more parallel veins per side, each ending in a large tooth, with 2-3 intervening teeth; 6-13 cm long

BUDS sharp pointed, often hairy, 2 shades of brown on each, diverging from twig; 6-8 mm long

TWIGS slender, usually slightly hairy, sometimes slightly zigzag

YOUNG BARK shiny reddish-brown with large horizontal lenticels

MATURE BARK dark yellow to bronze; ends of wide horizontal sheets peel into tight curls

SIZE up to 25 m tall and 100 cm in diameter

Ostrya virginiana / IRONWOOD

Similar to blue-beech (*Carpinus caroliniana*).

BLUE-BEECH bark is smooth and unbroken; buds are pressed against the twig.

OTHER COMMON NAMES hop-hornbeam

LEAVES alternate, simple; oval with a pointed tip and rounded base; hairy beneath; veins straight, parallel and sometimes forked, each ending in a large tooth, with smaller intervening teeth; dark yellowish-green; 6-13 cm long

BUDS greenish-brown, slightly hairy; sharp pointed, diverging from the twig; thicker than the twig; 3-4 mm long

TWIGS dark reddish-brown, slender

YOUNG BARK soon rough

MATURE BARK greyish-brown; shaggy, with narrow, flat, vertical strips loose at both ends; easily rubbed off

SIZE up to 12 m tall and 25 cm in diameter



Populus tremuloides / TREMBLING ASPEN



Trembling aspen
(*Populus tremuloides*)



Largetooth aspen
(*Populus grandidentata*)



Eastern cottonwood
(*Populus deltoids*)

Similar to balsam poplar (*Populus balsamifera*), largetooth aspen (*Populus grandidentata*) and eastern cottonwood (*Populus deltoids*). Most easily distinguished by the shape and edges of their leaves.

BALSAM POPLAR oval, taper to a point, edges with many blunt teeth; 6-15 cm long

LARGETOOTH ASPEN ovate to round, usually sharp-pointed, edges with 7-15 large teeth, 5-10 cm long

EASTERN COTTONWOOD rounded-triangular, tip tapers to a point, edges with 20-25 rounded teeth, 5-17 cm long

OTHER COMMON NAMES quaking aspen

LEAVES alternate, simple, round to ovate; short, sharp-pointed tip; edges with 20-30 fine, irregular teeth; 3-7 cm long; leafstalk often longer than the blade, causing leaves to tremble

BUDS reddish-brown, shiny; pointed, with tips curving inward; slightly resinous; 5-7 mm long

TWIGS slender; shiny dark green to dark brown; with lenticels

YOUNG BARK pale green to almost white, with dark marks; smooth

MATURE BARK whitish to dark grey; becoming furrowed

SIZE up to 25 m tall and 60 cm in diameter

Ulmus americana / WHITE ELM

Similar to rock elm (*Ulmus thomasii*) and slippery elm (*Ulmus rubra*).

ROCK ELM leaves with shiny, smooth upper surface; buds diverging from the twig; corky wings on branchlets

SLIPPERY ELM leaves very rough like sandpaper; many forked veins; leaves, twigs and buds hairy

COMMON NAMES American elm

LEAVES alternate, simple; oval-shaped with an uneven base and pointed tip; 15-20 straight veins per side, few forked; edges toothed; smooth or slightly rough surface; slightly hairy beneath; 10-15 cm long

BUDS reddish-brown; sharp-pointed; somewhat flattened; sometimes slightly hairy; end bud on an angle; lateral buds pressed against twig; 5 mm long

TWIGS greyish-brown; hairless or slightly hairy; slightly zigzagged

YOUNG BARK dark brown with shallow, intersecting ridges

MATURE BARK greyish- or reddish-brown; divided into flat, intersecting ridges; outer bark shows alternating layers of light and dark

SIZE AND SHAPE up to 24 m tall and 80 cm in diameter; unique vase-shaped form



Prunus serotina / BLACK CHERRY



The three forest species of cherry are black cherry, pin cherry (*Prunus pensylvanica*) and choke cherry (*Prunus virginiana*).

PIN CHERRY leaves narrowest; very thin texture; bark has long, orange-powdery lenticels

CHOKO CHERRY broadly oval in shape; the only cherry with fine and very sharp teeth; dull, greyish-brown bark

LEAVES alternate, simple, oval; sharp-pointed, tapering to both ends; thick, leathery texture; edges with incurved teeth; underside has white (becoming reddish-brown) hairs along the lower midvein; 5-15 cm long

BUDS reddish-brown with spots of green; pointed; diverging slightly from the twig; 3-4 mm long

TWIGS reddish-brown, slender

YOUNG BARK dark reddish-brown with grey lenticels; smooth

MATURE BARK almost black; broken into large, squarish scales with edges curving outward

SIZE up to 30 m tall and 100 cm in diameter



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