2ND EDITION

Trees *of* Wisconsin

Field Guide

Stan Tekiela

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TABLE OF CONTENTS

WISCONSIN AND TREES

Wisconsin is a great place for anyone interested in trees. With *Trees of Wisconsin Field Guide*, you'll be able to quickly identify 101 of the most common trees in Wisconsin—nearly all of which are native to the state. This guide also includes a number of common non-native trees that have been naturalized in Wisconsin. This book makes no attempt to identify cultivated or nursery trees.

Because this book is a unique all-photographic guide just for Wisconsin, you won't have to page through photographs of trees that don't grow in the state, or attempt to identify live trees by studying black-and-white line drawings.

WHAT IS A TREE?

For the purposes of this book, a tree is defined as a large woody perennial plant, usually with a single erect trunk, standing at least 15 feet (4.5 m) tall, with a well-defined crown. *Trees of Wisconsin Field Guide* helps you observe some basic characteristics of trees so you can identify different species confidently.

HOW THIS BOOK IS ORGANIZED

To identify a tree, you'll want to start by looking at the thumb tab in the upper right-hand corner of the text pages. These thumb tabs define the sections of the book. The tabs combine several identifying features of a tree—main category, needle or leaf type and attachment—into one icon.

It's possible to identify trees using this field guide without learning about categories, leaf types and attachments. Simply flip through the pages to match your sample to the features depicted on the thumb tabs. Once you find the correct section, use the photos to find your tree. Or, you may want to learn more about the features of trees in a methodical way, using the following steps to narrow your choices to just a few photos.

1. First, determine the appropriate section and find the right icon by asking these questions: Is the tree coniferous or deciduous? If it is a conifer, are the needles single, clustered or scaly? If it is deciduous, is the leaf type simple, lobed or compound, and do leaves attach to twigs in an opposite or alternate pattern?
2. Next, simply browse through the photos in that section to find your tree. Or, to further narrow your choices, use the icon in the lower right-hand corner of the text pages. These icons are grouped by the general shape of the needle or leaf, and they increase in size as the average size of the needle or leaf increases.
3. Finally, by examining the full-page photos of needles or leaves, studying the inset photos of bark, flowers, fruit or other special features and considering information on text pages, you should be able to confidently identify the tree.

While these steps briefly summarize how you can use this book, it is quite helpful to learn more about how the sections are grouped by reading the Identification Step-by-Step section.

IDENTIFICATION STEP-BY-STEP

Conifer or Deciduous

Trees in this field guide are first grouped into two main categories that consist of 16 conifers and 85 deciduous trees.

Trees with evergreen needles that remain on branches year-round and have seeds in cones are conifers. Some examples of these are pines and spruces. The only exception in this main category is the Tamarack, a conifer that behaves like a deciduous tree, shedding its needles in autumn. Trees with broad flat leaves that fall off their branches each autumn are deciduous. Some examples of these are oaks and maples.

You will see by looking at the thumb tabs that trees with needles (conifers) are shown in the first sections of the book, followed by trees with leaves (deciduous).

Needle or Leaf Type

CONIFER GROUP:
Single, Clustered or Scaly Needles

SINGLE **CLUSTERED** (Range of 2–30 needles) **SCALY**

If the tree is a conifer, the next step is to distinguish among single, clustered and scaly needles. Begin by checking the number of needles that arise from one point. If you see only one needle arising from one point, look in the single needle section. Conifers with single needles are shown first. If there are at least two needles arising from one point, turn to the clustered needles section. This second section is organized by the number of needles in a cluster. If you are trying to identify needles that overlap each other and have a scale-like appearance, unlike the other needles, you will find this type in the scaly needles section.

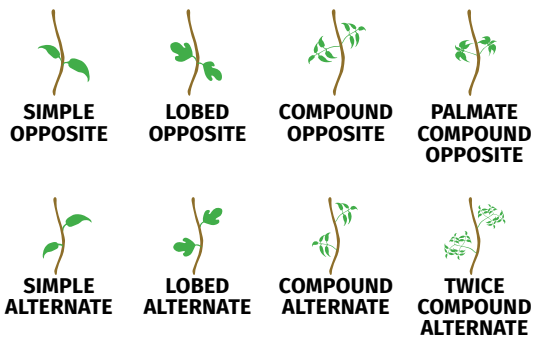
DECIDUOUS GROUP:
Simple, Lobed or Compound

SIMPLE **LOBED** **COMPOUND** **TWICE COMPOUND** **PALMATE COMPOUND**

If the tree is deciduous, the next step is to determine the leaf type. Many of the simple leaves have a basic shape such as oval, round or triangular. Other simple leaves are lobed, identified by noticeable indentations along their edges. Simple leaves without lobes are grouped first, followed by the lobed leaf groups.

If a leaf is composed of smaller leaflets growing along a single stalk, you'll find this type in the compound leaf sections. When a leaf has small leaflets growing along the edge of a thinner secondary stalk, which is in turn attached to a thicker main stalk, check the twice compound section. If the leaf has leaflets emerging from a common central point at the end of a leafstalk, look in the palmate compound section.

Leaf Attachment



For deciduous trees, once you have determined the appropriate leaf type, give special attention to the pattern in which the leaves are attached to the twig. Trees with leaves that attach directly opposite of each other on a twig are grouped first in each section, followed by trees with leaves that attach alternately. The thumb tabs are labeled "opposite" or "alternate" to reflect the attachment group. All the above features (main category, needle or leaf type and attachment) are depicted in one icon for easy use.

Needle or Leaf Size

Once you have found the correct section by using the thumb tabs, note that the section is further loosely organized by needle or leaf size from small to large. Size is depicted in the needle or leaf icon located in the lower right-hand corner of text pages. This icon also reflects the shape of the needle or leaf. For example, the icon for the Amur Maple, which has a leaf size of 2–4 inches (5–10 cm), is smaller than the icon for the Norway Maple with a leaf size of 5–7 inches (12.5–18 cm). Measurement of any deciduous leaf extends from the base of the leaf (excluding the leafstalk) to the tip.

Using Photos and Icons to Confirm the Identity

After using the thumb tabs to narrow your choices, the last step is to confirm the tree's identity. First, compare the full-page photo of the leaves and twigs to be sure they look similar. Next, study the color and texture of the bark, and compare it to the inset photo. Then consider the information given about the habitat and range.

Sometimes, however, it is a special characteristic, such as flowers, fruit or thorns (described and/or pictured), that is an even better indicator of the identity. In general, if it's spring, check for flowers. During summer, look for fruit. In autumn, note the fall color.

Another icon is also included for each species to show the overall shape of the average mature tree and how its height compares with a two-story house. For trees with an average height of more than 50 feet (15 m), this icon is shown on a slightly smaller scale.

