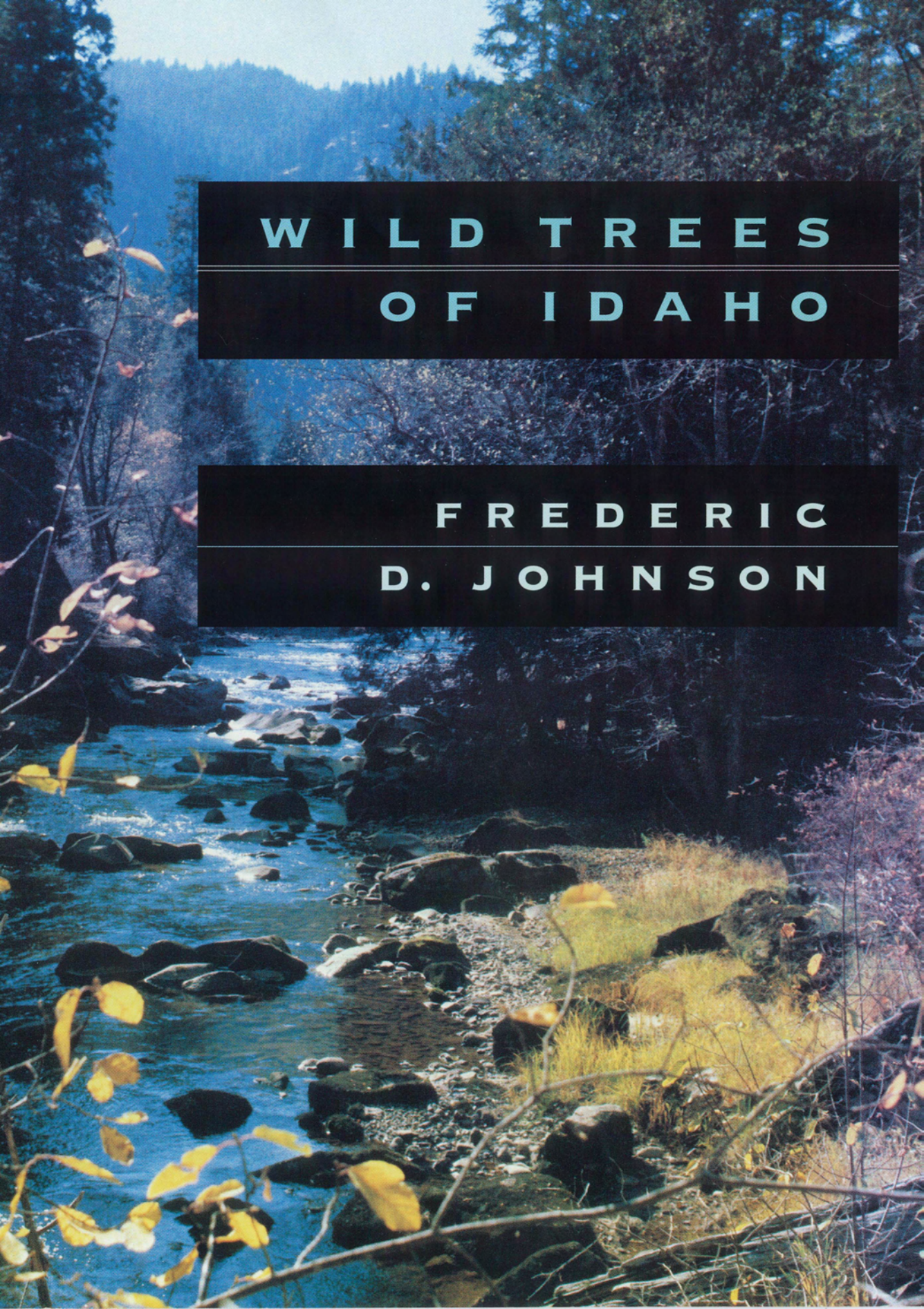

WILD TREES
OF IDAHO
FREDERIC
D. JOHNSON

Index to Scientific Names appears on the inside of the back cover.

* indicates Idaho native

We are surrounded with things which we have not made and which have a life and structure different from our own: trees, flowers, grasses, rivers, hills, clouds. For centuries they have inspired us with curiosity and awe. They have been objects of delight. We have re-created them in our imaginations to reflect our moods. And we have come to think of them as contributing to an idea which we have called nature.

–Sir Kenneth Clark

I am attached to my trees. I address to them elegies and sonnets and odes. I know them all by their names like my children. They are my family.

–François René Chateaubriand

1810

WILD TREES OF IDAHO

FREDERIC D. JOHNSON

College of Forestry
Wildlife and Range Sciences
University of Idaho

UNIVERSITY OF IDAHO PRESS
MOSCOW, IDAHO
1995

Manufactured in the United States of America.

University of Idaho Press
Moscow, Idaho 838444-1107

98 97 96 95 5 4 3 2 1

Front cover: White alder, Douglas-fir and grand fir along Lolo Creek, Clearwater County. Photograph by author.
Back cover: Subalpine firs in central Idaho high country. Photograph by author.

Design by Caroline Hagen
Typeset in Granjon and Gill Sans

Library of Congress Cataloging-in-Publication Data

Johnson, Frederic D. (Frederic Duane), 1925–
Wild trees of Idaho / by Frederic D. Johnson.
p. cm. — (Northwest naturalist books)
Includes bibliographical references (p.) and index.
ISBN 0-89301-145-2 (paper)
1. Trees—Idaho—Identification. 2. Leaves—Idaho—Identification. 3. Trees—Idaho—Pictorial works. 4. Leaves—Idaho—Pictorial works. I. Title. II. Series.
QK156.J64 1994
582.1609796—dc20 94-10980
CIP

To Jinny, Paul, Jacque, Laure, Judi, and Mark: their patience (most of the time), understanding (almost always), and loads of assistance (when most needed), helped to make this a labor of love. Thanks, family!

CONTENTS

PLATES

FIGURES

ACKNOWLEDGMENTS

A number of people provided a critical review of all or part of the initial manuscript. Thanks to Terry Armstrong, Dick Bingham, Steve Brunsfeld, John Fisher, Doug Henderson, Walt Koepl, Jack Smiley, Bob Steele, and Chuck Wellner. Through their experience with Idaho trees and forests and with educational materials, this becomes a more readable and accurate work. Special gratitude to Steve Brunsfeld for help with the willows.

The following folks dedicated time and effort toward data assembly, maps, initial drafts, and editing: Lorraine Ashland, Roberto Avila, Dawn Bradbury, Steve Brunsfeld, Anita Cholewa, Linda Geer, Monta Lazelle, Al Merkel, Susan Roberts, Jory Shelton, and Mickey Stehr. Thanks to all—it's been a long pull.

I am indebted to the Stillinger Trust Foundation and the Idaho Forest, Wildlife and Range Experiment Station: they provided funds for data collection and development of this book. The cooperation of the Idaho Transportation Department and the Idaho Department of Parks and Recreation is gratefully acknowledged.

All photographs and artwork are by the author unless otherwise noted.

An excellent job of copy editing by John DeRoo deserves praise. Finally, the folks at the University of Idaho Press, especially Caroline Hagen and Peggy Pace, have my heartfelt thanks for their patience and guidance and for a professional job well done.

Royalties from this book are dedicated to a special fund promoting international education at the College of Forestry, Wildlife and Range Sciences, University of Idaho.

Errors of omission or commission are my responsibility.

Fred Johnson
Moscow, Idaho
October 1, 1994

INTRODUCTION

Humankind has sung the praises of trees and forests long before invention of the written word. Throughout our history, forests were magical and mystical, foreboding and feared, yet sheltering and life-sustaining. Trees were worshiped and blessed and were sources of food and fuel and economic security. It seems that somewhere in each of us is a primeval recognition that trees must frame our existence. One of the first acts of pioneers in treeless areas was the planting of trees—immediately for shade and food, later for fuel, fence posts, and beauty. And we still plant trees by our homes and schools, along our streets and boulevards. What would any city park be without trees? At considerable expense, we soften the effects of our commercial buildings with circles of trees and lawns. With high hopes for their survival, we plant them in the concrete-framed spaces between mall parking units. Cities and towns by the score are remodeling town centers, certainly always making room for groups and lines of trees. We humans simply love trees and want them nearby, wherever we are. Our appreciation of the world we live in is influenced by the trees that shape our natural and man-made landscapes.

Knowledge gained through experience and research has eliminated most of the mystical qualities our forebears ascribed to trees and forests. However some mysteries remain, and fortunately wonderment of trees as living things has not diminished. Who among us can but stand in awe at the base of a giant tree as we think of the centuries it has witnessed? Can anyone resist the exhilaration of a deep breath of air from a fragrant mountaintop forest? Welcome shade on a hot summer's day? A Christmas tree in the living room corner? Spirelike spruces lining a ski run? A cathedral grove of redcedar with a green carpet of ferns? Willows along a stream, their branches reaching for a badly placed fisherman's fly?

Appreciation of our rich natural heritage clearly involves recognition and understanding of Idaho trees and Idaho forests. That's what this book is about.

ORIGINS

To understand the trees and forests of Idaho, one must appreciate the incredible length of time that has elapsed in the development of Idaho's present vegetation. While the fossil record has many gaps, a reasonable chronology of Idaho vegetation history can be presented.

Our story will begin in the Triassic period some 200 to 250 million years ago. The antecedents of our modern coniferous trees were well developed and liv-

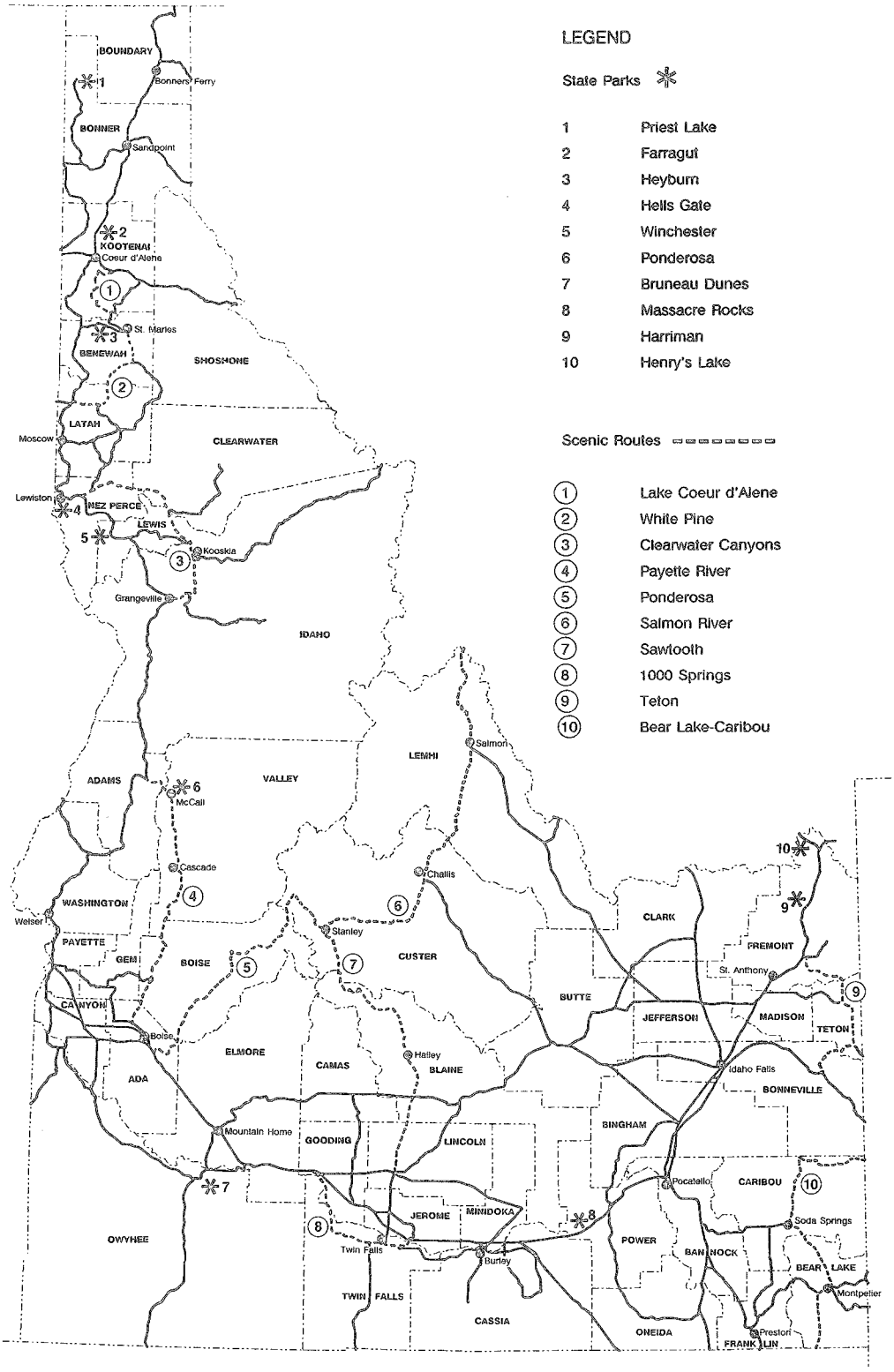


Figure 1. Idaho counties, major highways, and selected towns, scenic routes, and state parks.

ing in what was to be North America. Broadleaf trees and their relatives, the wildflowers of forest and meadows and flowering plants in general, had not yet appeared on the scene. Idaho at that time was likely covered by a shallow sea. Dinosaurs stalked the land; birds first appeared, evolved from reptilian ancestors. Tiny primitive mammals came into being (2, 15, 23).

About 100 million years ago, in the Cretaceous period, Idaho and most of the West had emerged from the sea, but an ocean separated eastern and western pre-North America. The great Idaho Batholith, that vast mass of granite of the state's central mountains, was beginning to emerge. Some 65 million years ago, dinosaurs suddenly became extinct and mammals began to flourish. Modern vegetation history essentially begins with this period. Coniferous trees were well developed, with genera such as pine, larch, spruce, fir, and hemlock present in what we now call the Pacific Northwest. Hardwood trees began to appear, and with them the whole assemblage we call angiosperms—the flowering plants. Genera native to Idaho today had progenitors in Idaho 100 or so million years ago. Maples, alders, birches, dogwoods, hawthorns, cottonwoods, and willows were all here.

This Cretaceous forest in what was to be Idaho also had many tree genera now found in eastern North America: hickory, chestnut, beech, sweetgum, tulip-poplar, magnolia, and many others. There were also genera now native only to eastern Asia: tree-of-heaven, ginkgo, dawn-redwood, and more. So the Cretaceous forests of Idaho contained a rich mixture of many kinds of broadleaf and coniferous trees growing in a warm, evenly moist, subtropical climate.

In the Miocene epoch 25 to 13 million years ago, some drastic changes began to shape the landforms of present-day Idaho. By that time, most Idaho mountains were in place. To the west there were a few low hills and ridges dotting the forested landscape, but there was little to block the warm, moist air coming in off the Pacific Ocean. At lower elevations in these lowlands, we believe there was abundant rainfall, warm and rainy summers, and mild winters. Red soils, often seen on northern Idaho road-cuts, form only under warm, moist conditions—they attest to an almost tropical climate in the past (2). The tremendous basalt flows that filled the Columbia Basin extended well into western Idaho. Many watercourses were dammed by the flowing rock, and in places, pond sediments have preserved a remarkable array of tree leaves and fruits (2, 15, 54, 55). Tree genera still included many that are now common in the southeastern United States: sassafras, sycamore, chestnut, tulip-poplar, bald-cypress, and numerous others. Many of these heat- and moisture-demanding species became extinct in western North America, but other Miocene genera, such as cottonwood, cherry, hawthorn, dogwood, and maple, still persist in Idaho (54). At higher elevations in the mountains, the climate was cooler and conifers formed dense forests containing pine, spruce, Douglas-fir, hemlock, fir, yew, and redcedar. Moisture-demanding trees such as hemlock and larch, now confined to northern Idaho, were then found in east-central Idaho along with a variety of other conifers. Mammals that roamed the forests included rhinoceros, camels, horses, and cousins to elephants, as well as large members of both the dog and cat families. To the southeast, the Central Rockies began their spectacular rise, which ultimately helped to block the eastward flow of maritime air masses from the Pacific, creating a rainshadow in mid-continent that became the Great Plains. To the southwest, the immense block of granite we now call the Sierra Nevada developed into an impressive barrier against the flow of oceanic air, creating the southwestern deserts in their rainshadow to the east (22).

Roughly 12 million years ago, in the Pliocene epoch, the Cascade Mountains began their explosive volcanic rise. By the time they reached full height, Idaho's climate had undergone important changes—there were hotter summers, colder winters, and it was significantly cooler and drier overall. As the Cascades rose, many plants of the Northern Rockies, particularly those in the Idaho panhandle, slowly migrated toward the new Pacific coast. Gradually these migrants, expanding their ranges in reaction to the cool-

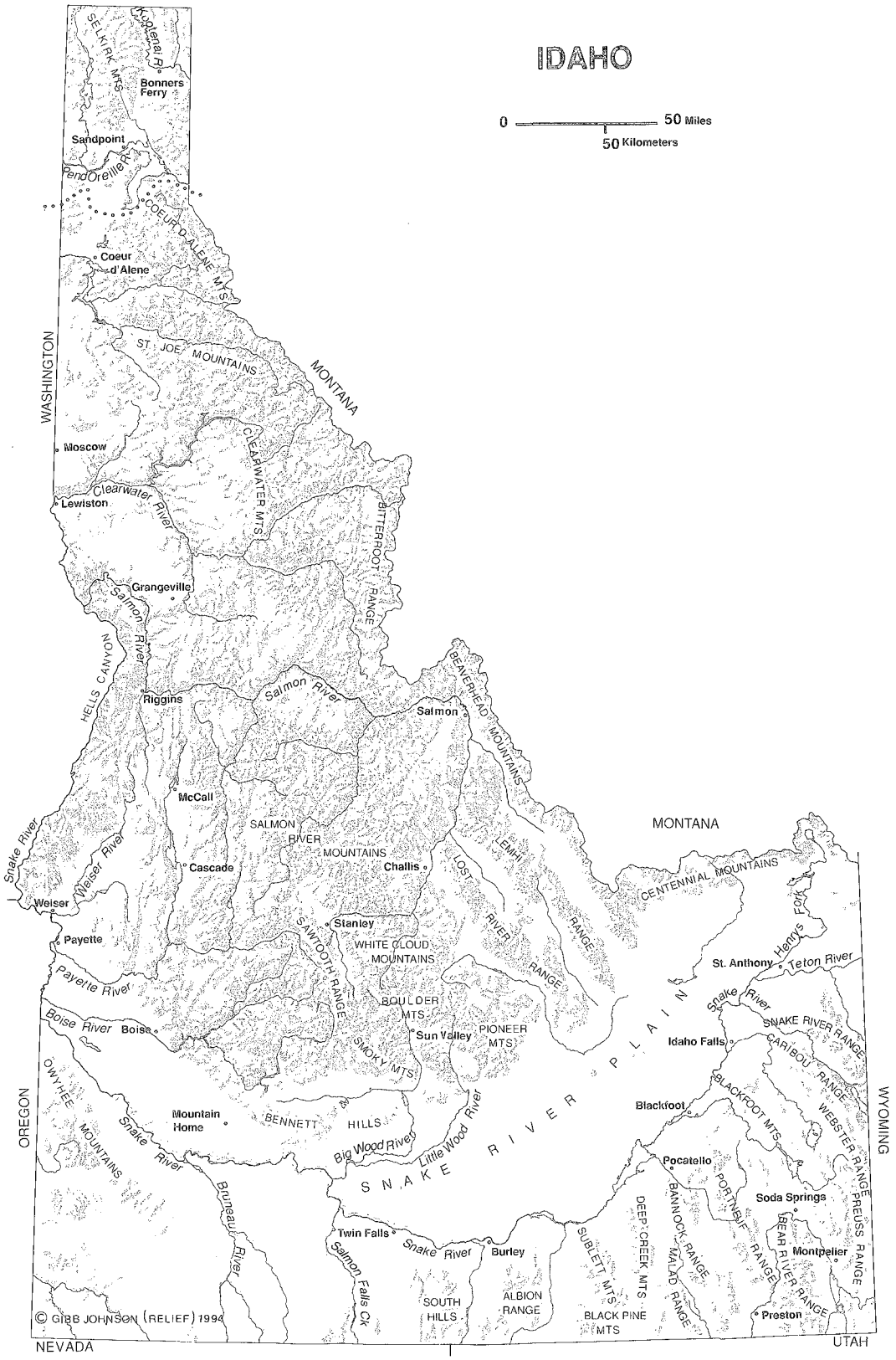


Figure 2. Idaho topography.

ing climate, formed the nucleus of the present-day coniferous forests that stretch from coastal Alaska to northern California. Meanwhile, in the Northern Rockies, conifers, which prospered under cooler, relatively dry climates, also expanded their domain.

Some of the plants along the western front of the Northern Rockies found refuge in the low-elevation valleys of western Idaho and adjacent Oregon and Washington. Most important was the Clearwater River drainage, where the canyons have very low elevations, providing more heat. The canyon bottoms, surrounded by mountains, get significantly more rainfall than similar low elevations to the west. In these lush valleys, relics of the distant past still remain. Small populations of trees such as Pacific dogwood and red alder are separated from their extensive ranges west of the Cascades. Numerous other flowering plants join these two species as disjuncts from major coastal populations (22, 45).

The rainshadow formed by the Cascades and Sierra Nevada created much drier habitats to the east of this cordillera. These drier and warmer habitats allowed southern plants to move northward. By contrast, the cooler climate of the higher elevations encouraged northern plants to migrate south. The stage was set for the present vegetation of Idaho.

One more series of events occurred before the trees and forests of Idaho assumed their current composition and distribution: a series of continental glaciers that repeatedly covered parts of far-northern Idaho (2, 15, 52). At the beginning of this sequence of ice sheets, about 2 million years ago, most of the contemporary native tree species already dominated Idaho forests. As glaciers pushed south, the climate changed. Again and again, vast creeping masses of ice thousands of feet deep moved southward, retreated, and then reformed and moved south again. The attendant, relatively rapid climatic changes were probably responsible for the demise of mammals such as horses, camels, rhinoceros, and wooly elephants; undoubtedly, many plants also met their doom. In Idaho, the last of these ice walls melted some 10 to 15 thousand years ago. The map in Figure 2 indicates the approximate maximum extent of continental glaciation in Idaho—roughly a bit south of Lake Pend Oreille. During these ice ages, numerous more-localized glaciers were formed in Idaho's mountains, sculpting the high peaks, rounding lower mountains, and forming the myriad subalpine lakes that dot the mountain landscape. Obviously, all the land covered by ice was reinvaded by plants after the ice melted and the climate warmed.

With the past in mind, we can now attend to the origins of present-day Idaho forests. The relict vegetation of the Pliocene are now termed Pacific coastal elements. There is ample evidence that many species of plants endured the periglacial climates in the low elevations of the western canyons of Idaho. Again, Pacific dogwood and red alder are outstanding examples. These are accompanied by numerous smaller plants that are rare inland: Oregon bluebells (*Mertensia bella*), red-flowering currant (*Ribes sanguineum*), redwoods violet (*Viola sempervirens*), and western starflower (*Trientalis latifolia*) are examples (36, 45). Trees such as western redcedar, Pacific yew, and grand fir also overwintered the ice ages in these warm valleys. Recent discoveries of red alder and other plants of Pacific coastal affinity in the Salmon River drainage indicate that these canyons, too, hold plant relics of the past.

But what of the denuded glaciated area of northern Idaho? Where did the trees now so prevalent come from? Several pathways are possible; however, two seem most likely (45). It is almost assured that plants from the deep canyon refuges moved northward. A second credible route involves the many common plants in the glaciated areas that don't occur south of glaciation; beaked hazel, western paper birch, and dwarf birch are examples described in this book. Wild sarsaparilla (*Aralia nudicaulis*), Columbia lily (*Lilium columbianum*), salal (*Gaultheria shallon*), and red huckleberry (*Vaccinium parvifolium*), all common on the Pacific coast, occur only north of glaciation in northern Idaho or adjacent British Columbia, even though there appears to be ample similar habitat to the south. It is known that there were unglaciated

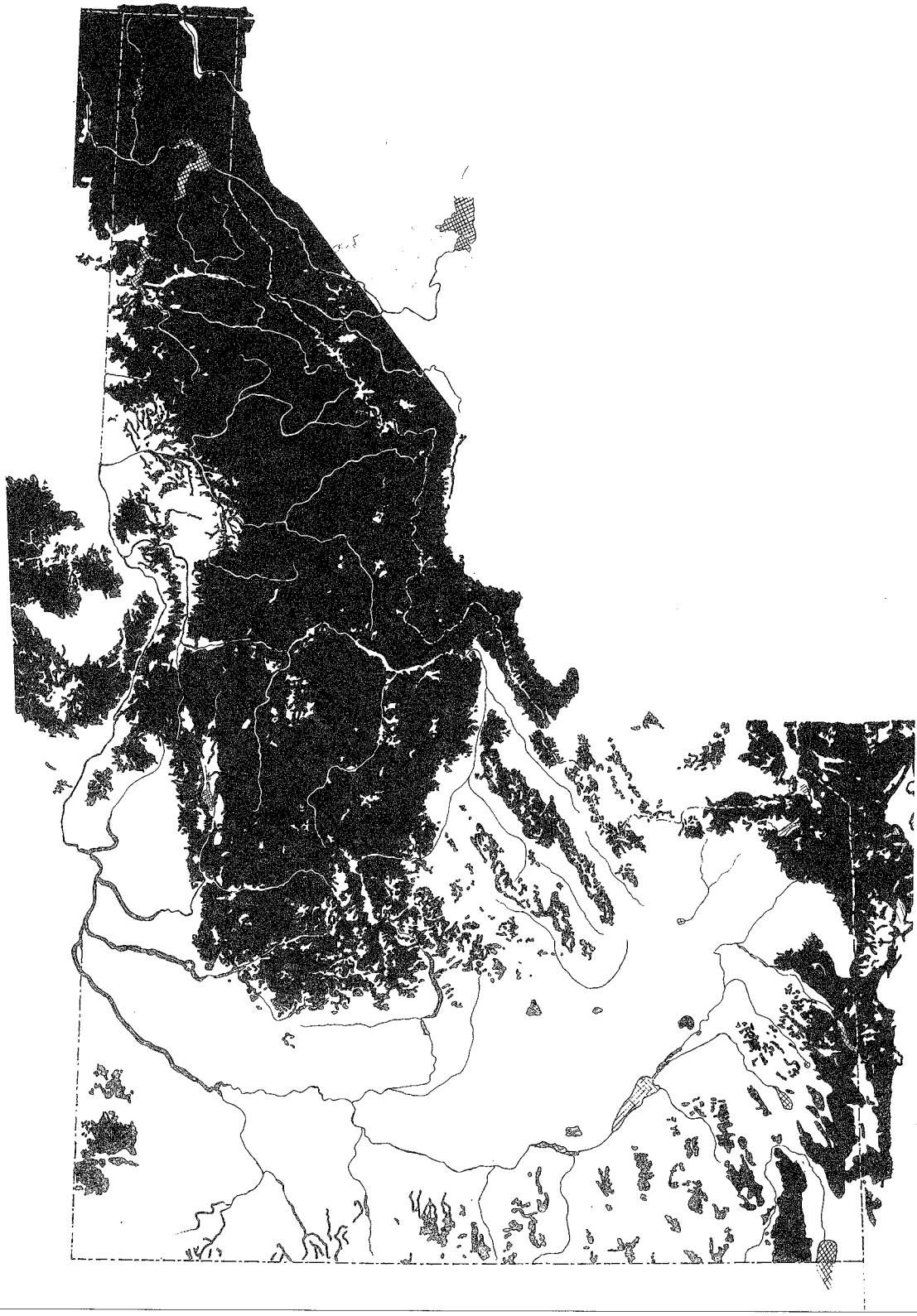


Figure 3. Approximate potential forested areas of Idaho.

areas along the western shore of British Columbia, and others to the north. From pollen records, it appears that western hemlock came into the glaciated area from the west (27). Perhaps this is the reason it hasn't moved farther south in Idaho. Conceivably, hemlock and other plants migrating from the coast are still moving slowly southward. So, it appears that after the glaciers retreated, the "coastal" vegetation of northern Idaho reinvaded from at least two major areas—from the Pacific coast, spreading eastward through southern Canada, and from the low-elevation canyons of western Idaho, spreading northward.

Other native trees of Idaho, as well as hundreds of other plants, have boreal affinities. This means we think they moved down the Rocky Mountains from the north, most certainly millions of years ago. The relatives of the high-elevation plants of Idaho can be traced to the vast tract of boreal coniferous forests that stretches from Alaska to Newfoundland. Good examples are lodgepole pine, subalpine fir, quaking aspen, paper birch, and black cottonwood. Lodgepole pine is very closely related to jack pine (*Pinus banksiana*), which ranges from Alberta east to the Atlantic. Where the ranges of these two pines overlap, in Alberta, they readily hybridize. Subalpine fir also has its boreal counterpart, balsam fir (*Abies balsamea*), which has virtually the same west to east range as jack pine. Lodgepole pine and subalpine fir are but slightly modified versions of their northern relatives. Quaking aspen and paper birch both have transcontinental northern distributions—from Alaska to the Atlantic shores. Western paper birch extends as far south as northern Idaho, Montana, and Washington in western North America. Quaking aspen, by contrast, is common from the high western mountains south to Mexico. Black cottonwood is closely related to the boreal balsam poplar; both are described in this book. There are many other forest plants that represent this northern origin: bog birch, twinflower (*Linnaea borealis*), bunchberry dogwood (*Cornus canadensis*), pink elephants (*Pedicularis groenlandica*), and Labrador-tea (*Ledum glandulosum*) are some easily recognized examples.

Still another group of plants have their origins to the south, where climates were certainly drier and often much warmer. Many of these may have had ancestors from Mexico or the southwestern United States. Trees such as ponderosa and limber pine, Utah and western juniper, singleleaf pinyon, and bitterbrush are examples. Mexico is the center of pine evolution in the Western Hemisphere, and that country is home to very close relatives of both ponderosa and limber pine. Utah and western juniper represent a group of species of southwestern North America. Most of their distributions are south of Idaho. The pinyon pines, unique and restricted to southwestern North America, are represented by singleleaf pinyon, which reaches its northern limit in southern Idaho near the Utah border.

Netleaf hackberry and white alder are more interesting examples of the northward migration of southern species. Hackberry, so common in Hells Canyon and the lower Salmon River, has its major distribution from southern Arizona to central Texas. There are numerous spot locations to the north, but in Idaho's western canyons, netleaf hackberry becomes a prominent tree, lining the rivers for miles and miles. During some period of warmer climate, possibly between ice advances, this tree moved northward in response to warmer climates that are thought to have occurred sporadically. The warm canyons are quite adequate for its existence even though the present surrounding mountain terrain is much too cold for its subsistence.

The story for white alder is quite similar, except the present distribution is largely on the west side of the Sierra Nevada, reaching south to the Mexican border. Small, scattered populations occur in eastern Oregon, but in the western canyons of Idaho white alder is the dominant riparian tree, often sharing space with netleaf hackberry. This Sierran alder was also isolated in Idaho as the climate cooled in the surrounding mountains.

Thus, as we view the general picture, Idaho vegetation, including trees, has three major origins. 1. Relict and reinvaded Pacific coastal vegetation found

primarily in northern Idaho and represented best by the forests dominated by grand fir, western redcedar, and western hemlock. 2. Northern vegetation that over millions of years migrated south and is depicted by boreal species of the subalpine and alpine zones of our higher mountains such as lodgepole pine, subalpine fir, Engelmann spruce, and quaking aspen. 3. Lastly, vegetation from drier, warmer, and more southerly origins such as ponderosa and limber pine, singleleaf pinyon, and Utah and western juniper. This brief summary prepares us to discuss the present trees and forests of Idaho.

NATIVES AND NEW NATIVES

While ginkgo and dawn-redwood were Idaho natives several million years ago, in this book I will use the term "native" to indicate trees growing wild in Idaho since our earliest written records. Native trees, then, show all indications of having well-established populations in Idaho since the first written botanical observations were made by Lewis and Clark.

When people from the eastern United States began to settle in Idaho, they soon brought many kinds of trees to plant in the new land. Some were planted to remind folks of home. Shade was important, and trees like silver maple and eastern cottonwood were planted to provide quick shade. Many were planted to bear fruit—apples, pears, cherries, and plums were early emigrants. Some had wood that was particularly useful—black locust and catalpa were planted to provide decay-resistant fence posts. Others were brought to Idaho solely because they could survive—violet box-elder, black locust, Russian-olive, and Siberian elm can all withstand exceptionally rigorous climates. Trees planted away from their native habitats are called "introduced trees" or they may also be termed "aliens" or "exotics." Hence, silver maple from eastern North America, Russian-olive from central Asia, bigleaf maple from the Pacific coast, and tree-of-heaven from China are all introduced trees. None are native to Idaho, yet all may be found in Idaho as wild trees.

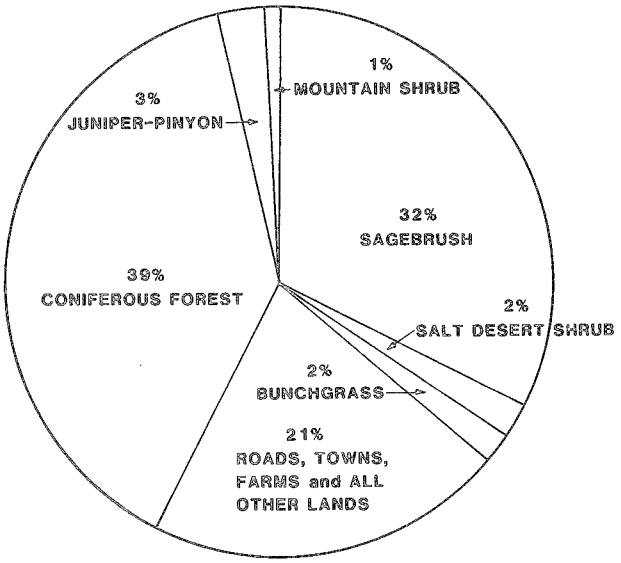


Figure 4. Approximate area of major vegetation types in Idaho. Total area is 53.5 million acres.

