



Michigan
**FORESTS
FOREVER**

-Forest Basics- **Tree Identification**

Adapted from the on-line Teachers Guide

<http://mf.dsisd.net>

MICHIGAN STATE
UNIVERSITY
EXTENSION

Tree Identification Primer

Tree identification is a basic component to understanding forests and forest ecology. Forests are dominated by trees. The trees largely determine the characteristics of other ecological components, such as wildlife habitat, soil type, water cycles, etc. Of course, all the other ecological characteristics impact trees, too. Nevertheless, when we talk about forests, trees are the best place to begin. Knowing the species is a good first step in learning about each of their individual sets of environmental requirements. Beyond that, there are many aspects of forests that can be explored.

Tree Identification Characteristics

Trees are cool. Learning how to ID trees and learning about their "personalities" is like making new friends. There's a lot more to know about trees than just how to tell them apart! The more time you spend with trees and in the forest, the more you will understand about some of the neatest places on Earth. But we have to begin somewhere and ID is a great first step.



There are certain parts of a tree that will tell you what species you're looking at. Usually, we think only of **leaves**. But, of course, this doesn't help us much in winter if the leaves have fallen (not all do!). Leaves on tall trees that are only way up in the air don't help us much either.

So, we should learn to look at other parts, such as **twigs, buds, bud scars, bark, flowers, fruits, branching pattern, tree form, where the tree is growing**, and **"who" the tree is growing with**. It's not necessary to learn every characteristic of every species (although it's fun). Generally, just one or two features will be enough ... but you have to know which ones are important for which tree! That's the hard part. For example, most of us can identify paper birch from just the bark. But how many of us can tell the difference between maples, elms, oaks, and ashes without the leaves? (How many of us can do that even with the leaves!) And, what about all the conifers? Some of the following considerations will help you look in the correct place in a tree ID book or this on-line tree ID key.



TWIGS: *Slender or chubby? Smooth or hairy?
Any spots, ridges, or special colors?
Boxelder twigs have a purplish color to the most recent growth.*



BUDS: *Pointy or blunt? Shiny or dull?
Hairy or smooth? Big or small? Colors?
Sugar maple have very pointy buds.
Oaks have a cluster of "end" buds.*



BUD SCARS: *These are the places where last year's leaves fell off.
They have shapes, sizes, and "face" patterns unique to each species.
This is helpful with ashes, butternut, walnut, and hickories because the scars are bigger.*



BARK: Rough, smooth, special colors, thickness, patterns, oddities? Bark can be difficult to learn because most trees have bark that changes appearance with age. Only a few trees have really easy bark to recognize, like birches, aspens, or American elm.



FLOWERS: We don't normally think of trees with flowers but all trees have them. In some cases, the flowers help us with identification. Flowers are also one of the main parts that scientists have used to put trees in categories. Red maple is about the first tree to bloom in the spring.



FRUITS: All trees have fruits, too. Cones, nuts, acorns, seeds, and helicopters are just some of the many kinds of fruits that trees produce. A fruit is any kind of organ that hold seeds, not just edible fruits like apples or oranges.



BRANCHING PATTERN: The way in which a tree branches can sometimes be a helpful thing to know. "Opposite" branching occurs only in maples and ashes (at least with U.P. trees). Some shrubs also have opposite branching, so identification of tree saplings may be harder. Most other trees have "alternate" branching. The angle at which branches come off the trunk, or the density of branches in the crown, can be good clues in tree ID. Sometimes the crown (all the branches together) has special characteristics. Paper birch looks purple.



TREE FORM: The overall shape of a tree is the form. Some trees have very distinctive forms. An American elm is shaped like a large flower vase. Or balsam fir has a very pointy crown.



GROWING PLACE or SITE: Some trees, like cedar, black spruce and tamarack are usually found on wet sites. Yellow birch and hemlock grow in cooler, moister places like ravines and the north side of hills.



TREE ASSOCIATES: Trees, like people, like to "hang" around in certain groups. If you can identify one or two trees in an area, you'll have some clues to what else might grow there. For example, if there is a lot of sugar maple, chances are good that you'll find basswood, beech, and ironwood. Aspen, paper birch, and jack pine probably won't be there.



LEAVES: Leaves include needles and scales of conifers. Leaves are one of the best ways to ID a tree, when they are available. Simple or compound? Margins smooth or margins rough? Shape? Size? Color variation? Texture? Any sinuses or lobes?

Getting good at identifying trees takes practice. Once you know your trees, it becomes much easier to learn about shrubs, flowers, and wildlife that grow together with the trees. Trees dominate forest ecosystems, so if you have a pretty good idea of what trees are there, you'll have a pretty good idea of what's happening in that environment and what else might be living with those trees.



It's a good thing to know about trees and forests because we need them for many reasons. So, have fun learning to identify trees and discovering how they grow! The forest is a great place to live and work.

Michigan Tree Species

These are species you're likely to find in the forests of the Upper Peninsula, not necessarily including all the species grown for ornamentals, street trees, or arboreta. Most were identified by the U.S. Forest Statewide Inventory, 1993. The red-lettered species, or at least some species within a genus, are exotics (non-natives).