STAN'S NOTES

Stan's Notes is fun and fact-filled with many gee-whiz tidbits of interesting information, such as historical uses, other common names and much more. Most information given in this descriptive section cannot be found in other tree field guides.

CAUTION

In Stan's Notes, it's occasionally mentioned that parts of some trees were used for medicine or food. While some find this interesting, DO NOT use this field guide to identify edible or medicinal trees. Certain trees in the state have toxic properties or poisonous look-alikes that can cause severe problems. Do not take the chance of making a mistake. Please enjoy the trees of Wisconsin with your eyes, nose or with your camera. In addition, please don't pull off leaves, cut branches or attempt to transplant any trees. Nearly all of the trees you will see are available at your local garden centers. These trees have been cultivated and have not been uprooted from the wild. Trees are an important part of our natural environment, and leaving a healthy tree unharmed will do a great deal to help keep Wisconsin the wondrous place it is.

Enjoy the Trees!

Stan

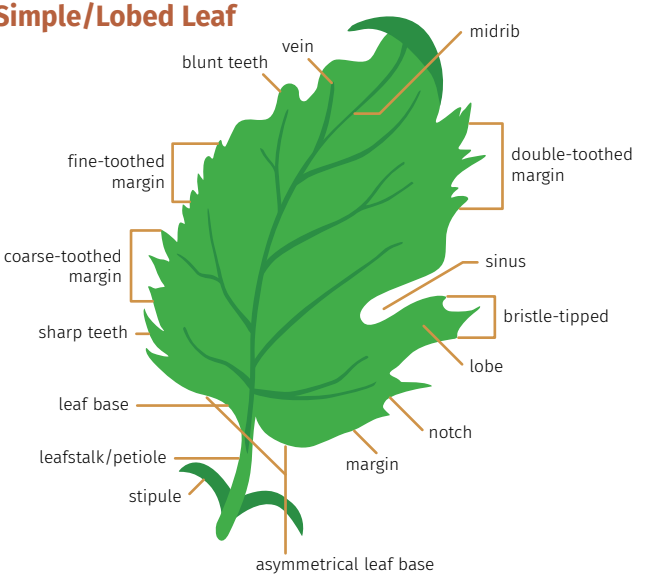
LEAF BASICS

It's easier to identify trees and communicate about them when you know the names of the different parts of a leaf. For instance, it is more effective to use the word "sinus" to indicate an indentation on an edge of a leaf than to try to describe it.

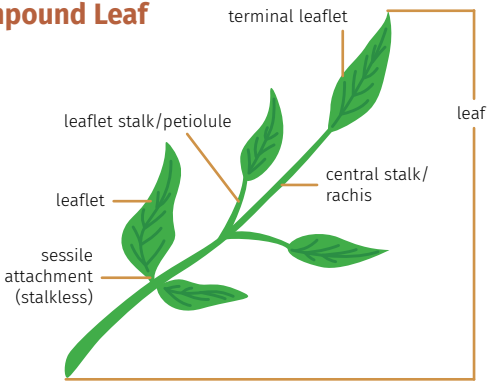
The following illustrations show coniferous needles in cross section and the basic parts of deciduous leaves. The simple/lobed leaf and compound leaf illustrations are composites of leaves and should not be confused with any actual leaf of a real tree.

Needle Cross Sections

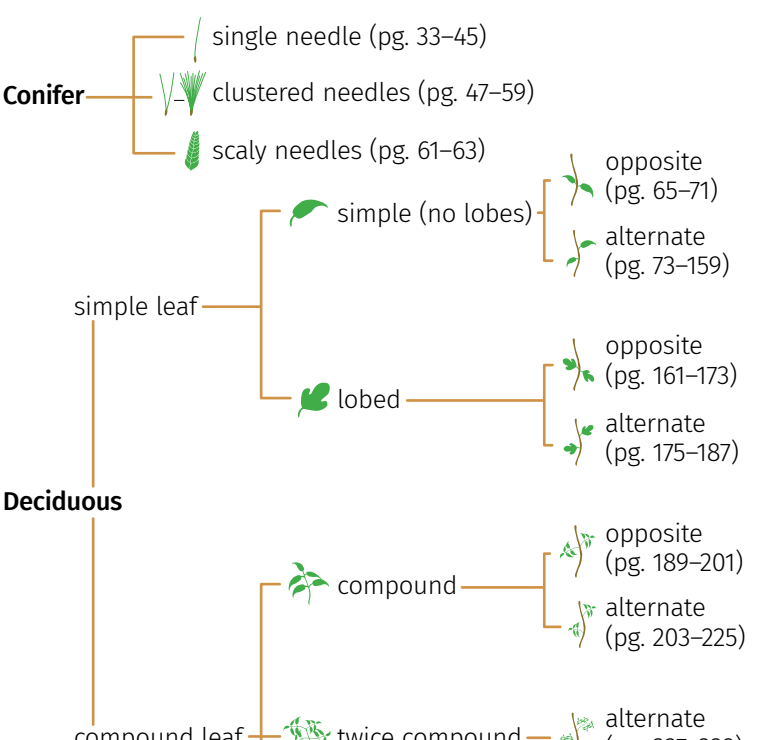
Simple/Lobed Leaf



Compound Leaf



FINDING YOUR TREE IN A SECTION



The smaller needles and leaves tend to be toward the front of each section, while larger sizes can be found toward the back. Check the icon in the lower right corner of text pages to compare relative shape.

SILHOUETTE QUICK COMPARES

To quickly narrow down which mature tree you've found, compare its rough outline with the samples found here. For a sense of scale, we've included the tree's height range compared with a drawing of a typical U.S. house. Obviously, tree heights and general shapes can vary significantly across individuals, but this should help you rule out some possible options, hopefully pointing you in the right direction. Once you've found a possible match, turn to the specified page and confirm or rule it out by examining the photos of bark and leaves and the accompanying text.