Of the numerous introduced trees, a number have been particularly successful because they are well adapted to Idaho habitats. They bear fertile seeds that, carried by water, wind, or birds, germinate and grow away from their parent tree. Such trees from introduced parents, whether growing wild by a fence, along a roadside, or close by a stream, are called "escapes" (Pl. 21). As escaped trees grow to maturity they often develop their own fertile seeds, and seedlings may become established and compete with native vegetation. Should a population of trees from escaped parents develop, such a population is termed "naturalized." In a sense, naturalized trees are "new natives," and in a few hundred years most people will forget their distant origins; they will be thought of as natives (Pl. 33).

This book is about wild trees—native, escaped, and naturalized trees that you might encounter in Idaho well beyond the limits of any town or farm.

WHAT IS A TREE

Generally, the answer to the question "What is a tree?" is simple enough. But first, what is a shrub?

When do shrubs become large enough to be classed as trees? Nature provides us with no clear guidelines to help decide these questions. Essentially, defining a tree depends on the purpose of the definition, which in turn depends on the person making the definition.

Picture a small, gnarled whitebark pine growing from a crack in a granite slab at 7,000 feet in central Idaho. We sacrifice the plant by cutting it at the base. It is 2 inches in diameter and only 3 feet tall. The annual rings are counted . . . slowly, for they are so very narrow. Eighty-six years old! Is this 3-foot plant a tree?

Another example: A Rocky Mountain maple grows beneath a stand of western redcedar in northern Idaho. The cedars are 3 to 5 feet in diameter and some 150 feet tall, while the maple is but 4 inches in diameter and about 18 feet tall. Is the maple a tree?

In defining trees, we generally consider the species as a whole. If whitebark pines are usually trees, we recognize the potential of small ones to become trees. In the case of the adverse habitat illustrated in our example, we consider the environment and make allowances. Most folks would think of that 3-foot whitebark pine as a small tree, even though it appears likely that it will never reach "tree size."

In the case of the maple, a forest ecologist would usually consider that 18-foot plant a tall shrub, for it is readily recognized that the Rocky Mountain maple will never dominate a mature forest in this area; hence it is an understory plant and classed as a tall shrub. Nonetheless, many publications show Rocky Mountain maple on lists of trees. We're back to the purpose of definitions. In this case, the ecologist considers dominance, while another definition considers only size.

In this book, a tree is a woody plant that somewhere in Idaho is known to reach a height of at least 13 feet and a diameter of at least 3 inches. This definition is from the "Checklist of United States Trees" (43), and is adopted by the Idaho Big Tree Program and American Forests for its national Big Tree Program, as well as by most forestry agencies. Tree diameters are taken 4.5 feet above the ground. This is termed "breast height" by foresters. Many tree definitions indicate trees as having but a single stem. However, one can easily picture a clump of tree birches or cottonwoods with several large trunks: no one would hesitate calling such a plant a tree. The best that can be said is that trees generally have one to several trunks, and we will follow that idea.

After all of this defining, there are a number of plants in this book that are almost always considered shrubs. But, somewhere in Idaho, we have record of them reaching that magical 3-inch diameter by 13-foot height. Examples are serviceberry, big sagebrush, bitterbrush, coyote willow, and mountain-mahogany—mostly tall shrubs, but occasionally, or perhaps rarely, a small tree.

A tree is a tree by definition. Remember: 3 inches and 13 feet, one to several stems—that's a tree.

BIG TREES, LITTLE TREES

Somehow we're all impressed by extremes: largest, tallest, widest, longest. Since 1940, the association of American Forests has promoted measurement and listing of the largest trees in each species for all 679 species of native United States trees and those that have been naturalized (43). The national list is published periodically in the magazine *American Forests.*

Most states, including Idaho, also have a Big Tree Program to promote interest in the largest trees in the state. In this book, the diameter, height, and general location of the largest of each kind of tree for which we have Idaho records is listed on the text page for that tree.

For a current list of Idaho record trees, send a self-addressed, stamped envelope to: Idaho Big Tree Program, College of Forestry, University of Idaho, Moscow, Idaho, 83844-1131.

HABITATS

Idaho is a tree state. The map in Figure 3 emphasizes areas in the state where trees are dense enough to be called forests. Even what we consider nonforested

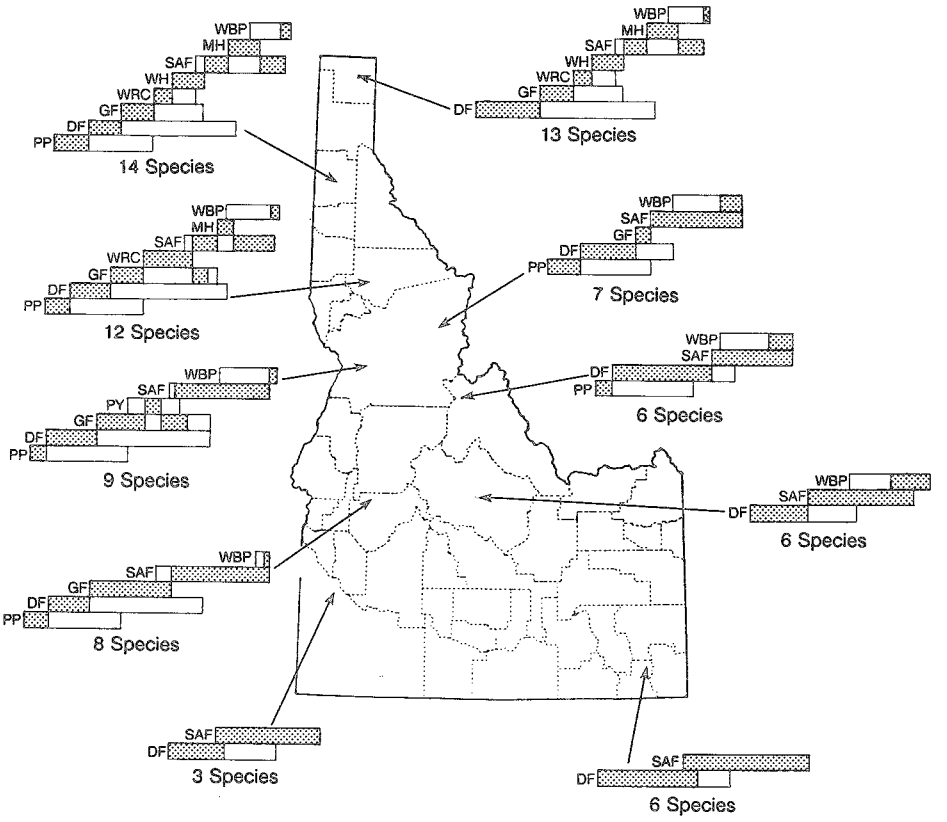


Figure 5. Distribution of climax coniferous trees at selected sites. Horizontal bars depict approximate ecologic amplitude of each species. Each set of amplitudes illustrates increasing elevation: warm and dry conditions at the lower left grading to cool and moist environments at upper elevation. Shaded sections portray where the species are climax, while open portions of the bars depict where trees are seral. Species number is the total number of overstory trees in the area. Note the reduction in numbers of trees from north to south in western Idaho. This reflects the gradual reduction of the Pacific maritime climatic influence. The west to east movement of moist air masses in central Idaho results in drier conditions in the east and fewer tree species. Increasing summer precipitation in southeastern Idaho, characteristic of the Central Rockies, produces more tree species when compared to summer-dry southwestern Idaho.

parts of Idaho (shown in white) have wild trees along streams, in clefts in rocks, along irrigation ditches, and in a variety of other special habitats. There are only a few places in Idaho where one is out of sight of at least a few wild trees. About 40 percent of the state is forested (Figure 4). Of the 50 United States, only the 4 states bordering the Pacific Ocean have more standing timber volume than Idaho.

In this book, there are maps depicting the locations where described native trees may be found. These range maps are quite general and don't begin to indicate the numbers of trees of a particular species that are present in an area. Although an entire mountain range may be included on the range map for a species, this does not imply great numbers of trees, nor does it imply that the species is present at both

low and high elevations. Trees, and all plants, grow only in particular environments or habitats. The proper habitat for a particular plant must contain the correct combination of soil, water, sunlight, nutrients, heat, and other environmental factors. At the base of a mountain, black cottonwoods may be growing along a stream where abundant water and sufficient heat allow successful growth. Thousands of feet above the river, growing on a rocky site with little soil or water and in a much colder climate, a stand of whitebark pine develops in an entirely different habitat. Both the cottonwood and the pine would appear at the same point on the maps, yet in reality they are literally miles apart.

Plants with similar habitat requirements are often found growing together in a community. Plant communities dominated by trees are designated as forests. Recognizing forest communities and some characteristics of habitats helps to understand the ecology of an area and frequently assists in tree identification.

Idaho has tremendous variation in habitats, and much of the variation is due to substantial changes in elevation. Precipitation (rainfall, snowfall, and dew combined) usually increases with elevation, while temperatures on average become lower. Forest communities are strongly influenced by the changing mountain environments. Often we find different kinds of forests growing in somewhat predictable patterns that are broadly related to elevation. But elevation is not the only factor to consider in forest distribution. There are major climatic differences between northern Idaho, with its strong Pacific oceanic influence, and southeastern Idaho, where a more continental climate prevails (Figure 5). The floristic history already summarized also has an influence, and local variation in soils can be a factor as well.

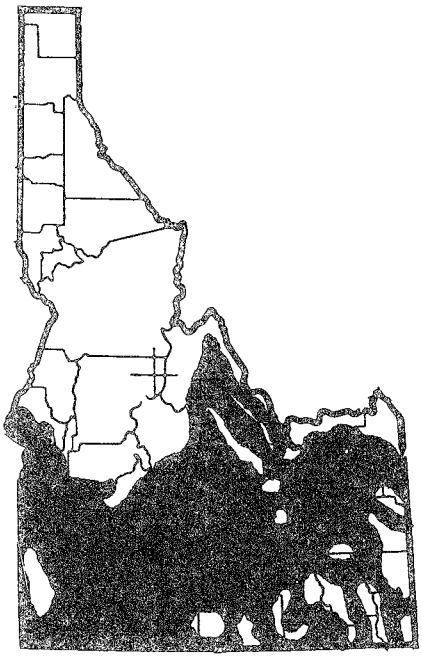
Nonetheless, there are patterns related to elevation and there is predictability that can be expected. Plant communities whose distribution is closely tied to elevation can be grouped into zones. For example, forests of the subalpine zone in Idaho are usually composed of subalpine fir with some Engelmann spruce and, after fires, considerable lodgepole pine. Far below, the sagebrush zone may have trees only along watercourses.

Forests are not arrayed on any mountain system in a regular order because mountains are not orderly. Ridges, deep canyons, north slopes and south slopes, streambottoms, and rocky outcrops all contribute to irregularity in tree and forest habitats almost anywhere in Idaho. A south-facing slope that is treeless can be easily located, while over the ridge on the north-facing slope a dense forest may appear at the same elevation.

There are many kinds of forests for two fundamental reasons: there are many habitats, and there are many kinds of forest plants. Because habitats are numerous, a system of defining habitats based upon undisturbed, mature communities has been developed by ecologists. This system utilizes a basic principal of ecology: plants integrate environmental factors. By extensive sampling and detailed analyses, most of the vegetation of Idaho has been habitat-typed, that is, the type of habitat has been defined by mature, stable vegetation. Habitat types are landscape units, areas of land that unless substantially disturbed will remain the same habitat type even after the mature forest has been removed by wildfire or logging. Guidebooks are available for northern, central, and eastern Idaho forests, for sagebrush and related vegetation of southern Idaho, and for the grasslands of western Idaho canyons. While these guidebooks are reasonably technical, people with a good knowledge of major forest plants can utilize the habitat-type manuals to enhance their understanding of Idaho vegetation. References are also available for the vegetation near the Idaho border in northeastern Oregon and Washington, northern Utah, western Wyoming, and for forest vegetation of Montana. Habitat-type manuals for Idaho and adjacent areas are listed separately at the end of the Selected Annotated References at the end of the book.

To expand understanding of Idaho's forests and trees, the major classes of vegetation and the principal trees in each will be outlined. Broadly speaking, Idaho's 53.5 million acres are made up of about one-third coniferous forest, one-third sagebrush, and one-third everything else (Figure 4).

The following synopsis of Idaho vegetation describes but an instant in a vegetation sequence that is still changing over time. But it is an important instant for it is "our" instant. Vegetation is extremely complex, and here only broad patterns can be described, so expect exceptions to these generalities. Also in the following synopsis only common names will be used for trees found in this book, however, both common and scientific names are given for other plants.



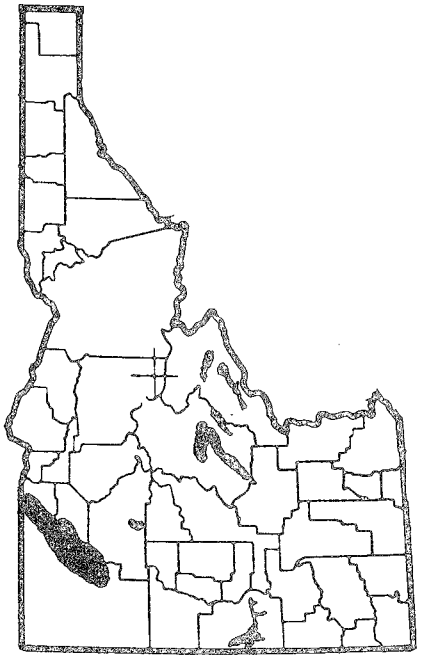
Sagebrush/grass

Sagebrush/Grass

About 35 percent of the land area of Idaho is or was dominated by low shrub communities designated as the sagebrush/grass zone (70). Typical across much of southern Idaho, this group of communities includes various shrubby sagebrushes (species of *Artemisia*) interspersed with a number of other small shrubs and different species of grasses. After fire, when most or all of the shrubs have been killed, the site may be occupied by tracts of annual grasses and weedy plants. Most of the irrigated farmland of southern Idaho was originally dominated by sagebrush so typical of the interior West. To pioneers, this vast stretch of arid land was the Snake River Desert—a dreaded barricade to westward travel. Early settlers found trees only along watercourses or occasionally in a few localized peculiar habitats such as deeply fractured rocks. Thanks to irrigation, cultivated trees are now abundant in towns and near ranches in southern Idaho. Irrigation runoff changes water availability and ditches provide new "streamside" habitats.

Cottonwoods are common in the sagebrush zone along rivers, streams, and irrigation ditches. To the east, one finds native narrowleaf cottonwood; to the west, black cottonwood. More recently, escaped eastern cottonwood has been a feature. Cottonwood groves were a welcome oasis for travelers in the early days; now, as then, they are vital to the existence of a host of wild animals and birds that utilize the nearby sagebrush desert. Willows also line streambanks. Coyote willow, with its silvery leaves, periodically makes a small tree, while peachleaf and escaped European willow trees are distributed across the Snake River Plain. Beneath the taller cottonwoods, a variety of small trees are usually found: river hawthorn to the east, black hawthorn to the west; chokecherry, serviceberry, and water birch are common throughout. Also found here are numerous escaped and naturalized trees, especially along the main Snake River and its larger tributaries. Russian-olive and black locust are excellent examples. The lower Boise, Payette, and Weiser rivers have high numbers of introduced trees that have gone wild: silver maple, Frémont cottonwood, green ash, and violet box-elder are common, while now and then an escaped catalpa or tree-of-heaven may be seen (Pl. 12).

In the upper Snake River area in eastern Idaho,



Salt Desert Shrub

growing seasons are shorter and the number of escaped trees dwindles. Still, riparian habitats support considerable Russian-olive and violet box-elder, often mixed with the native interior box-elder, black locust, and green ash. Along cooler streams thinleaf alder is common, while bigtooth maple is added to the list in extreme southeastern Idaho.

On broken rock within the sagebrush zone, a few mountain-mahoganies or junipers may appear. Dense stands of these species are discussed under juniper woodland and mountain shrub vegetation. Limber pine can be found on recent lava flows in the Craters of the Moon area where the lava rock islands are surrounded by a sea of sagebrush.

Salt Desert Shrub

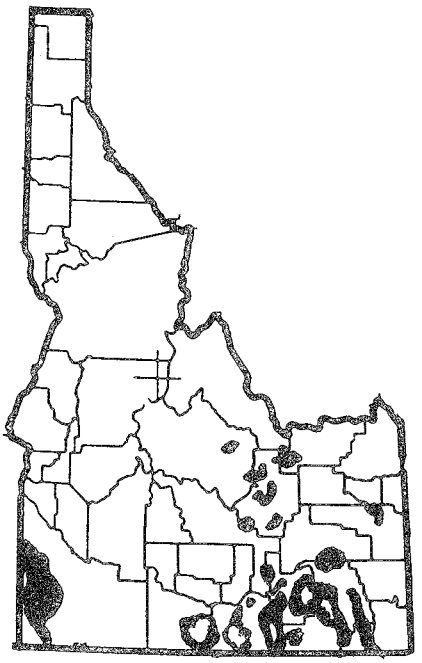
In some portions within the sagebrush/grass zone, salts have accumulated in the soil of broad basins and river terraces. These alkaline or saline soils support salt-tolerant plants. Low shrubs, similar in appearance to sagebrushes, are abundant, and often the sages are not present. Shrubs such as greasewood (*Sarcobatus vermiculatus*), winterfat (*Eurotia lanata*), and shadscale (*Atriplex confertifolia*) dominate the salt desert shrub vegetation. These salt-loving plants are widely scattered throughout southern Idaho and only reach major prevalence along the Snake River in southwestern Idaho. Salt desert shrubs can be easily recognized because they are greener than the silvery sages.

Most of the trees mentioned in the summary of sagebrush/grass vegetation also occur along rivers and streams lined by salt desert shrubs. A notable exception is the occurrence of branched tamarisk, an escaped and naturalized Asiatic native. This halophyte forms dense colonies of tall shrubs, or occasionally small trees, and is spreading eastward from a considerable population along the southwestern Snake River. Russian-olive also thrives in salt-laden soils and is a common associate of tamarisk.

Juniper Woodland

There are many millions of acres of vegetation in the foothills of the central and southern Rocky Mountains dominated by various junipers, often accompanied by any of three species of pinyon (1). In Idaho, about 3 percent of the land area, some 1.5 million acres, is occupied by one of three species of juniper, very rarely accompanied by either singleleaf pinyon or limber pine (Figure 4).

Essentially, the juniper-pinyon woodlands of western North America are forests of dwarf conifers, usually widely spaced, with plants of the adjacent nonforest vegetation filling the spaces between the small trees. One of the three species of junipers dominates, with sagebrush/grass vegetation between the trees. In eastern Idaho the principal tree is Rocky Mountain juniper, often mixed with a few broadleaf mountain-mahoganies. Near Soda Springs, limber pine is also present, filling the ecological position of a pinyon. In the central portion of southern Idaho it's Utah juniper that is dominant, sometimes joined by either Rocky Mountain juniper or broadleaf mountain-mahogany. Near the Utah border in Cassia



Juniper Woodland

County, at the Silent City of Rocks, these three trees are joined by limber pine and the northernmost stands of singleleaf pinyon. West of Salmon Falls Creek occur extensive stands of western juniper, Idaho's largest species of juniper, generally accompanied by broadleaf mountain-mahogany, as in the Juniper Hills of Owyhee County.

The total area of juniper woodland is constantly changing. Junipers are readily killed by wildfires, and it takes many decades for re-establishment of juniper dominance. Annual grasses and sagebrushes often take over after fire (13, 66). By contrast, extensive fire-free periods allow junipers to invade the nearby sagebrush/grass vegetation, and, in time, the total juniper-dominated area increases. So, frequent fires reduce the total area of juniper woodland, while long fire-free periods increase the acreage.

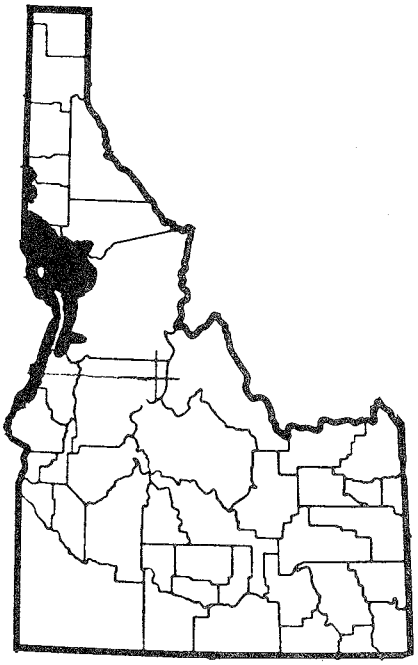
As elevation increases or as slope direction or soils change, the junipers generally give way to mountain shrub vegetation. The fact is that the junipers often are quite prevalent in mountain shrub areas, especially if the shrub density has declined due to fire or grazing disturbance. In a few places in southeastern Idaho, juniper woodland merges to Douglas-fir forest.

Near stream courses, junipers usually give way to either sagebrush/grass or salt desert shrub vegetation. Thus, the riparian trees near juniper stands are those described under the sagebrush and salt desert shrub headings.

Bunchgrass

In the vicinity of Brownlee Reservoir along the Snake River a rather remarkable transition in vegetation can be seen. Sagebrush vegetation, dominated by low grey shrubs, is prevalent near Weiser at the south end of the reservoir. Moving northward the low shrub component gradually thins, until at the northern end of Hells Canyon Reservoir grasses dominate the steep slopes. Only about 2 percent of Idaho's land area is now in bunchgrass, but the Palouse Prairie north of Lewiston and the Camas Prairie near Grangeville, both prime farmland now, were originally in bunchgrass (76). The bunchgrass type is now restricted to slopes too steep to plow and is found primarily on the canyon sides of the lower Clearwater and Salmon rivers and Hells Canyon of the Snake. Idaho fescue (*Festuca idahoensis*) and bluebunch wheatgrass (*Agropyron spicatum*) are the predominant perennial grasses and are, still abundant on the slopes where grazing has been judicious. Fingers of Douglas-fir or ponderosa pine forests extend down into the grasslands, but in places, bunchgrass develops upwards to elevations as high as some 7,000 feet.

On rocky canyon slopes, narrowleaf mountain-mahogany may appear in dense colonies of dwarf trees. Netleaf hackberry is one of the most common trees near river level, forming long lines just above the high flood level, garlands around talus slopes, and dense tangles in dry gullies. In autumn, patches of red mark the territory of smooth sumac on the lower slopes. Clusters of chokecherry, interior bittercherry, serviceberry, or cherry plum are scattered on the stony soils of the canyon sides. Occasionally, especially in the Salmon and Snake canyons, wild apricots



Bunchgrass

or mahaleb cherries may be seen (Pl. 21).

But the greatest assortment of trees is found along the rushing side streams, fed by mountain snows and warmed by low elevation and the heat-holding capacity of these magnificent western canyons. In a recent study, some 85 species of woody plants were tallied along these streams, and 40 percent were not native (46). They are escapes from canyon ranches and often have become naturalized. In riparian habitats the major tall native trees are white alder and water birch; black cottonwood is often quite scarce, as are willows except coyote willow, which lines the riverbank. Bird cherry is naturalized and shows promise of sharing the tall tree canopy. From the slopes above, serviceberry, chokecherry, and hackberry also find a place along streams. This is one of the rare locations reporting naturalized Persian walnuts. Wild apple trees are scattered, much to the delight of fall hikers and black bears. Cascara reaches its greatest sizes in Idaho in western canyons, as does hackberry, blueberry elder, smooth sumac, and red-osier dogwood. Violet box-elder makes frequent appearances, but escaped Osage-orange is a rare find. Black locust and white mulberry inhabit riversides as well as streamsides, and both are reasonably common. Walking through the dense tangle of riparian vegetation is slowed by the sharp thorns of black hawthorn and the even longer and sharper thorns of Columbia hawthorn. Beneath the trees, poison-ivy (*Rhus radicans*) often forms a solid cover, or dense patches of naturalized blackberries (mostly *Rubus procerus*) make passage impossible.

Strangely absent from Hells Canyon are certain trees prevalent along the Snake River in southwestern Idaho: tamarisk, Russian-olive, Frémont and eastern cottonwoods, and peachleaf willow are all missing. Why? No one knows. The climatic change northward from southwestern Idaho must be involved, at least in part. The bunchgrass type is in the area of Pacific oceanic climate. The southern limit of bunchgrass dominance near Hells Canyon Reservoir is also very near the southern limits of grand fir, Pacific yew, and western larch, all trees that indicate the Pacific coastal influence. On the other hand, the naturalized trees of southwestern Idaho may be absent for lack of seed source, although before Brownlee Dam was constructed the free-flowing water of the Snake River should have carried seeds to Hells Canyon. Lack of suitable habitat is another possibility, yet this seems an unlikely reason for their complete absence.

Mountain Shrub

Interposed between the flat valley bottoms and rolling hills dominated by sagebrush and the tall coniferous forests of higher elevations, a dwarf forest often dominates Idaho mountainsides. We've seen that juniper woodlands are dwarf forests dominated by widely spaced coniferous trees, with sagebrush or grass in openings between trees. By contrast, the mountain shrub type is a dense dwarf forest dominated by broadleaf species with many plants from the adjacent coniferous forest beneath. The mountain shrub type is very complex and the most difficult of Idaho vegetation types to describe. Occurring mostly

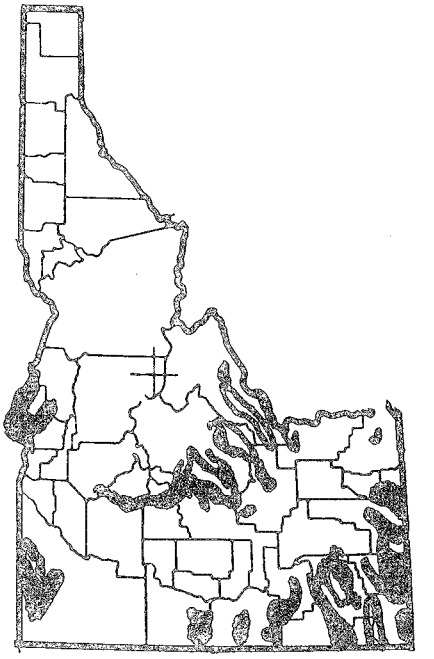
in southern Idaho, these shrublands occupy only 1 percent of the state's area (Figure 4). Not only are the species extraordinarily variable, but so are their sizes. In some places, dense stands of small trees are the rule—often tall enough for a person to walk beneath with little difficulty. In other areas, the plants are shrubs, often no more than 3 feet tall and very dense.

Most quickly recognized are the nearly pure stands of mountain-mahogany. On the steep slopes of arid east-central Idaho, in southeastern canyon faces, or in the mountains of Owyhee County, dense, dark green patches of this evergreen tree are a striking contrast to nearby vegetation. In places, mountain-mahogany occupies a southerly or westerly slope, while Douglas-fir develops a dense stand on the adjacent northerly or easterly aspect. Another pattern has juniper woodland facing south next to mountain-mahogany facing east. The dense stands, the dark green or grey-green color, and the unique leaves of mountain-mahogany combine to create an easily recognized introduction to the mountain shrub formation.

In southeastern Idaho, small trees dominate this "shrubland." Bigtooth maple and/or interior box-elder are the most frequent. Patches of chokecherry are readily identified, and broadleaf mountain-mahogany may be intermixed. Limber pines are often perched on the rocky ridges, while quaking aspen groves are common. Fingers of Douglas-fir forest extend downward, so a few "Doug-fir" are usually scattered about. Rocky Mountain juniper invades and may reach quite a large size. The shrublands of southeastern Idaho are the tallest and most varied mountain shrub unit in Idaho—spectacular in fall when the maples turn red and the aspens change to gold (Pl. 42).

In south-central Idaho, mountain-mahogany is the most widespread representative of the mountain shrub vegetation. But stands of chokecherry can still be found, and in many places lower shrubs such as bitterbrush, mountain snowberry (*Symphoricarpos oreophilous*), or Utah serviceberry are seen.

In the Owyhee Mountains of southwestern Idaho, broadleaf mountain-mahogany again forms pure stands or may be mixed with western juniper and maybe a few Douglas-firs.

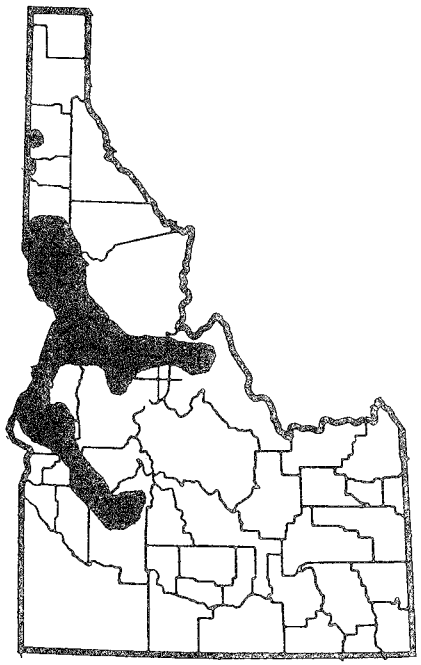


Mountain Shrub

Along the Snake River from east to west, across the state, patches of shrubs and small trees represent the mountain shrub type, but the steep rocky canyon sides don't accommodate large stands. Here the species listed before may appear in their respective positions. To the west, smooth sumac and netleaf hackberry are added to the mix.

To the north, interior bitter cherry forms dense stands of small trees, for instance along Arrowrock Reservoir or just above the Snake River in southern Hells Canyon. Chokecherry is also common, and scattered blueberry elder, hackberry, and black hawthorn foretell the major vegetational changes taking place. Dense colonies of smooth sumac form the flaming reds of autumn here.

North of the Salmon River, climax shrubfields are smaller in area and more scattered. In the canyons of the middle Snake, lower Salmon, and Clearwater rivers, patches of shrubs occupy specific habitats in the bunchgrass zone. Usually shrubs dominate on



Ponderosa Pine

stony soils, where their woody roots penetrate to available water better than the fibrous-rooted grasses on adjacent, deeper soils. Smooth sumac and netleaf hackberry commonly form dense colonies, the latter often mixed with Columbia or black hawthorn. The northernmost remnants of climax shrub communities are found on the lower Clearwater canyon sides. Here sumac and hackberry parcels are joined by ninebark communities (*Physocarpus malvaceus*), which are head-high or higher and so dense that getting about is very difficult. The ninebark is joined by ocean-spray (*Holodiscus discolor*) and syringa (*Philadelphus lewisii*) as well as chokecherry, serviceberry, hawthorn, and blueberry elder. Once into the forests there are shrubfields aplenty, but they are usually seral on habitats that have been disturbed by wildfire or logging, and sooner or later coniferous forests will overtop the shrubs and they will gradually die in the shade of the taller trees.

Ponderosa Pine

Ponderosa pine forests are often the lowest in elevation of the tall coniferous forests. Draw an imaginary line from Mountain Home to the town of Salmon; south of that line there is virtually no ponderosa pine in Idaho. Why? Well, this is one of the great mysteries of western forests, but a bit of explanation may help clarify. The ponderosas of Idaho can be called Pacific ponderosa pine—a widespread variety characteristic of the Pacific coastal forests from California to southern British Columbia and the Northern Rockies. Ponderosas are missing from southwestern Montana, southern Idaho, western Wyoming, and northern Utah. Farther east and south in these adjacent states, ponderosa reappears in the lower-elevation forests, but this is Rocky Mountain ponderosa pine, the variety *scopulorum*. So, there is a significant gap in the ranges of these two widespread varieties (see map p. 155).

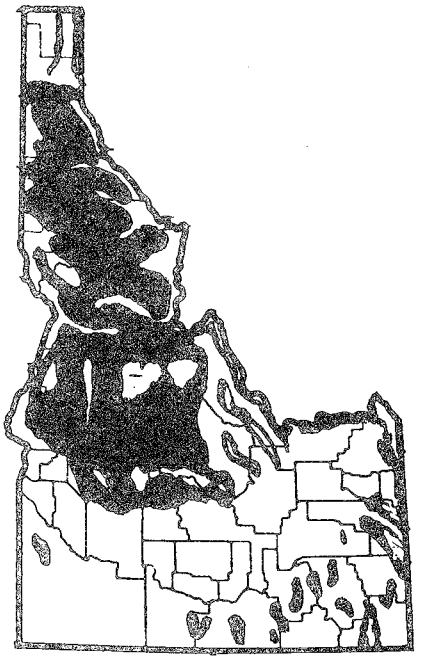
Ponderosa pine is the only coniferous tree in the ponderosa pine zone. In fact, with rare exceptions, it's the only tree. Sometimes a few quaking aspen groves may be included, or stands of small trees such as chokecherry, but for big trees—only ponderosa. Generally, the bunchgrass zone is just below the ponderosa pine zone, and the first ponderosas will be scattered over a grassy undergrowth. Shrubs present will occur on special microhabitats, such as rock outcrops (68, 74).

Many species described in this book can appear as small trees or tall shrubs beneath the towering ponderosas. Black hawthorn and Columbia hawthorn are common in the Salmon and Clearwater valleys. Chokecherry, bitter cherry, or cherry plum add interest. West of Coeur d'Alene, shrubby mahaleb cherries have escaped beneath ponderosas. Almost anywhere one might discover Scouler willow or blueberry elder scattered beneath the pines, especially if rocky outcrops occur.

So, ponderosa pine is the only climax tree of any size in this zone, and barring catastrophic disturbance, ponderosa pine will remain dominant for a very long time. A quick test to determine if you're truly in the ponderosa zone: look for Douglas-firs. More than a few scattered about, whatever their size,

indicates you're most likely in the next zone up—Rocky Mountain Douglas-fir.