CONIFERS OR SOFTWOODS - 22

Cedar, N. White (*Thuja occidentalis*)
Douglas-fir (*Pseudotsuga menziesii*)
Fir, Balsam (*Abies balsamea*)
Fir, Fraser (*Abies fraseri*)
Fir, White (*Abies concolor*)
Hemlock, Eastern (*Tsuga canadensis*)
Juniper (*Juniperus spp.*)
Larch, European (*Larix decidua*)
Pine, Black (*Pinus nigra*)
Pine, Jack (*Pinus banksiana*)
Pine, Ponderosa (*Pinus ponderosa*)
Pine, Red or Norway (*Pinus resinosa*)
Pine, Scotch (*Pinus sylvestris*)
Pine, White (*Pinus strobus*)
Red-cedar, Eastern (*Juniperus virginiana*)
Spruce, Black (*Picea mariana*)
Spruce, Colorado Blue (*Picea pungens*)
Spruce, Engelmann (*Picea engelmannii*)
Spruce, Norway (*Picea abies*)
Spruce, White (*Picea glauca*)
Tamarack (*Larix laricina*)
Yew, Canada (*Taxus canadensis*)

DECIDUOUS OR HARDWOODS - 76

Ailanthus, Tree-of-Heaven (*Ailanthus altissima*)
Alder, Tag (*Alnus rugosa*)
Apple (*Malus spp.*)
Ash, Black (*Fraxinus nigra*)
Ash, Green (*Fraxinus pennsylvanica*)
Ash, Mountain (*Sorbus americana*)
Ash, White (*Fraxinus americana*)
Aspen, Quaking (*Populus tremuloides*)
Aspen, Bigtooth (*Populus grandidentata*)
Balm-of-Gilead (*Populus balsamifera*)
also known as balm, bam, & balsam poplar
Basswood (*Tilia americana*)

Beech, American (*Fagus grandifolia*)
Birch, Yellow (*Betula alleghaniensis*)
Birch, Paper (*Betula papyrifera*)
Birch, River (*Betula nigra*)
Birch, Sweet (*Betula lenta*)
Boxelder (*Acer negundo*)
Buckeye, Ohio (*Aesculus glabra*)
Buckthorn (*Rhamnus spp.*)
Butternut (*Juglans cinerea*)
Catalpa, Northern (*Catalpa speciosa*)
Cherry, Black (*Prunus serotina*)
Cherry, Choke (*Prunus virginiana*)
Cherry, Pin or Fire (*Prunus pensylvanica*)
Cottonwood, Eastern (*Populus deltoides*)
Dogwood (*Cornus spp.*)
Dogwood, Flowering (*Cornus florida*)
Elderberry (*Sambucus spp.*)
Elm, American (*Ulmus americana*)
Elm, Slippery (*Ulmus rubra*)
Elm, Siberian (*Ulmus pumila*)
Elm, Rock (*Ulmus thomasi*)
Hackberry (*Celtis occidentalis*)
Hawthorne (*Crataegus spp.*)
Hazel (*Corylus americana, C. cornuta*)
Hickory, Bitternut (*Carya cordiformis*)
Hickory, Shagbark (*Carya ovata*)
Hickory, Shellbark (*Carya laciniata*)
Hickory, Mockernut (*Carya tomentosa*)
Hickory, Pignut (*Carya glabra*)
Honeylocust (*Gleditsia triacanthos*)
Horse-chestnut (*Aesculus hippocastanum*)
Ironwood (*Ostrya virginiana*)
also known as American hornbeam
Juneberry/Serviceberry (*Amelanchier spp.*)
Locust, Black (*Robinia pseudoacacia*)
Maple, Black (*Acer nigra*)
Maple, Mountain (*Acer spicatum*)
Maple, Norway (*Acer platanoides*)

Maple, Red ([Acer rubrum](#))
Maple, Silver ([Acer saccharinum](#))
Maple, Striped or Moosewood ([Acer pensylvanicum](#))
Maple, Sugar ([Acer saccharum](#))
Mulberry, Red ([Morus rubra](#))
Musclewood ([Carpinus caroliniana](#))
also known as hop-hornbeam & blue beech
Oak, Bur ([Quercus macrocarpa](#))
Oak, Chestnut ([Quercus prinus](#))
Oak, Chinakapin ([Quercus muelenbergii](#))
Oak, Northern Pin ([Quercus ellipsoides](#))
also known as Hill's oak, scrub oak, & jack oak
Oak, Northern Red ([Quercus rubra](#))
Oak, Pin ([Quercus palustris](#))
Oak, Scarlet ([Quercus coccinea](#))

Oak, Swamp White ([Quercus bicolor](#))
Oak, White ([Quercus alba](#))
Poplar, Yellow ([Liriodendron tulipifera](#))
Pear ([Pyrus spp.](#))
Plum ([Prunus spp.](#))
Sassafras ([Sassafras albidum](#))
Sycamore ([Platanus occidentalis](#))
Tupelo, Water ([Nyssa aquatica](#))
Walnut, Black ([Juglans nigra](#))
Willow, Bebb's ([Salix bebbiana](#))
Willow, Black ([Salix nigra](#))
Willow, Peachleaf ([Salix amygdaloides](#))
Willow, Pussy ([Salix discolor](#))
Willow Shrubs ([Salix spp.](#))
Willow, Weeping ([Salix babylonica](#))

Tree Keys - What is a "Dichotomous" Key?

"Dichotomous" means "two-way", or a fork-in-road. A dichotomous key is a tool designed to distinguish the differences among a set of objects, in this case, a group of trees. The key separates trees into various categories, based on physical characteristics, until there are only two species remaining. It's sort of like a process of elimination.

The use of keys requires careful observation and usually involves the learning of some basic terminology. Patience is often needed, especially the first few times working through the key. These are excellent decision-support opportunities. During the process, students learn quite a bit about trees, or whatever taxonomic group a key is designed for. It is the beginning of a better understanding of trees, forests, and natural resources.

On-Line Tree Identification Keys and Tools

These are not common on the Internet, for some good reasons. The larger the geographical area covered, the more species are involved. More species means a more complex key and many more images and supporting documentation. Increased complexity is increasingly problematic and expensive. There are many excellent image sets on the Internet, but not many keys. Image sets generally require that you know what you're looking for before you look. A catch-22.

There are several good resources on the Internet.

1. Tree ID Key for Michigan's Upper Peninsula - <http://uptreeid.com>

This MSU Extension website was designed specifically for students and forest owners. There is a wealth of information about the trees of the U.P. It is more than just a dichotomous key. Applicability to southern Michigan is limited due to important changes in forest types.

2. **National Arbor Day Foundation Key** - <http://treelink.org/whattree/index.htm>

This is a key to the more common trees (about 130) of the eastern and central USA. It provides a good representation over a large geographical area.