Common Prickly-ash
5–15'
pg. 209

Poison Sumac
5–20'
pg. 215

American Plum
10–15'
pg. 119

Wild Apple
10–15'
pg. 101

Crab Apple
10–20'
pg. 99

European Buckthorn
10–20'
pg. 65

Juneberry
10–20'
pg. 103

Nannyberry
10–20'
pg. 69

Pussy Willow
10–20'
pg. 111

Roundleaf Serviceberry
10–20'
pg. 105

Russian-olive
10–20'
pg. 131

Smooth Sumac
10–20'
pg. 217

Staghorn Sumac
10–20'
pg. 219

Pin Cherry
10–30'
pg. 123

White Mulberry
10–30'
pg. 117

Amur Maple
15–20'
pg. 161

Canada Plum
15–20'
pg. 121

Blue Beech
15–25'
pg. 141

Eastern Redbud
15–25'
pg. 149

European Mountain-ash
15–25'
pg. 205

Hawthorn
15–25'
pg. 133

Speckled Alder
15–25'
pg. 139

American Mountain-ash
15–30'
pg. 207

Choke Cherry
15–35'
pg. 125

American Bladdernut
20–25'
pg. 191

Common Hoptree
20–25'
pg. 203

Eastern Wahoo
20–25'
pg. 67

Mountain Maple
20–30'
pg. 163

Red Mulberry
20–30'
pg. 115

Witch-hazel
20–30'
pg. 151

Ironwood
20–40'
pg. 137

Ohio Buckeye
20–40'
pg. 233

Jack Pine
20–50'
pg. 47

Alternate-leaf Dogwood
25–35'
pg. 145

Laurel Willow
25–45'
pg. 109

Black Spruce
25–50'
pg. 35

Eastern Redcedar
25–50'
pg. 61

Amur Cork-tree
30–50'
pg. 193

Black Locust
30–50'
pg. 221

Boxelder
30–50'
pg. 189

Eastern Whitecedar
30–50'
pg. 63

Siberian Elm
30–50'
pg. 73

Scotch Pine
30–80'
pg. 49

Black Ash
40–50'
pg. 201

Austrian Pine
40–60'
pg. 51

Black Oak
40–60'
pg. 183

Black Willow
40–60'
pg. 113

Butternut
40–60'
pg. 225

Colorado Spruce
40–60'
pg. 37

Eastern Hemlock
40–60'
pg. 41

Ginkgo
40–60'
pg. 129

Hackberry
40–60'
pg. 135

Honey Locust
40–60'
pg. 227

Horse-chestnut
40–60'
pg. 231

Kentucky Coffeetree
40–60'
pg. 229

Northern Pin Oak
40–60'
pg. 177

Norway Maple
40–60'
pg. 173

Paper Birch
40–60'
pg. 95

Red Maple
40–60'
pg. 165

River Birch
40–60'
pg. 91

Rock Elm
40–60'
pg. 75

Shagbark Hickory
40–60'
pg. 213

Swamp White Oak
40–60'
pg. 179

White Ash
40–60'
pg. 195

White Poplar
40–60'
pg. 175

White Spruce
40–60'
pg. 33

Black Maple
40–70'
pg. 169

Quaking Aspen
40–70'
pg. 81

Tamarack
40–70'
pg. 59

Red Pine
40–80'
pg. 53

Weeping Willow
40–80'
pg. 107

Green Ash
50–60'
pg. 199

American Basswood
50–70'
pg. 153

Balsam Poplar
50–70'
pg. 87

Bigtooth Aspen
50–70'
pg. 83

Black-gum
50–70'
pg. 147

Blue Ash
50–70'
pg. 197

Chinquapin Oak
50–70'
pg. 155

Douglas-fir
50–70'
pg. 45

Northern Red Oak
50–70'
pg. 185

Norway Spruce
50–70'
pg. 39

Ponderosa Pine
50–70'
pg. 55

Slippery Elm
50–70'
pg. 79

Sugar Maple
50–70'
pg. 167

Sweet Birch
50–70'
pg. 93

White Oak
50–70'
pg. 181

Yellow Birch
50–70'
pg. 97

Balsam Fir
50–75'
pg. 43

Black Cherry
50–75'
pg. 127

Black Walnut
50–75'
pg. 223

Northern Catalpa
50–75'
pg. 71

Bur Oak
50–80'
pg. 187

Bitternut Hickory
50–100'
pg. 211

American Beech
60–80'
pg. 143

Lombardy Poplar
60–80'
pg. 85

American Chestnut
60–90'
pg. 159

Sycamore
60–90'
pg. 157

American Elm
70–100'
pg. 77

Eastern Cottonwood
70–100'
pg. 89

Eastern White Pine
70–100'
pg. 57

Silver Maple
75–100'
pg. 171

NEEDLE AND LEAF QUICK COMPARES

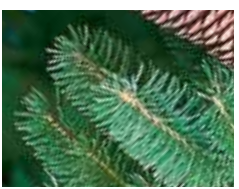
To help you differentiate among similar-looking tree species, compare your finds with the following leaf images. For each species, we've also included information about the leaf shape and attachment, which can help quickly point you in the right direction.

Note: Leaf images are not to scale.

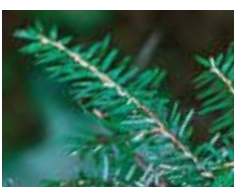
White Spruce
single needle
pg. 33

Black Spruce
single needle
pg. 35

Colorado Spruce
single needle
pg. 37



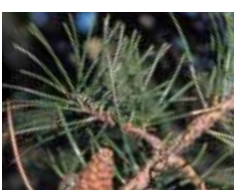
Norway Spruce
single needle
pg. 39



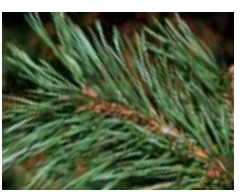
Eastern Hemlock
single needle
pg. 41

Balsam Fir
single needle
pg. 43

Douglas-fir
single needle
pg. 45



Jack Pine
clustered needles
pg. 47



Scotch Pine
clustered needles
pg. 49

Austrian Pine
clustered needles
pg. 51

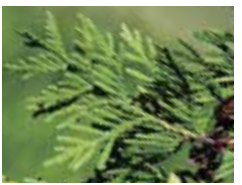
Red Pine
clustered needles
pg. 53

Ponderosa Pine
clustered needles
pg. 55

Eastern White Pine
clustered needles
pg. 57

Tamarack
clustered needles
pg. 59

Eastern Redcedar
scaly needles
pg. 61



Eastern Whitecedar
scaly needles
pg. 63

European Buckthorn
simple opposite
pg. 65

Eastern Wahoo
simple opposite
pg. 67

Nannyberry
simple opposite
pg. 69

Northern Catalpa
simple opposite
pg. 71

Siberian Elm
simple alternate
pg. 73

Rock Elm
simple alternate
pg. 75

American Elm
simple alternate
pg. 77

Slippery Elm
simple alternate
pg. 79

Quaking Aspen
simple alternate
pg. 81

Bigtooth Aspen
simple alternate
pg. 83

Lombardy Poplar
simple alternate
pg. 85

Balsam Poplar
simple alternate
pg. 87

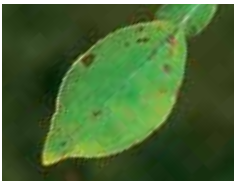
Eastern Cottonwood
simple alternate
pg. 89