Streambottoms and riversides in the ponderosa pine zone contain a rich mixture of trees and shrubs. The largest trees are black cottonwood, water birch, and quaking aspen. White alder or thinleaf alder are quite common. Beneath the taller trees, red-osier dogwood, black hawthorn, and blueberry elder may be easily found. Cascara, chokecherry, interior bittercherry, cherry plum, and serviceberry all frequent riparian habitats. Escaped bird cherry becomes a straight tree, while escaped apples and pears are more obviously smaller in stature.



Douglas-fir

Douglas-Fir

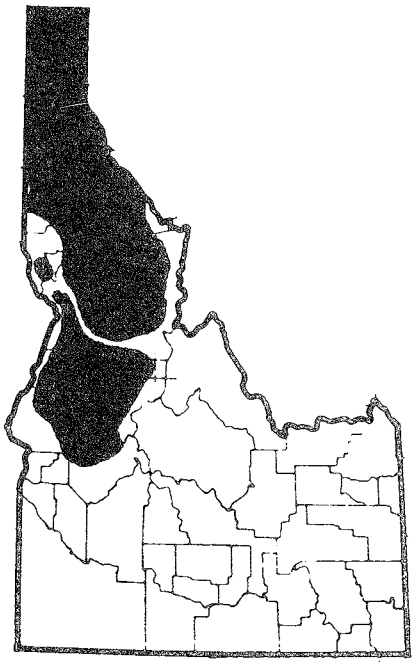
As elevation increases, more precipitation and lower temperatures are usually encountered. Above the ponderosa pine forests of western Idaho, the next elevational zone is dominated by Douglas-fir. South of an irregular line between Mountain Home and the town of Salmon there is little if any ponderosa pine, and here Douglas-fir forests are adjacent to mountain shrub, juniper woodland, or even sagebrush types of lower elevations (68, 74, 75).

Rocky Mountain Douglas-fir (to be exact) is the only climax species in this zone. Within its range, ponderosa pine is the most important seral tree, and it is here that ponderosa pine often reaches its best growth and greatest size. Where the climate is sufficiently cold, lodgepole pine is another abundant successional tree. North of the vicinity of the town of Cascade, western larch appears in the moister portions of the Douglas-fir zone. These four conifers, Douglas-fir, ponderosa pine, lodgepole pine, and western larch, are the only tall trees in this zone, although aspen may occur in scattered locations (Figure 5).

South of the Salmon River, quaking aspen occurs in extensive stands. In fact, it is sometimes difficult to tell you're in a potential coniferous forest, for no conifers can be seen. Extensive aspen groves will occupy the land for many hundreds of years before conifers reinvade (Pl. 1). In a few locations in southern Idaho isolated aspen groves may be encountered, surrounded by sagebrush vegetation. In such cases, aspens form self-perpetuating stands removed from coniferous competition. In other instances Douglas-firs overtop the aspen, and it's usually easy to predict the eventual death of the aspens as the dense crowns of Douglas-fir close off the sunlight that aspens need.

Many tall shrubs appear beneath forests of Douglas-fir. While they may reach tree size, they will never be tall overstory trees, and ecologists label them tall shrubs. Whether trees or tall shrubs, many are in this book. Black hawthorn, Scouler willow, Rocky Mountain maple, serviceberry, and chokecherry are common. In southeastern Idaho, bigtooth maple and scattered Rocky Mountain junipers are often added to this list. To the north, above the deep western canyons, cherry plum is often found naturalized. A host of shrubs not found in this book can also be located, and in some Douglas-fir forests travel is exceptionally difficult due to the dense tangle of shrubs and small trees.

Are you really in a Douglas-fir climax forest?



Grand Fir-Western Redcedar-Western Hemlock

The quick test is to try and find young grand fir, western hemlock, or redcedar when in their range, or at higher elevations search for subalpine fir. If there are more than a few of any of these conifers, you're likely not where Douglas-fir is climax.

Grand Fir-Western Redcedar-Western Hemlock

Western and northern Idaho are under strong Pacific maritime influence and are characterized by climax forests of grand fir, western redcedar, and western hemlock. These three species are widespread west of the Cascade Mountains. Generally, grand fir occupies the drier sites within the zone, western redcedar those that are intermediate, and western hemlock requires the moister habitats. This results in a pattern of grand fir forests at lower elevations, next to the Douglas-fir zone, and western hemlock highest, next to the subalpine zone above (16).

But there are problems with this general pattern that relate to the north-south distribution of these trees. Imagine a line between Moscow and the village of Elk River, then running east. Western hemlock is rarely found south of that line, and this means that the zone is now composed of only grand fir and western redcedar climax forests. Imagine another line, roughly just south of the Clearwater-Lochsa River (U.S. Highway 12). South of that line western redcedar drops out and grand fir is left to occupy the habitats between Douglas-fir below and subalpine fir above. Figure 5 illustrates the result of the lessening maritime influence on tree distribution from north to south in western Idaho.

Still another exception soon confronts the observant forest traveler, and that is that western redcedar also occurs on extra-moist habitats. It is on moist streambottoms, stream terraces, and gentle, moist coves that redcedar reaches its greatest size and develops into spectacular groves. In these cathedral groves, trees 6, 8, and 10 feet in diameter are reasonably common; you must look farther to find the trees 13, 16, and even 18 feet in diameter, the largest in Idaho (Pl. 75).

These "coastal" forests contain a remarkable assemblage of smaller trees beneath. One of the most interesting is Pacific yew, which is ordinarily a climax understory shrub. In streambottoms it may become a small tree, usually quite scattered amongst the dense riparian vegetation. But in the mountains east of Grangeville it achieves remarkable importance. Here, stands of yew develop so densely that they virtually eliminate all other trees, and there are reasonable arguments that these yew woods form a distinctive climax of low trees (17).

The list of trees coming into these forests after wildfire or timber harvesting is impressive. Few places in the world can support so many different species of conifers. On warmer habitats, ponderosa pine appears, but only a tree here or a small group there. Common after disturbances are Douglas-fir and western larch. On moist habitats, western white pine develops into one of the largest pines in the world. At higher elevations, especially where western hemlock is climax, subalpine fir and Engelmann spruce are found as seral trees. On cooler habitats almost anywhere in this broad elevational zone, dense stands of lodgepole pine develop after stand-replac-

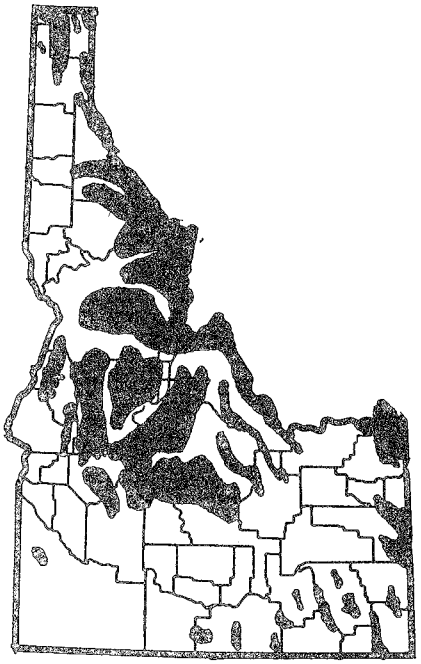
ing fires. Count them, that's 10 species of coniferous trees that may occur in the grand fir-western redcedar-western hemlock zone, and there are numerous instances where all 10 species have been found in a single young stand. Beneath many of these forests, Pacific yew thrives.

Yet this does not complete the tree species list, for a number of broadleaf trees are also found after disturbance. Paper birch flourishes after fire and is particularly common from Sandpoint north and in the upper Clearwater valleys. Red alder makes an appearance in the lower elevations. Black cottonwood leaves its usual streamside haunts and marches out into mid-slopes. And what of quaking aspen, so common in Rocky Mountain forests? Well, aspen is strangely rare—small groups occur here and there, but mostly on the western front, where the forests meet the Palouse Prairie. All of these broadleaf trees are overtopped by taller conifers several decades after fire and begin to decline soon after that; they're usually dead by the time a stand reaches 100 years of age.

A number of tall shrubs are found in the grand fir-western redcedar-western hemlock forests, and on occasion these become small trees. Heading this list are serviceberry, Rocky Mountain maple, and Scouler willow. This trio is dominant over thousands of acres of brushfields. Some of these dense shrub stands developed after the great 1910 fires and still hold the ground. Less common and at lower elevations, cascara and Pacific bittercherry produce small trees. More rare still are trees of Pacific dogwood, confined to the lower Lochsa/Selway canyons, or the newly discovered Suksdorf hawthorn, found on the banks of lakes and streams. In the upper elevations, Sitka alder often thrives beneath the dense conifers. We can round off this long list of natives with western and red-osier dogwood and black hawthorn.

Nearer to towns or old logging camps, escaped apple or pear trees may be found, and in places bird cherry has developed naturalized populations. Norway maple is scattered, to confuse the unwary with Douglas maple.

These coastal relict forests, often simply termed



Subalpine Forests

the cedar-hemlock zone, have the most varied list of trees in Idaho. This area also contains the most timber, the most roads, the most wood volume, and the most value in wood products—all because of the moderating influence of the moist Pacific winds that override the Cascades to produce a climate unlike any other in the Rocky Mountain system.

North of the Salmon River, approaching the elevation of about 5,000 feet, more and more subalpine fir and Engelmann spruce appear in the forest mix; western larch becomes scarce. Go a bit higher and you are in the highest-elevation forest, the subalpine forest.

South of the Salmon, the zonal pattern is somewhat different than it is to the north, since grand fir is confined to the western front and thus this entire zone may be absent (Figure 5). Often there is a rapid transition from Douglas-fir climax forests to the subalpine forests above. In many of the high valleys, one goes from mountain big sage (*Artemisia tridentata* subspecies *vaseyana*) directly to forests of lodgepole pine, subalpine fir, and Engelmann spruce. The lower limits of subalpine forests varies in southern Idaho, from roughly 6,000 to 7,000 thousand feet in elevation.

The subalpine forests of the Rocky Mountains are often called the spruce-fir zone, for from Canada to Arizona, Engelmann spruce and subalpine fir are near-constant companions in the highest forest zones. This is also true in Idaho, where the upper transition from mid-elevation forests gradually displays more and more of these familiar trees. In west-central and northern Idaho, forests dominated by the many species of conifers of the grand fir-cedar-hemlock forests begin to lose their dominance at about 5,000 feet in elevation; above that level one generally encounters subalpine conditions. Beyond the range of grand fir, in east-central and all of southern Idaho, the Douglas-fir forests are just below the subalpine zone (68, 74, 75).

Why "subalpine"? Ecologically, alpine is defined as above timberline, that area in high mountains where trees can no longer exist. Thus, the forests just below alpine areas are termed subalpine.

In northern Idaho, roughly north of U.S. Highway 12, the Lewiston-Missoula highway, mountain hemlock is a major climax tree of subalpine forests; it continues north to the Coeur d'Alene Mountains. It is rare or absent in the area affected by continental glaciation. Two species, subalpine fir and mountain hemlock, form most of the climax stands of high elevation forests in northern Idaho. Engelmann spruce is often co-climax and is the most important commercial tree of the subalpine forests.

The major seral species throughout these forests is lodgepole pine. In many places, past fires have been so frequent and extensive that large areas are dominated by little but dense stands of lodgepole. Such is the case in the forests east of Cascade in the Warm Lake and Landmark areas, near the Stanley Basin, and in the vicinity of Harriman State Park and Henrys Lake. Periodically, these dense lodgepole pine stands are decimated by infestation of the mountain pine beetle, which killed millions upon millions of trees in the 1980s. The dense stands of dead trees, many fallen and crisscrossed on the ground, provide the fuel for catastrophic fires. But lodgepole pine is a fire-dependent species, and just as dense stands were fire-originated, fire will set the stage for lodgepole to again fashion dense forests.

Quaking aspen is a ubiquitous seral tree in the subalpine zone of central and southern Idaho, but it is rare in this zone in the northern part of the state. On rocky slopes, ridge tops, and the highest mountains, two more pines are waiting the adventurous traveler. Most common is whitebark pine, which achieves its largest dimension in the Sawtooth Mountains. It occurs virtually throughout the state where elevations are high enough. More restricted to east-central and southeastern Idaho is limber pine, which also requires a sunny position and well-drained soil. Neither of these two subalpine pines do well beneath a forest of subalpine fir, for the young pines need light. Consequently, in dense forests they are considered successional species. But on open ridge tops, fully exposed to the rigors of a near-arctic climate, they live for many centuries.

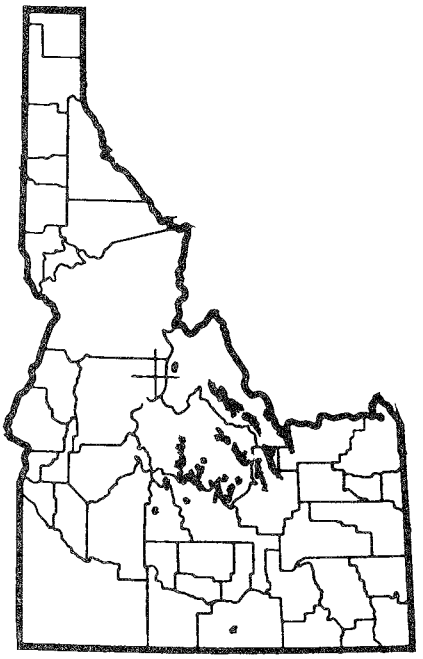
Another tree of the highest mountains is subalpine larch (Pl. 64). Except for the northern Cascade Mountains of Washington, this tree is restricted to the northern Rocky Mountains, including Canada just north of the U.S. border. This unusual larch requires a most demanding climate. In the southern part of its range in Idaho, elevations must be above 8,000 feet for it to survive, while to the north, 7,000 feet is sufficiently high (5).

Excepting aspen and occasional native cottonwoods, which occur on high-elevation riversides, no other broadleaf trees occur in this zone. A number of species in this book may be found, but not as trees, for the heavy snows and short summers reduce them to shrubs. Rocky Mountain mountain-ash occurs throughout the state, while Sitka mountain-ash is present north of about the latitude of Moscow. There are numerous shrubby willows, but only Scouler willow gets large enough to be called a tall shrub, and it is mostly in northern Idaho in this zone. On southerly slopes in the lower subalpine area, either chokecherry or bittercherry may be appear, presenting their tasty

fruits to the ever-present Franklins grouse. Add some serviceberry, blackbead, or redbead elders, and that's about the list for tall shrubs. The fact is, most of the shrubs up in the high country are head-tall or smaller.

One coniferous shrub needs mention, and that one is called "common juniper." This tough little shrub can endure on rock slides, boulder fields and the most exposed, wind-whipped ridge tops you can imagine. On these exposed habitats it is seldom over a foot tall, but beneath a stand of lodgepole pine or subalpine fir, 3-foot common junipers may be found.

As elevation increases, the climate becomes more and more difficult for trees to tolerate. If the mountain is high enough, a belt of dwarf conifers marks the beginning of the alpine zone. Whitebark pine or subalpine fir are frequently the last tree species to be seen. Twisted dwarfs, they alert the puffing mountain hiker that the alpine zone approaches.



Alpine

Alpine

Above the last dwarfed, twisted trees of whitebark pine or subalpine fir the alpine zone begins. To be defined as alpine, the ecologist insists that a belt of dwarfed conifers occur just below, with a more-or-less continuous cover of low plants above. Yet, we can easily see that trees do not occur on the tops of many western mountains: they are too steep, too rocky, and erosion is too rapid for the trees to gain a foothold. If the first conifers encountered below these treeless rocky peaks are solid, upright trees, not stunted shrubs, then there is no true alpine area. At any rate, there is not much of the alpine vegetation type in Idaho, for elevations have to exceed about 10,000 feet in the state's central portion and 8,500 to 9,000 feet in the north, and there simply aren't many peaks that high. Most of the potential alpine areas are in east-central Idaho, where the highest peaks are located: the Boulder, Pioneer, White Cloud, Sawtooth, and Salmon River mountains, plus the Lemhi and Lost River ranges, are most important.

Because of the austerity of the habitats at these altitudes, the plants tend to form low dense mats, often rounded in outline and hence called "cushion plants." The few shrubs are stunted dwarfs rarely exceeding a foot in height, while no trees exist. Many of the cushion plants tucked amongst the rocks have exceptionally large and colorful flowers, and the flower display that awaits the intrepid hiker in the few brief weeks of summer is truly magnificent. But when a July storm catches the hiker with freezing wind and snowflakes flying, the shelter of the forest below is most welcome (9, 14).

NAMES—COMMON AND SCIENTIFIC

In the 1700s, Europeans spoke many languages, many more dialects. People educated at universities studied, wrote and spoke Latin and Greek, the classical languages. It was during this period that systems were developed for the classification of plants and animals. Undoubtedly, a common language for scientists would be of tremendous value. Since all scientists understood Latin, and since the Latin alphabet was like that of western Europe, Latin was chosen to name plants and animals. Thus came about the Latin

names for all plants and animals that we now usually call "scientific names."

We are quite accustomed to scientific names in our everyday life. Consider: chrysanthemum, gladiolus, viola, narcissus, rhododendron, catalpa, veronica, papaya, citrus—each is an unaltered scientific name. The scientific name for a particular plant or animal consists of a name for the genus, a noun, followed by a modifying adjective. For example, *Pinus albicaulis* translates to "pine, white stem." But in English, we place the adjective before the noun—hence the common name becomes "whitebark pine." To complete a scientific name, an abbreviation of the name of the person who first published the name is added: *Pinus albicaulis* Engelm. This signifies that the botanist George Engelmann named this pine. Authors of scientific names are omitted in this book, but may be found in dendrology books, technical floras, and elsewhere (19, 30, 42, 43).

Word has gotten about that scientific names are used because they're stable, unchanging, and set for all time. Not true! There are at least 36 published scientific names for Douglas-fir, 7 for ponderosa pine, and 2 for Pacific dogwood, and yet there is only 1 for white alder. So, scientific names may vary. New interpretations follow research, and new names or combinations are the result. In this book, Suksdorf hawthorn is considered a separate species, but until recently it has been known as a variety of black hawthorn. Times change, names change.

What of so-called "common names"? These are also termed "English names," which is not too precise, since many of our common names are derived from other languages: "tamarack" is derived from an American Indian term, "pinyon" and "cascara" from Spanish, and "sumac" from Greek. Every language uses common names for common plants. Are common names stable? Sure . . . sometimes . . . well, it depends. Widespread trees usually have lots of local names: *Pinus ponderosa* may be known as ponderosa pine, yellow pine, bull pine, blackjack pine, pondosa, *pino real,* or (for a nice extreme) just call those old, orange-barked trees "punkins" and any woodsman will know what you're referring to.

Which is correct, the scientific name or the common name? It makes no difference; both are "correct" if, when used, the audience understands. Which is the correct one of several scientific names? Often the different names are the result of different interpretations. The best bet is to use what is current and accepted, and that is what I've tried to do in this book. To be safe, alternate scientific and common names in general use are also listed. The two most recent checklists of United States trees contain a comprehensive coverage of tree names (42, 43).

It will pay to read on and discover a number of shortcuts to efficient use of this book.

Leaves provide the most obvious means of identifying trees. Therefore, trees are arranged in seven groups based on leaf characteristics. To help understand leaf groups, a picture key follows on the next page.

Following the key is a glossary, which describes terms used in the text that may be unfamiliar: refer to the glossary for words you may not know.

Most trees are illustrated with life-sized reproductions of actual leaves, chosen to represent both average leaves and often some expected variation. Keep in mind that no book can illustrate the entire range of variation to be found in nature. The name of the leaf group is located on each page of description for quick reference.

In addition to the descriptive material for each tree, a series of brief entries is found:

The key emphasizes the most important identifying characteristics of each species.

The eye indicates a few places where one might most easily locate each species. Emphasis is placed on accessible highways, state parks, and designated scenic routes. These are located on the map in Figure 1.

The map found with each species of native tree indicates the general range of that tree in the Northwest. Maps only of Idaho indicate that adjacent areas are not reliably mapped. Base maps are from reference 44. Range maps are a tremendous aid to tree identification, so learning the geography of Idaho and relating range maps to that knowledge is of high value.

Color photos of certain trees are included in the center section. These are cross-referenced—the number in the box corresponds to the plate number of the color photo of the subject.

A tree symbol indicates the size and general location of the largest known tree of each Idaho native species, as of publication date.

Reference to appropriate literature is indicated in the text by a number in parentheses ( ). The list of references in the back of the book is arranged numerically and by first author's last name. Habitat-type manuals for Idaho and adjacent areas are listed separately at the end of the reference section (p. 211).

PICTURE KEYS TO TREE LEAVES

The trees in this book are arranged in groups based on leaf characteristics. Before you decide which group a tree belongs to, study the illustration below and understand the terms used.

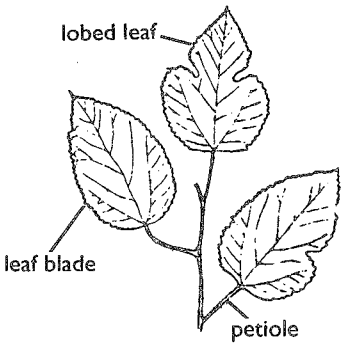
BROADLEAF TREE GROUPS

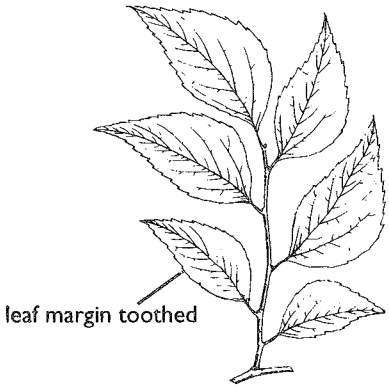
GENERALLY THIN, MOST LEAVES FALL OFF IN AUTUMN—

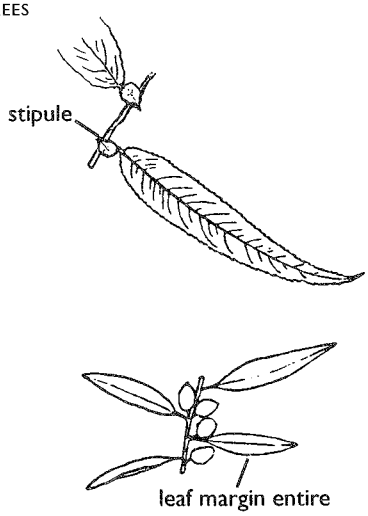
DECIDUOUS TREES, BROADLEAF TREES, HARDWOOD TREES

GROUP 1

Leaves and buds ALTERNATE on the twigs.
Leaves SIMPLE.





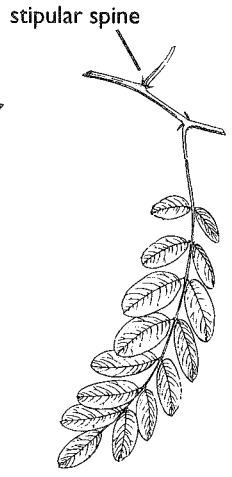


GROUP 1 Broadleaf trees with alternate, simple leaves

alder	**plum**	**cascara**	**cottonwood**
service berry	**apple**	**Russian-olive**	**poplar**
hawthorne	**pear**	**mulberry**	**willow**
mountain-mahogany	**elm**	**Osage-orange**	**birch**
cherry	**hackberry**	**bitterbrush**	

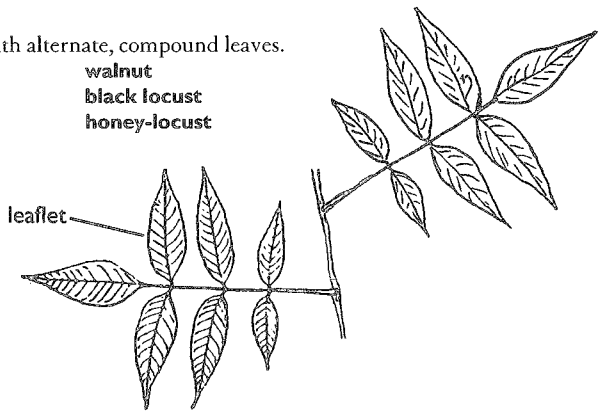
GROUP 2

Leaves and buds ALTERNATE on the twigs.
Leaves PINNATELY COMPOUND.



GROUP 2 Broad leaf trees with alternate, compound leaves.

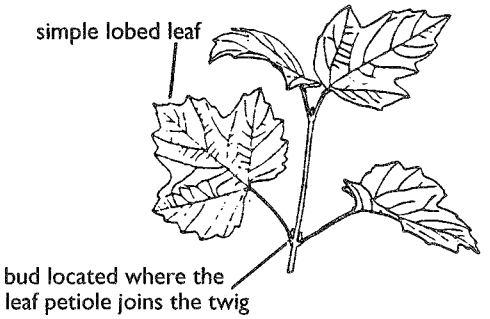
mountain-ash	**walnut**
sumac	**black locust**
tree-of-heaven	**honey-locust**

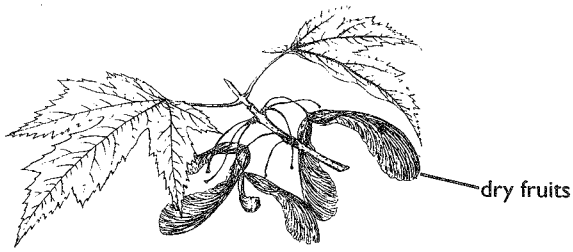


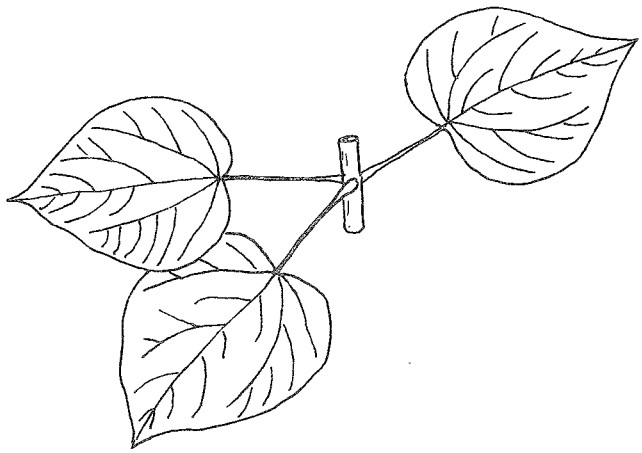
GROUP 3

Leaves and buds OPPOSITE on the twigs.

Leaves SIMPLE.





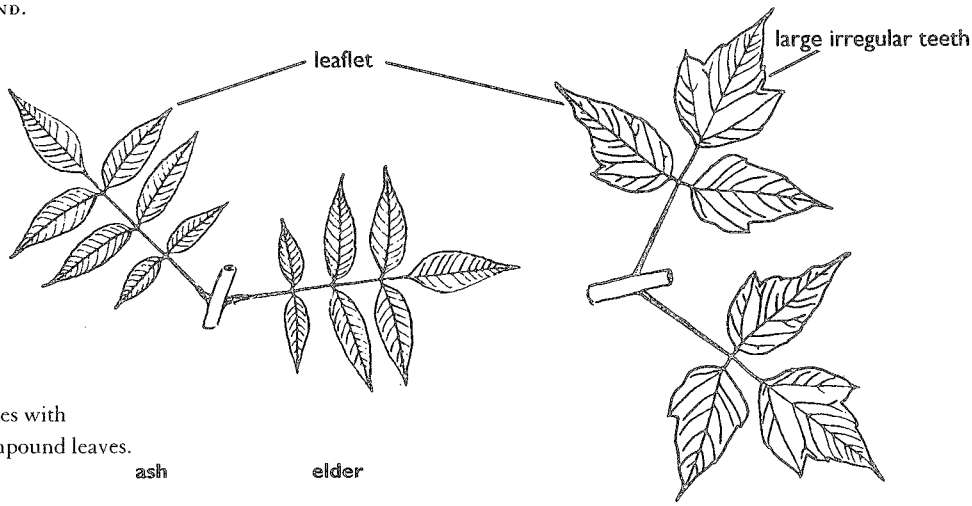


GROUP 3 Broad leaf trees with opposite, simple leaves.
maple **dogwood** **catalpa**

GROUP 4

Leaves and buds OPPOSITE on the twigs.

Leaves PINNATELY COMPOUND.



GROUP 4 Broadleaf trees with
opposite, compound leaves.
boxelder **ash** **elder**

CONIFEROUS TREE GROUPS

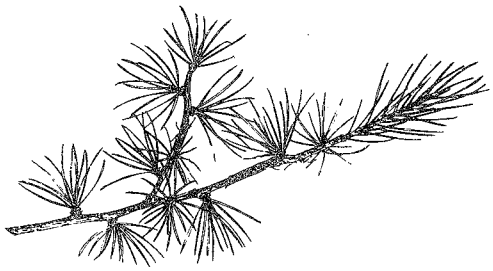
LEAVES EITHER NARROW AND NEEDLE-LIKE OR TINY AND SCALE-LIKE—

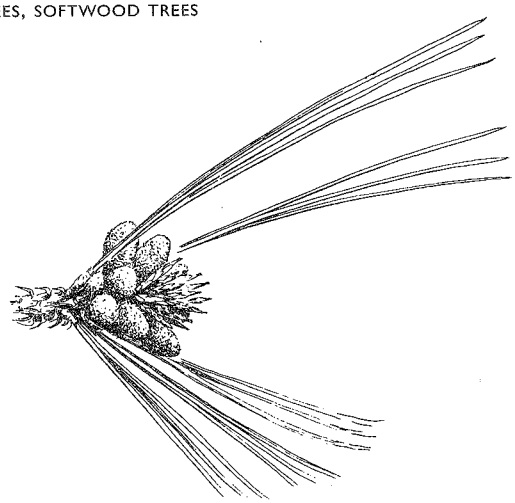
CONIFEROUS TREES, EVERGREEN TREES, SOFTWOOD TREES

GROUP 5

Leaves NEEDLE-LIKE (many times longer than broad).

Leaves in BUNDLES of 2, 3, 5, or many





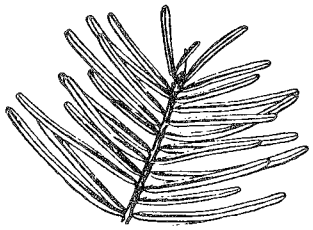
GROUP 5 Coniferous trees with needle-like leaves in bundles

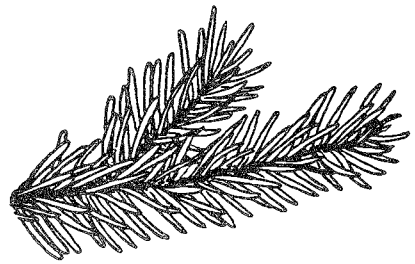
pine (except singleleaf pinyon) **larch**

GROUP 6

Leaves NEEDLE-LIKE (many time longer than broad)

Leaves SINGLE.



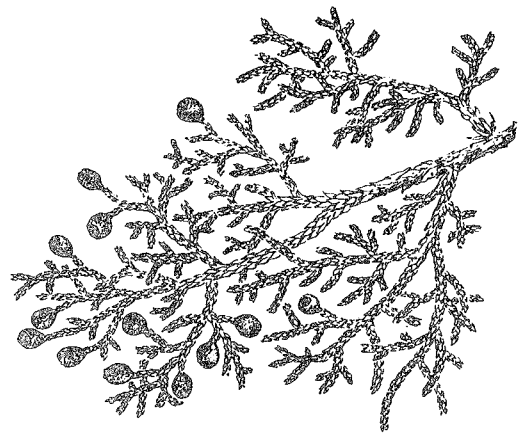


GROUP 6 Coniferous trees with needle-like single leaves.

single leaf pinyon **yew**
Douglas-fir **spruce**
hemlock **fir**

GROUP 7

Leaves tiny; SCALE-LIKE.