3. **An Atlas of Current and Potential Future Distributions of Common Trees of the Eastern United States**

<http://www.fs.fed.us/ne/delaware/atlas/index.html>

This fascinating USDA Forest Service website allows the user to look at the distribution of a given tree species under various scenarios of climate change. There is a large somewhat confusing number of possible scenarios, and there are limitations due to the assumptions involved in any prediction of this type.

4. **U.S. Forest Service "Silvics of North America"**

http://www.na.fs.fed.us/spfo/pubs/silvics_manual/table_of_contents.htm

A professional summation of nearly all commercial tree species in North America, divided into Conifers (~65 species) and Hardwoods (~130 species). Also includes a glossary, tree characteristics, insects & mites, disease organisms, birds, and mammals.



Documents prepared by Michigan State University Extension.

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Conifer Key – Upper Peninsula of Michigan

Identifying conifers, or needle-bearing trees, is the easiest and a good choice to learn how to use identification keys. Some tree parts change appearance over the course of the year or the lifetime of a tree. Working these keys takes practice.

Be careful to **READ THE DESCRIPTIONS CLOSELY** and **CAREFULLY!** Carefully compare the descriptions with your sample and your memory of what the tree and habitat looked like. Remember that words such as "often" and "usually" do NOT mean "always". It is best to use a mature tree, or one that is not a seedling or sapling. Deciding if a small tree is just a shrub or if it is a young tree can be difficult. The appearance of a tree sometimes changes quite a bit as a tree ages (kind of like people).

1. Needles in bundles/groups. (2)
1. Needles single or flattened & scaly. (6)
 2. Needles in clusters. [Tamarack](#)
 2. Needles 2-5 per bundle. (3)
 3. Five needles per bundle. [White Pine](#)
 3. Needles in pairs. (4)
 4. Needles 3-4 inches long. [Red or Norway Pine](#)
 4. Needles under 2 inches. (5)
 5. Bark dark gray. [Jack Pine](#)
 5. Bark orange-brown. [Scotch Pine](#)
6. Needles square, round, or scaly. (7)
6. Needles flat. (9)
 7. Needles scaly, flattened. [Northern White Cedar](#)
 7. Needles square or round. (8)
 8. Needles 1/3-3/4 inch long, twigs hairless. [White Spruce](#)
 8. Needles 1/4-3/4, new twigs with hair. [Black Spruce](#)
 9. Shrub. [Canada Yew](#)
 9. Tree. (10)
 10. Needles 1/2 inch long with short stem. [Eastern Hemlock](#)
 10. Needles 3/4 –1 1/4 inches long, no stem. [Balsam Fir](#)

Some exotic conifer species are not included in this key: Austrian (black) pine, Colorado blue spruce, Norway spruce, Douglas-fir, European larch, eastern red-cedar, juniper, white fir, and Fraser fir.

Deciduous Summer Key – Upper Peninsula of Michigan

Identifying deciduous, or broad-leaf bearing, trees using leaves isn't too hard and can be fun. However, leaves can vary in shape and size with a species or even on the same individual tree. Knowing as many identification features as possible is always a good idea. But that takes practice. Working these keys also takes practice.

Be careful to **READ THE DESCRIPTIONS CLOSELY** and **CAREFULLY!** Carefully compare the descriptions with your sample and your memory of what the tree and habitat looked like. Remember that words such as "often" and "usually" do NOT mean "always". It is best to use a mature tree, or one that is not a seedling or sapling. Deciding if a small tree is just a shrub or if it is a young tree can be difficult. The appearance of a tree sometimes changes quite a bit as a tree ages (kind of like people).

1. [Opposite](#) branching. (2)
1. [Alternate](#) branching. (12)
 2. [Compound](#) leaves. (3)
 2. [Simple](#) leaves. (6)
 3. [Leaflets](#) 3-5, [coarsely-toothed](#). [BOXELDER](#)
 3. [Leaflets](#) 5-9, [shallow-toothed](#). (4)
 4. [Leaflets](#) 9-11, stemless. [BLACK ASH](#)
 4. [Leaflets](#) 5-9, with stems. (5)
 5. Top of [leaf scar](#) smile-shaped. [WHITE ASH](#)
 5. Top of leaf scar straight. [GREEN ASH](#)
 6. [Tree](#) size. (7)
 6. [Shrub](#) size. (9)
 7. [Leaf margin smooth](#). [SUGAR MAPLE](#)
 7. [Leaf margin toothed](#). (8)
 8. Leaves [double-toothed](#), green both sides. [RED MAPLE](#)
 8. Leaves with deep [sinuses](#), silvery underneath. [SILVER MAPLE](#)
 9. Leaf veins [palmate](#), maple-like. (10)
 9. Leaf not palmate. (11)
 10. Leaf [sinuses](#) roundish, trunk with obvious stripes. [STRIPED MAPLE](#)
 10. Leaf [sinuses](#) sharp-angled, trunk gray. [MOUNTAIN MAPLE](#)
 11. Leaves with [finely-toothed margins](#). [BUCKTHORN](#)
 11. Leaves with smooth [margins](#). [DOGWOOD](#)
 12. [Compound](#) leaves. (13)
 12. [Simple](#) leaves. (18)
 13. [Leaflets](#) over 2". (14)
 13. [Leaflets](#) under 2". (16)
 14. [Leaflets](#) 7-11, with largest at end of leaf. Hickory nuts. [BITTERNUT HICKORY](#)
 14. [Leaflets](#) 11-23, largest in the middle or all even length. Twigs with chambered pith. (15)
 15. Leaves 15-30 inches long, 11-17 leaflets. Dark pith. [BUTTERNUT](#)
 15. Leaves 12-36 inches long, 15-23 leaflets. Tan pith. [BLACK WALNUT](#)