River Birch
simple alternate
pg. 91

Sweet Birch
simple alternate
pg. 93

Paper Birch
simple alternate
pg. 95

Yellow Birch
simple alternate
pg. 97



Crab Apple
simple alternate
pg. 99

Wild Apple
simple alternate
pg. 101

Juneberry
simple alternate
pg. 103

Roundleaf Serviceberry
simple alternate
pg. 105

Weeping Willow
simple alternate
pg. 107

Laurel Willow
simple alternate
pg. 109

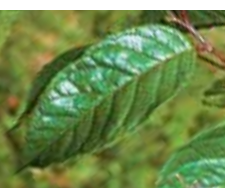
Pussy Willow
simple alternate
pg. 111

Black Willow
simple alternate
pg. 113

Red Mulberry
simple alternate
pg. 115

White Mulberry
simple alternate
pg. 117

American Plum
simple alternate
pg. 119



Canada Plum
simple alternate
pg. 121

Pin Cherry
simple alternate
pg. 123

Choke Cherry
simple alternate
pg. 125

Black Cherry
simple alternate
pg. 127

Gingko
simple alternate
pg. 129

Russian-olive
simple alternate
pg. 131

Hawthorn
simple alternate
pg. 133

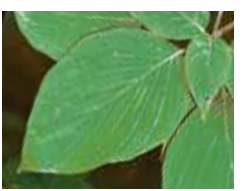
Hackberry
simple alternate
pg. 135

Ironwood
simple alternate
pg. 137

Speckled Alder
simple alternate
pg. 139

Blue Beech
simple alternate
pg. 141

American Beech
simple alternate
pg. 143



Alternate-leaf Dogwood
simple alternate
pg. 145

Black-gum
simple alternate
pg. 147

Eastern Redbud
simple alternate
pg. 149

Witch-hazel
simple alternate
pg. 151

American Basswood
simple alternate
pg. 153

Chinquapin Oak
simple alternate
pg. 155

Sycamore
simple alternate
pg. 157

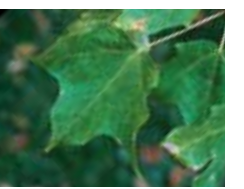
American Chestnut
simple alternate
pg. 159

Amur Maple
lobed opposite
pg. 161

Mountain Maple
lobed opposite
pg. 163

Red Maple
lobed opposite
pg. 165

Sugar Maple
lobed opposite
pg. 167



Black Maple
lobed opposite
pg. 169

Silver Maple
lobed opposite
pg. 171

Norway Maple
lobed opposite
pg. 173

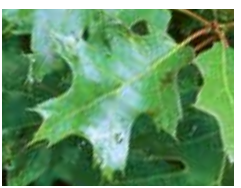
White Poplar
lobed alternate
pg. 175

Northern Pin Oak
lobed alternate
pg. 177

Swamp White Oak
lobed alternate
pg. 179

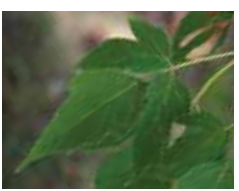
White Oak
lobed alternate
pg. 181

Black Oak
lobed alternate
pg. 183

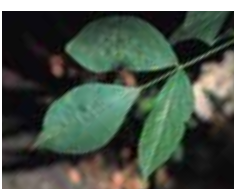


Northern Red Oak
lobed alternate
pg. 185

Bur Oak
lobed alternate
pg. 187



Boxelder
compound opposite
pg. 189



American Bladdernut
compound opposite
pg. 191

Amur Cork-tree
compound opposite
pg. 193

White Ash
compound opposite
pg. 195

Blue Ash
compound opposite
pg. 197

Green Ash
compound opposite
pg. 199

Black Ash
compound opposite
pg. 201

Common Hoptree
compound alternate
pg. 203

European Mountain-ash
compound alternate
pg. 205

American Mountain-ash
compound alternate
pg. 207

Common Prickly-ash
compound alternate
pg. 209

Bitternut Hickory
compound alternate
pg. 211

Shagbark Hickory
compound alternate
pg. 213

Poison Sumac
compound alternate
pg. 215

Smooth Sumac
compound alternate
pg. 217

Staghorn Sumac
compound alternate
pg. 219

Black Locust
compound alternate
pg. 221

Black Walnut
compound alternate
pg. 223

Butternut
compound alternate
pg. 225

Honey Locust
twice compound
alternate
pg. 227

Kentucky Coffeetree
twice compound
alternate
pg. 229

Horse-chestnut
palmate compound
opposite
pg. 231

Ohio Buckeye
palmate compound
opposite
pg. 233

SAMPLE PAGE

THUMB TAB

LEAF TYPE & ATTACHMENT

Common Name

Scientific name

Average mature tree compared with a two-story house. Icon is shown on a smaller scale when average tree height is over 50 feet.

Family: common family name (scientific family name)

Height: average range in feet and meters of the mature tree from ground to top of crown

Tree: overall description; may include a shape, type of trunk, branches or crown

Leaf/Needle: type of leaf or needle, shape, size, and attachment; may include lobes, leaflets, margin, veins, color or leafstalk

Bark: color and texture of the trunk; may include inner bark or thorns

Flower: catkin, flower; may include shape, size or color

Fruit/Cone: seed, nut, berry; may include shape, size or color

Fall Color: color(s) that deciduous leaves turn to in autumn

Origin/Age: native or non-native to the state; average life span

Habitat: type of soil, places found, sun or shade tolerance

Range: throughout or part of Wisconsin where the tree is found; may include places where planted

Stan's Notes: Helpful identification information, history, origin and other interesting gee-whiz nature facts.

Shape of an individual needle, needle cluster, or leaf. Use this icon to compare relative size among similarly shaped leaves.


bark
cone
close-up

White Spruce

Picea glauca

Family: Pine (Pinaceae)

Height: 40–60' (12–18 m)

Tree: single straight trunk, many horizontal branches sometimes sloping down, ragged conical crown

Needle: single needle, ⅓–¾" (.8–2 cm) long, stiff, pointed, square in cross section, aromatic when crushed, bluish green with a line of white dots on all sides

Bark: light gray in color, many flaky scales, inner bark is salmon pink

Cone: green, turning brown at maturity, smooth to the touch, 1–2½" (2.5–6 cm) long, single or in clusters, hanging from branch

Origin/Age: native; 175–200 years

Habitat: variety of soils, usually not as wet as Black Spruce (pg. 35) soils, often growing on banks of lakes and streams, sometimes in pure stands

Range: northern half of the state

Stan's Notes: Also known as Skunk Spruce because its crushed needles give off a strong odor that reminds some of skunk. Needles have a whitish cast, giving this tree its common name. Like all other species of spruce, White Spruce needles are square in cross section. Needles frequently last 7–10 years before falling off, leaving a raised base on the twig. Susceptible to fire and Spruce Budworm, a caterpillar that eats new needles. Lower branches die and fall off, leaving the trunk straight and lacking branches. A variety, Black Hills White Spruce (*P. glauca densata*), is a widely planted urban tree.