GROUP 7 Trees with scale-like, tiny leaves.

western redcedar
juniper
tamarisk

Technical terms used in this book are defined in this glossary.

alien A tree cultivated away from its native habitat. (See **introduced.**)

alternate Leaves, buds, or new twigs borne alternately on branches. Aspens have alternate leaves. (See **opposite.**)

ament (catkin) An inflorescence (flower cluster) composed of simple, unisexual flowers, usually very close together. A pussy willow is an ament, and so are the large, flexible clusters of flowers that fall from male cottonwood trees in spring.

amplitude The total variety of habitats a particular tree can successfully occupy. Douglas-fir has a wide amplitude, while western hemlock's amplitude is quite narrow. (See Figure 5.)

angiosperms The flowering plants. The broadleaf trees in this book are all angiosperms.

arcuate Type of vein pattern in which the side veins curve toward the apex of the leaf, as in dogwoods.

berry A fleshy fruit with several to many seeds within. Cascara fruits are small black berries.

blade The flat, broad, green portion of a leaf.

boreal Literally, "northern," boreal refers to plants whose main population is in far-northern North America. White spruce is a boreal species with a disjunct population in eastern Idaho.

bract A modified leaf usually just below a flower or inflorescence. A modified cone-scale, as seen in Douglas-fir cones. Pacific dogwood has 4 to 7 white bracts around the flower cluster.

broadleaf tree (hardwoods, angiosperms) The group of trees that usually have large, flat leaf blades, such as maple and cottonwood. Some broadleaf trees, such as mountain-mahogany, have rather small, narrow leaves. Others, like tamarisk, have leaves reduced to scales. Still, we class them with broadleaf trees because they have true flowers and lack cones as fruit. (See **conifer.**)

browse (verb and noun) Woody plant material eaten by large animals. Mountain-mahogany is prime winter browse for mule deer, and certain plants have been browsed heavily in some areas.

capsule A dry fruit that splits open at maturity and contains numerous seeds. Catalpa has long, thin capsules full of flat, fringed seeds.

catkin See **ament.**

climax The stable, more-or-less permanent plant community supported by any particular habitat. Climax communities will occupy a site with little change unless some disturbance—such as fire, grazing, or logging—causes a change. Climax

stands are in dynamic equilibrium. Minor changes occur as old trees die, yet overall change is slight. (See **successional.**)

clone Genetically identical individuals, such as trees that arise from root sprouts, like black locust or aspen. This is also used as a collective noun: we speak of a group of aspen from the same parent as a clone. The cultivated and intensely silvery blue spruces are clones, as are all Lombardy poplars.

community (plant community) A group of individuals living together, usually implying a specific habitat. Douglas-fir communities often include Rocky Mountain maple.

coniferous (trees) (conifers, needleleaf trees, evergreens, softwoods, gymnosperms) Literally, "cone-bearing," the so-called "evergreen" trees, such as pines and spruces, are conifers. All Idaho gymnosperms have real cones except yew and junipers—in these the cones are modified to a fleshy, berrylike fruit. (See **broadleaf.**)

deciduous Shedding of plant parts. Used particularly as an adjective to describe the loss of leaves in the fall. Maples and larches are deciduous trees. (See **persistent.**)

dendrology Generally considered a technical approach to the identification of trees, but incorporating aspects of their biology, evolution, distribution, and values.

disjunct population A small population of plants removed by a significant distance from the main population. Red alder and Pacific dogwood are found mainly west of the Cascade Mountains, but both have disjunct populations in Idaho.

disturbance (plants) See **successional.**

dominant The plants that exert the greatest influence on the immediate habitat—usually this is the plant of a particular life form that is most abundant or occupies the most space. Trees are the dominant plants in forests, but beneath Douglas-fir, Scouler willow may be the dominant small tree, ninebark the dominant shrub, and arnica the dominant herb.

drupe A fruit with a hard, nutlike seed and a soft outer covering. Cherries, peaches, and plums are all drupes.

ecology The art and science of trying to understand the interactions between plants and animals and their environment.

entire (margin) Leaves or leaflets whose margins lack teeth, such as those of black locust or Russian-olive.

environment The physical surroundings of a plant or animal. Limber pine requires an environment that includes cool temperatures, stony soil, and plenty of sunlight.

escaped Introduced plants that have spread to wild situations from seeds of cultivated plants. This term usually connotes a small and/or even-aged population—or a few widely scattered individuals that are not obviously successfully reproducing. Peach has occasionally escaped in Idaho. (See **introduced, native, naturalized.**)

exfoliate The process of peeling off in thin layers. The exfoliating bark of paper birch is a key characteristic.

exotic See **introduced.**

family A plant family consists of similar genera. Pine, spruce, and larch are each in a different genus, but they are in the same family, *Pinaceae.* (See **genus.**)

flora The sum of all the plants in an area. The tree flora of Idaho consists of 54 native species. (See **vegetation.**)

forest A plant community dominated by trees.

fruiting spur A short, stubby branch especially suited for bearing heavy fruits, common in plums and apples. In some plums, such as cherry plum, the fruiting spur may become pointed, eventually losing its ability to produce leaves or flowers and becoming a thorn. (See **spur shoot.**)

genera Plural of "genus." In this book, there are six genera in the pine family (*Pinaceae*).

generic Adjectival form of "genus." The generic name for pines is *Pinus.*

genus A group of closely related species. Larches are

in the genus *Larix*. The plural of genus is "genera." There are six genera in the pine family in this book.

glabrous Without hairs of any type; nonpubescent. The leaves of quaking aspen are glabrous.

glaucous Literally, "silvery." Usually the thin, white, waxy covering on certain plant parts. The effect is to change the color of the parts it covers. The glaucous color of blue spruce needles is well known. Most juniper fruits are glaucous, as are purple plums, and apples as they come from the tree.

gymnosperms In this book, the cone-bearing trees plus yews. (See **conifer, broadleaf.**)

habitat The particular environment where a plant or animal lives. Junipers often thrive in open, rocky habitats.

habitat type All units of land that are capable of supporting very similar plant communities at climax. There are habitat-type descriptions for most of the major types of vegetation in Idaho (see the list of habitat-type manuals, p. 211).

halophytes Plants that can tolerate or require salt-laden soils. Tamarisk is a good example.

hybrid A cross between parents that are different species. Many trees hybridize; one example is the hybrid population of grand fir and concolor fir near McCall.

inflorescence A cluster of flowers.

introduced (exotic, alien) Plants or animals brought to Idaho from the outside. Utah juniper is native, while silver maple is introduced. (See **escaped, native, naturalized.**)

lenticels Rough or bumpy scars on otherwise smooth bark. Lenticels are organs that help the exchange of gasses in the tissues of living bark. Birch bark has long, horizontal lenticels that are very characteristic.

native Plants or animals living in Idaho for the past several centuries. Ponderosa pine is native, dandelions are introduced. (See **escaped, introduced, naturalized.**)

naturalized Introduced and escaped plants that are competing with native plants and successfully reproducing in the wild. Usually evidenced by a population of numerous individuals in one locale, with different size (age) classes, including seedlings. Cherry plum has naturalized in Hell's Canyon. (See **escaped, introduced, native.**)

opposite Leaves, buds, or new twigs borne opposite to each other on branches. Maples and dogwoods have opposite leaves. (See **alternate.**)

ovate Roughly egg-shaped in outline—this term is generally applied to leaf shapes. The juvenile leaves of Russian-olive are ovate.

persistent Retention of plant parts beyond the usual shedding time. Persistent leaves are often termed "evergreen." Mountain-mahogany has persistent leaves; larch has persistent cones. (All plant parts such as leaves and fruits are eventually shed.) (See **deciduous.**)

petiole The stalk that joins the leaf blade to the twig.

pinnately compound Leaves that consist of a main stem (rachis) with 3 to many small leaflets. The leaves of black locust and mountain-ash are pinnately compound.

pome A fleshy fruit with a few seeds in the center. Apples, pears, and hawthorn fruits are pomes.

pubescence Hairiness on plant parts. Leaves, twigs, fruits, and other parts may be pubescent. The easiest way to differentiate subalpine from western larch is by the twig pubescence. Apricot fruits are pubescent, and there is a silvery pubescence on the leaves of silver poplar.

range The total area occupied by a species. Maps of range do little to indicate habitat, but they do give a rough idea of the geographic area in which a plant may be found. In Idaho the range of western hemlock is confined to the northern part.

riparian Streamside, riverside, and lakeside habitats where high water tables provide a habitat distinctly different from surrounding higher ground. Many willows are riparian species.

saline Salty. Tamarisks require a saline soil, thus they are halophytes.

samara A small, dry seed with a thin wing. The seeds of maple, ash, and elm are samaras.

scale leaf (or scalelike) Tiny leaves that are overlapping and thus look like little scales. Junipers and western redcedar have scale leaves.

selection A tree chosen from a population for some particular, outstanding characteristic, such as growth, color, or form. Lombardy poplar is a selection, as are most blue spruces grown in yards and parks.

seral See **successional.**

series The various plant communities dominated at climax by a single species or pair of species. The major coniferous tree series in Idaho are: ponderosa pine, Douglas-fir, grand fir, western redcedar, western hemlock, mountain hemlock, and subalpine fir.

serotinous Pine cones that are late in opening. Instead of opening in the fall of the second year, as do the cones of most other pines, some lodgepole cones remain unopened on the tree for many years. Then, when the cones are opened by the heat of a fire, many years' worth of seeds are shed at one time. The young forest that follows has many thousands of trees per acre, producing the term "doghair stands" of lodgepole pine.

shrub A woody plant usually not reaching 13 feet in height and, if tall, often with many stems. Low shrubs frequently have but one stem. Serviceberry is usually a shrub in Idaho, but in a few specialized habitats it reaches tree size.

simple leaf A leaf with a single blade, as opposed to a compound leaf. Bigtooth maple has simple leaves, while box-elder has pinnately compound leaves.

species A population of very similar, but not identical, individuals that reproduce almost exclusively with each other. The species is the basic unit of plant classification. Species is both singular and plural, like the word "deer." Western juniper and Utah juniper are closely related species. (See **genus.**)

specific Adjectival form of "species." The specific name of western white pine is *monticola.*

spine A sharp-pointed modified leaf or stipule. Black locust has a pair of triangular stipular spines at the base of each leaf. (See **thorn.**)

spur shoot A short, stubby branch, bearing either needles or cones in larch (similar to a fruiting spur).

stamens The pollen-bearing organs of a flower. Suksdorf hawthorn flowers have 20 stamens, black hawthorn only 10.

stand A specific segment of forest that may be either large or small. Western redcedar often forms small stands of very large trees, often called cedar groves.

stipule Small appendage to a leaf, usually in pairs, attached to the base of the petiole. Willows have leafy stipules that usually fall off by mid-season.

successional (seral) A disturbance to the climax community produces a different kind of vegetation due to the change in heat, light, moisture, and other environmental factors. Such disturbance communities change relatively quickly, often in a somewhat predictable succession. Thus, they are called "successional communities" and plants in these stages of development are termed "successional plants." Lodgepole pine is almost always a successional tree, coming into areas after fire or other disturbance. Each of the stages in a successional sequence is called a "sere," hence the term "seral," which also means successional. (See **climax.**)

talus Loose rock debris on a hillside.

thorn A sharp-pointed, modified branch. Thorns are very tough and woody. Hawthorns and cherry plum both have thorns. (See **spine.**)

tree There are numerous definitions of a tree. For this book, a tree is a woody plant with one to several stems, that, at maturity, attains a height of at least 13 feet and a diameter (taken 4.5 feet above the ground) of at least 3 inches. The difference between a small tree and a large shrub may be difficult to decide. Scouler willow is usually a large shrub, but sometimes it is a small tree. Woody plants in Idaho that are known to reach 3

inches in diameter and 13 feet in height are included in this book as trees.

trifoliolate Pinnately compound leaf with but 3 leaflets, as some box-elder leaves.

variety With plants, a variety is usually the next unit below species. A variety is a population with the main characteristics of a species but with minor variations. There are two varieties of mountain-mahogany in Idaho.

vegetation The sum of all the plant communities in an area. There are 10 major vegetation types described in this book.

wild A plant or animal living in areas away from the direct influence of humans. Silver maples and Chinese pheasants are not native to Idaho, but both can be found in the wild. (See **introduced, escaped, naturalized.**)

windbreak One to several lines of trees planted for wind protection. Lombardy poplar and Russian-olive are common windbreak trees.

zone In this book, the term is used to denote the elevational (altitudinal) limits of similar plant communities. Subalpine fir grows in the highest tree zone in Idaho, the spruce-fir zone; hackberry grows in the lowest, the bunchgrass zone.

SOME STATISTICS

There has been considerable research devoted to trees and shrubs since publication of the last Idaho tree bulletin in 1966 (33). Most of the new information in this book came as a direct result of research supported by grants from the Stillinger Trust Foundation and funding from the Forest, Wildlife and Range Experiment Station, University of Idaho.

Here is a synopsis of the changes reflected by a comparison of two publications:

Native Trees of Idaho (1966)

	Genera	*Species*	*Varieties*
Native Trees	24	46	5
Escaped and Naturalized Trees	12	17	1

Wild Trees of Idaho (1995)

Native Trees	26	54	16
Escaped and Naturalized Trees	18	34	3

Treated in this book are 19 families of trees in 38 genera covering 88 species and 19 varieties. An additional 19 species of shrubs are described that are not known to reach tree size in Idaho, a total of 126 descriptions of Idaho woody plants found in the wild.

WILD TREES OF IDAHO

COTTONWOODS
ASPENS, POPLARS

GROUP I
Broadleaf, alternate, simple

Populus — *populus* is the classical Latin name for these trees

FAMILY — SALICACEAE

GROUP I

Every part of the Northern Hemisphere has native cottonwoods growing along the rivers. In the crisp days of fall, yellow cottonwoods shine like beacons, familiar trees for all Idahoans to enjoy.

There are 3 common names for trees in this genus—aspen, poplar, and cottonwood. Poplar may be applied to either aspens or cottonwoods. Thus Lombardy poplar is actually a cottonwood while silver poplar is an aspen. In Idaho, one native aspen, one escaped aspen, 2 native cottonwoods, numerous hybrid cottonwoods, and 3 escaped cottonwoods are found in the wild. Following is a generalized chart of these 8 species; however, since cottonwoods are difficult to identify, read all the leaf descriptions carefully and check the range descriptions and maps (8).

IDAHO COTTONWOODS, ASPENS, AND POPLARS

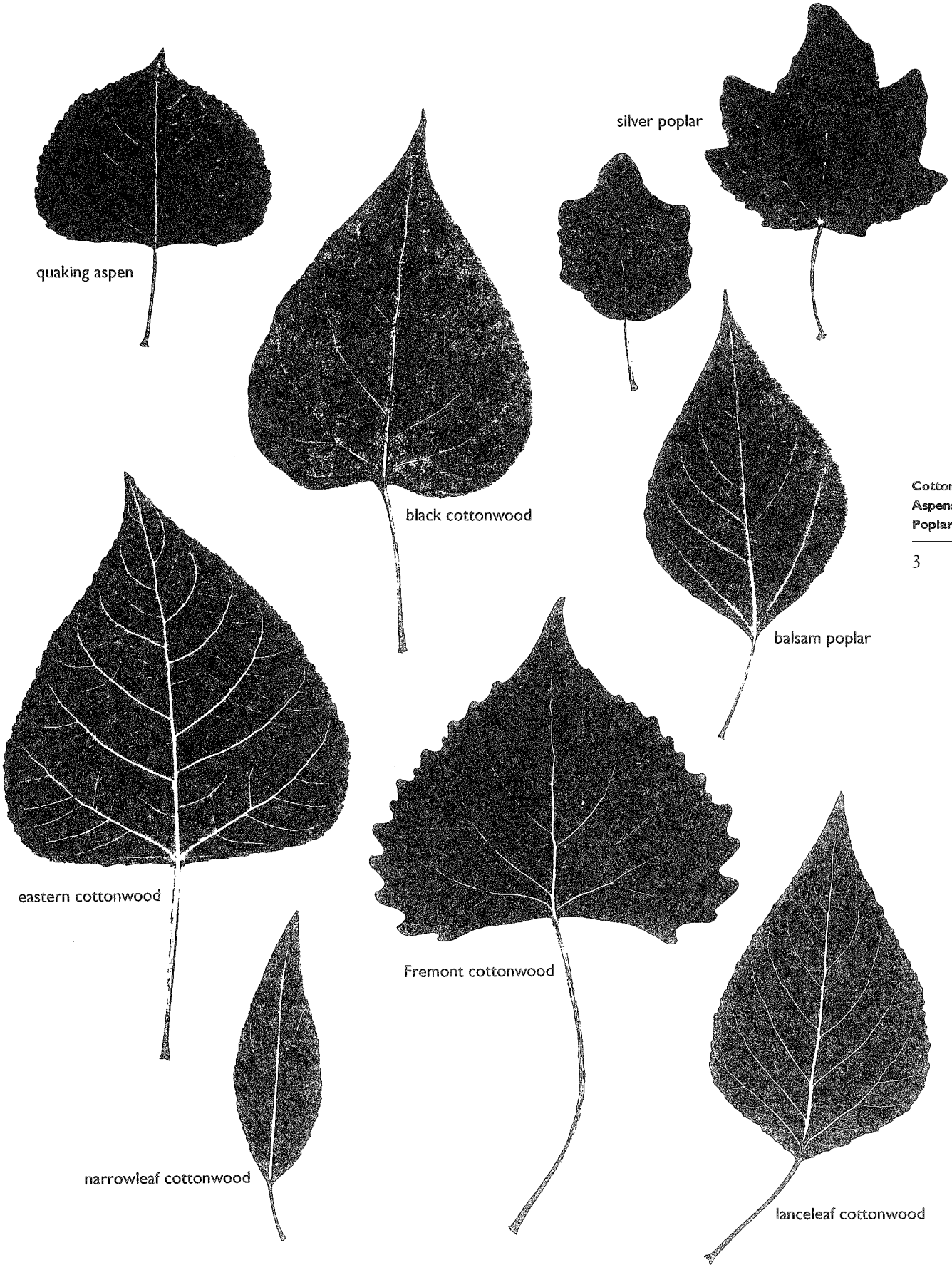
Species	Leaves	Petiole Cross-Section	Mature Bark
quaking aspen	heart-shaped	flat, thin	smooth, white
silver poplar	ovate to maple-shaped	oval	smooth, white
black cottonwood & balsam poplar*	broad, triangular to lance-shaped, brown-streaked and pale green below	oval to round	furrowed, black to grey
eastern cottonwood & Frémont cottonwood*	broad, triangular, green below, same color as top	flat, thin	furrowed, grey
narrowleaf cottonwood	lance-shaped to lance-linear, lighter green below, may be brown-streaked	oval to round	furrowed, grey to near-white
lanceleaf cottonwood	lance-shaped, sharply tapered tip	oval to flattened	furrowed, grey

* See further discussion of balsam poplar (page 10) and Frémont cottonwood (page 14).

Technical description: Leaves: 3 to 6 inches long, usually about as wide as long, margins with rounded teeth, petiole long (narrowleaf cottonwood has willowlike leaves—see twig and bud characteristics). Twigs: stout, knobby, grey to light brown. Buds: with overlapping bud scales, often coated with brownish resin. Flowers: male flowers in long catkins that fall to the ground; female flowers in dense catkins. Fruit: a cylindrical mass of small capsules that split to discharge tiny seeds carried by masses of cottony hair.

These trees can be divided into two major groups, the cottonwoods and the aspens.

Species	Mature Bark	Buds
cottonwood	dark, rough, furrowed	large, resinous
aspen	white, smooth, unfurrowed (except near base in old trees)	small, nonresinous


quaking aspen
black cottonwood
silver poplar
balsam poplar
eastern cottonwood
narrowleaf cottonwood
Fremont cottonwood
lanceleaf cottonwood

QUAKING ASPEN

GROUP 1
Broadleaf, alternate, simple

Populus tremuloides
Also known as trembling aspen

NATIVE
tremuloides means "like tremula";
Populus tremula is the common aspen of northern Eurasia

FAMILY — SALICACEAE

GROUP 1

Aspen is *the* tree of the Rocky Mountains. It occurs on a wide variety of habitats throughout the Rockies, where its bright white bark and pale green leaves contrast vividly with the darker conifers. In the fall its golden leaves lend a splash of color to the mountainsides. In Idaho, aspen thrives nearly everywhere there are forests. The major exception is in northern Idaho, where, except for the western foothills, it is quite uncommon in the moist, dense forests of grand fir, western redcedar, and western hemlock. From about McCall south and east it becomes more and more plentiful. South of the Snake River, in the sagebrush/grass zone, aspen frequently forms pure groves where no other trees are found.

One rarely sees a single aspen—they grow in clumps or colonies that sprout from shallow underground roots. Such colonies are called "clones" because they are genetically identical individuals. After fire aspen roots still live, though the tops are dead. But where there was one aspen before a fire, 10 or 20 more spring up after, all from root sprouts. Conifers often invade aspen groves. As they grow taller, the conifers shade the aspens, and the aspen colony will eventually die unless fire or logging removes the conifers, allowing the sun to renew aspen vigor. Thus, in coniferous forests, aspen is a good example of a seral tree, one that is temporary in a habitat (68, 72, 73, 74, 75).

Aspen leaves tremble in the slightest breeze. Why? Examine a leaf. The petiole is flat, but at right angles to the leaf blade. This makes the broad blade unstable, so just a whisper of wind shakes the leaf, thus the name "quaking aspen."

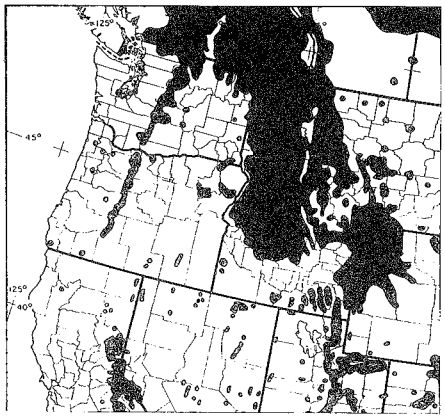
The mountain men appreciated aspen. In their search for beaver, they first looked for streams with aspen alongside, because aspen bark is a favorite beaver food. Deer and moose also find the bitter twigs good winter browse. Grouse find the male catkins particularly tasty. Aspen wood is used for wood pulp in Canada and the eastern United States, but not in the West. Most of our wooden matches are made of eastern aspen, but recently western aspen has also been used.

Heart-shaped leaf on a flat petiole; smooth white bark; in colonies (very rarely single trees).

Along U.S. 95 between Plummer and Coeur d'Alene; Craters of the Moon National Monument; Silent City of Rocks, Cassia County; along the Sawtooth Scenic Route; Ketchum to Stanley; Harriman State Park, Fremont County.

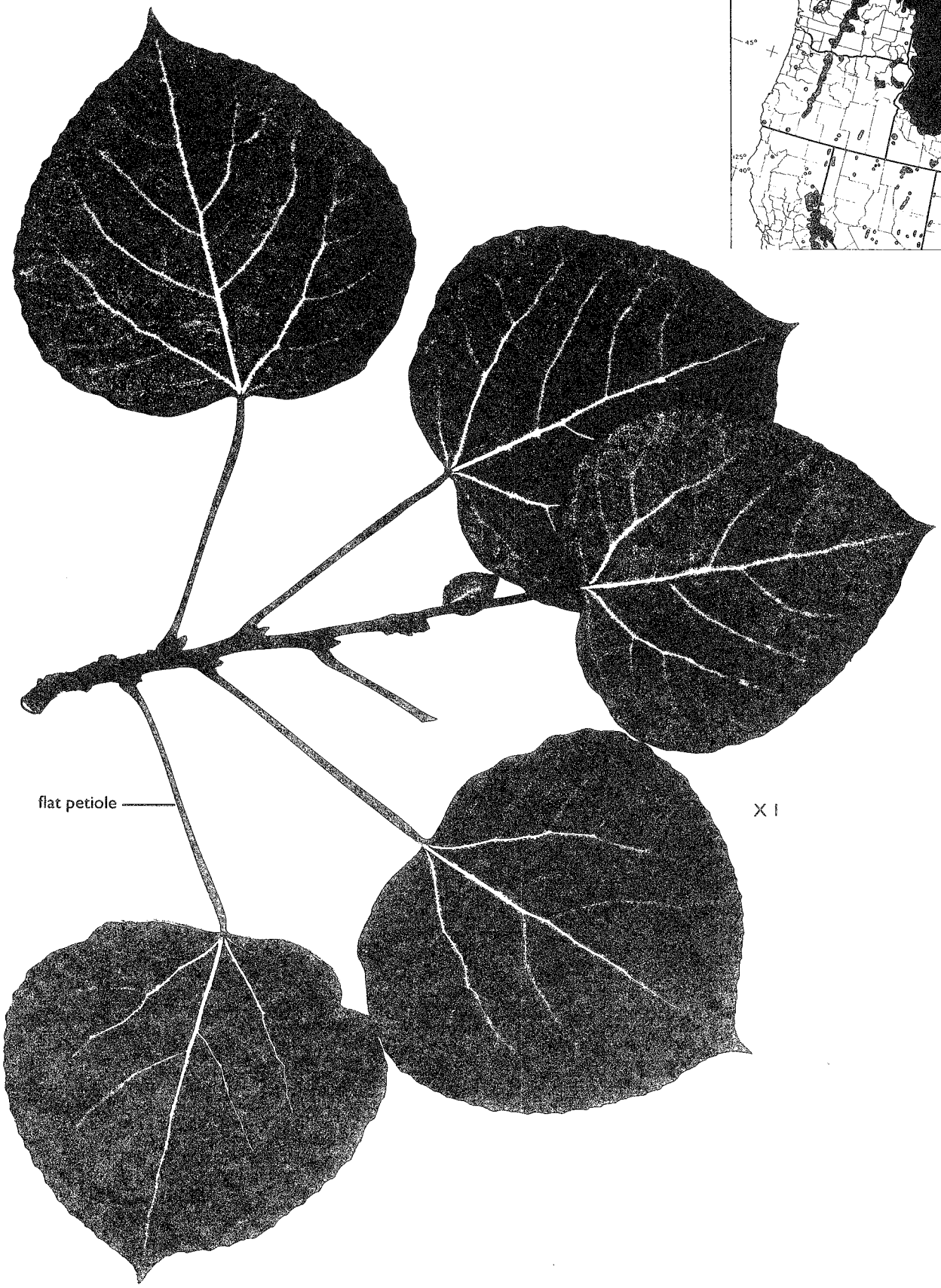
Diameter 30.4 inches, height 99 feet, near Bonners Ferry, Boundary County.

Seral aspen being replaced by Douglas-fir, Blaine County.



Quaking Aspen

5



X 1

SILVER POPLAR

GROUP I
Broadleaf, alternate, simple

Populus alba
Also known as white poplar

ESCAPED
alba means "white"—the leaves and bark are white

FAMILY — SALICACEAE

GROUP I

6

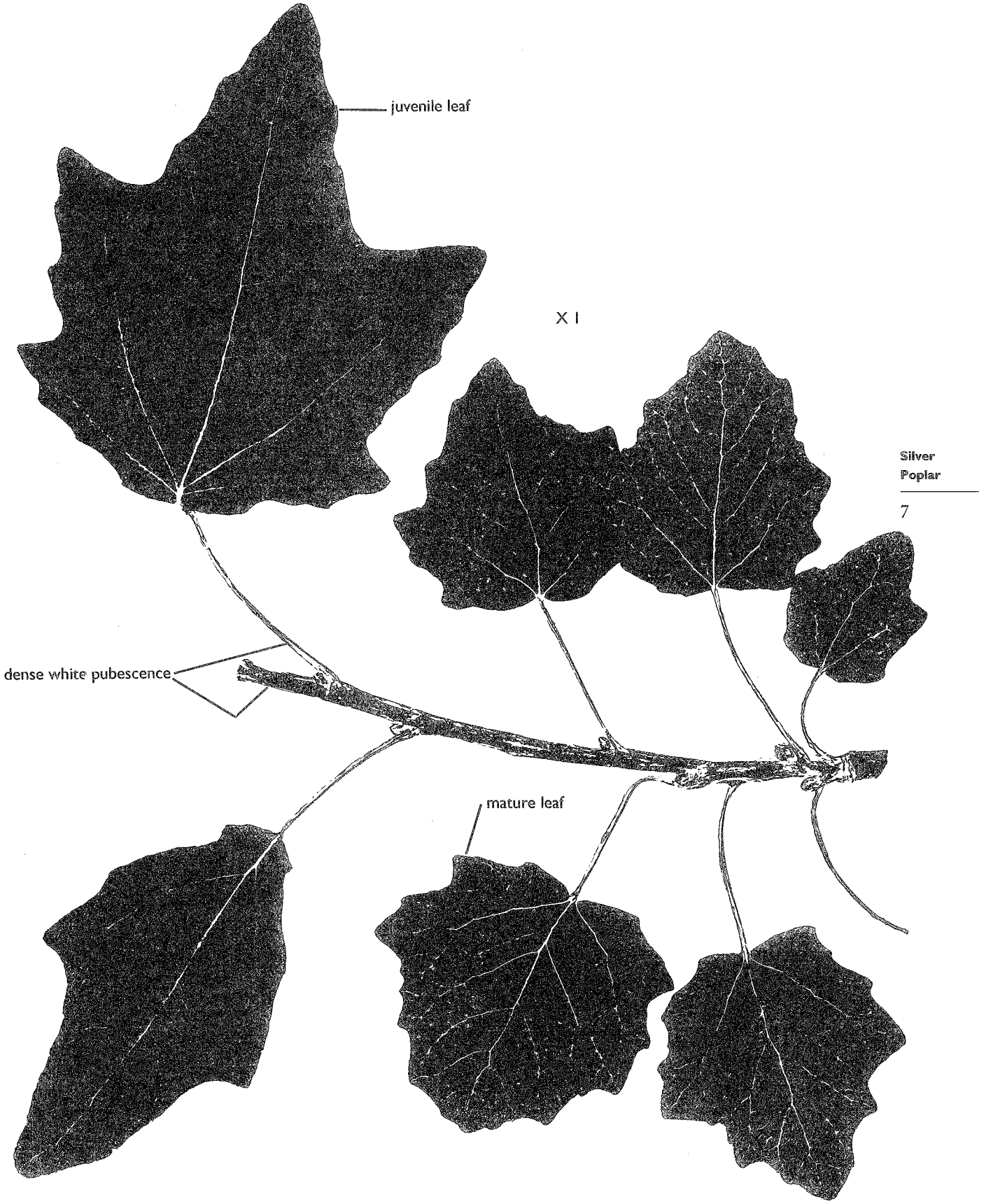
Silver poplars are common in Idaho, particularly in areas that have been settled for a long time. Years ago, this beautiful tree was quite popular, but it has one particularly bad characteristic which has made new plantings uncommon: Silver poplar sprouts from the roots, as does quaking aspen. A few years after planting, silver poplar will start to send up small trees from the shallow roots. The more such sprouts are cut, the more are generated. I have seen lawns that are literally paved with wood—a near-solid mat of ugly woody growths that appear at the base of cut sprouts. Female trees bear tremendous quantities of fluffy, cottony seeds. When the seeds are in the air, outdoor work and play are often uncomfortable, thus male trees are usually planted.

A form of silver poplar called "Bolleana poplar" is fairly common in southern Idaho. In this form the branches are sharply ascending and the tree takes the shape of Lombardy poplar. Considered one of the most ornamental of the columnar trees (67), some of the Bolleana poplars have little or no tendency to root-sprout.

Silver poplar is sometimes found in the wild. I think that escaped trees are the result of live branches breaking off, floating downstream, lodging in mud, rooting, and forming a new tree by vegetative reproduction. Silver poplars often remain alive at old homesteads long after abandonment, for as old trees die, younger trees derived from root sprouts take their place. Such trees are called "long residuals," and they may appear to be escaped when all traces of human habitation are gone. Since such colonies, or clones, continue to form new trees from root sprouts, they may occupy the site for many, many decades.

One of the easiest of all trees to identify—a dense, white, felty pubescence covers the leaf undersides, petioles, and new twigs. Note the difference in shape between juvenile and mature leaves. Bark is like that of quaking aspen—smooth and white with black markings.

Occasionally seen along river floodplains in southern Idaho; long residual anywhere near abandoned farms or ranches.



Silver Poplar

7

BLACK COTTONWOOD

GROUP 1
Broadleaf, alternate, simple

Populus trichocarpa
(*Populus balsamifera* subspecies *trichocarpa*)
Also known as Balm-of-Gilead

NATIVE
trichocarpa means "having hairy capsules"

FAMILY — SALICACEAE

GROUP 1

8

Balsam poplars, relatives of black cottonwood, are found in the boreal forests from Labrador to Alaska, appearing after fire. In the Pacific Northwest, black cottonwood appears after disturbances in and near our coniferous forests. Since it is so closely related to the boreal species both in appearance and its role after fire, black cottonwood is sometimes named *Populus balsamifera* subspecies *trichocarpa* (8).

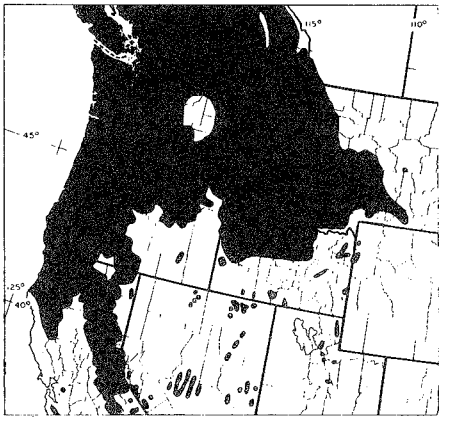
Whatever scientific name is accepted, black cottonwood is an important tree in Idaho. It is our largest native broadleaf tree. In northern Idaho, trees over 5 feet in diameter and more than 150 feet tall may be found. Black cottonwood is also one of Idaho's most widespread trees; few rivers in the state lack stretches dominated by this large tree. The Boise, Big Wood, and Little Wood rivers, were all named for dense stands of black cottonwood found by early settlers. In the northern part of Idaho, it will grow in the moist forests of the cedar-hemlock-grand fir zone, after disturbance has opened the stand. But for best growth, black cottonwood needs the extra water of streamside and riverbank situations.

A sweet-smelling, yellow-brown resin covers the large winter buds. In spring, this fragrant resin perfumes the air of Idaho riversides as the new leaves unfold. This sweet-smelling resin is responsible for the name Balm-of-Gilead, by which many people know this tree. As the new leaves expand, streaks of brown resin are transferred to the leaf undersides, and the sweet odor remains for most of the summer. The sizes and shapes of black cottonwood leaves are exceptionally variable—look for the russet streaks of aromatic resin on the undersides.

Leaves are variable—round-triangular on older branches, lance-shaped on younger growth. All have brownish streaks on the underside, which are deposits of the resin from the buds. Leaves from young root sprouts frequently look much like narrowleaf cottonwood leaves. Bark is furrowed and dark on large trees. (See balsam poplar, p. 10.)

Common along our major rivers, especially the Kootenai, Coeur d'Alene, lower St. Joe, middle Clearwater, upper Salmon, Big Wood, Little Wood, Lemhi, Boise, and Payette.