- 16. Leaflets serrated. [MOUNTAIN ASH](#)
- 16. Leaflets smooth margined. (17)
 - 17. Leaves often [double-compound](#), many [leaflet](#) pairs. [HONEYLOCUST](#)
 - 17. Leaves single-compound, 7-19 leaflets. [BLACK LOCUST](#)
- 18. [Lobed](#) leaves. Smooth or toothed [margins](#). (19)
- 18. Leaves not [lobed](#). [Simple](#) leaves, [toothed margins](#). (22)
 - 19. Pointed lobes. (20)
 - 19. Rounded lobes. (21)
 - 20. [Sinuses](#) usually no closer to mid-vein than 1/2 inch. Tree usually with good form. [NORTHERN RED OAK](#)
 - 20. Sinuses usually large and nearly to mid-vein. Scrubby-looking tree. [NORTHERN PIN OAK](#)
 - 20. Angled lobes or very large teeth. [Toothed margins](#). Thorns. [HAWTHORNE](#)
 - 21. Leaf "club-shaped" with one pair of sinus that nearly to mid-vein. Twigs with corky growths. Acorn cups fuzzy. Rare. [BUR OAK](#)
 - 21. Lobes and sinuses fairly balanced. Twigs without corky growths. Acorn cups not fuzzy. Rare. [WHITE OAK](#)
- 22. Papery bark, like birches. (23)
- 22. Bark not papery. (24)
 - 23. Leaves [single-toothed](#), white peeling bark. [PAPER BIRCH](#)
 - 23. Leaves [double-toothed](#), yellow or bronze bark. [YELLOW BIRCH](#)
 - 24. Leaf stems flat. (25)
 - 24. Leaf stems round. (26)
 - 25. Leaves have small teeth (<1/16"), bark usually white. [QUAKING ASPEN](#)
 - 25. Leaves have large teeth (1/8-1/4"), woolly underneath in the spring. [BIGTOOTH ASPEN](#)
 - 25. Triangular leaf with base angled-back towards the twig. Long, sticky buds. [COTTONWOOD](#)
- 26. Leaves & small twigs with bitter taste. (27)
- 26. Leaves & twigs not bitter. (30)
 - 27. Rusty fuzz on back of leaf along mid-rib. [BLACK CHERRY](#)
 - 27. No rusty fuzz. (28)
 - 28. Leaf much longer than wide. [PIN CHERRY](#)
 - 28. Leaf not much longer than wide. (29)
 - 29. [Terminal buds](#) long and slender. [JUNEBERRY](#)
 - 29. Terminal buds shorter, only about 2-3 times the width of the twig. [CHOKÉ CHERRY](#)
 - 30. Leaf margins [double-toothed](#), elm-like or birch-like leaves. (31)
 - 30. Leaf margins not as above. (35)
 - 31. Bark cross-section [layered](#) and unequal [leaf base](#). (32)
 - 31. Bark not layered. (34)
 - 32. Leaves 2-3 inches. Bark and twigs with corky wings or ridges. [ROCK ELM](#)
 - 32. Leaves usually over 3 inches long. Bark not as above. (33)
 - 33. Leaves 4-6 inches, very scratchy.

- Inner bark slimy when chewed. [SLIPPERY ELM](#)
33. Leaves 4-6 inches. Bark cross-section with alternate dark & light layers. [AMERICAN ELM](#)
34. Bark smooth, small [understory](#) tree. [MUSCLEWOOD](#)
34. Bark shreddy, small [understory](#) tree. [IRONWOOD](#)
35. Leaves much longer than wide. *(36)*
35. Leaves not so long & narrow. *(38)*
36. [Shrub](#) size. [SMALL WILLOWS](#)
36. [Tree](#) size. *(37)*
37. [Leaf bases](#) rounded with [stipules](#). [BLACK WILLOW](#)
37. [Leaf bases](#) sharply angled without [stipules](#) (or tiny ones). [PEACHLEAF WILLOW](#)
38. [Shrub](#) or small tree. Leaves may be somewhat [lobed](#). Thorns. [HAWTHORNE](#)
38. [Tree](#) size. *(39)*
39. Heart-shaped leaves. Trees often in clumps. Brick-red, smooth buds. [BASSWOOD](#)
39. Leaves not heart-shaped. *(40)*
40. Leaves with large, coarse, pointed teeth. [AMERICAN BEECH](#)
40. Leaves with teeth that are not so obvious. *(41)*
41. Leaves are rusty-looking with barely serrate margins. Long, sticky buds.
[BALM-of-GILEAD](#)
41. Leaf serrations point to leaf tip. Twigs and bark with corky ridges.
[HACKBERRY](#)

Some species not covered in this key but included in the species description pages are: pears, plums, black maple, Norway maple, elderberries, weeping willow, pussy willow, and Bebb's willow.

Deciduous Winter Key – Upper Peninsula of Michigan

Identifying trees in the non-leaf seasons can be fun. Often, it is easier. However, the differences between species are sometimes more subtle and we have to look at parts of the tree we don't usually pay much attention to. Key features are bark, twigs, and buds. However, other features are sometimes important, such as branching patterns, overall form, habitat, and taste. Once in awhile we can use leaves on the ground or brown leaves that still remain on the tree. But you need to be sure the fallen leaves are really from the tree you're looking at! Working these keys takes practice.