bark


cone

Black Spruce

Picea mariana

SINGLE NEEDLE

Family: Pine (Pinaceae)

Height: 25–50' (7.5–15 m)

Tree: small to medium-sized slender tree with a narrow pyramid shape, many dead lower branches, upper branches widely spread and drooping

Needle: single needle, ¼–1" (.6–2.5 cm) long, densely set along twig, straight, blunt tipped, square in cross section, dull blue-green

Bark: reddish brown in color, large scales, inner bark is olive-green

Cone: lavender to purple, turning brown when mature, egg-shaped, ½–1½" (1–4 cm) long, hanging from the branch

Origin/Age: native; 150–200 years

Habitat: wet or poorly drained soils, bogs, peats, often in pure stands or with Tamarack (pg. 59)

Range: northern half of the state

Stan's Notes: A relatively slow-growing, long-lived tree, it is one of seven spruce species that are native to the U.S. Common along marshes and bogs, with cones usually occurring at the top of the tree. Cones mature in autumn but often don't open, remaining on the tree for up to 15 years. Heat from fire opens the cones, after which many seeds are released. This species can live as long as 200 years but attains a height of only 50 feet (15 m). Young twigs have tiny orange-to-brown hairs. Treetops are commonly used in planters in winter for decoration. Long fibers in the wood make it desirable for making paper. A golden-colored pitch that collects on wounds was once gathered and sold as spruce gum.


bark
cone

Colorado Spruce

Picea pungens

Family: Pine (Pinaceae)

Height: 40–60' (12–18 m)

Tree: pyramid shape, lower branches are the widest and often touch the ground

Needle: single needle, ½–1" (1–2.5 cm) long, very stiff, very sharp point on the end, square in cross section, bluish green to silvery blue

Bark: grayish brown and flaky, becoming reddish brown and deeply furrowed with age

Cone: straw-colored, 2–4" (5–10 cm) long, in clusters or single, hanging down

Origin/Age: non-native, was introduced to the state from the Rocky Mountains; 150–200 years (some can reach 600 years in some western states)

Habitat: variety of soils, does best in clay and moist soils, sun

Range: throughout, in cities, parks, along roads, planted around homes

Stan's Notes: A common Christmas tree and landscaping tree that is widely planted around homes and along city streets. Naturalized now throughout Wisconsin. A victim of the Spruce Budworm and needle fungus, so not planted as much anymore. Very susceptible to cytospora canker, which invades stressed trees, causing loss of branches and eventual death. Will grow in a wide variety of soils, but prefers moist and well drained. Slow growing, some living up to 600 years in the West. Needles are very sharp and square in cross section. The species name *pungens* is Latin for "sharp pointed." Also known as Blue Spruce or Silver Spruce.


cone
bark

Norway Spruce

Picea abies

Family: Pine (Pinaceae)

Height: 50–70' (15–21 m)

Tree: pyramid shape, single trunk, branches drooping or weeping

Needle: single needle, ½–1" (1–2.5 cm) long, with a slight curve, stiff and pointed, square in cross section, aromatic when crushed, deep blue-green

Bark: reddish gray, many round scales

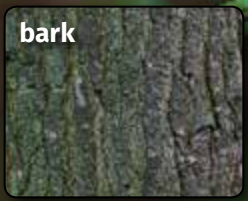
Cone: straw brown, papery, 2–7" (5–18 cm) long, hangs from branch

Origin/Age: non-native, introduced to the U.S. from Europe and Asia; 150–200 years

Habitat: rich moist soils, sun

Range: throughout, as windbreaks, in parks, cemeteries and yards

Stan's Notes: Produces the largest cones of all spruces. The fastest-growing and tallest spruce in Wisconsin, popular for planting as windbreaks. Introduced from Europe, as the name would imply, it is the dominant tree in the Black Forest area of Germany. One of the earliest trees used for reforestation in North America. The bark on the twigs is orange, turning reddish brown on the small branches. The trunk oozes a pitch known as burgundy pitch, which has been used in varnishes and medicine. Many horticultural varieties of this tree are available.


bark


cone

Eastern Hemlock

Tsuga canadensis

Family: Pine (Pinaceae)

Height: 40–60' (12–18 m)

Tree: pyramid shape, spreading branches are horizontal with drooping tips, irregular crown

Needle: single needle, ½–1" (1–2.5 cm) long, arranged in 2 rows with a few shorter needles on the upper row, borne on a soft and flexible tan stalk, soft, flat, flexible, tapering at the end, dark yellow-green above, lighter-colored with 2 whitish lengthwise parallel lines below

Bark: dark brown to dark gray in color, deeply grooved with broad flat-topped ridges

Cone: green, turning brown at maturity, round to ovate, ½–1" (1–2.5 cm) long, on a short stalk, at the end of twig, hanging down

Origin/Age: native; 150–200 years (some reach 600 years)

Habitat: wet soils in cool moist sites, shade tolerant

Range: northeastern half of the state and isolated sites

Stan's Notes: One of four species of hemlock in the U.S. and the only one native to Wisconsin. An extremely long-lived tree, some with trunk diameters measuring 4 feet (1 m). A very shade-tolerant tree, often growing in dense shade of taller trees, growing slowly until reaching the canopy. Because the tip of the leader shoot (treetop) droops, it often doesn't grow as straight as the other conifers. Bark is rich in tannic acid (tannin) and was once used to tan hides. Open cones will remain on the tree for up to two years. Has heavy seed crops every two to three years. Doesn't reproduce very well, as the young trees are fragile and often do not reach maturity. Doesn't transplant well. Also called Canada Hemlock.


bark
cone

Balsam Fir

Abies balsamea

Family: Pine (Pinaceae)

Height: 50–75' (15–23 m)

Tree: tapering spire with horizontal branching from the ground up, dark green

Needle: single needle, ½–1" (1–2.5 cm) long, with a spiral arrangement on the twig, soft, flat, blunt-tipped, shiny green above, 2 silvery lengthwise lines or grooves below

Bark: light gray, smooth with many very aromatic raised resin blisters (pitch pockets), breaking with age and leaving brown scales

Cone: bluish, erect, 2–4" (5–10 cm) long, dense clusters near the top of tree

Origin/Age: native; 100–150 years

Habitat: moist soils, shaded forest, along bogs, sun to partial shade

Range: northern half of the state

Stan's Notes: Well known for its fragrant needles, this is a popular Christmas tree because it holds its needles well after cutting. One of about 50 fir species worldwide. One of nine fir species in the U.S. and one of only two species east of the Rocky Mountains, with the Fraser Fir (not shown) native to the Appalachian Mountains. Often attacked by the Spruce Budworm, which eats the new needles. The upright cones break apart by autumn, leaving only a thin central stalk. Resin from the trunk was once used for making varnishes and sealing birch bark canoes. The common name, "Balsam," comes from the Greek root *balsamon*, which refers to aromatic oily resins found in the tree. Also called Canada Balsam or Eastern Fir.