Diameter 96 inches, height 113 feet, in Sandpoint, Bonner County.



round petiole

X 1

brown streaks below

Black Cottonwood

9

no glands

leaf variations x .6

BALSAM POPLAR

GROUP 1
Broadleaf, alternate, simple

Populus balsamifera
(*Populus balsamifera* subspecies *balsamifera*)
(*Populus tacamahacca*)
Also known as tacamahac
Balm-of-Gilead

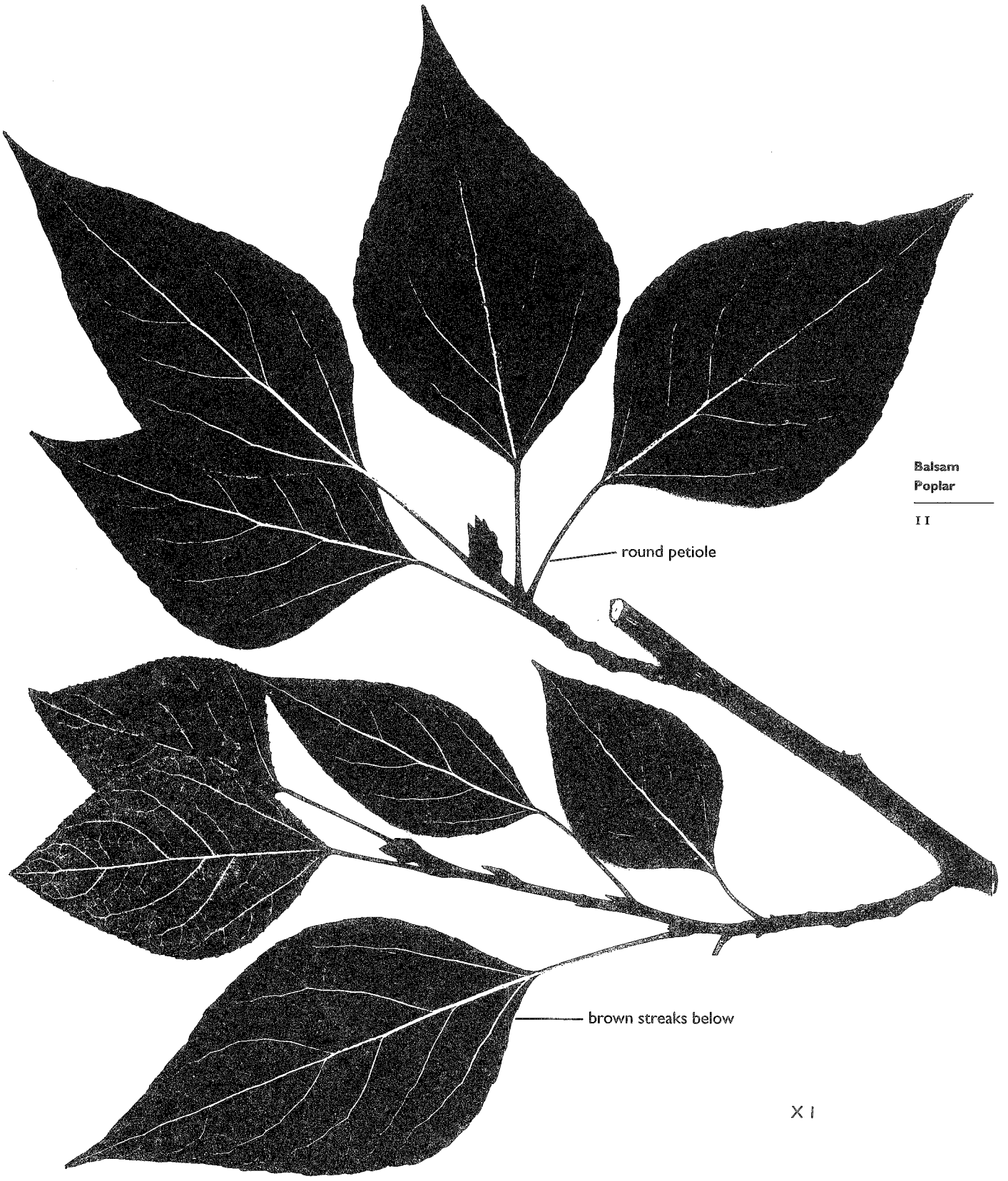
INTRODUCED, POSSIBLY ESCAPED
balsamifera means "bearing balsam"

FAMILY — SALICACEAE

GROUP 1

Balsam poplar is very similar to black cottonwood. In southern Alberta and probably elsewhere, the two species mingle and hybridize (8). Balsam poplar is a boreal tree, extending in a great arc from Alaska southeastward to New England and the Lake States, and northward throughout this vast range to the northern limit of trees. Many tree-identification books note large populations of balsam poplar in Idaho. This error is likely due to the similarity in shape of juvenile black cottonwood and balsam poplar leaves. Only a very few confirmed balsam poplars have been collected in Idaho, one along the Salmon River near Challis. A small population is located along Curry Creek in Hells Canyon. Apparently trees were planted for erosion control along the stream, for this warm canyon is an unlikely habitat for a boreal, cold-loving tree. However, the presence of young trees indicates it may be escaping or spreading by root sprouts. A recent collection from near Henrys Lake is interesting, since it is near another boreal disjunct—white spruce. Idaho likely has some balsam poplar X black cottonwood hybrids near the Canadian border. Certainly balsam poplar is not widespread in Idaho. Here is a means of separating the two very closely related species:

Species	Mature Leaves	Capsules	Distribution
black cottonwood (*Populus trichocarpa*)	about as wide as long, triangular	3 segments, pubescent	common, native (see map, p. 9)
balsam poplar (*Populus balsamifera*)	longer than wide, broadly ovate	2 segments, glabrous	very restricted and quite rare



Balsam Poplar

11

X 1

EASTERN COTTONWOOD

GROUP 1
Broadleaf, alternate, simple

Populus deltoides
variety *deltoides,*
variety *occidentalis*

NATURALIZED

deltoides means "like the Greek letter delta" (Δ)

FAMILY — SALICACEAE

GROUP 1

12

Eastern cottonwood is widely distributed, as a native tree, roughly from the foothills of the Rocky Mountains in central Montana and eastern Colorado east to the Atlantic Ocean. This description includes both the eastern and Great Plains forms of this widespread species complex. Plains cottonwood (variety *occidentalis*) differs but little from the more prevalent eastern variety, *deltoides.* In the eastern United States, particularly in the Mississippi Valley, this cottonwood is often planted on the extensive floodplains to take advantage of spectacularly fast growth and wood very suitable for pulp (62). The known tolerance of this tree to flooding was the likely reason it was planted along the Kootenai River dikes north of Bonners Ferry. Fast growth was an attractive inducement to planting eastern cottonwood in the upper Snake country, for there the early settlers were faced with the smaller and less shade-producing narrowleaf cottonwood. Eastern cottonwood couples a broad crown of dark green leaves with fast growth, and that was certainly appealing to settlers in the hot Idaho summers. The history of its introduction to southern Idaho is not known to me, but this tree has been there long enough to produce the largest-known eastern cottonwood in the United States.

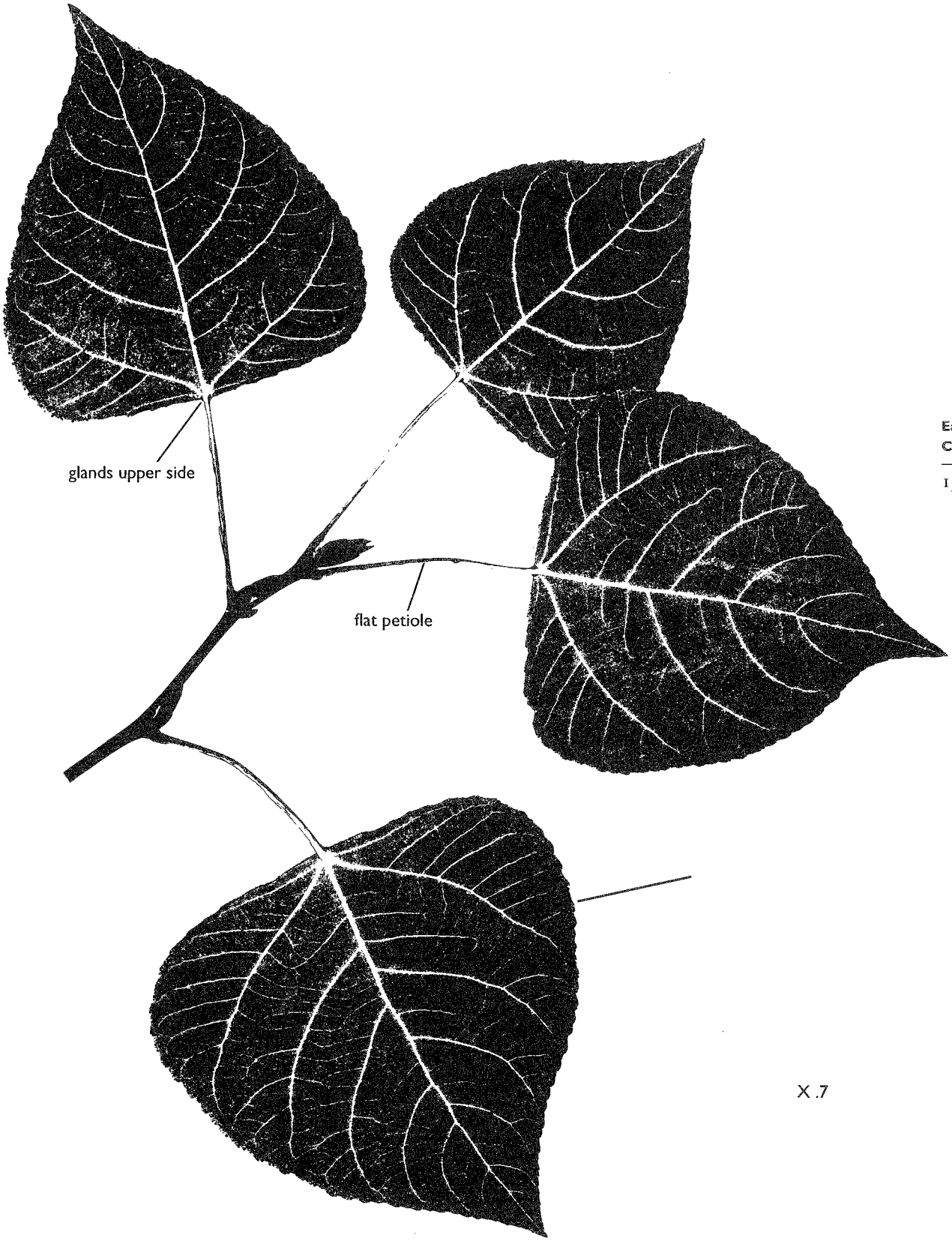
Seedlings from cultivated parents soon became established, for cottonwoods produce abundant seed at an early age. These escaped trees thrived all along the Snake and its tributaries across the Snake River Plain. The escaped trees in time produced seedlings, and now density and various age classes indicate that eastern cottonwood has become naturalized. The fact is, on many places along the Snake River Plain, exotic cottonwoods seem to have replaced the native cottonwoods—narrowleaf to the east, black to the west. In fact, most of the trees along these rivers are not natives—eastern cottonwood, silver maple, green ash, and Russian-olive dominate the riverbanks. In southwestern Idaho, Frémont cottonwood has also naturalized. Eastern, Plains, and Frémont cottonwoods are particularly difficult to identify. There are so many intermediate forms that it seems certain that these large cottonwoods are hybridizing (see Frémont cottonwood).

Broad triangular (deltoid) leaves, with a flat petiole and 2 to 5 glands at the base of the blade and medium-sized teeth; winter buds glabrous. (See Frémont cottonwood, p. 14)

Along the Snake River from Blackfoot to Weiser; planted for erosion control on dikes along the Kootenai River north of Bonners Ferry (and possibly escaping).

Diameter 138 inches, height 85 feet, near Burley, Cassia County; the largest in the United States.

Note small-toothed leaves.



Eastern Cottonwood

13

X .7

FRÉMONT COTTONWOOD

GROUP I
Broadleaf, alternate, simple

Populus fremontii

NATURALIZED

Named for John Frémont, explorer of western North America

FAMILY — SALICACEAE

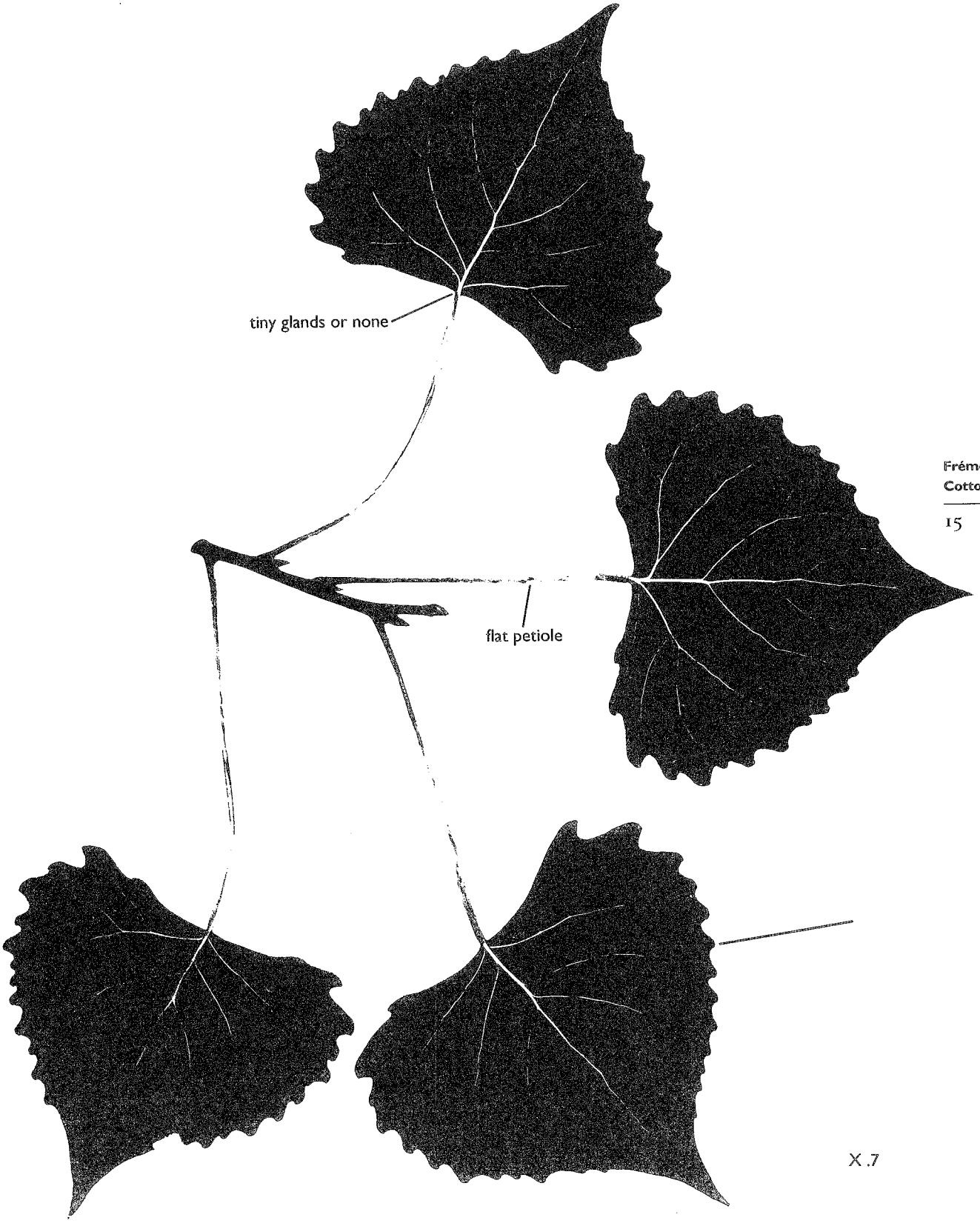
GROUP I

Like its close relative eastern cottonwood, Frémont cottonwood was brought to Idaho as a cultivated tree and has now escaped and naturalized. This tree is native from western Texas to northern California and to central Utah. Perhaps early settlers brought this tree from Utah to Idaho to plant around farms. Whatever its source, it is now common along the lower Boise, Payette, and Weiser rivers, where it grows with both eastern cottonwood and black cottonwood. Since the mature leaves of all three of these trees are broadly triangular, identifying them properly demands care. To add to the confusion, hybrids are most certainly present (see lanceleaf cottonwood, p. 18). The following conspectus shows the details of separation.

Species	Mature Leaves	Leaf Teeth	Leaf Glands	Winter Buds	Capsule
black cottonwood (*Populus trichocarpa*)	somewhat triangular, brown-streaked and fragrant below	small, rounded	absent	glabrous	3 segments, pubescent
eastern cottonwood (*Populus delotides*)	broadly triangular, light green below	medium	present	glabrous	3–4 segments, glabrous
Frémont cottonwood (*Populus fremontii*)	broadly triangular, light green below	large, curved	absent (or small)	slightly pubescent	3–4 segments, glabrous

Similar to eastern cottonwood but has larger teeth, none or tiny glands at the apex of the petiole and generally with pubescent winter buds.

Lower Boise, Payette, and Weiser rivers.



Frémont Cottonwood

15

X .7

NARROWLEAF COTTONWOOD

GROUP I
Broadleaf, alternate, simple

Populus angustifolia

NATIVE
angustifolia means "narrowleaf"

FAMILY — SALICACEAE

GROUP I

This tree, generally smaller than black cottonwood, is the common native cottonwood along streams and rivers of southeastern Idaho. North of Pocatello, along streams in the sagebrush plains of the upper Snake River Plateau, it grows with black cottonwood. This is a tree of the Great Basin and Central Rockies, found more commonly either south or east of Idaho (40). Extensive stands of large narrowleaf cottonwoods are found in the bottomlands of the Snake River below Palisades Reservoir. The twigs, limbs, and bark of narrowleaf are lighter in color than black cottonwood. The whole tree appears very light-colored from a distance.

This unusual cottonwood could be mistaken for a willow due to the narrow leaves, but its leaves have a longer petiole than most willows. As Lewis and Clark made their way up the Missouri River, in central Montana they came upon "a species of cottonwood with a leaf like that of a wild cherry." And they were quite correct, for the leaves of eastern black cherry (*Prunus serotina*) do resemble those of narrowleaf cottonwood. Narrowleaf cottonwood branches are thick and knobby-looking, and the buds have a resinous coating like those of black cottonwood, but don't smell as sweet. The numerous bud scales are also typical of cottonwoods, but are absent in willows.

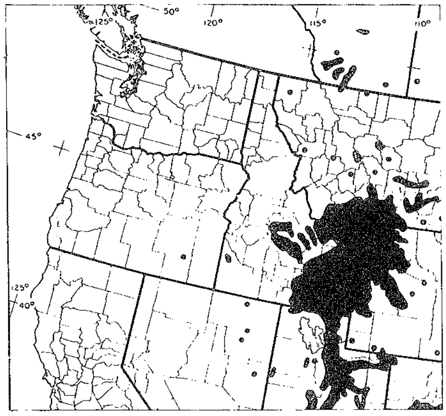
There is considerable variation in the shape of narrowleaf cottonwood leaves, from quite narrow and linear to leaves broad enough to look like the juvenile leaves of black cottonwood. Cottonwoods hybridize easily, and in stands of narrowleaf cottonwood, trees with wider and darker green leaves and darker twigs can often be seen. These are usually hybrids that may have either black cottonwood or eastern cottonwood as parents, or both. Hybridization and backcrossing to parents makes positive identification very difficult. Some hybrids may be referred to as lanceleaf cottonwood (*Populus acuminata*).

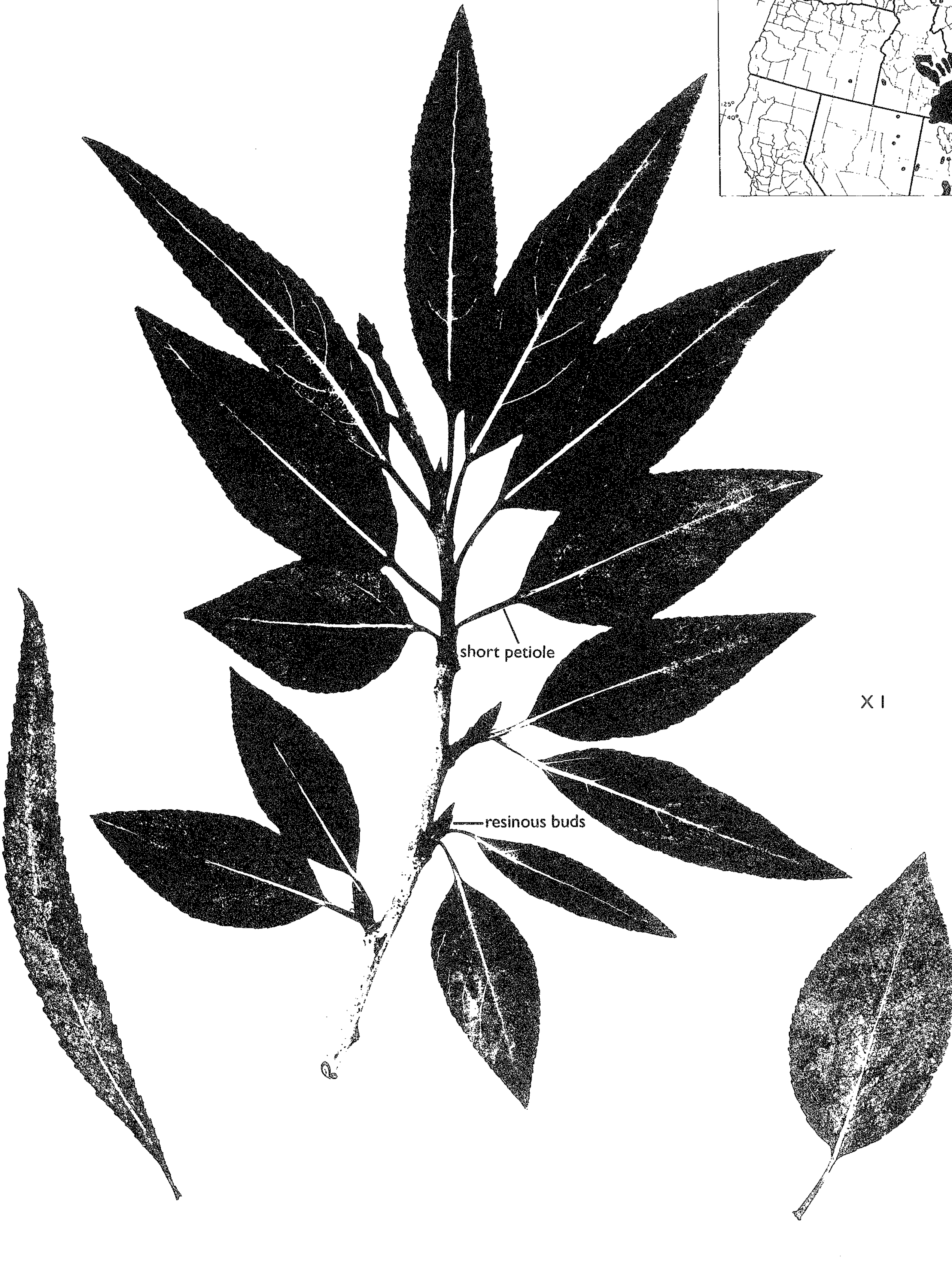
Narrow, willowlike leaves on knobby branches, buds covered with resin.

Craters of the Moon National Monument; Portneuf River near Pocatello; Snake River, Rexburg to Palisades Reservoir; Arco to Challis, U. S. 93.

Diameter 39.2 inches, height 74 feet, near Heise, Jefferson County.

Note willow-like leaves.





Narrowleaf Cottonwood

17

LANCELEAF COTTONWOOD

GROUP 1
Broadleaf, alternate, simple

Populus acuminata

NATIVE

Acuminate is the term for a long, tapered leaf tip

FAMILY — SALICACEAE

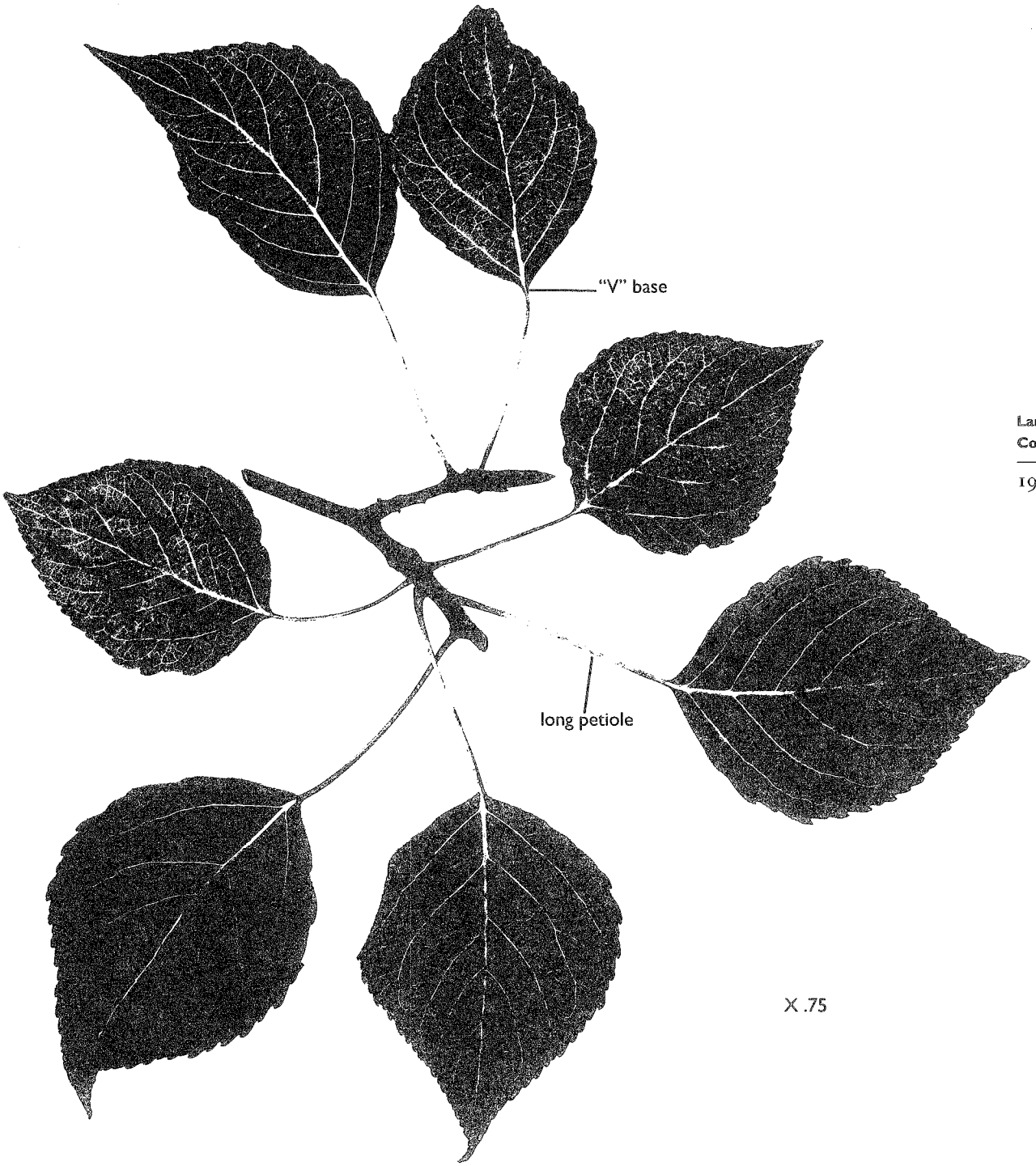
GROUP 1

Cottonwoods have variable leaf forms, and they easily hybridize. This combination makes identification particularly difficult where two or more cottonwoods grow in the same general area. Such is the case in southern Idaho. Lanceleaf cottonwood is considered to be a hybrid between narrowleaf cottonwood and plains cottonwood (*Populus deltoides* var. *occidentalis* or *P. sargentii*). While southern Idaho has no native plains cottonwood, and it has apparently not escaped, native populations occur just over 100 miles away in southwestern Montana. We suspect that our widespread native narrowleaf cottonwood also hybridizes with eastern cottonwood, which has long been planted in southern Idaho and has escaped and naturalized throughout the Snake River Plain. In south-central and southwestern Idaho, we've seen populations of what appear to be hybrids between narrowleaf and black cottonwood. Naturalized Frémont cottonwood is also a possible parent. Until considerable taxonomic work is done on the four valid species of southern Idaho cottonwoods, it seems reasonable to use "lanceleaf cottonwood" as a name for apparent hybrids between narrowleaf cottonwoods and species with broader leaves. The scientific name for lanceleaf cottonwood is frequently written *Populus* X *acuminata;* the "X" indicates a hybrid.

To hopefully clarify this cottonwood identification problem, start by learning something of the leaf shapes of narrowleaf, black, eastern, and Frémont cottonwoods. Imagine a mature leaf intermediate to narrowleaf cottonwood and any of the other three species. Those trees with intermediate leaves are what we're here calling lanceleaf cottonwoods. Once north of the range of narrowleaf cottonwood, lanceleaf cottonwood has not been found. There is insufficient data to produce a significant map of the distribution of lanceleaf cottonwood.

Note the leaf shape: wider than narrowleaf cottonwood leaves, with a proportionately longer petiole, and with the base of the blade in more of a "V" shape.

Vicinity of Bear Lake; Snake River near Pocatello; Arco to Challis, U. S. 93.



X .75

Lanceleaf Cottonwood

19

WILLOW

GROUP I
Broadleaf, alternate, simple

Salix

Salix is the old Latin name for willow

FAMILY — SALICACEAE

GROUP I

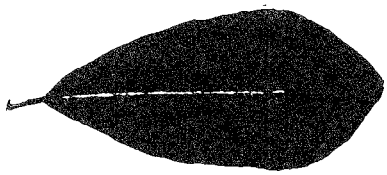
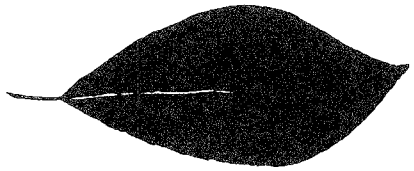
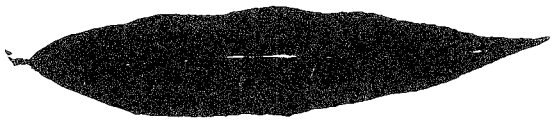
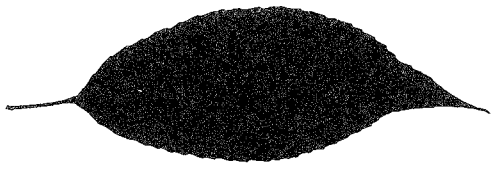
Willows comprise a very common genus of trees and shrubs in the Northern Hemisphere. In Idaho, there is scarcely a creek or river that doesn't have obvious willows growing on the banks. While often associated with riparian habitats, willows also occur in forested areas, particularly after disturbance. In the high elevations of eastern Idaho, certain willows form matlike shrubs only a few inches high (11). At the other extreme, peachleaf and whiplash willows grow to mid-sized trees in southwestern Idaho. In all, there are some 30 kinds of willows native to Idaho, our largest genus of woody plants (8). In addition, at least two widespread escaped species add to the possible confusion.

Willows have very bitter bark, which was found to relieve headache. The willow family, Salicaceae, is the source of the name of salicylic acid, the active ingredient in aspirin. Willows form an important genus of plants. They have high value as food for deer, elk, and moose, which relish the twigs. Willow bark is a major food supply for beaver. Willows growing along streams reduce streambank erosion during periods of high water. A number of native Idaho willows would make acceptable ornamentals, but they are rarely used.

Willows are a difficult group to differentiate to species. Most willows have several different leaf forms on the same plant, thus a variety of forms are illustrated for each species in this book. Early season leaves are frequently atypical. Vigorous stems, often called sprouts, have peculiar leaves, generally easily spotted as larger than average. So, when trying to identify willows, use leaves from mid-season onward and look for leaves from the slower growing twigs and those twigs that lack flowers or fruit. The willows included here are those known to most frequently form trees in Idaho. Other species, which are usually listed as shrubs, may rarely develop a plant that meets the minimum size for a tree.

Technical description: Leaves: 1 to 7 inches long, usually narrow; finely toothed or entire. Some have tiny glands near the base of the leaf blade. Many have green leafy stipules near the base of the petiole on young twigs. Twigs: smooth, usually shiny; may be green, yellow, orange, or brown; very bitter. Buds: egg-shaped, held close to the twig, usually covered by a single caplike bud scale. Flowers: small, in dense cylindrical clusters called aments or catkins. Fruit: a dense cluster of capsules that split to discharge cottony seeds. Willows are unisexual—some plants have only male flowers, others only female.

CONSPECTUS OF IDAHO TREE WILLOWS

Species/Status	Leaves	Size
Scouler willow (*Salix scouleriana*), statewide native		tall shrub, small tree
Bebb willow (*Salix bebbiana*), statewide native		tall shrub, rarely small tree
whiplash willow (*S. lasiandra caudata*), statewide native		tall shrub, small to mid-sized tree
European willow (*Salix alba* X *fragilis*) escaped exotic (lower elevations)		small to large tree
peachleaf willow (*Salix amygdaloides*), statewide native (lower elevations)		tall shrub to large tree
golden willow (*S. alba vitellina*), escaped exotic (lower elevations)		tall shrub to large tree
coyote willow (*Salix exigua*), statewide native		colonial shrub, rarely small tree

SCOULER WILLOW

GROUP I
Broadleaf, alternate, simple

Salix scouleriana

NATIVE

Named for John Scouler, discoverer of this species on the Pacific Coast

FAMILY — SALICACEAE

This is a willow of the forests, although it also grows along forest streams or on lowland lakeshores. In coniferous forests it is usually a tall shrub with several stems 2 to 6 inches in diameter, rising 15 to 25 feet tall. Where there is more moisture, it may grow to 20 to 24 inches in diameter.

Scouler willow is probably the most important willow in the state for big-game winter browse. It grows well in areas where forests have been removed by fire or logging. Scouler willow often shares these postfire brushfields with other tall shrubs such as serviceberry and Rocky Mountain maple.

Scouler willow is the common wild "pussy willow" of Idaho. The large, fuzzy, silvery catkins emerge long before the leaves. People plant this willow as an ornamental because cuttings are easily rooted and plants grow quickly. Once established, rigorous pruning forces development of the long, straight shoots preferred for decoration when the young catkins burst forth. Stems over an inch or so in diameter are frequently attacked by willow weevils, causing the branch to die above the attack location. Severe pruning also helps prevent weevil attacks by keeping the stems small.