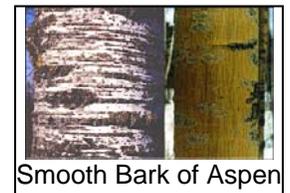
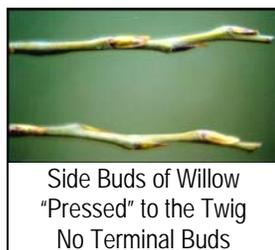
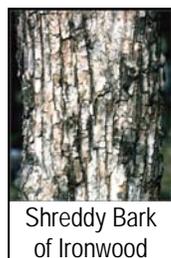
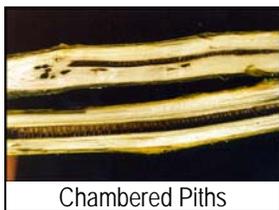
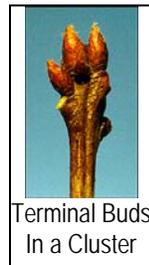
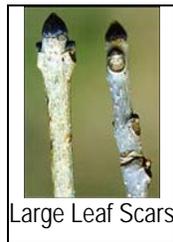
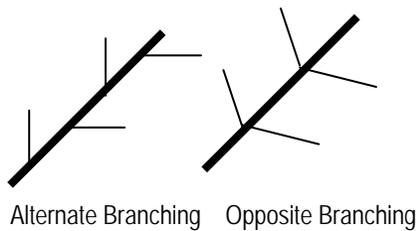
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1. *Opposite* branching. (2)
1. *Alternate* branching. (10)
 2. Twigs often stout but never reddish. Dark Terminal buds, sometimes large. *Leaf scars* are large. Ashes. (3)
 2. "Normal" or slender twigs. Maples & shrubs. (4)
 3. Chocolate brown Terminal bud. First set of side buds close to the terminal. Leaf scar has a distinct notch in the top. Bark is tight, furrowed in larger trees. [WHITE ASH](#)
 3. First set of side buds usually set back 1/8 to 1/4 inch from Terminal bud. Leaf scar slightly notched. Bark flakes off easily when rubbed. Swampy habitat. [BLACK ASH](#)
 3. Side buds tight against the Terminal bud. Leaf scar top straight across. Twig ends tend to be somewhat flattened. Branching looks somewhat droopy. Bark often has many horizontal cracks. [GREEN ASH](#)
 4. Tree size, at least 4" diameter & 30 feet tall. (5)
 4. Shrub size. (8)
 5. Youngest twigs reddish or purplish. (6)
 5. Youngest twigs gray or brownish. (7)
 6. Terminal buds blunt and rounded. Twigs often with a gray or bluish powder. Bark medium brown and [light](#). Tree often with poor form. [BOXELDER](#)
 6. Terminal buds reddish and blunt. Female flower buds, if present, occur in clusters. Bark is smooth and gray on young trees, becoming flaky or shaggy on large trees. [RED MAPLE](#)
 7. Terminal buds blunt and rather brownish. Twigs smell somewhat bad when crushed. Bark smooth and gray on young trees, becoming loose and peeling upward. Usually along river corridors or planted as an ornamental. [SILVER MAPLE](#)
 7. Terminal buds quite sharp and pointy. Slender twigs, gray or medium-brown. Bark smooth and gray on young trees, becoming textured, thick, deeply fissured but always tight on large trees. [SUGAR MAPLE](#)
 8. Bark light colored, brown or yellowish or bark is red-purple. [VIBURNUMS, DOGWOODS & OTHERS](#)
 8. Bark medium to dark gray or greenish, may be striped. (9)
 9. Bark greenish with heavy white stripes. Buds much longer than wide, blunt. [STRIPED MAPLE](#)
 9. Bark gray and smooth. Bud length about twice the twig width. [MOUNTAIN MAPLE](#)
 9. Bark gray and smooth. Twigs end in spines. [BUCKTHORN](#)
10. Twigs with thorns or spines. (11)
10. Twigs without thorns. (14)
 11. Tree. (12)
 11. Shrub. (13)
 12. Thorns under 1/4 inch and located in the crotches of twigs and branches. [BLACK LOCUST](#)
 12. Thorns longer. Twigs with a distinct "zig-zag" appearance. An ornamental. [HONEYLOCUST](#)
 13. Thorns dark purple and at least 2 inches long. [HAWTHORNE](#)
 13. Twigs that end in sharp points/spines. Stems medium gray. [BUCKTHORN](#)
14. *Terminal buds in clusters*. (15)
14. Terminal buds single or absent. (18)

15. Very stiff, smooth twigs. Medium to dark gray. Bark dark. (16)
15. Twigs normal stiffness, light to medium gray. Bark medium gray. (17)
16. Bark smooth and gray on young trees, fissured with flattened ridges on older trees. Usually a reasonably well-formed trunk. NORTHERN RED OAK
16. Similar bark but without flattened ridges on older trees. Inner bark yellowish. Usually a scrubby-looking tree growing on sandy sites. NORTHERN PIN OAK
17. Twigs with corky or warty ridges. Bark thick, even on young trees. Acorns with a fuzzy cup. Rare. BUR OAK
17. Twigs without growths and often greenish-maroon-brown. Acorn cups without fuzz. Rare. WHITE OAK
17. Twigs slender and bitter. Usually a shrub. PIN CHERRY
18. Bark papery or mostly smooth (especially higher up in large trees). (19)
18. Bark mostly rough/textured/shreddy/etc. (32)
19. Bark papery. (20)
19. Bark mostly smooth, especially higher up in large trees. (21)
20. Papery bark white. Smallest twigs purplish or dark brown. PAPER BIRCH
20. Papery bark yellow or bronze. Smallest twigs gray. YELLOW BIRCH
21. Tree size (over 20 feet or so). (22)
21. Shrub or small tree size (under 20 feet or so). (27)
22. Bark color medium gray to dark gray. (23)
22. Bark color mostly white, light-gray, or olive-gray. (24)
23. Bark black & scaly, like burnt potato chips. Buds sharp-tipped. BLACK CHERRY
23. Buds much longer than wide, cigar-shaped, brown. Smooth bark even on large trees. BEECH
24. Red or maroon buds that are roundish and shiny. BASSWOOD
24. Buds quite gummy when squeezed, usually over 1/2 inch long. (25)
24. Buds not gummy, under 1/2 inch. (26)
25. Buds very gummy, reddish brown. BALM-of-GILEAD
25. Buds somewhat gummy, yellowish brown. COTTONWOOD
26. Bark bright white to light-gray, sometimes slightly greenish. Buds shiny and 1/8 inch long. Side buds hug twig close. Very common tree. QUAKING ASPEN
26. Bark can be light-gray sometimes with an olive-green cast. Buds dull, usually between 1/8 and 1/4 inch long. Side buds slightly point away from twig. Common, but less common than quaking aspen. BIGTOOTH ASPEN
27. Twigs not bitter. (28)
27. Bitter twigs. (30)
28. Terminal buds absent or "false" terminals cocked at a sharp angle. SHRUB WILLOWS
28. Terminal buds present. (29)
29. Trunk sinewy, like muscles. Uncommon. MUSCLEWOOD
29. Bark gray & cherry-like. Terminal buds hairy, about 3/8 inch long. Orange berries might be leftover from the Fall. MTN. ASH
29. Terminal buds brick red, smooth, and about 1/8 inch long. Trees often grow in clumps. (45)
30. Lower trunk bark black & scaly like burnt potato chips or showing cracks. Small buds sharp. BLACK CHERRY
30. Bark mostly smooth. (31)
31. Bark smooth and gray with wide *lenticels* across stem. Terminal bud length 1-2 times width. SHRUB CHERRIES
31. Bark smooth and gray. Terminal bud length more than 4 times width. JUNE BERRY
32. Bark *cross-section noticeably layered* (break off a thick piece). (33)
32. Bark cross-section not noticeably layered. (35)
33. Bark layers the same color. Inner bark slimy when chewed. Buds dark, almost black. SLIPPERY ELM
33. Bark layers red & white (or light & dark). (34)
34. Large trees with vase-like form. Terminal bud distinctly cocked to one side and pointed. AMERICAN ELM
34. Older twigs with corky growths. Buds very sharp-pointed. Rare. ROCK ELM
35. Older twigs have bark ridges on them. Rare. HACKBERRY
35. Twigs do not have bark ridges. (36)
36. Dark bark is scaly and looks like "burnt potato chips". (37)
36. Bark doesn't look like above. (38)
37. Twigs gray with sharp-tipped terminal buds. BLACK CHERRY
37. Twigs with overlapped scales. Look for small cones. A conifer without needles. TAMARACK
38. Twigs very stout. (39)
38. Twigs normal size or slender, but not stout. (41)