immature
cone
bark
cone

Douglas-fir

Pseudotsuga menziesii

SINGLE NEEDLE

Family: Pine (Pinaceae)

Height: 50–70' (15–21 m)

Tree: scraggly-looking tree, pyramid shape, many lower branches dead and remaining on the tree, pointed irregular crown

Needle: single needle, 1–1½" (2.5–4 cm) long, arranged spirally on a twig, borne from a raised stalk, soft, linear but often curved, sharp point on the end, flat in cross section, yellow-green above, two lines of white dots below

Bark: gray to brown in color, with many flaky scales and scattered resin blisters (pitch pockets)

Cone: green, turning brown to straw-colored at maturity, large and distinct, 2–4" (5–10 cm) long, with curly 3-pronged cone scales, hanging from branch

Origin/Age: non-native, introduced from the Rocky Mountains and Pacific Northwest; 150–200 years (sometimes reaches 1,000 years in the Pacific Northwest)

Habitat: well-drained moist soils, cool shady places

Range: throughout, near cities and parks

Stan's Notes: Very characteristic large cones with distinctive three-point cone scales. Also known as the Coast Douglas-fir or Common Douglas-fir. A very large tree of the Pacific Northwest and Rocky Mountains, where it often grows to over 300 feet (91.5 m) and lives 500–1,000 years. Tolerates growing close together in thick stands. Only two of the eight species in the genus *Pseudotsuga* are native to the western U.S.; the other six are native to Asia. *Pseudotsuga* means "false hemlock," referring to its close resemblance to the Eastern Hemlock (pg. 41).


immature cone
bark
cone

Jack Pine

Pinus banksiana

Family: Pine (Pinaceae)

Height: 20–50' (6–15 m)

Tree: single trunk, many dead branches with very open irregular crown

Needle: clustered needles, 2 per cluster, ¾–1½" (2–4 cm) long, widely forked; each needle is narrow, stiff, slightly twisted, sharply pointed, yellowish green

Bark: reddish gray to black, many loose scales or plates

Cone: yellow-green, turning brown to gray at maturity, woody, in pairs, often is curved, 1–2" (2.5–5 cm) long, stalkless, tip pointing down the twig

Origin/Age: native; 100–150 years

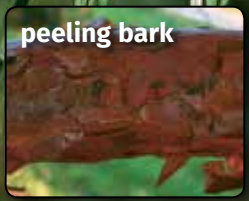
Habitat: dry, sandy or rocky soils, poor quality sites, sun

Range: northern half of the state

Stan's Notes: The northernmost pine tree species found in North America, often growing on rocky outcroppings and in other dry soils in Wisconsin. A very fast-growing tree for the first 20 or so years. Also a pioneer species, being the first conifer to grow after a forest fire. Its hard, resinous cones, known as fire cones, can stay closed on the tree for many decades, opening only after exposure to the heat of a fire. Unopened cones are often gathered by squirrels for winter food. Michigan's and Wisconsin's endangered Kirtland's Warbler depends upon the Jack Pine, nesting only in young Jack Pine stands after forest fires. The common name, "Jack," may refer to its wood, which is used to make levers to jack things up. Also known as Gray Pine, Scrub Pine, Banksian Pine or Hudson Bay Pine.


bark


cone


peeling bark

Scotch Pine

Pinus sylvestris

Family: Pine (Pinaceae)

Height: 30–80' (9–24.5 m)

Tree: single trunk that is often crooked, with spreading irregular crown

Needle: clustered needles, 2 per cluster, 1½–3" (4–7.5 cm) long; each needle is stiff, twisted and pointed

Bark: orange-brown and flaky lower, bright orange and papery upper

Cone: oval, 1–2½" (2.5–6 cm) long, on a short stalk, in clusters of 2–3, frequently pointing backward up the branch

Origin/Age: non-native, introduced to the U.S. from Europe; 100–150 years

Habitat: well-drained sandy soils, sun

Range: throughout, along roads, in parks and yards, as shelterbelts

Stan's Notes: One of the more popular Christmas trees grown. Among the first species of trees introduced to North America. The most widely distributed pine in the world, found from Europe to eastern Asia, the Arctic Circle to the Mediterranean Sea, and now North America. In Europe it grows tall and straight, but in North America it seldom has a straight trunk because of the seed source chosen by early settlers; apparently it was easier to collect cones for seeds by climbing trees with crooked trunks. Growing conditions, insect pests and disease also crook trunks. Easily identified by its orange-to-red upper branch bark (see inset) that often peels from the branches in thin papery strips. The main trunk bark has loose scales that fall off to reveal a reddish-brown inner bark. Two twisted needles per cluster are characteristic. Also known as Scots Pine.


bark
cone

Austrian Pine

Pinus nigra

Family: Pine (Pinaceae)

Height: 40–60' (12–18 m)

Tree: often irregular-shaped with large, open horizontal branches, broad round crown

Needle: clustered needles, 2 per cluster, 3–6" (7.5–15 cm) long; each needle is twisted, sharply pointed, not breaking cleanly when bent, dark green

Bark: gray-brown with reddish branches, very scaly

Cone: green, turning brown at maturity, woody, ovate, 1–3" (2.5–7.5 cm) long, each cone scale ending in a sharp point

Origin/Age: non-native, introduced to the U.S. from southern Europe; 100 or more years

Habitat: wide variety of soils, sun, shade

Range: throughout, mostly in the southern half of the state, planted in parks, along roads, as wind-breaks and wildlife shelterbelts

Stan's Notes: A very important tree, also known as European Black Pine. Originally from Europe, it was introduced to North America in 1759. This was the first species of trees to be planted during the dedication of the Dust Bowl Shelterbelt Project in 1935. Frequently confused with Red Pine (pg. 53) but easily differentiated from it by the way the needles break. Needles of the Austrian Pine don't break cleanly when bent, like Red Pine needles. Widely planted in parks and along roads because of its tolerance to salt spray, air pollution and dry soils. Easily grown from seed, it thrives in many soil types and transplants well.


immature cone
bark
cone

Red Pine

Pinus resinosa

Family: Pine (Pinaceae)

Height: 40–80' (12–24.5 m)

Tree: single straight trunk, dead lower branches fall off soon after dying, broad round crown

Needle: clustered needles, 2 per cluster, 4–6" (10–15 cm) long; each needle is straight, brittle, pointed, breaks when bent, dark green