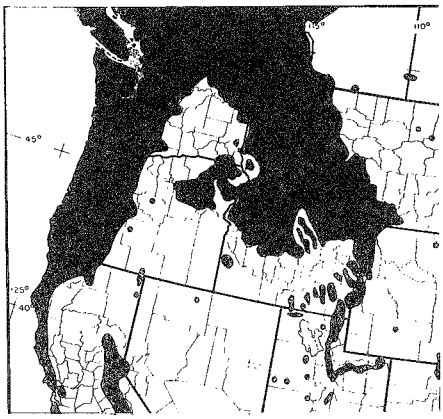
Few willows grow in Idaho forests—most are found in full sunlight along streams or rivers. In fact, with rare exceptions, a willow growing beneath conifers, away from water in either the ponderosa pine, Douglas-fir, or Grand Fir-Cedar-Hemlock zone, is Scouler willow. Notice the leaf shapes on the opposite page: while variable, the majority of Scouler willow leaves have the greatest width above the center of the leaf, and the tips are rounded. Leaf shape and habitat combine to make positive identification of Scouler willow much more likely. Scouler and Bebb willow may easily be confused (see the Bebb willow discussion on p. 24).

Most common willow under coniferous forests or on disturbed forest areas, usually a tall shrub. Leaves broader above the middle, whitish below; mature leaves have rounded tips.

South shore of Little Payette Lake; most Douglas-fir zones where there is a good layer of shrubs; shrub communities along U. S. 12 east of Kooskia.

Diameter 21.5 inches, height 45 feet, near McCall, Valley County.

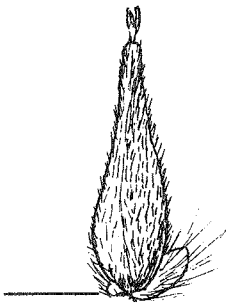
Note whitish underside of leaves.



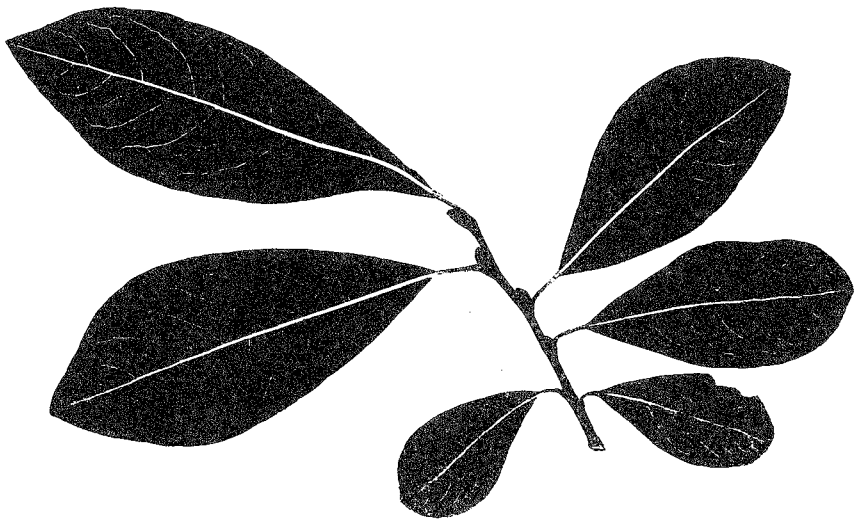
X 1

Scouler Willow

23



capsule X 5



BEBB WILLOW

GROUP 1
Broadleaf, alternate, simple

Salix bebbiana

NATIVE

Named for Michael Bebb, an early willow specialist

FAMILY — SALICACEAE

Bebb willow, like Scouler willow, is a forest plant, although it is not as common as Scouler. It also occurs along streams in the higher elevations of the big sagebrush zone. It has a wide range in Idaho, virtually statewide, although our data is still too sparse for an accurate range map.

Bebb willow appears to be absent or rare from the warm canyons of major rivers. In mid-elevation coniferous forests it is largely a riparian species, occasionally forming a small tree up to 9 or 10 inches or so in diameter. At higher elevations, particularly in northern Idaho, Bebb willow is found as a successional plant, sharing brushfields after fire or logging with Scouler willow. Here it is a many-stemmed shrub. Because it dies shortly after coniferous shade develops, it is uncommon beneath stands of taller trees. Scouler willow, by contrast, is shade tolerant and will live many decades beneath all but the most dense canopy of conifers.

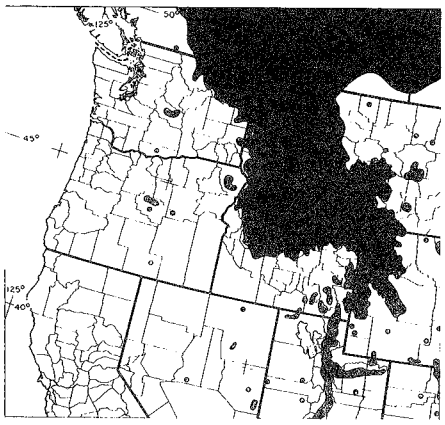
Since Bebb willow leaves are so similar to those of Scouler willow, many streamside Bebbs have probably been mistaken for the more common Scouler. This may be a major part of the reason for the insufficient geographic data on Bebb willow (8, 11).

Differentiating Bebb from Scouler willow can be tricky. Look at many leaves to get a sense of what is "average." Note in particular the leaf tips—mature leaves mostly have pointed tips in Bebb and are mostly rounded in Scouler. Should your specimens be in flower: Bebb willow flowers expand with the leaves on leafy side branches, while Scouler willow flowers bloom before the leaves emerge—either directly on the stem or on very short side branches, which may have a tiny leaf or two. If you're fortunate enough to have capsules, identification is much more positive. Capsules of Bebb are long-stalked and have a long, narrow tip; those of Scouler have a short stalk and a short tip.

Mostly riparian, not tolerant of shade; usually a medium to tall shrub, with distinctly rounded crown outline. Leaves mostly widest near or above the middle, undersides silvery; tips on mature leaves pointed.

Nowhere common. Scattered along Lemhi River, Leadore to Salmon town; North Fork Salmon River; roadside meadows between Coeur d'Alene and Sandpoint.

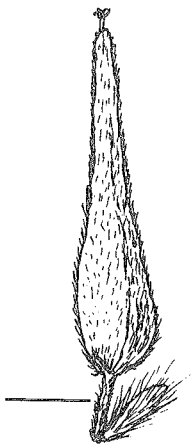
Diameter 32 inches, height 23 feet, near Elba, Cassia County, largest known in the United States.



X 1

Bebb
Willow

25



capsule X 5

WHIPLASH WILLOW

GROUP I
Broadleaf, alternate, simple

Salix lasiandra
variety *caudata*
(*Salix caudata*)

NATIVE

caudata means "tailed," referring to the tapered leaf tip

FAMILY — SALICACEAE

GROUP I

Whiplash willow is one of the most common willows in Idaho, and one of the easiest to identify. While it is mostly a tall, several-stemmed shrub, it often forms a tree. Whiplash willow trees generally have several stems and may reach diameters of 2 feet. This species has a very wide ecological amplitude. It is found along our lowest-elevation rivers, such as the Snake and Clearwater near Lewiston. At the other extreme, it can be found as a shrub in subalpine meadows. It thrives along streams in the sagebrush zone and in all forested zones except the high subalpine. It seems notably absent in side streams of the bunchgrass zone in the western canyons, thus whiplash willow and white alder are seldom associates. One requirement of whiplash willow seems to be that it must grow near water; while it can be located on lakeshores, it is primarily a streamside/riverside species.

Like most willows, twigs of this widespread species are enjoyed by both deer and elk, though the tree is not often heavily utilized because the deep snows of creek bottoms make it difficult for the animals to browse in winter. Beavers love it and are often responsible for the plants remaining as shrubs, since repeated cutting prevents development of a large trunk.

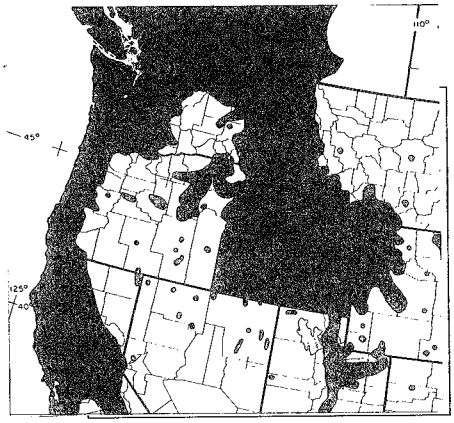
It is called "whiplash willow" because of the long, tapered tip on the leaves. In fact, the tip is often bent a bit, heightening the impression of a whip. One might also envision a "tail" on this long, curved leaf apex, and hence the name *caudata,* meaning "tail." This leaf characteristic is an important identifying feature. No other native or escaped willow in Idaho has such narrow a leaf with a long, slender tip. The underside is pale green, not silvery or glaucous. Generally, there are one or two wartlike glands near the base of the leaf blade. Leaves and twigs may be glabrous or pubescent. In all, it is a good willow to get acquainted with, for whiplash willow grows from the Canadian boundary to Bear Lake and from Salmon to Owyhee County—truly statewide and truly easy to identify (11).

Leaves narrow with a long, tapered tip, green below.

Along Pend Oreille River and Lake Pend Oreille; Chatcolet Lake, Heyburn State Park; lower Weiser, Payette, and Boise rivers; North Fork to Challis along Salmon River; Henry's Fork River, Fremont County.

Diameter 18.5 inches, height 49 feet, East Fork of Salmon River, Custer County.

Typical habitat.



green below

Whiplash Willow

27

X 1

EUROPEAN WILLOW

GROUP I
Broadleaf, alternate, simple

Salix X *rubens*
(*Salix alba* X *fragilis*)

ESCAPED
fragilis refers to the easily broken branchlets

FAMILY — SALICACEAE

For many years, certain tree willows in many parts of Idaho have been considered to be *Salix lasiandra* var. *lasiandra*—Pacific willow. Recent observations leave no doubt that some other willow has been masquerading as Pacific willow! One of the impelling observations has been that there are no male plants, an intolerable situation for a natural population. These mysterious willows also have consistently different leaves and capsules when compared to confirmed Pacific willow. Another important factor is that populations are generally localized and near human habitation.

With present knowledge, it appears that this confusing tree willow is a hybrid between two Eurasian willows, *Salix alba* and *Salix fragilis,* both widely escaped in eastern North America. Preventing positive identification is the lack of male flowers, since confirmation depends on a stamen count. There is an outside chance that some other hybrids may exist in the Idaho populations. *Salix alba* (white willow) and *Salix fragilis* (crack willow) readily hybridize (43), and there are a number of other forms and hybrid combinations.

For convenience, I'll just call this group "European willow" until more study clarifies the situation. European willows form large trees. Dispersal is like that of golden willow: the brittle live branchlets break off, land in water, and float to another site. Some become lodged in mud or debris, take root, and develop into new plants. Since European willow branches root so easily, they are commonly used to plant along streams to control bank erosion. More than likely, this is how they became so common in parts of Idaho. They are so prevalent in the Palouse area of northern Idaho and eastern Washington that for years they were thought to be native, and hence they were misidentified as the similar Pacific willow (30).

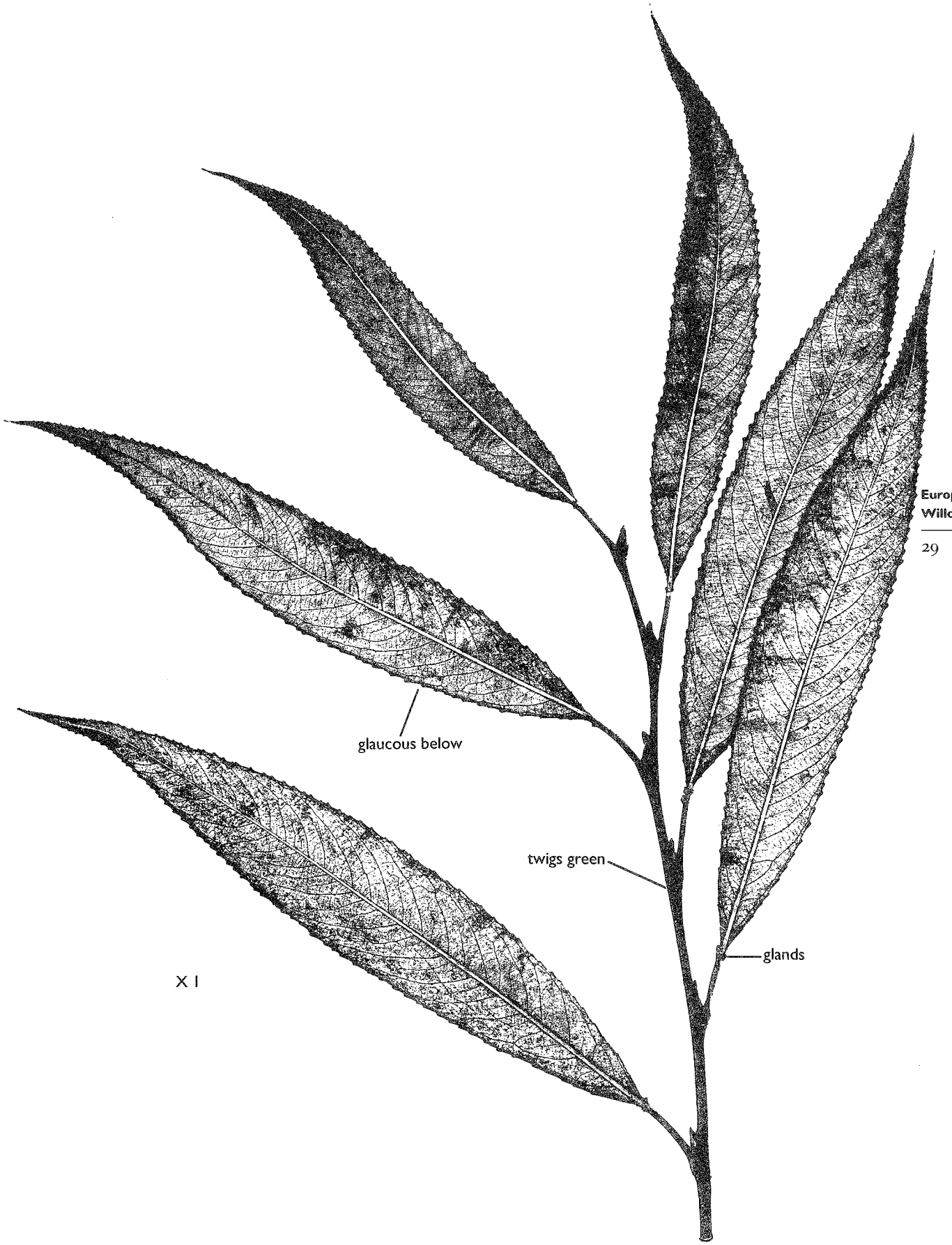
European willow is common on the Palouse Prairie with populations in riparian habitats from east to west across the Snake River Plain and scattered along the rivers of southwestern Idaho. European willow can be a large tree, and even young plants are vigorous and have the appearance of potentially getting much larger.

While Pacific willow (*Salix lasiandra* var. *lasiandra*) is commonly listed as an Idaho native, we have very few records that have been confirmed by experts. The fact is, we aren't certain of its range or of its size, if indeed there are any extensive native populations.

European willow forms a sizable tree; no male flowers in population; large leaves with glandular teeth, glands at base of blade, and silvery beneath; twigs green.

Palouse Prairie and vicinity; north shore of Black Canyon reservoir, Gem County; along lower Boise and Payette rivers; west shore of Bear Lake in Bear Lake County.

Diameter 58.3 inches, height 75 feet, University of Idaho campus, Moscow (cultivated).



European Willow

PEACHLEAF WILLOW

GROUP I
Broadleaf, alternate, simple

Salix amygdaloides

NATIVE

amygdaloides means "like an *amygdalus,*" the Latin name for peach trees, which have similar leaves

FAMILY — SALICACEAE

GROUP I

This willow does not have leaves like peach leaves, rather, despite the scientific name, the leaves are more similar to those of almond trees, which at one time were placed in the genus *Amygdalus.*

Peachleaf willow, native over much of Idaho, is usually a shrub, and, like dozens of other willows, is difficult to identify. On the Snake River Plain and particularly in southwestern Idaho, however, it becomes a tree, and identification becomes much more certain. The range map reflects only those areas where peachleaf willow is expected or known to become a tree. Look at the leaves of the tree willows of Idaho (see p. 21). Notice that peachleaf willow has relatively longer petioles and a less tapered apex than golden or European willows. Leaves are glandless, or nearly so. Branches on peachleaf willow tend to droop (the leaves hang downward); while difficult to explain, this "droopiness" is a good field characteristic (11).

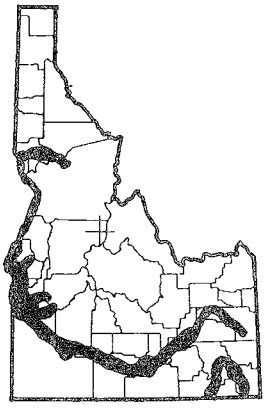
Peachleaf, whiplash, and European willows often grow to tree size in southwestern Idaho. To the careful observer, the branches and leaves of peachleaf willow are more drooping; leaves are somewhat wider in relation to length; glands are tiny or absent.

Tree willow; leaves with a short-tapered apex and without glands, or with very small glands; leaves tend to droop on pendulous branches.

Lower Bruneau River; near Bruneau; Snake River near Fruitland; Snake River near Lewiston; Thousand Springs Scenic Route, from Bliss to Twin Falls; Bear River near Preston.

Diameter 22.5 inches, height 42 feet, near Bruneau, Owyhee County.

Note drooping leaves.



Peachleaf Willow

31

X 1

sprout leaf

glands tiny or none

GOLDEN WILLOW

GROUP I
Broadleaf, alternate, simple

Salix alba
variety *vitellina*

ESCAPED

vitellina means "egg-yolk yellow"

FAMILY — SALICACEAE

Golden willow, a native of cold interior Europe and Asia, has been planted in the interior western United States for many years. It is very cold-hardy and will take considerable drought for a willow. Golden willow has been planted all over Idaho, primarily for windbreaks and to control streambank erosion, although it is commonly grown as an ornamental in rural areas. It quickly matures to tree size. A golden willow near Wallace is 68 inches diameter and 58 feet tall, until recently the largest known in the United States. The common weeping willow in Idaho is *Salix alba* var. *tristis,* which has strongly drooping branches and yellow-green twigs.

Most of the golden willows in Idaho are likely related. In fact, many are clones. The reason for this conclusion is simple: we've never been able to find a female, seed-bearing plant. Idaho's male golden willows are propagated by cuttings. In fact, most nurseries sell only cuttings ready to root. In the spring, cuttings are inserted in moist soil, and most will root to become young trees.

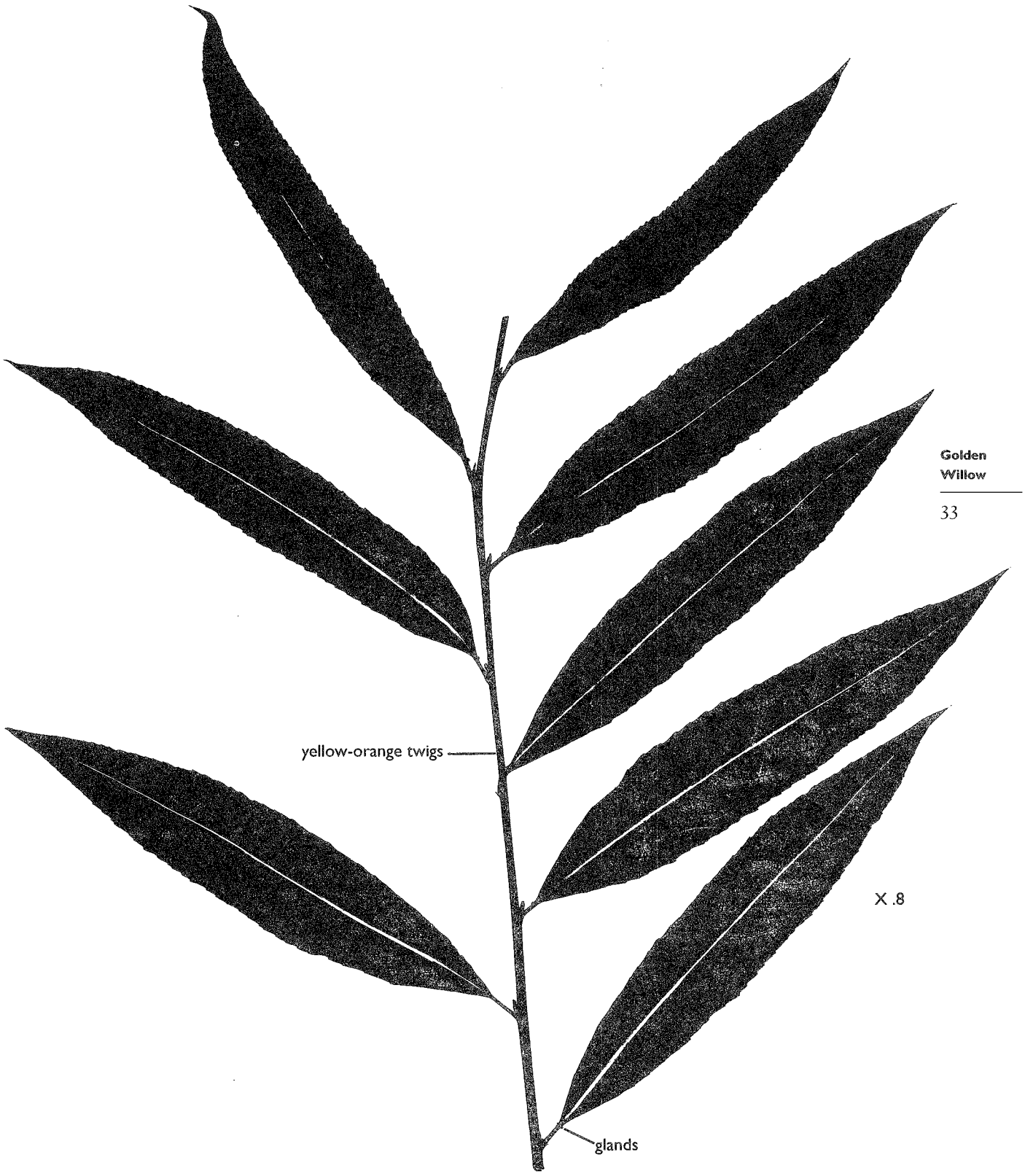
Golden willow has escaped along streams, rivers, and even on the edges of lakes, but never far from farms or towns. As far as we know, it spreads only vegetatively, that is, from branches that break off trees and are carried downstream to eventually become buried in mud and form roots and a new plant. Escaped plants have been found only downstream from established trees or along lakeshores.

This attractive tree takes both its scientific and common names from the bright orange-yellow twigs. In fact, it is most easily identified between fall and spring, when trees are bare of leaves. Without leaves, the orange twig color is an almost positive identifying feature. Leaves are similar to both whiplash and European willow. Whiplash willow leaves are much more tapered at the tip than those of golden willow. European willow leaves, while generally larger, are so similar that the orange-yellow twig color of golden willow is the quickest means of separating these two escaped trees. Golden willows are capable of becoming large trees. However, golden willow has a short life span, as do all willows, and large trees often have rotten branches and severe heart-rot, making them quite hazardous.

Orange-yellow twigs on a tree willow; near farms or towns.

Streamsides on the Palouse Prairie; along streams and irrigation ditches in the farmlands of southern Idaho.

Diameter 68 inches, height 58 feet, Silverton, Shoshone County, until recently largest known in the United States (cultivated).



Golden Willow

33

COYOTE WILLOW

GROUP I
Broadleaf, alternate, simple

Salix exigua
Subspecies *exigua*
Subspecies *melanopsis*
Also known as sandbar willow

NATIVE
exigua means "small-sized"

FAMILY — SALICACEAE

GROUP I

Anyone who has fished Idaho's rivers has doubtless fought through thickets of silvery coyote willow. This willow is common on sandbars, gravel bars, and among rocks along our rivers and larger streams, particularly at low to mid-elevations. Here it forms dense, shrubby patches after flood disturbance. Occasionally it becomes a small tree, most often along the quiet stretches of a river or on smaller streams.

Coyote willow adapts well to riverside habitats where floods continually rearrange the sand and gravel bars. It has extensive underground roots that sprout when the tops have been removed. Thus, coyote willow occurs in dense shrub stands, with hundreds of individual stems arising from the roots. They are valuable in protecting streambanks from erosion. Bank beavers relish the bark.

There are two major forms of coyote willow in Idaho, and these subspecies are sometimes considered separate species:

	Teeth	Pubescence	Form
subspecies *melanopsis*	few to numerous rounded teeth	little to none	always shrubby
subspecies *exigua*	few or no small teeth	moderate to very dense	usually a shrub, occasionally a small tree

In southern Idaho, especially along the lower Boise, Payette, and Weiser rivers, coyote willow grows with Russian-olive (see p. 96). Although both have very silvery leaves, they can be separated easily.

Species	Leaves	Fruit	Habit
coyote willow	narrow, very short petiole; hairy	dense cluster of small capsules, cottony seeds	many separate stems form a colony
Russian-olive	narrow, long petiole; scaly	¼" silver berry	1 to few stems, individual trees

Very narrow leaves with almost no petiole, with or without a few teeth on margins, and generally silvery pubescent on both sides; along rivers or large streams just below high-water lines.

Boise River below Boise; Clearwater River near Lewiston; Little Salmon River along U. S. 95 south of Riggins.

Diameter 5.3 inches, height 24 feet, near Leadore, Lemhi County (subspecies *exigua*).

Note leaves and male flowers.

flowering branchlets

Coyote Willow

35

X 1

vigorous twig

leaf variations

BIRCHES

GROUP I
Broadleaf, alternate, simple

Betula

betula is the classical Latin name for birch

FAMILY — BETULACEAE

GROUP I

Birches have some things in common with willows. Both often grow near water, and both have intergrading forms that make positive identification in some areas difficult (8). Nonetheless, birches are generally easily recognized by their bark. Note the photos of bark, and remember that no other wild trees in Idaho (except two of the cherries) have bark like birches. Birch and cherry leaves differ in appearance, so separation is not difficult.

Technical description: Leaves: 1 to 4 inches long, with jagged, sharp-pointed, irregular teeth on margin. Twigs: slender, usually red-brown, with scattered, clear, rounded bumps (resin drops); lacking a true terminal bud. Fruit: a small cylindrical, papery "cone" that falls apart when mature, scattering tiny winged seeds. Bark: white to dark red-brown, smooth, papery, and marked by prominent horizontal lenticels.

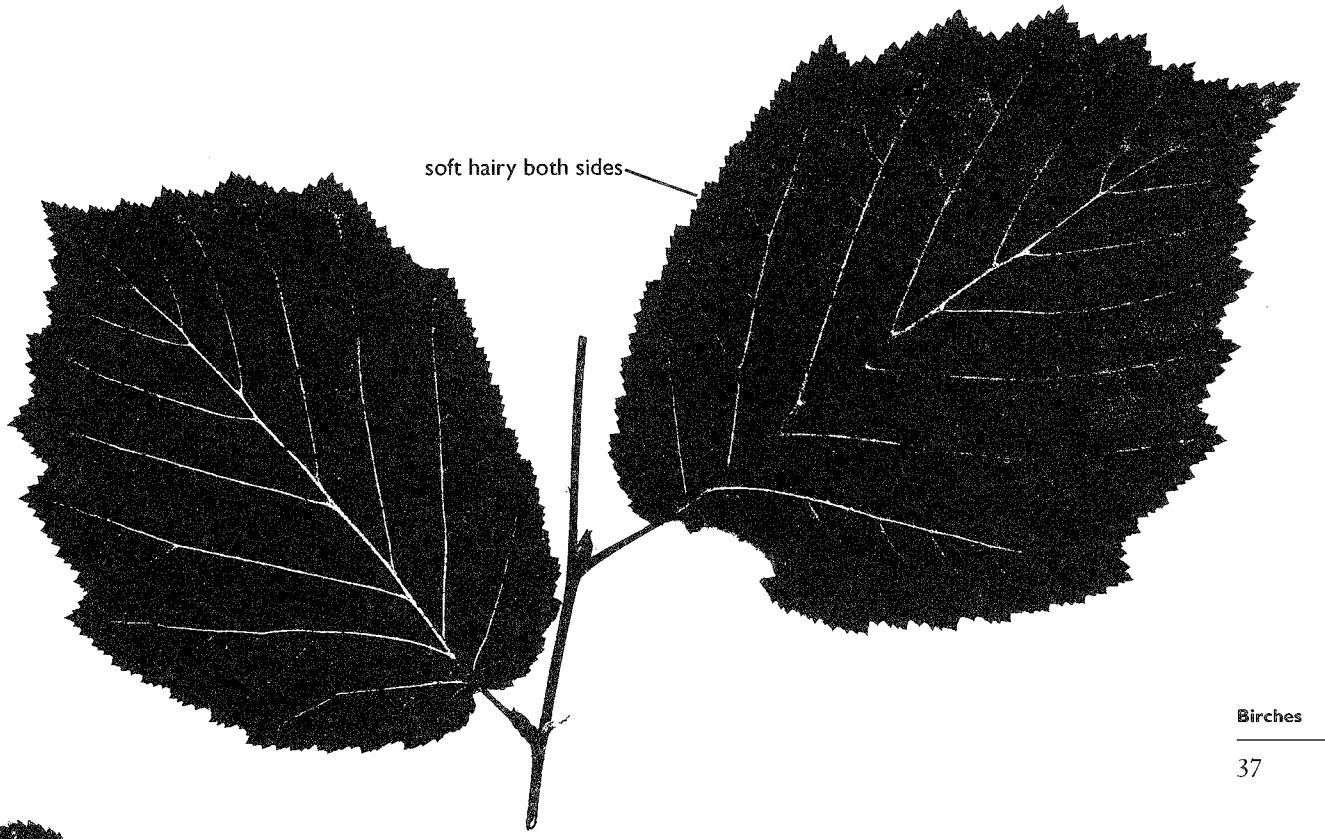
IDAHO BIRCHES

Species	Leaf Size	Texture of Mature Bark	Color of Mature Bark	Tree size
paper birch	2–4"	peeling in thin papery strips	white to light brown	medium
water birch	2–3"	tight, not peeling naturally	medium to dark brown	small to medium
shrubby birches	1–1½"	tight, not peeling naturally	dark brown	shrubby, 5 feet (*B. glandulosa*) to 12 feet (*B. pumila*)

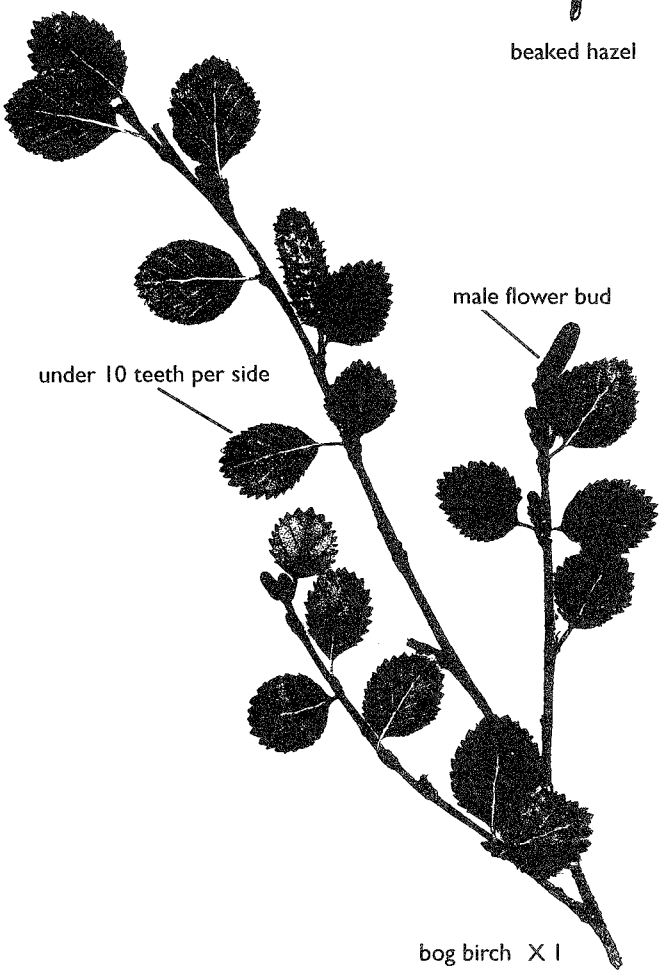
Dwarf birch (*Betula pumila*) has recently been found in far-northern Idaho, the first record in the western United States. It is a tall shrub, 6 to 15 feet in height, with leaves about 1 to 1½ inches long and with more than 10 teeth on each side. It occurs only in the Kootenai and Moyie river drainages in Boundary County; may be seen at Herman or Bonner lakes (10).

Bog birch (*Betula glandulosa*) was included in earlier publications on Idaho trees. However, it is always a shrub and rarely exceeds 6 feet in height. It grows primarily in subalpine areas in bogs, along streams, and in wet meadows. Leaves are oval and less than 1 inch long, with under 10 teeth on each side. Hybrids between *B. pumila* and *B. glandulosa* (*B.* X *sargentii*) occur from the Priest River drainage south through the western Idaho mountains in moist habitats. Pure *B. glandulosa* occurs in east-central and southeastern Idaho (10).