- 39. Yellow terminal bud. Pith not *chambered*. [BITTERNUT HICKORY](#)
- 39. Leafy-looking terminal bud. *Chambered pith*. (40)
 - 40. Chambered pith chocolate-brown. Uncommon. [BUTTERNUT](#)
 - 40. Chambered pith light brown. Rare. [BLACK WALNUT](#)
- 41. Smaller understory tree, shreddy bark. [IRONWOOD](#)
- 41. Shrub or tree. Bark textured on trees & larger shrubs. (42)
 - 42. Willow-like. No terminal buds or "false" Terminal buds cocked at a sharp angle. Side buds without scales and *pressed to the twig*. (43)
 - 42. Not willow-like. (45)
 - 43. Shrub size. [SMALL WILLOWS](#)
 - 43. Tree size. Yellowish twigs. Can grow to very large diameters. (44)
 - 44. Common in ditches and along roads. *Fissured bark*. Yellow colored twigs, droopy, rather brittle. [BLACK WILLOW](#)
 - 44. Uncommon. Twigs as above but flexible. Small tree or large shrub. [PEACHLEAF WILLOW](#)
 - 45. Buds rounded & red or quite sticky. (46)
 - 45. Buds brownish. Bark in *upper tree smooth and either white or light gray*. (47)
 - 46. Buds round and red, about 1/8 inch in size. Bark medium-dark gray. [BASSWOOD](#)
 - 46. Buds quite sticky and much longer than wide. (48)
 - 47. Bark bright white to light-gray, sometimes slightly greenish. Buds shiny and 1/8 inch long. Side buds hug twig close. Very common tree. [QUAKING ASPEN](#)
 - 47. Bark can be light-gray sometimes with an olive-green cast. Buds dull, usually between 1/8 and 1/4 inch long. Side buds slightly point away from twig. Common, but less common than quaking aspen. [BIGTOOTH ASPEN](#)
 - 48. Buds very gummy, red-brown. Bark cracked up & down (smooth on small trees). [BALM-of-GILEAD](#)
 - 48. Buds somewhat gummy, yellowish brown. Bark *fissured*. [COTTONWOOD](#)

Some species not covered in this key but included in the species description pages are: pears, plums, black maple, Norway maple, elderberries, weeping willow, pussy willow, and Bebb's willow.