Bark: reddish brown, becoming redder higher up, many flat scales or plates

Cone: green, turning brown at maturity, 2–3" (5–7.5 cm) long, containing many small brown nutlets

Origin/Age: native; 150–200 years

Habitat: dry sandy soils, often in pure stands, sun

Range: northern two-thirds of the state, frequently in mass plantings

Stan's Notes: Very impressive tree when seen in large pure stands. Often planted for Christmas trees. Also called Norway Pine because early settlers confused the tree with the Norway Spruce (pg. 39) of northern Europe. Often confused with the Austrian Pine (pg. 51), which has needles as long but which bend without breaking cleanly. Common name comes from its reddish bark. The scaly bark peels off the mature tree and lies at its base, resembling scattered jigsaw puzzle pieces. Branches occur in whorls around the trunk. Cones remain on the tree for several years. Heavy seed crops every four to seven years. Needs a fire to expose mineral soils for seeds to germinate. Used in reforestation projects.

immature cone

Ponderosa Pine

Pinus ponderosa

Family: Pine (Pinaceae)

Height: 50–70' (15–21 m)

Tree: single straight trunk, showing little tapering, loses lower branches when mature, irregular crown

Needle: clustered needles, 3 per cluster with occasionally 2 or 5 per cluster on same tree, 5–8" (12.5–20 cm) long; each needle is straight, flexible, bending rather than breaking, dark green

Bark: reddish brown with large, long black furrows and some scales

Cone: green, turning brown at maturity, 2–6" (5–15 cm) long, each cone scale armed with a sharp spine

Origin/Age: non-native, introduced to the state from western North America; 150–200 years

Habitat: wide variety of soils, sun

Range: throughout, in parks and yards, as shelterbelts

Stan's Notes: One of the most widely distributed pine tree species in the U.S. and most abundant pine tree in the western U.S. Was also called Western Yellow Pine, but the name was changed in 1932. Also called the Blackjack Pine. It is fast growing, producing a long straight trunk that is prized in the lumber industry for making window sashes, paneling and cabinets. One of the few pine trees that will have three or two (rarely five) needles per cluster. Pieces of fallen bark lie at the base of the tree like jigsaw puzzle pieces. Its thick bark makes the mature tree very fire resistant. Cones contain seeds that are eaten by birds and small animals. Needles and twigs are eaten by deer. Twigs and cones often ooze a clear, fragrant, sticky resin (see inset) that is often hard to remove from skin or clothing.


bark


immature cone


cone

Eastern White Pine

Pinus strobus

CLUSTERED NEEDLES

Family: Pine (Pinaceae)

Height: 70–100' (21–30.5 m)

Tree: single tall trunk, whorls of horizontal branching evenly spaced along trunk with branches concentrating near the top when mature, irregular crown

Needle: clustered needles, 5 per cluster, 3–5" (7.5–12.5 cm) long; each needle is soft, flexible and triangular in cross section

Bark: gray to brown and smooth when young, breaking with age into large broad scales that are separated by deep furrows

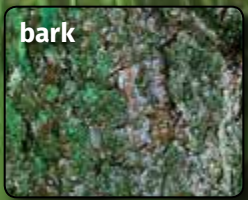
Cone: green, turning brown when mature, drooping and curved, 4–8" (10–20 cm) long, pointed white tip on each cone scale, resin coated

Origin/Age: native; 200–250 years

Habitat: wide variety of soils, from dry and sandy to moist upland sites, sun

Range: northern two-thirds of the state

Stan's Notes: The largest conifer in Wisconsin. A favorite place for Bald Eagles to build their nests. Formerly a dominant tree in the state and the backbone of the timber industry, it was known as the Monarch of the North. Also called Northern White Pine, Soft Pine or Weymouth Pine. With many killed by white pine blister rust, a fungus that slowly girdles the trunk, restoration efforts are under way to bring this tree back.


bark


cone

Tamarack

Larix laricina

CLUSTERED NEEDLES

Family: Pine (Pinaceae)

Height: 40–70' (12–21 m)

Tree: cone shape, single straight trunk, narrow crown

Needle: clustered needles on any twigs and branches older than 1 year, 12–30 per cluster, ¾–1¼" (2–3 cm) long, single needles on current year's growth; each needle is soft, pointed, triangular in cross section, light green

Bark: gray when young, reddish brown and flaky scales with age

Cone: light brown, round, ½–1" (1–2.5 cm) diameter, on a short curved stalk

Fall Color: bright golden yellow

Origin/Age: native; 100–150 years

Habitat: wet soils, swamps, bogs, occasionally in uplands

Range: throughout

Stan's Notes: A highly unusual species, being the only conifer in the state that sheds its leaves in autumn (deciduous). Turns bright golden yellow in the fall before shedding needles. One of the northernmost trees in North America. Often growing with Black Spruce (pg. 35), which also grows in acid bogs and muskegs. Also called Eastern Larch or American Larch. Larch Sawfly larvae eat the needles and in some years can defoliate entire stands of Tamarack. The roots of this tree have been used for lashing wooden slats together.


cone
bark

GLOSSARY

Acorn: A nut, typically of oak trees, as in the White Oak. See *nut* and *fruit*.

Aggregate fruit: A fruit composed of multiple tiny berries, such as a mulberry, raspberry or blackberry. See *fruit*.

Alternate: A type of leaf attachment in which the leaves are singly and alternately attached along a stalk, as in Balsam Poplar.

Arcuate: Curved in form, like a bow, as in veins of Alternate-leaf Dogwood leaves.

Asymmetrical leaf base: A base of a leaf with lobes unequal in size or shape, as in elms. See *leaf base*.

Berry: A fleshy fruit with several seeds within, such as European Buckthorn. See *fruit*.

Bract: A petal-like structure on a flower, as in Blue Beech.

Branch: The smaller, thinner, woody parts of a tree, usually bearing the leaves and flowers.

Bristle-tipped: A type of leaf lobe ending in a projection, usually a sharply pointed tip, as in Northern Red Oak.

Capsule: A dry fruit that opens along several seams to release the seeds within, as in Ohio Buckeye. See *pod*.

Catkin: A scaly cluster of usually same-sex flowers, as in Bigtooth Aspen or any willow.

Chambered pith: The central soft part of a twig that is broken into spaced sections. See *pith*.

Clasping: A type of leaf attachment without a leafstalk in which the leaf base grasps the main stalk, partly surrounding the stalk at the point of attachment.

Clustered needles: A group of needles emanating from a central point, usually within a papery sheath, as in pine trees.

Compound leaf: A single leaf composed of at least 2 but usually not more than 20 leaflets growing along a single leafstalk, as in Smooth Sumac.

Cone: A cluster of woody scales encasing multiple nutlets or seeds and growing on a central stalk, as in coniferous trees.