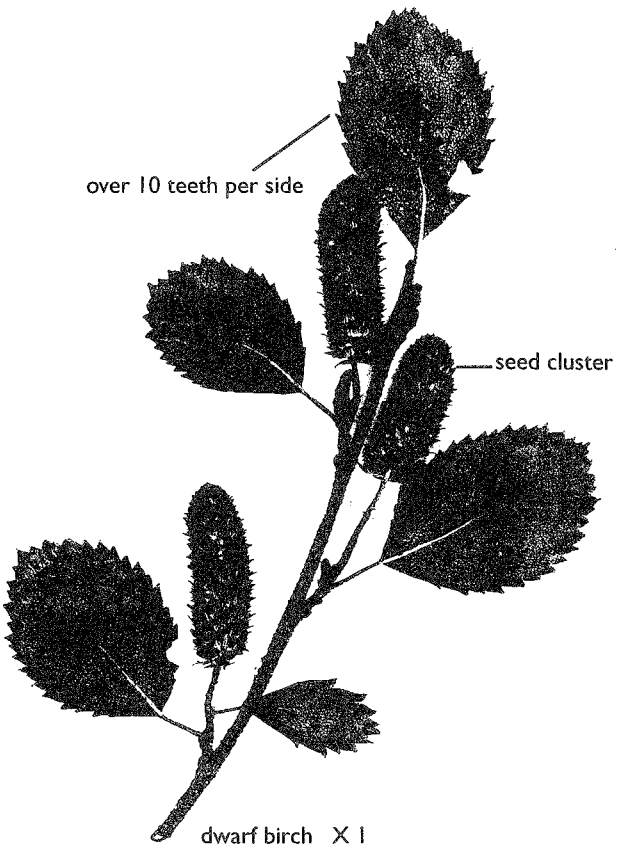
Beaked hazel (*Corylus cornuta*) is often listed as a small tree in the western United States. We have no record of this northern Idaho native being anything but a tall shrub in this state. Beaked hazel is found in lower elevation forests along the Kootenai River valley for several miles south of the Canadian border, along the Moyie River almost as far south as Bonners Ferry, and near Oldtown in Bonner County.



beaked hazel X 1



bog birch X 1



dwarf birch X 1

PAPER BIRCH

GROUP 1
Broadleaf, alternate, simple

Betula papyrifera
northwestern paper birch
Betula papyrifera variety *subcordata*
western paper birch
Betula papyrifera variety *commutata*

NATIVE
papyrifera means "paper-bearing"

FAMILY — BETULACEAE

GROUP 1

Paper birch is a northern tree, its range stretching in a great arc from Alaska to the northeastern states (32). In Idaho, paper birch is confined to the northern portion, where it appears in young forests mixed with conifers, principally in the grand fir-western redcedar-western hemlock zone. It becomes a medium-sized tree, up to 36 inches or more in diameter. While many associate the white, chalky bark of paper birch with northern forests, in Idaho not all paper birches have pure white bark. The variety *subcordata* (northwestern paper birch) has light brown to medium-brown bark and grows chiefly in the Clearwater River drainage. The variety *commutata* (western paper birch) occurs primarily from Coeur d'Alene north; most mature trees have near-white bark. It is particularly common near Pend Oreille and Priest lakes.

Within the range of the white-barked variety *commutata,* native birches are found in yards and parks, as seen near Sandpoint. But in the rest of Idaho, the common cultivated white-barked birches are mostly forms of the European *Betula pendula.* When bark is peeled from a birch trunk, an ugly black scar remains for the life of the tree. European birches have tighter bark, therefore it is less tempting to peel, resulting in fewer ugly scars (67).

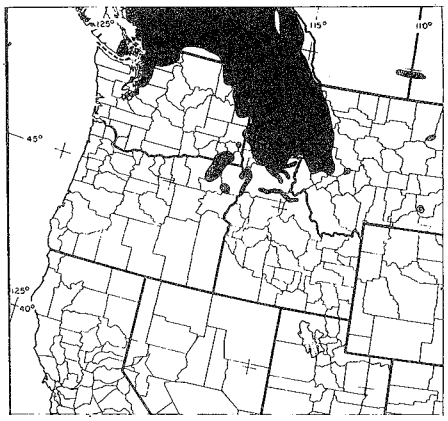
In trying to identify Idaho birches, note carefully the distribution maps. North of Coeur d'Alene, western paper birch is common as a seral tree in coniferous forests, especially around Pend Oreille and Priest lakes. In the Clearwater drainage, upstream from Ahsahka on the North Fork, or from Lowell on the Lochsa/Selway River, northwestern paper birch is found in young forests. But on the western front of the Northern Rockies, from Coeur d' Alene to Cascade, paper birch hybridizes with water birch and identification to variety or even species is generally very difficult. Examine carefully the material on water birch.

Peeling (exfoliating) bark, leaves 2 to 3 inches long with slight hairiness beneath; white bark from Coeur d'Alene north (var. *commutata*), brown bark in Clearwater Valley (var. *subcordata*), intergrading forms between paper birch and water birch from Coeur d'Alene to Cascade; twigs on paper birches have few or no crystalline glands (resin drops).

White-bark variety *commutata:* around Priest Lake, Pend Oreille Lake, and in Sandpoint. Brown-bark variety *subcordata:* lower Lochsa and Selway rivers, along U. S. 12.

Western paper birch (var. *commutata*): diameter 52 inches, height 75 feet, Sandpoint, Bonner County. Northwestern paper birch (var. *subcordata*): diameter 14.5 inches, height 65 feet, Hells Canyon, Adams County; national co-champion.

Note white, peeling bark.



Paper Birch

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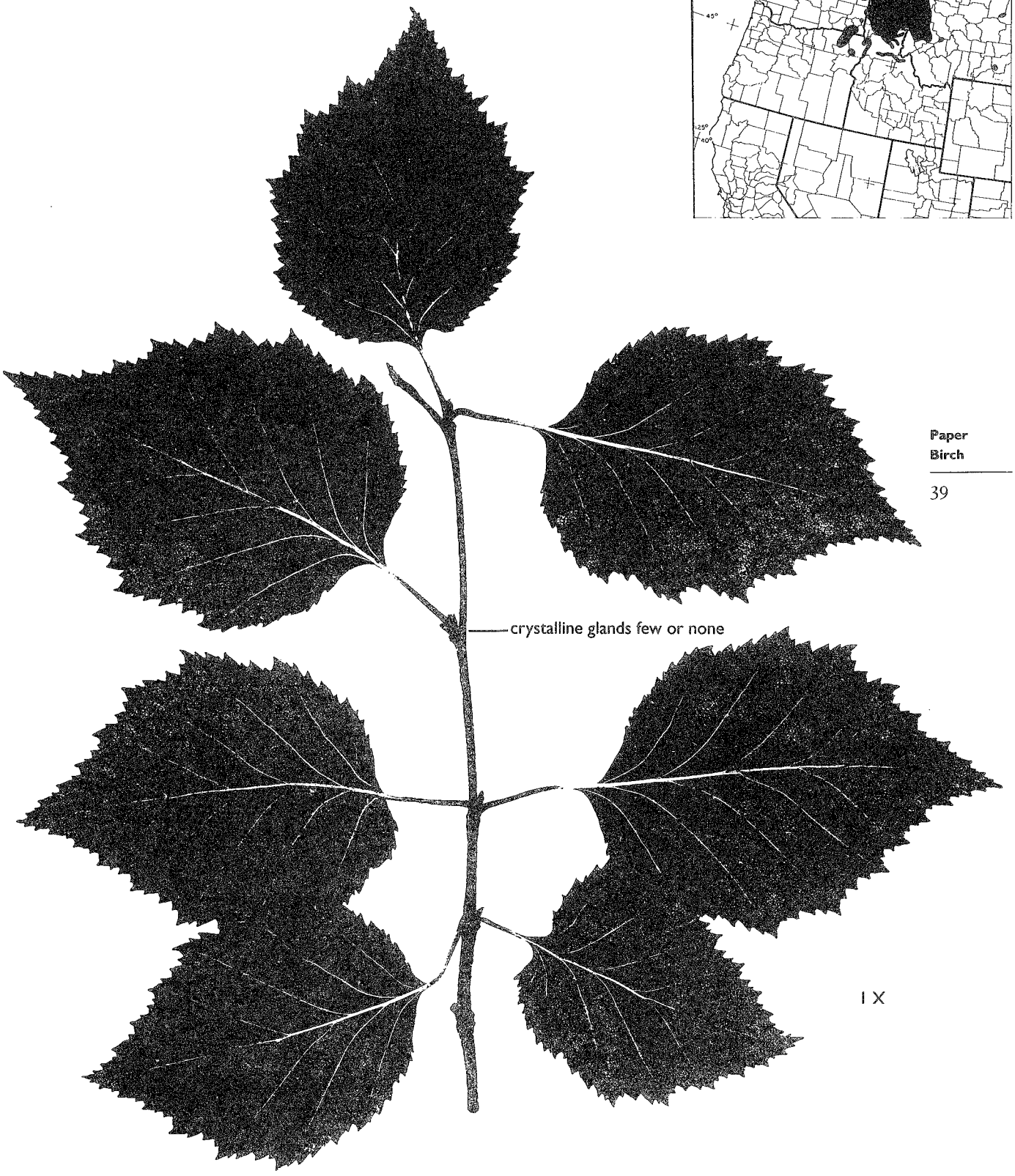


IX

WATER BIRCH

GROUP 1
Broadleaf, alternate, simple

Betula occidentalis
variety *inopina*
variety *occidentalis*
(*Betula fontinalis*)
(*Betula* X *piperi*)

NATIVE
occidentalis means "western"

FAMILY — BETULACEAE

GROUP 1

This is the most common birch both in Idaho and in the interior of the western United States. It is a small- to medium-sized tree, usually with several stems from the same base. It prospers along perennial streams, hence the name "water birch." In northern and west-central Idaho, water birch occurs along the western forest boundary; there it intergrades or hybridizes with paper birch. Perhaps this is why the largest water birches grow along the main streams leading into the lower Salmon and middle Snake rivers, where they reach diameters of over 20 inches. South and east of west-central Idaho, water birches are smaller in stature and have smaller leaves. Generally, north of the area affected by continental glaciation (a bit north of Coeur d'Alene—see Figure 2) water birch is rare and the white-barked western paper birch becomes prevalent. On the western fronts of northern Idaho mountains "pure" water birch does occur at lower elevations. Intergrades between paper and water birches are the rule rather than the exception in much of the remainder of northern Idaho, at least as far south as the Salmon River. For example, in the Clearwater drainage, water birch is at the western, lower portion; intergraded forms occur as one proceeds eastward upstream, and then, starting at about the Lochsa/Selway rivers, northwestern paper birch becomes common and usually can easily be differentiated from water birch by the peeling bark.

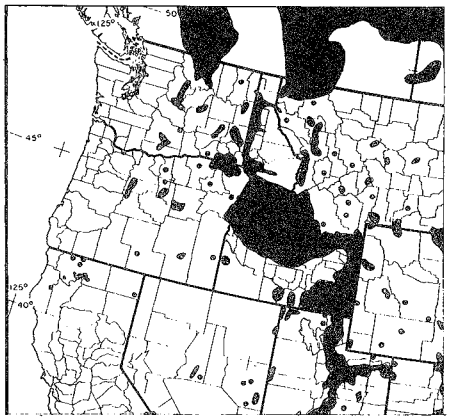
Hybrid birches are hard to identify accurately because they have characteristics of both parents. The name *Betula* X *piperi* is sometimes given to those specimens that are suspected hybrids. Two varieties of *Betula occidentalis* have been described—variety *inopina,* with fine hair on the young twigs, and variety *occidentalis,* which has little or no fine hair on young twigs. There seems to be some question, however, as to whether the variety *inopina* may be a hybrid with paper birch. South of Cascade, paper birch features virtually disappear from the population, and water birch becomes the only wild tree birch. See the discussion of paper birch in reference 30, volume 2.

Bark dark brown, not peeling (exfoliating) from tree; leaves 1 to 2 inches long with little or no hairiness beneath; twigs with many crystalline glands (resin drops).

Birch Creek along State Highway 28, south of Gilmore, Clark County; Weiser River, U. S. 95 near Cambridge; Little Salmon River, U. S. 95; Portneuf River south of Pocatello.

Diameter 29 inches, height 50 feet, near Burley, Casila County.

Note tight, shiny brown bark.



Water Birch

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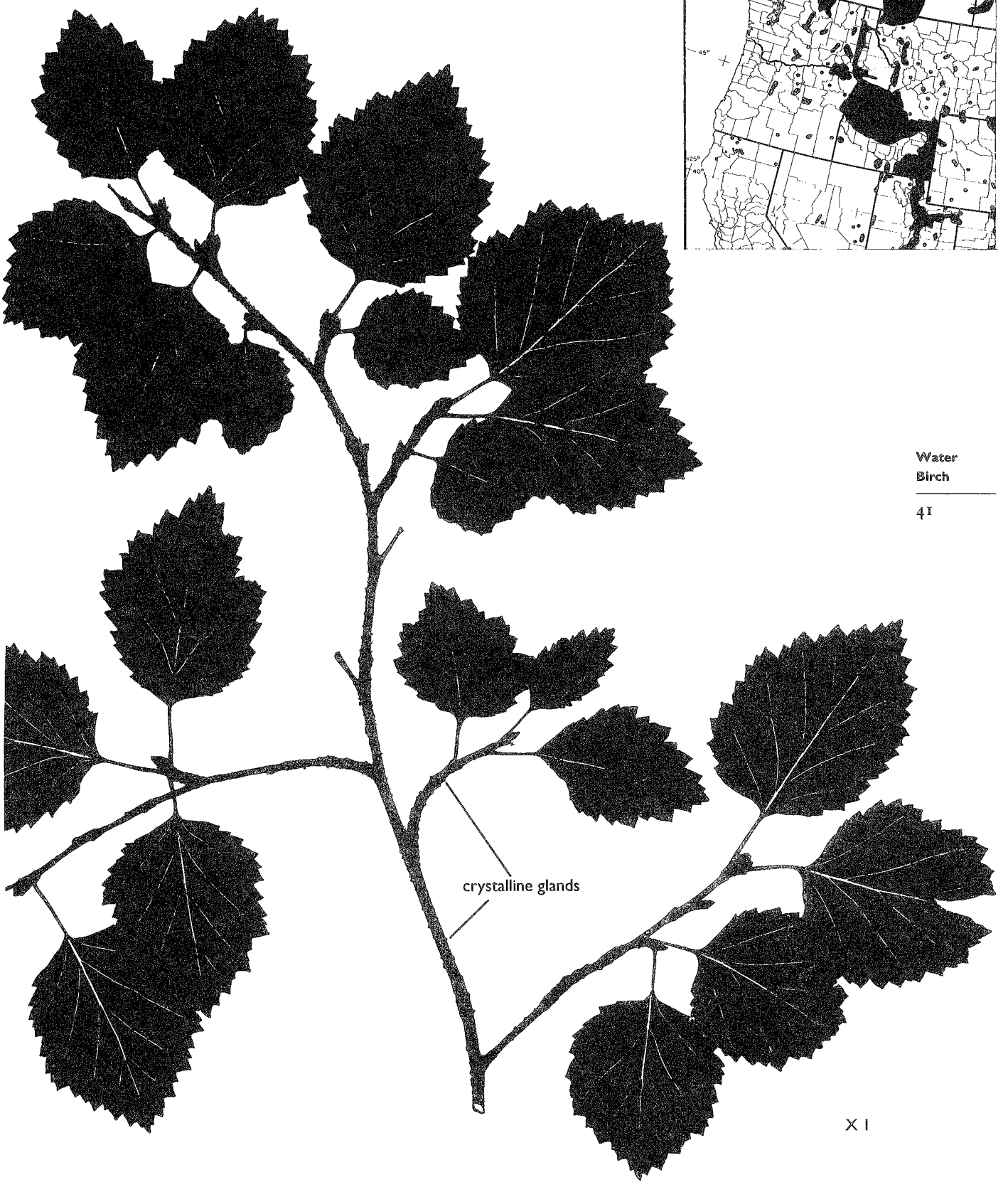


X 1

ALDERS

GROUP I
Broadleaf, alternate, simple

Alnus — *alnus* is the classical Latin name for alders

FAMILY — BETULACEAE

In the forested areas of Idaho, hardly a stream is without one species of alder or another growing with its roots in the moist streamside soil. Idaho has four native alders, and among them they cover the state very well (8, 34).

Alder roots give protection to streambanks, helping to prevent bank erosion. Find an alder next to a mountain stream and look into the water—masses of red-pink alder roots will be soaking up the water. Micro-organisms in alder roots add nitrogen to the soil. Unfortunately, alders aren't good food for big game, nor do beavers care for the bark. Small birds, like pine siskins, eat the tiny seeds.

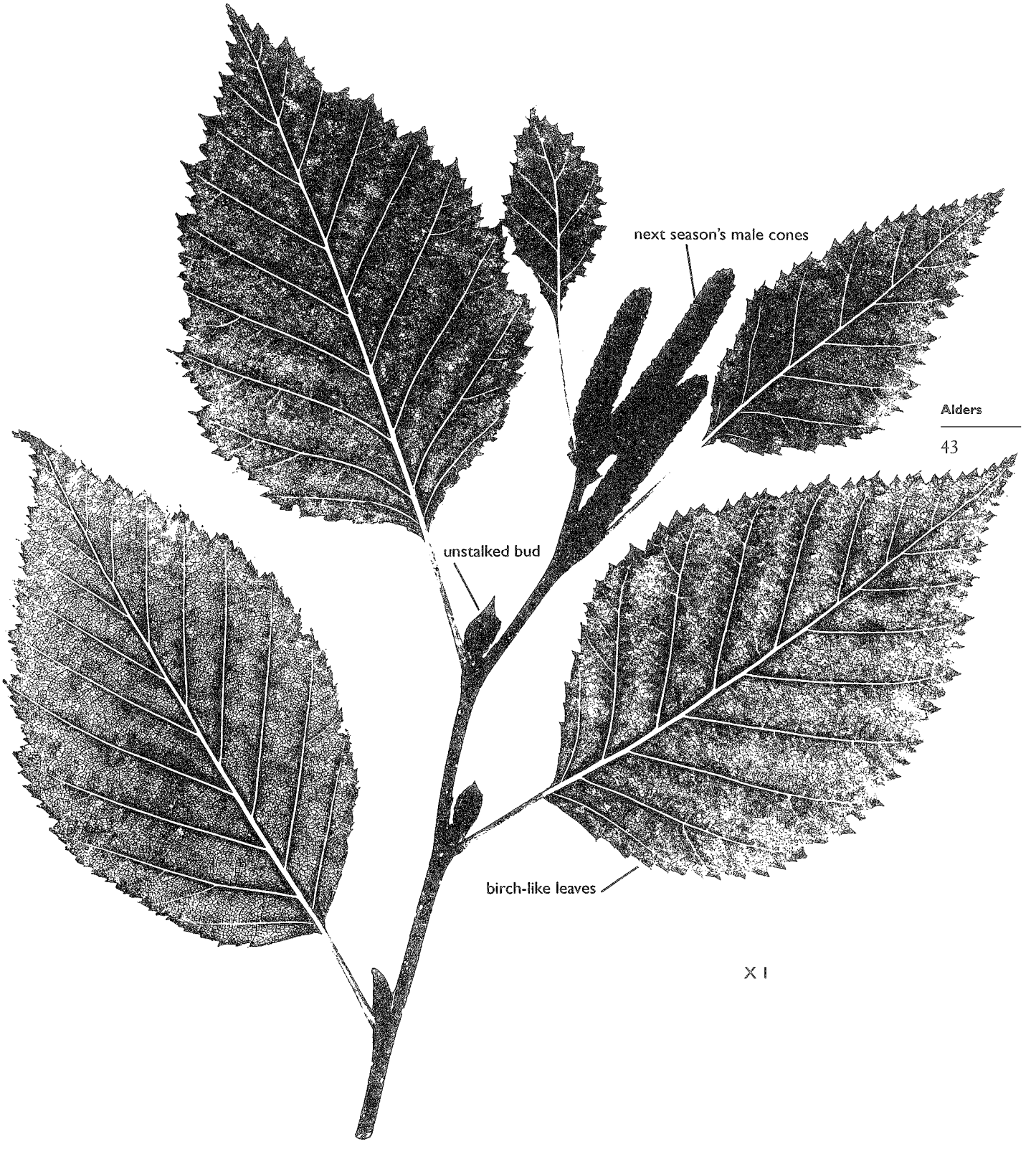
Alders and birches have much in common. They prefer moist soil and they're closely related, being in the same plant family. They can be confused, but there are two easy ways to separate them: First, alders lack the typical birch bark, for alder bark is grey, with small wartlike knobs (lenticels) on the surface. Second, alder fruits are really miniature woody cones. Some alder cones remain on the tree for a year, while birch cones disintegrate at the end of the growing season and are more flimsy. Alder cones look so much like those of conifers that they are commonly used for Christmas decorations (Pl. 6).

Technical description: Leaves: 2 to 5 inches long, sharply toothed or with many somewhat rounded teeth; dark green. Buds: borne on a short stalk (except Sitka alder), terminal bud present. Fruit: seed a small, winged nutlet, like birch but borne in a small woody cone whose scales do not drop off. Bark: thin, grey, not papery, with small, raised, rough spots.

IDAHO TREE ALDERS

Species	Leaf Tip	Leaf Margin	Idaho Habitat
thinleaf alder	sharp- pointed	large teeth, double toothed	forest streams, widespread
white alder	rounded	small irregular teeth	streams, bunchgrass zone, western canyons
red alder	sharp- pointed	medium teeth; margin rolled under edge of leaf	streams, western redcedar forests

Sitka alder (*Alnus sinuata*) is sometimes listed as a tree, but there is no record of this species becoming a tree in Idaho. It is a shrub of middle to high elevations found in the northern two-thirds of the state. Most commonly found in dense colonies, it grows along road banks and in open brushfields and avalanche chutes of the higher mountains. In northern Idaho, it also occurs in moist forest, particularly with western hemlock and western redcedar. Sitka alder is distinguished from other alders by its buds without stalks, thinner cone scales, and thin cone branches. The leaves look more like birch than those of any other Idaho alders.



X 1

Sitka alder

THINLEAF ALDER

GROUP I
Broadleaf, alternate, simple

Alnus incana
(*Alnus tenuifolia*
(*Alnus incana* variety *occidentalis*)
Also known as mountain alder

NATIVE

incana means "white," referring to hair on buds

FAMILY — BETULACEAE

GROUP I

This is the most common alder in Idaho, perhaps the most common in the world. It grows across Europe and northern Asia, and from the Atlantic to the Pacific in North America. Thinleaf alder is part of a species complex, that is, a group of closely related species (or sometimes, a single species with many varieties). The scientific names reflect this complexity. *Alnus incana* is a species of Europe, Asia, and North America; the group from western North America is the variety *occidentalis. Alnus tenuifolia* is another name often used for this western alder. Whatever scientific name is used, thinleaf alder is a well-established common name, derived from *tenuifolia,* which translates as "thin leaf."

Thinleaf alder is a small tree of forest streams, occurring mainly in the Douglas-fir and grand fir-cedar-hemlock zones. Occasionally it grows along streams in the higher elevations of the sagebrush/grass zone. Thinleaf alder also occasionally enters the lower parts of subalpine forests.

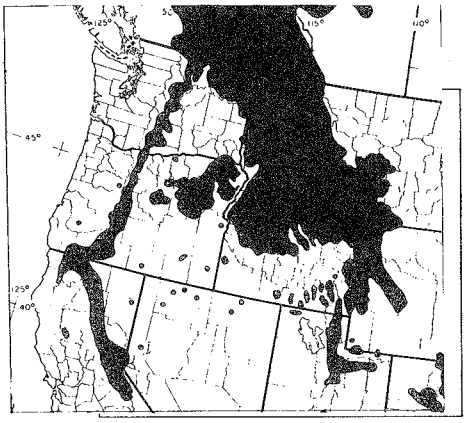
In northern Idaho, thinleaf alder might be confused with red alder where their range and habitats overlap. The buds of thinleaf alder are somewhat rounded, and when mature they are covered with short whitish hairs; red alder buds are pointed and hairless. Thinleaf alder leaves have large, sharp-pointed teeth, while red alder leaves have small teeth obscured by a margin that is rolled under. Thinleaf and red alder apparently hybridize where their populations overlap.

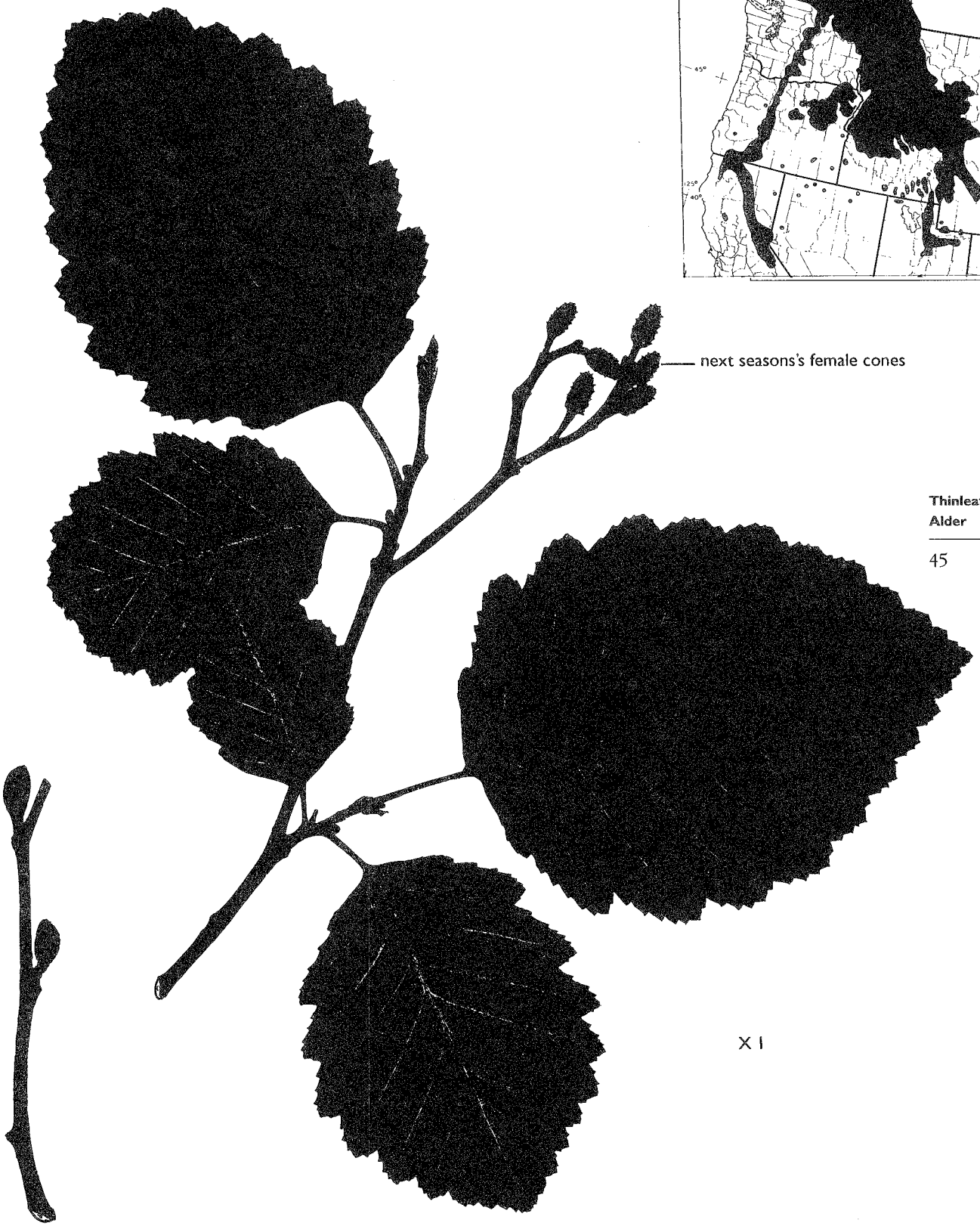
Leaf edges with sharp pointed, rather long teeth; winter buds stalked and rounded.

Forested streams, statewide.

Diameter 10.2 inches, height 30 feet, near McCall, Valley County.

Note female cones, last year's brown and present-season's green in mid-summer.





Thinleaf Alder

45

X 1

WHITE ALDER

GROUP I
Broadleaf, alternate, simple

Alnus rhombifolia

NATIVE

rhombifolia means "diamond-shaped leaves"

FAMILY — BETULACEAE

GROUP I

46

This alder loves heat and needs lots of water. Its main range is in California. Farther north, white alder grows in the deep valleys of western Idaho and in the lower Salmon and Clearwater and middle Snake river canyons. There are a few small populations in southwestern Idaho, even in the Owyhee Mountains. In the bunchgrass zone it is the principal tree along most streams, where it reaches diameters of nearly 4 feet, making it one of Idaho's largest native broadleaf trees (46).

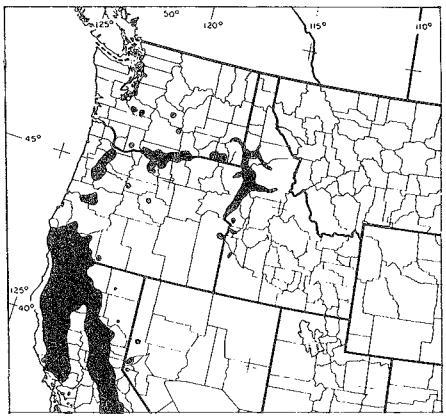
It is quite probable that white alder migrated into western Idaho during some interglacial period. We know that there were periods, thousands of years ago, when the climate of western Idaho was much warmer; white alder could have traveled eastward via the mountain streams in central Oregon to reach Idaho's western canyons. Now these Idaho populations are isolated, and the white alders, with their great demands for heat, are trapped in these warm canyons, the colder highlands on every side keeping them confined. The fact that the largest white alder known is in Hells Canyon despite the fact that a much larger population is in California, speaks eloquently of the uniqueness of the habitat. Several other state and national record big trees are found in Idaho's deep western canyons. White alder is a tree that one can recognize by habitat. If you can see an open hillside of bunchgrass, the alder in the streambottom most likely will be white alder.

Found along perennial streams in bunchgrass zone of western canyons; leaves rounded at tip.

Along Potlatch River near Juliaetta, State Highway 3; streams along the Salmon River, from White Bird to Riggins along U. S. 95; along Brownlee Creek, State Highway 71, Summit to Oxbow; side streams in Hells Canyon.

Diameter 41.4 inches, height 70 feet, Hells Canyon, Idaho County; the national record.

Note round-tipped leaves and last season's cones.



rounded tip

next season's female cones

immature female cones

X 1

White Alder

47

RED ALDER

GROUP I
Broadleaf, alternate, simple

Alnus rubra

NATIVE

rubra means "red"

FAMILY — BETULACEAE

Not many years ago red alder was unknown as a native tree in Idaho. Recently three main populations have been found: around Lake Pend Oreille, on the North Fork Clearwater River near the old Canyon Ranger Station, and in the lower Lochsa/Selway river area (33). Red alder hybridizes with thinleaf alder; thus, around Lake Coeur d' Alene, in the valley of the Palouse and lower St. Joe River, pure stands of red alder are not easily found, but individual trees with red alder characteristics do occur. Trees with red alder genes can often be spotted, since they are larger and single-stemmed—different than the more common thinleaf alder trees with which they are growing. Red alder is a species that grows mainly west of the Cascade Mountains from Alaska to central California. Here in Idaho, good development of this coastal species requires upwards of 30 inches of precipitation a year and the warmer temperatures of lower elevations, so red alder occurs from 1,400 to 2,500 feet in elevation (59).

The red alders in the Clearwater River drainage appear to be relics of more-widespread coastal vegetation that once existed in Idaho, perhaps some 10 million years ago during the Miocene epoch. At that time, the Cascade Mountains did not exist to block the warm, moist air from the Pacific. Northern Idaho probably had a climate more similar to coastal Washington today. As the Cascades arose, the interior climate became cooler, with drier summers. Much of the "coastal" vegetation disappeared. Today, red alder and Pacific dogwood are examples of these ancient times, relics of the past. Many Idaho native herbaceous plants and several shrubs have the same history. The red alders around the north end of Lake Pend Oreille have a different history. This area was covered by continental glaciers, which eliminated all vegetation. The red alders in the glaciated area, roughly from Coeur d'Alene north, must have reinvaded either from the St. Joe/Clearwater relict population, or, less likely, from the coast through southern British Columbia.

Red alder is a tree that requires bare soil and full sunlight for successful regeneration, thus we call it a "disturbance species." It establishes itself vigorously after fire, logging or road building in areas where western redcedar or western hemlock are the climax forest trees. As the forest grows, the conifers overtop the alders, and in the dense shade, alders die. But they have tiny wind-borne seeds that are blown onto bare soil. In the open sun the young alders grow and thrive and the cycle repeats. In the North Fork Clearwater River basin, logging activities have materially increased red alder habitat.

All alders have inner bark that turns rust-colored when wounded, just as a cut apple turns brown. In red alder, the bark runs a bright red-brown, hence the common name.

Restricted to low elevation western redcedar or western hemlock forests; leaves with edges turned under, whitish beneath; winter buds stalked, pointed, and hairless.

Lower Trestle Creek, north side of Lake Pend Oreille; North Fork Clearwater River between Isabella and Orogrande Creeks; scattered along side streams of the lower Lochsa River along U. S. 12.

Diameter 22.3 inches, height 110 feet, near Sandpoint, Bonner County.

Elk antlers exposed the inner bark.

pointed stalked buds

edges turned under

white below

X 1

WESTERN SERVICEBERRY

GROUP 1
Broadleaf, alternate, simple

Amelanchier alnifolia
(*Amelanchier florida*)
Also known as Saskatoon serviceberry
Pacific serviceberry

NATIVE
alnifolia means "alder-leaved"

FAMILY — ROSACEAE

GROUP 1

Folklore has it that serviceberry was named by western pioneers, who were taught by Indians to use the berries in pemmican, because the berries gave "good service." It is more likely, however, that the term has English roots. There the fruits of species of mountain-ash were used to flavor beer. The common name sarvis tree (from *cervis* tree, which is derived from the Latin for beer, *cerevisia*) came to be used for trees bearing this beer additive. Later the trees were called "sarvisberry," which in time evolved into "serviceberry". While the specific name, *alnifolia,* means "alder leaf," we must regard this as a flight of a botanist's fancy, for no alder has leaves similar to this serviceberry.

Serviceberry is usually a tall shrub, but it becomes a small, many-stemmed tree in a number of habitats. Along streams in Hells Canyon it reaches its greatest size, about 10 inches in diameter. In forests of grand fir, western redcedar, and western hemlock, it reaches 6-inch diameters and may be 35 feet tall. Serviceberry probably grows in more habitats than any other woody plant in Idaho. It is likely the most common shrub in the state. It may be found on rocky outcrops or along streams in the bunchgrass zone or in the sagebrush zone. It occurs in all forest areas up to the lower spruce-fir zone.