Leaf-only Key – Upper Peninsula of Michigan

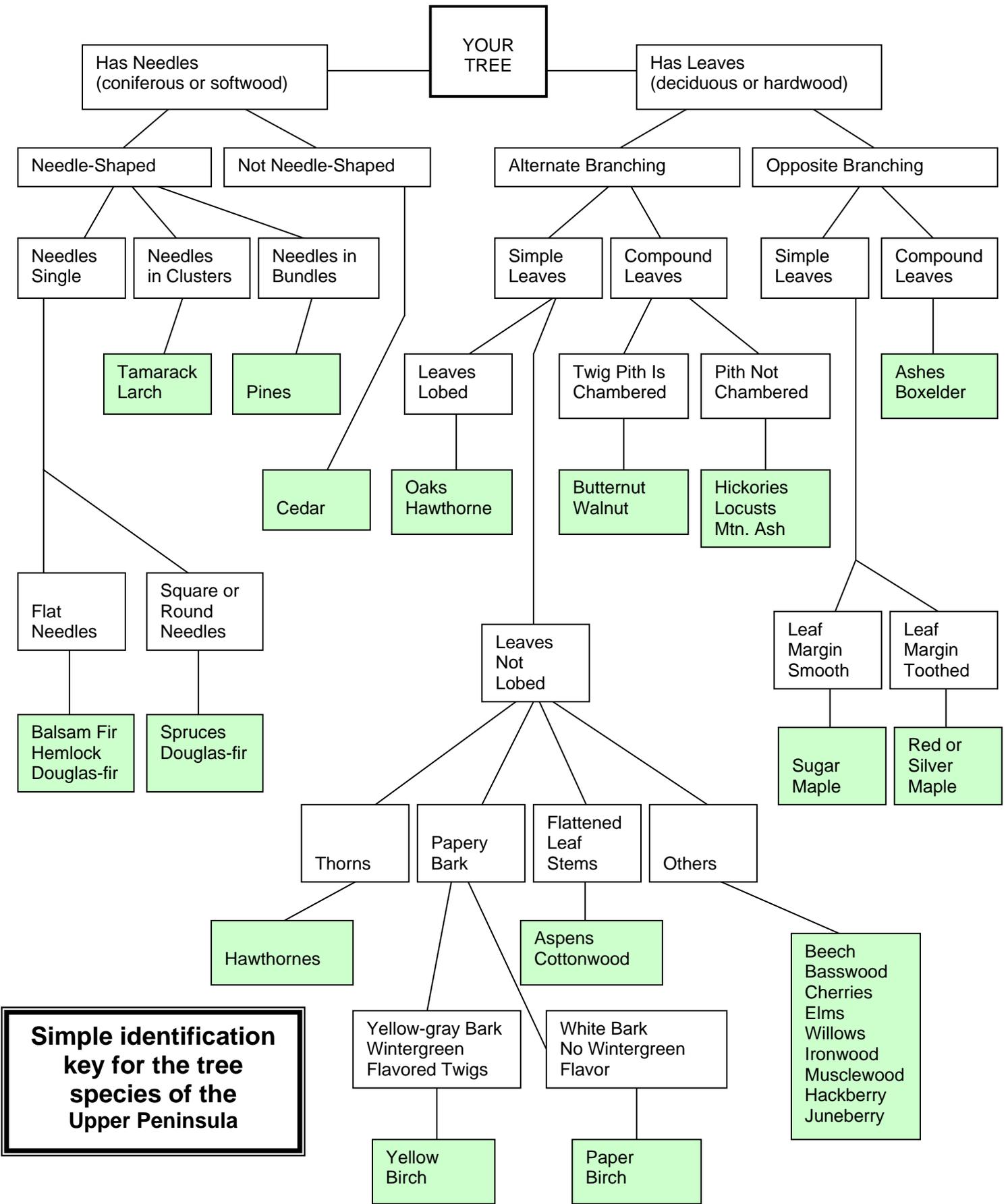
Using only leaves to identify trees is not the best approach to tree identification. Most of our U.P. trees are without leaves for over half the year! There are about a dozen possible tree ID characteristics, although only two or three typically need to be known for each particular tree species. The trick is learning which characteristics are most important for each species. Be careful to READ THE DESCRIPTIONS CLOSELY and CAREFULLY! Carefully compare the descriptions with your sample and your memory of what the tree and habitat looked like. Take notes when you collect the leaves. Remember that words such as "often" and "usually" do NOT mean "always". Leaves often change appearance with tree age, leaf age, location on the tree, and site conditions. Working these keys takes practice. It is best to pick several leaves from a mature tree, rather than a seedling or sapling. Deciding if a small tree is just a shrub or if it is a young tree can be difficult. The number in (4) in red tells you where to go next.

1. Conifers (2)
 2. Needles joined in groups or clusters, or scale-like (3)
 3. Needles joined at base in [bundles](#) of 2-5 (4)
 4. Five needles, usually 2-3 inches long ([white pine](#))
 4. Two needles per [bundle](#) (5)
 5. Needles 3+ inches ([red pine](#))
 5. Needles <3 inches ([jack or Scotch pine](#))
 3. Clusters of many needles in a group, or needles flattened and scale-like (6)
 6. Many needles clustered on short [spur branches](#), each needle about one inch long ([tamarack or larch](#))
 6. Needles look more like fish scales. Foliage has a flattened appearance ([northern white cedar](#))
 2. Single needles, each attached separately to the twig (7)
 7. Flat needles (8)
 8. Hair-like stem holding needle to twig, needles about 1/2-inch long, two white lines on underside of needle ([hemlock](#))
 8. No hair-like stem (9)
 9. Two white lines on underside of needles, needles 1/2 to 1 inch long ([balsam fir](#))
 9. No green lines on needles, needles 1/2 to 1 inch long ([yew](#))
 7. Round or square-ish needles (10)
 10. Needles not stiff and sharp, about 3/4-inch long ([Douglas-fir](#))
 10. Needles stiff and sharp (11)
 11. Needles usually under 1/2-inch, newest twigs may have tiny hairs ([black spruce](#))
 11. Bluish color to needles, 1/2 to 1 inch long ([blue or white spruce](#))
 11. No bluish color, 1/2 to 1 inch long ([white or Norway spruce](#))
1. Broad-leaved trees (hardwoods) (12)
 12. Hardwoods with [compound](#) leaves (13)
 13. Leaf is fan-shaped with seven [leaflets](#) ([horse-chestnut](#))
 13. Leaf is [compound](#) (branched), has numerous [leaflets](#) (14)
 14. Four or less pairs of [leaflets](#) (15)
 15. Clearly [toothed](#) leaflet [margins](#) (16)
 16. Many small sharp teeth on margins ([elderberry](#))
 16. Ragged margins with widely-spaced teeth, smooth sections, and indistinct lobes ([boxelder](#))
 15. Indistinct/irregular teeth or nearly smooth leaflet margins (17)
 17. Short leaflet stems, under 1/8-inch ([bitternut](#) or [black ash](#))
 17. Longer leaflet stems, usually over 1/8-inch ([green](#) or [white ash](#))
 14. Five or more pairs of leaflets (18)
 18. Small leaflets, about 1 inch, smooth margins (19)
 19. Bluntly-pointed leaflet tips, may be [double-compound](#) ([honeylocust](#))
 19. Rounded leaflet tips, never double-compound ([black locust](#))