Cone scale: An individual overlapping projection, often woody, on a coniferous cone, as in Ponderosa Pine.

Conifer: A type of tree that usually does not shed all of its leaves each autumn, such as pine or spruce.

Crooked: Off center or bent in form, not straight, as in a Black Locust trunk.

Deciduous: A type of tree that usually sheds all of its leaves each autumn, such as White Oak or Sugar Maple.

Disk: A flattened, disk-like fruit that contains a seed, as in the American Elm. See *samara*.

Double-toothed margin: A jagged or serrated leaf edge that is composed of two types of teeth, usually one small and one large, as in Siberian Elm.

Flower: To bloom, or produce a flower or flowers as a means of reproduction, as in deciduous trees.

Fruit: A ripened ovary or reproductive structure that contains one or more seeds, such as a nut or berry.

Furrowed: Possessing longitudinal channels or grooves, as in Bur Oak bark.

Gall: An abnormal growth of plant tissue that is usually caused by insects, microorganisms or injury.

Gland: An organ or structure that secretes a substance, as in Nannyberry leafstalks.

Intolerant: Won't thrive in a particular condition, such as shade.

Lance-shaped: Long, narrow and pointed in form, like a spearhead, as in Weeping Willow leaves.

Leaf base: The area where a leafstalk attaches to the leaf.

Leaflet: One of the two or more leaf-like parts of a compound leaf, as in White Ash.

Leafstalk: The stalk of a leaf, extending from the leaf base to the branch. See *petiole*.

Lenticel: A small growth, usually on bark, that allows air into the interior of a tree, as in Paper Birch.

Lobed leaf: A single leaf with at least one indentation (sinus or notch) along an edge that does not reach the center or base of the leaf, as in oaks or maples.

Margin: The edge of a leaf.

Midrib: The central vein of a leaf, often more pronounced and larger in size than other veins, as in Black Cherry.

Naturalized: Not originally native, growing and reproducing in the wild freely now, such as Russian-olive.

Needle: A long, usually thin, evergreen leaf of a conifer.

Notch: A small indentation along the margin of a leaf, as in Red Maple.

Nut: A large fruit encased by hard walls, usually containing one seed, such as an acorn. See *fruit*.

Nutlet: A small or diminutive nut or seed, usually contained in a cone or cone-like seed catkin, as in Red Pine or Paper Birch. See *fruit*.

Opposite: A type of leaf attachment in which leaves are situated directly across from each other on a stalk, as in Sugar Maple.

Ovate: Shaped like an egg, as in Austrian Pine cones.

Palmate compound leaf: A single leaf that is composed of three or more leaflets emanating from a common central point at the end of the leafstalk, as in Ohio Buckeye.

Petiole: The stalk of a leaf. See *leafstalk*.

Petiolule: The stalk of a leaflet in a compound leaf.

Pitch pocket: A raised blister that contains a thick resinous sap, as in Balsam Fir bark.

Pith: The central soft part of a twig in a young branch, turning to hard wood when mature.

Pod: A dry fruit that contains many seeds and opens at maturity, as in Kentucky Coffeetree. See *capsule*.

Pollination: The transfer of pollen from the male anther to the female stigma, usually resulting in the production of seeds.

Rachis: The central or main stalk of a compound leaf, as in the European Mountain-ash.

Samara: A winged fruit that contains a seed, as in maples, ashes or elms. See *disk* and *fruit*.

Seed catkin: A small cone-like structure that contains nutlets or seeds, as in birches.

Sessile: Lacking a stalk and attaching directly at the base, as in Black Ash leaflets.

Simple leaf: A single leaf with an undivided or unlobed edge, as in American Elm.

Sinus: The recess or space in between two lobes of a leaf, as in the Red Oak.

Spine: A stiff, usually short, sharply pointed woody outgrowth from a branch or cone, as in Ponderosa Pine cones. See *thorn*.

Stalk: A thin structure that attaches a leaf, flower or fruit to a twig or branch.

Stipule: An appendage at the base of a stalk, usually small and in pairs, with one stipule on each side of the stalk, as in Nannyberry.

Sucker: A secondary shoot produced from the base or roots of a tree that gives rise to a new plant, as in Quaking Aspen.

Tannin: A bitter-tasting chemical found within acorns and other parts of a tree, as in oaks.

Terminal: Growing at the end of a stalk or branch.

Thorn: A stiff, usually long and sharply pointed woody outgrowth from a branch or trunk, as in Canada Plum. See *spine*.

Tolerant: Will thrive in a particular condition, such as shade.

Understory: A foliage layer that grows under a shady canopy of larger trees and which may include smaller tree species, such as Ironwood.

Whorl: A ring of three or more leaves, stalks or branches arising from a common point, as in Red Pine or Northern Catalpa.

Winged: A membranous, thin appendage, usually attached to a seed, as in maple seeds.

Woody: Composed of wood, as in trees or cones. See *cone scale*.

CHECKLIST/INDEX

Use the boxes to check trees you've seen.

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- Birds of Wisconsin Field Guide
- Birds of Prey of the Midwest Field Guide
- The Kids' Guide to Birds of Wisconsin
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- Bears
- Birds of the Midwest
- Hummingbirds
- Loons
- Mammals of the Midwest
- Owls
- Raptors
- Trees of the Midwest
- Wildflowers of the Midwest

ABOUT THE AUTHOR

Naturalist, wildlife photographer and writer **Stan Tekiela** is the originator of the popular state-specific field guide series that includes *Birds of Wisconsin Field Guide*. Stan has authored more than 190 educational books, including field guides, quick guides, nature books, children's books, playing cards and more, presenting many species of animals and plants.

With a Bachelor of Science degree in Natural History from the University of Minnesota and as an active professional naturalist for more than 30 years, Stan studies and photographs wildlife throughout the United States and Canada. He has received various national and regional awards for his books and photographs. Also a well-known columnist and radio personality, he has a syndicated column that appears in more than 25 newspapers, and his wildlife programs are broadcast on a number of Midwest radio stations. Stan can be followed on Facebook and Twitter. He can be contacted via www.naturesmart.com.

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About the Author

Naturalist Stan Tekiela is an award-winning wildlife photographer and the author of many popular state-specific field guides. He has written educational books about wildlife, including children's books, quick guides and more, presenting birds, mammals, reptiles, amphibians, trees, wildflowers and cacti.

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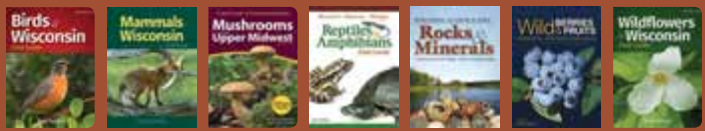

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