- 18. Larger leaflets, over 1 inch, with teeth (20)
 - 20. Sharply [serrated](#) margins, leaflets under 3 inches or linear ([sumac](#) or [mountain ash](#))
 - 20. Indistinct teeth, larger leaflets usually over 3 inches long ([butternut](#) or [black walnut](#))
 - 12. Hardwoods with [simple](#) leaves (21)
 - 21. Major [lobes](#) & [sinuses](#) (22)
 - 22. Rounded lobe tips (23)
 - 23. Lobes roughly evenly spaced ([white oak](#))
 - 23. Club-shaped leaf, middle sinuses deep ([bur oak](#))
 - 22. Pointy lobe tips (24)
 - 24. Margins without teeth, maybe a few small points (25)
 - 25. Branched veins (26)
 - 26. Shallower sinuses (but variable), leaf usually longer than wide ([red oak](#))
 - 26. Very deep sinuses, leaf about as wide as long ([scrub oak](#))
 - 25. [Palmate](#) (fan-shaped) main veins (27)
 - 27. Deep sinuses, whitish underleaf ([silver maple](#))
 - 27. Canada flag shaped leaf, usually with five main lobes (28)
 - 28. Purplish or very dark green ([Norway maple](#))
 - 28. Normal leaf green ([sugar maple](#))
 - 24. Margins with many teeth (29)
 - 29. Branched veins, several small lobes with teeth ([hawthorne](#))
 - 29. [Palmate](#) (fan-shaped) main veins (30)
 - 30. Deep sinuses, rough teeth ([red maple](#))
 - 30. [Double-toothed](#), usually with 3 main lobes ([moosewood](#))
 - 30. Coarsely-toothed, usually with 5 main lobes ([mountain maple](#))
 - 21. Unlobed or not clearly lobed (31)
 - 31. Roundish shaped leaves, may or may not have a pointed tip (32)
 - 32. Leaves usually under 2 inches long ([apple](#) or [buckthorn](#))
 - 32. Leaves over 2 inches long, flattened leaf stems (33)
 - 33. Round leaf stems ([basswood](#))
 - 33. Flattened leaf stems (34)
 - 34. Small teeth ([quaking aspen](#))
 - 34. Coarse, larger teeth ([bigtooth aspen](#))
 - 34. Somewhat triangular shaped leaves with blunt teeth ([cottonwood](#))
 - 31. Linear, heart-shaped, triangular, or slightly lobed shaped leaves (35)
 - 35. Long & narrow ([black or other willow](#))
 - 35. Not long & narrow (36)
 - 36. Triangular or tear-drop shaped (37)
 - 37. Triangular with blunt teeth ([cottonwood](#))
 - 37. Tear-drop shaped with smooth leaf margins ([lilac](#))
 - 36. Other shapes (38)
 - 38. Wavy margins, large teeth ([witch hazel](#))
 - 38. Small lobes with coarse teeth ([hawthorne](#) or [tag alder](#))
 - 38. Heart-shaped, uneven [leaf bases](#) ([basswood](#))
31. Elliptical or "regular" shaped leaves with pointed tips (39)
 - 39. Uneven [leaf bases](#) (40)
 - 40. [Double-toothed](#) margins, leaves usually with a sandpapery feel ([elms](#))
 - 40. Not sandpapery (41)
 - 41. Heart-shaped, may have linear fruit [bracts](#) ([basswood](#))
 - 41. Leaves usually at least twice as long as wide ([hackberry](#))
 - 39. Even leaf bases (42)
 - 42. May have indistinct lobes, margins clearly toothed ([hawthorne](#) or [tag alder](#))
 - 42. Margins with indistinct teeth or no teeth (43)
 - 43. Tear-drop shaped with smooth leaf margins ([lilac](#))
 - 43. Blunt teeth, not obvious, may have rusty color, especially later in season ([balm-of-Gilead](#))
 - 42. Single-toothed margins (44)
 - 44. Large teeth about 1/4-inch apart, sharp points ([beech](#))

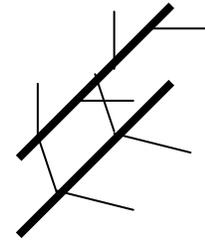
- 44. Margins with many small teeth (45)
- 45. Somewhat shaggy looking or wavy margins, leaves are thin and flimsy (46)
- 46. Leaf bases rounded, somewhat uneven ([yellow birch](#) or [ironwood](#))
- 46. Leaf bases even, mostly symmetrical ([paper birch](#) or [musclewood](#))
- 45. Evenly-spaced very fine teeth (47)
- 47. Rusty-colored fuzz usually along mid-vein on underside of leaf ([black cherry](#))
- 47. No fuzz ([pin cherry](#), [choke cherry](#), or [Juneberry](#))





Glossary of Terms Used in These Tree ID Keys

Branching, alternate: *Paired side branches do not occur opposite each other from a main twig. Also true for buds and leaf stem “scars.”*



Branching, opposite: *Paired side branches occur on opposite sides of a main twig. Also true for buds and leaf stem “scars.”*

Leaves, simple: *Your basic leaf with one stem and contiguous leaf surface.*

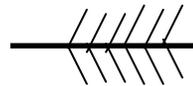
Leaves, compound: *One stem, multiple leaf surfaces (looks like separate leaves).*

Leaves lobed: *Finger-like projections of leaf, like oaks.*

Chambered pith: *Cores of twigs are divided into small chambers.*

Needle-shaped: *More or less, sharp and pointy.*

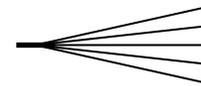
Needles, single: *Individual attachment to twig.*



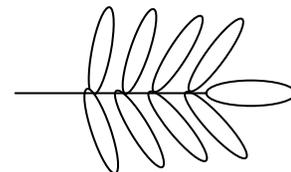
Needles, cluster: *A dense group of a dozen or more needles.*



Needles, bundle: *A group of 2-5 needles “bundled” together at their bases.*



Needles, flat: *Much wider than thick. Tends not to roll easily between fingers.*



Needles, square or round: *About as wide as thick. Rolls easily between fingers.*



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