Four weakly defined varieties have been described for Idaho based mostly on minute differences in hairiness of flower parts (30). The geographical and ecological implications of these varieties are not understood. Big game find all varieties appetizing and birds, bears and fishermen like the fruits. The best I've found for eating are in extreme southeastern Idaho near Palisades Reservoir in Bonneville County.

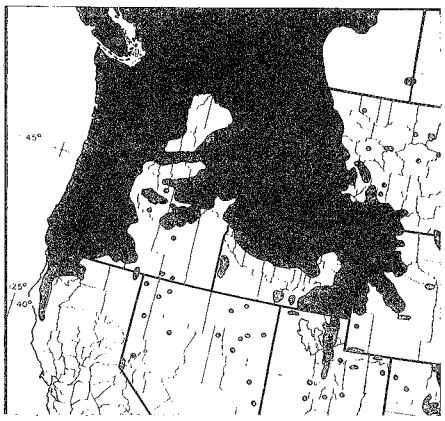
Technical description: Leaves: deciduous, alternate, simple, oval, 1 to 2 inches long; coarsely toothed, teeth usually on the upper one-third to one-half of the leaf. No glands on blade or petiole. Flowers: in small clusters, white and showy, our earliest native white-flowered shrub. Fruit: dark blue with whitish coating, looking much like a huckleberry; ¼ to ½ inch, juicy when on a moist site, edible but bland.

Leaves 1-inch round to elliptical with large teeth toward the tip only. It is generally the first white-flowered shrub on lower mountain slopes; fruits are blue-purple.

Lower mountain slopes throughout the state; Salmon, Clearwater, and Hells canyons; Fall Creek Ridge east of Ashton; along Palisades Reservoir; Pelican Ridge in Caribou County; Ponderosa Scenic Route, Boise to Lowman; Clearwater Canyons Scenic Route, Grangeville to Lewiston.

Diameter 9.6 inches, height 32 feet, near Whitebird, Idaho County.

Note early spring flowers and plump, tasty fruits.



immature fruits

Western Serviceberry

51

X 1

teeth variable

leaf variations

HAWTHORNS

GROUP 1
Broadleaf, alternate, simple

Crataegus
Also known as haw or thornapple

crataegus is the classical Greek name for hawthorns, from *kratos,* meaning "strength"

FAMILY — ROSACEAE

GROUP 1

A fairly recent list had 149 species of *Crataegus* in the United States, with over 1,100 published scientific names (42)! In the eastern United States this is a very difficult group to identify to species. In Idaho, however, the three species are relatively easy to separate, and the four varieties aren't too difficult.

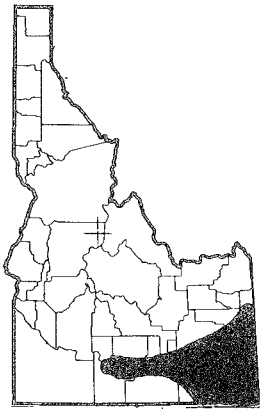
As for the genus *Crataegus,* it is the only group of native trees or shrubs in Idaho that has large leaves and thorns. Thorns are modified branches that are hard and woody and thus cannot easily be detached from the tree. Idaho has three native species of *Crataegus,* two with short thorns, black and Suksdorf hawthorn, and one with long thorns, Columbia hawthorn.

Hawthorns are valuable for a variety of wildlife in Idaho. The dense thickets of hawthorn, their twigs beset with sharp thorns, make excellent cover for song and game birds and many small animals. Hawthorns frequently appear in lines along fences or along small streams. These natural hedges are quite appropriate, for "haw" is Old English for hedge, while "thorn" is derived from a word meaning a "blade of grass" (sharp-pointed). The mature fruits of Idaho hawthorns, while sweet, tend to be dry and mealy—hardly tempting to humans. But birds love them; song birds such as robins and waxwings and game birds such as grouse, pheasant, and Hungarian partridge all relish the ripe haws. Despite the fact that two of our native species of *Crataegus* are both quite beautiful in form, flower, and fruit, almost all cultivated hawthorns in Idaho are either from the eastern United States or Europe.

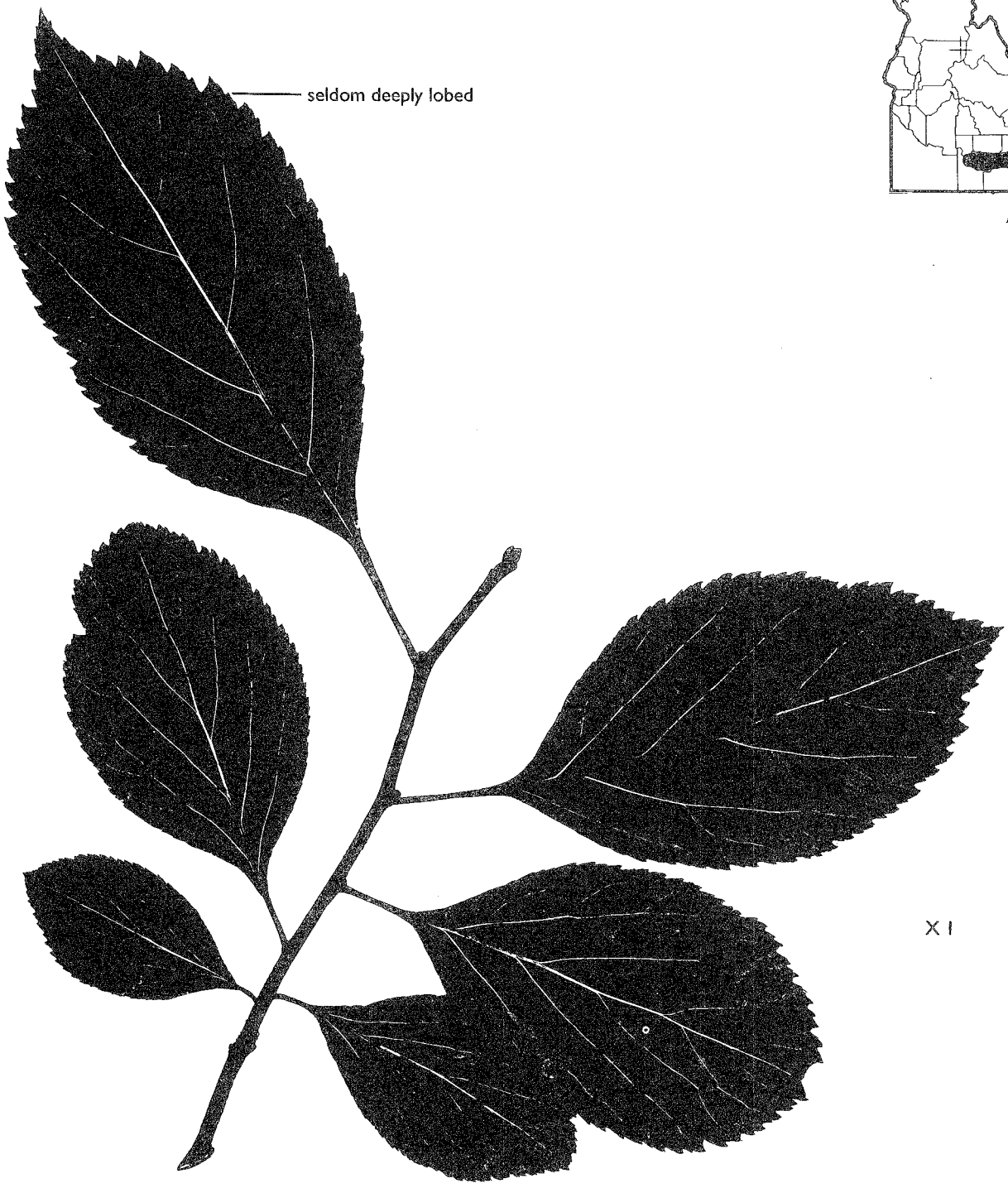
Leaves: 2 to 4 inches long, variable, base usually angled down the petiole, margins coarsely and unevenly large-toothed or somewhat lobed above the center. Twigs: shiny and reddish with rounded buds and sharp woody thorns, 1/4 to 3 inches long. Fruits: a little apple (pome) borne in clusters, red or black when ripe.

IDAHO HAWTHORNS

Species	Variety	Thorns	Mature Fruits	Range
black hawthorn	variety *douglasii*	½–1¼"	near black, ½"	generally north of Snake River Plain
river hawthorn	variety *rivularis*	¼–1"	maroon to black, ½ "	southeastern Idaho
Suksdorf hawthorn		1/2" or smaller	near black, ¼ "	western Idaho forests, moist habitats from Adams Co. to Canada
Columbia hawthorn	variety *columbiana*	1–3"	red, ½" without grey hairs	Spokane, Pend Oreille, and Kootenai riversides
canyon hawthorn	variety *piperi*	1–3"	red, ½" with grey hairs	lower western canyons



River hawthorn.



X 1

BLACK HAWTHORN

GROUP 1
Broadleaf, alternate, simple

Crataegus douglasii
variety *douglasii:* black hawthorn
Crataegus douglasii
variety *rivularis:* river hawthorn
(*Crataegus rivularis:* river hawthorn)

FAMILY — ROSACEAE

NATIVE

Named for David Douglas, pioneer western botanical explorer

GROUP 1

This small tree or large shrub occurs in dense colonies, especially in small streambottoms. As Idaho's most widespread hawthorn, it thrives in a variety of habitats. Black hawthorn grows primarily on forest edges, in disturbed forests, or in streambottoms. In the bunchgrass and sagebrush zones it is restricted to streamsides. Yet it commonly appears beneath near-climax ponderosa pine forests and grows beneath Douglas-fir. Black hawthorn appears in the lower elevations of the grand fir-cedar-hemlock zone. About the only place one might not find black hawthorn is in the spruce-fir zone.

Dense clumps of black hawthorn make excellent cover for birds and small animals. Since cattle avoid the thorny twigs, black hawthorn often invades grazed openings in forested areas. The fruits are edible but are rather dry and bland; nonetheless, bears and many birds relish them in early fall. The leaves turn shades of red in late fall, from a rather deep crimson to dark purple-red, depending on how dry the soil, how sunny the weather, and how sharp the frosts. This is a beautiful tree and deserves to be more widely cultivated.

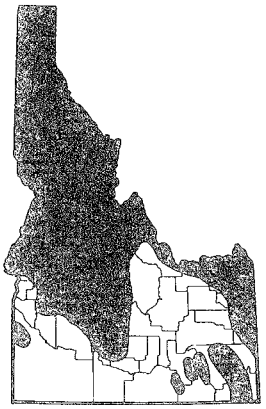
Plants of southeastern Idaho have narrower leaves and are often called *Crataegus rivularis,* river hawthorn. Others now consider this population as *Crataegus douglasii* var. *rivularis.* The broader-leaved variety *douglasii* occurs throughout much of the rest of the state; its flowers, as those of river hawthorn, have 10 stamens (12).

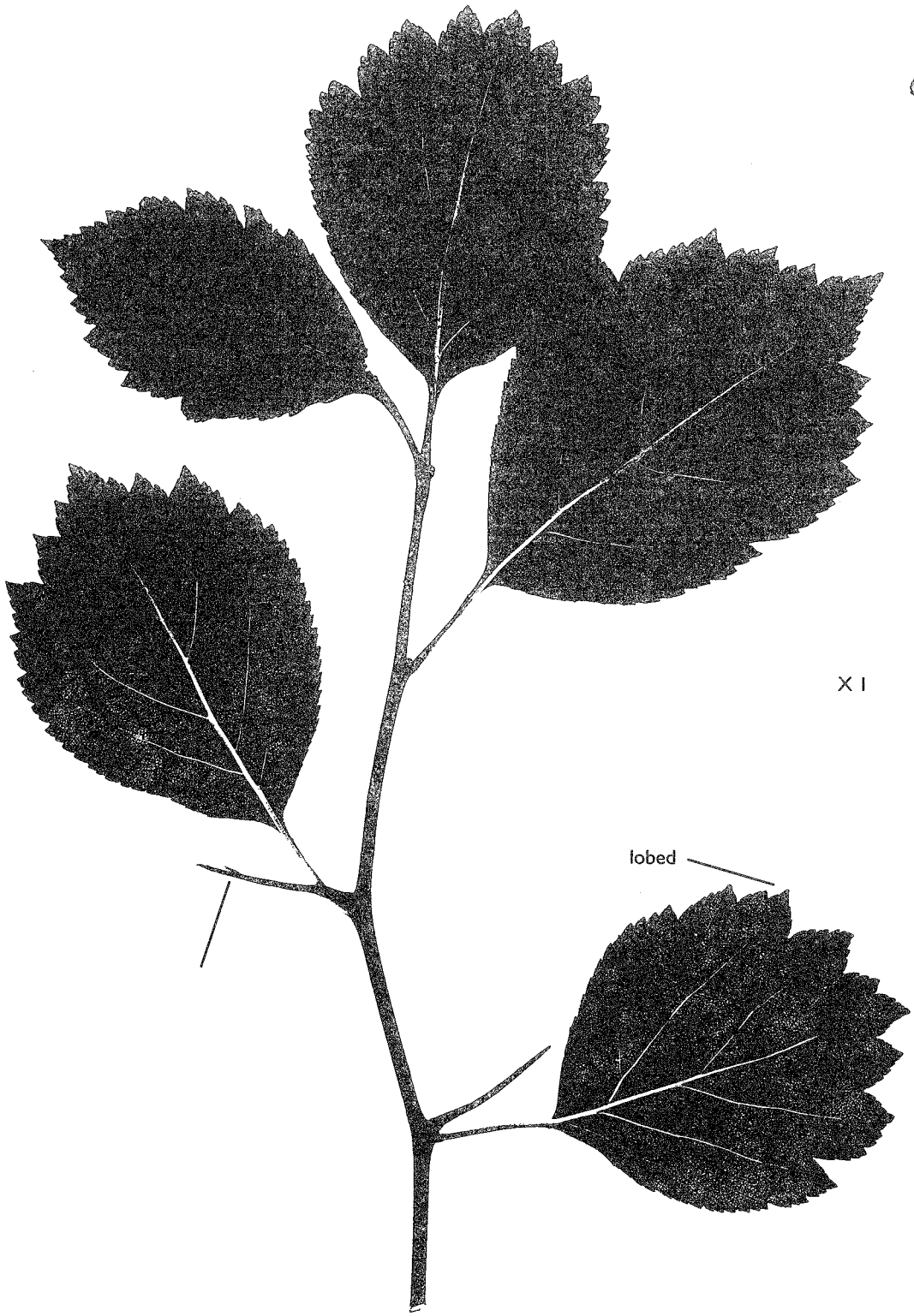
Leaves 3 to 4 inches long, often lobed near the tip; 10 stamens on flowers and fruits; thorns ½ to 1 inch long.

Common in fencerows between fields in northern Idaho; along the Palouse River near Potlatch (var. *douglasii*); along the Portneuf River south of Pocatello (*varrivularis*); breaks of the lower Salmon and middle Snake rivers (var. *douglasii*).

Black hawthorn (var. *douglasii*): diameter 26.7 inches, height 34 feet, near Cherry Lane, Nez Perce County. River hawthorn (var. *rivularis*): diameter 9.6 inches, height 21 feet, Soda Springs, Caribou County.

Note fall color and 1-inch thorns.





X 1

SUKSDORF HAWTHORN

GROUP 1
Broadleaf, alternate, simple

Crataegus suksdorfii
(*Crataegus douglasii*
variety *suksdorfii*)

NATIVE

Named for W. N. Suksdorf, eminent northwestern botanist

FAMILY — ROSACEAE

GROUP 1

Until quite recently, Suksdorf hawthorn was thought to be native only west of the Cascade Mountains. Most experts considered it a variety of *Crataegus douglasii.* Recent research, however, has established that this plant is a widespread native in the Northern Rockies, ranging in western Idaho from Adams County to Canada. We have also demonstrated it to be a separate species (12).

Like Columbia hawthorn, Suksdorf is a large shrub, sometimes becoming a small tree. It has an Idaho range quite similar to grand fir, thus showing its relationship to the Pacific maritime-influenced climate of northern Idaho. Unlike its cousin black hawthorn, Suksdorf occurs only in forested areas, almost exclusively in the grand fir-western redcedar-western hemlock zone. It is also more particular than black hawthorn as to habitat, preferring streamsides, moist, tree-speckled meadows, and lake edges, never dense shade.

In all ways, Suksdorf hawthorn is smaller than black hawthorn. The trees themselves are smaller, populations are smaller, flowers, fruits, leaves, and thorns are smaller. There are even fewer viable seeds per fruit.

In Suksdorf hawthorn, we most likely find another example of a plant that is a relict of ages past. These Miocene relicts are discussed under the grand fir-western redcedar-western hemlock vegetation zone along with other examples of relicts such as red alder and Pacific dogwood (45).

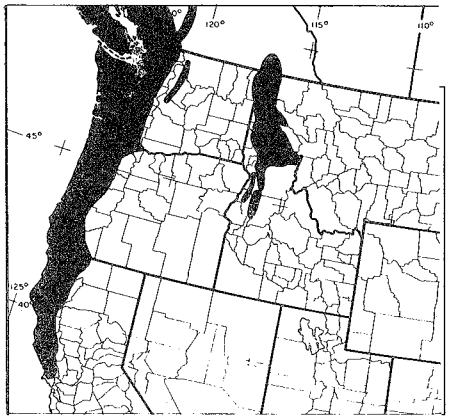
Technical description: Leaves: 1½ to 2½ inches long, with irregularly serrated margins, lacking lobes near the apex except on leaves of vigorous shoots. Thorns: usually under ½ inch long, absent on many twigs. Flowers: with 20 stamens (easily seen with a hand lens at any stage, even on fruits). Mature fruits: black, about ¼ inch in diameter.

Small riparian tree, leaves generally smaller and less lobed than black hawthorn; 20 stamens on flowers or fruits; thorns ½ inch long or less.

Shores of Payette Lake, especially at North Beach; Goose Creek near Last Chance Campground, between McCall and New Meadows; around White house Pond, near Powell Ranger Station on upper Lochsa River (mixed with *C. douglasii*); on the shores of Brush, Smith, and Sinclair lakes, north of Bonners Ferry; along Pend Oreille River between Priest River and Sandpoint.

Diameter 11.4 inches, height 44 feet, near Bonners Ferry, Boundary County.

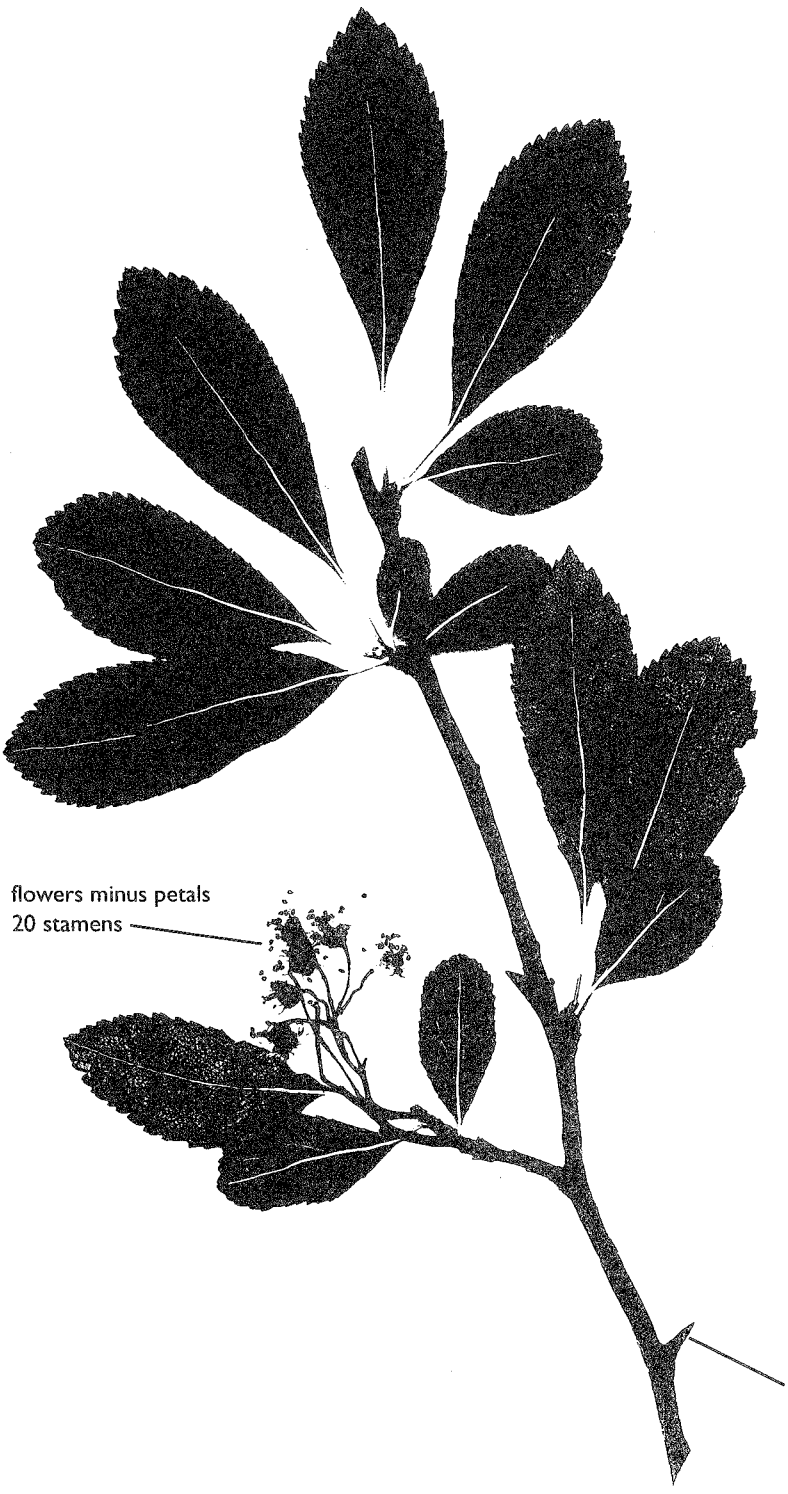
Note short thorns and unlobed leaves.

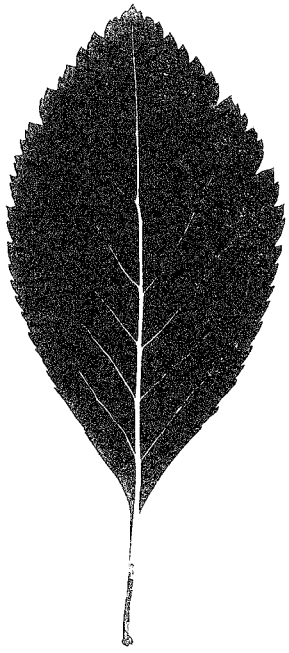


Suksdorf Hawthorn

57

X 1





COLUMBIA HAWTHORN

GROUP 1
Broadleaf, alternate, simple

Crataegus columbiana
variety *columbiana:* Columbia hawthorn
Crataegus columbiana
variety *piperi:* canyon hawthorn
Also known as red haw

FAMILY — ROSACEAE

NATIVE

columbiana is named for the Columbia River

Columbia hawthorn is a heat lover, and in Idaho is virtually restricted to the lower western canyons. While mostly a several-stemmed tall shrub, they will become small trees, 7 or 8 inches in diameter, particularly in riparian communities. There are two weakly defined varieties based on pubescence and geography. The variety *piperi* has a distribution much like that of netleaf hackberry and white alder; it's a low-elevation species of Idaho's western canyons. It occurs in scattered populations; little is known of its ecology. It appears mostly in streambottoms, but also in shrub patches at the foot of steep slopes. The best stands grow along nearly inaccessible stretches of the lower Salmon River. The variety *columbiana* has only recently been recognized as an Idaho native. It is a small, shrubby tree growing on floodplains of the Spokane River near Coeur d'Alene, along the Pend Oreille River west of Priest River, and scattered in the Kootenai Valley north of Bonners Ferry.

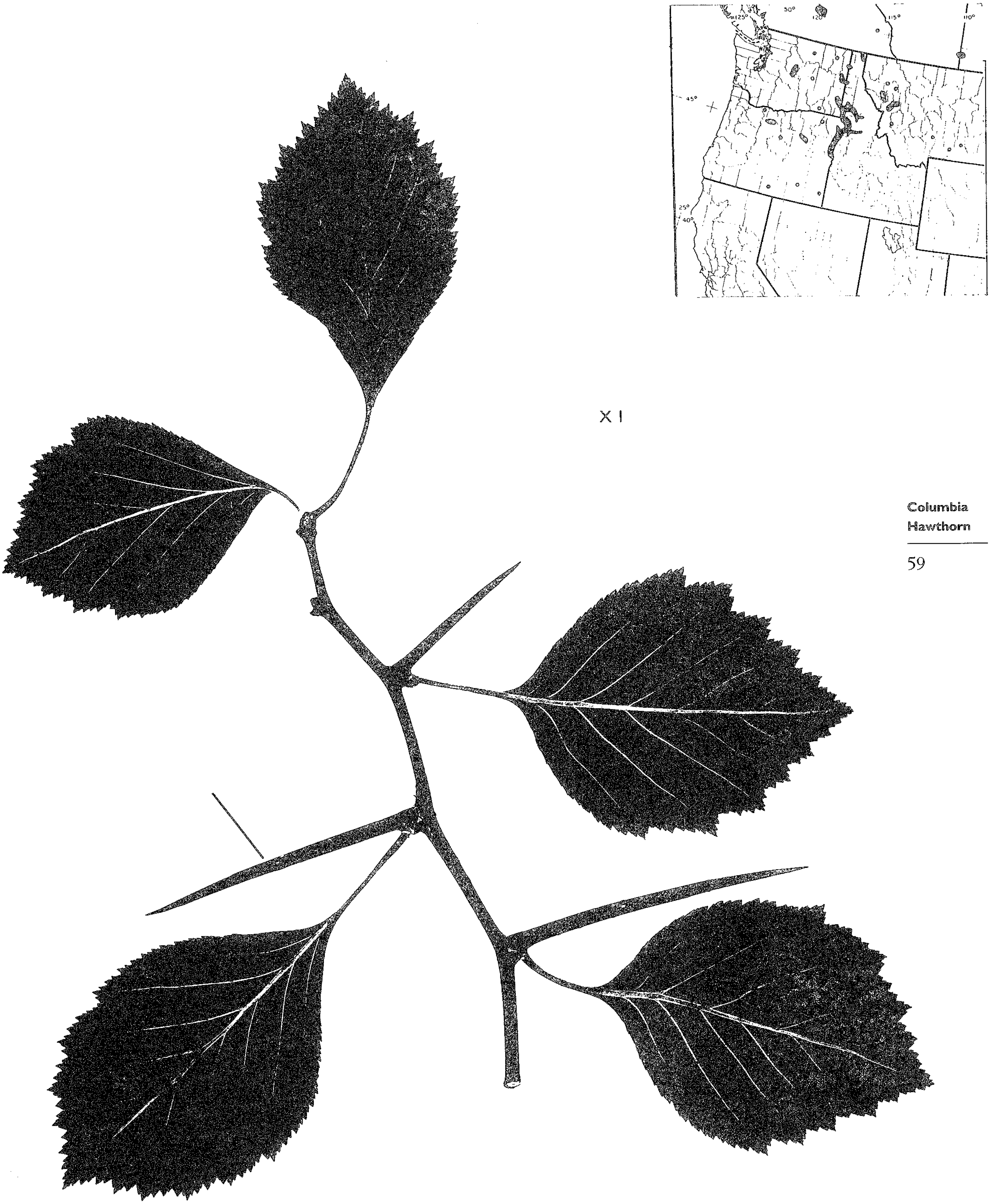
The red fruits are especially attractive to birds, for red is a "bird color," and many small, fleshy fruits are red when mature to coax birds to eat them and void the seeds some distance away. This uncommon shrub or small tree stands out in the fall with its dense clusters of red fruit and leaves that frequently turn some shade of red.

The long thorns, 1½ to 4 inches long, are unmistakable; fruits are red in fall. The Columbia hawthorns of our western canyons have greyish hairs on the flower stems and fruits; these are the variety *piperi.* The variety *columbiana* is rare in Idaho and has few or no hairs on the fruits or in the flower cluster.

Along Lapwai Creek, U. S. 95, near the town of Lapwai, Nez Perce County (variety *piperi*); along Spokane River near Coeur d'Alene (variety *columbiana*); along Pend Oreille River west of town of Priest River (variety *columbiana*); in vicinity of Kooskia and lower South Fork Clearwater River (variety *piperi*).

Canyon hawthorn (var. *piperi*): diameter 12.1 inches, height 24 feet, near Cherry Lane, Nez Perce County.

Note red fruits and long thorns.



Columbia Hawthorn

59

CURLLEAF MOUNTAIN-MAHOGANY

GROUP 1
Broadleaf, alternate, simple

Cercocarpus ledifolius
variety *ledifolius*
variety *intercedans*
(variety *intermontanus*)

NATIVE

cercocarpus means "seed with a tail"

FAMILY — ROSACEAE

Mountain-mahogany is a small tree or large shrub, rarely exceeding 25 feet in height or 20 inches in diameter. The trunk is rough-barked, stout, and usually crooked; the branches are gnarled and twisted. It grows in Idaho chiefly from the Salmon River southward. In scattered areas in eastern Idaho sagebrush country, mountain-mahogany occurs in pure stands in dense mountain shrub communities. In some places it may mix with ponderosa pine, Douglas-fir, or limber pine, but always in open areas and always on rocky habitats. In Owyhee County it appears with western juniper to form an open woodland. In southeastern Idaho it may be mixed with bigtooth maple and chokecherry in rather open stands.

Mountain-mahogany is not related to the true tropical mahoganies or the Philippine mahoganies. The dark wood does have beautiful grain patterns like tropical mahogany, which is probably how mountain-mahogany got its name. The extremely hard and heavy wood is used for novelties, fuel, and recently for flutes. Folklore has it that rustlers and bandits used mountain-mahogany wood for campfires, since it burns with so little smoke. Many stands of mountain-mahogany were cut during the early mining days, since the dense wood made excellent charcoal.

This plant is one of the most valuable browse plants for deer and elk in southern Idaho. When observing mountain-mahogany on a south slope, you will probably notice many plants that look as though they have been pruned. This condition, called "hedging," results from continual browsing by big game animals.

Two varieties of *Cercocarpus ledifolius* grow in Idaho. Variety *ledifolius* (broadleaf mountain-mahogany) is found primarily south of the Snake River Plain. Its leaves are slightly elliptical, about 1/4 inch wide, with slightly inrolled margins and short yellow hairs beneath. Variety *intercedans* (narrowleaf mountain-mahogany), which is found north of the Snake River Plain and extends northward along the Snake River to about the Grande Ronde River junction, has leaves that are very narrow, with deeply inrolled margins and dense white hairs beneath. A new interpretation calls this variety *ledifolius* and the broadleaf variety *intermontanus* (31).

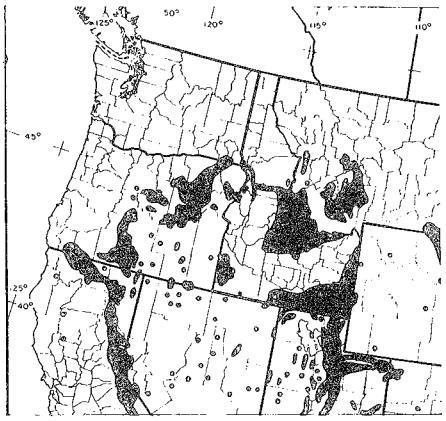
Technical description: Leaves: about 1 inch long, less than 1/4 inch wide, leathery, green above and yellow-hairy to white-hairy below, margins rolled under, persistent for 2 years (evergreen). Flowers: 1/4 inch wide, pale yellow, with 5, pointed petals, very early in spring. Fruit: a single, narrow, pointed seed, with a hairy, twisted, tail-like structure (plumose style) 2 to 3 inches long. These feathery plumes are often found beneath the trees in great abundance.

No other wild tree or tall shrub in Idaho has the leathery, narrow, evergreen leaves 1 inch long; the plumed seeds are also positive identification.

Willow Creek Pass, U. S. 93 between Mackay and Challis (var. *intercedans*); along the lower Little Salmon River, U. S. 95 south of Riggins (var. *intercedans*); Silent City of Rocks, Cassia County (var. *ledifolius*); along Palisades Reservoir in Caribou County (var. *ledifolius*).

Variety *ledifolius:* diameter 15.4 inches, height 21 feet, near Soda Springs, Caribou County. Variety *intercedans:* diameter 48 inches, height 28 feet, near Riggins, Idaho County.

Note unmistakable leaves and tailed fruit.



narrowleaf variety

broadleaf variety

X 1

Curlleaf Mountain-Mahogany

61

CHERRIES, APRICOT, PLUMS, PEACH

GROUP I
Broadleaf, alternate, simple

Prunus

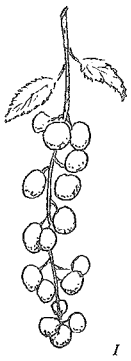
prunus is the classical Latin name for a plum tree

FAMILY — ROSACEAE

The *Prunus* group, one of the most important tree fruit crops in the world, includes cherries, peaches, plums, apricots, and even almonds. Pioneers found Idaho a good place to raise many of these delicious fruits; fruit growing is now a major industry. From cultivated parents, a wide variety of cherries and plums have escaped in Idaho, and a few are naturalized, growing well with wild vegetation. Be cautious in identifying *Prunus* near present or former farms or ranches, particularly in lower elevations and near streams or riverbottoms. In these situations several kinds of escaped *Prunus* may be encountered. Generally, once well back in the forests, only native *Prunus* are found.

Deciding that a specimen is a *Prunus* of some kind is not too difficult. Look for leaves with obvious glands—glands are the unique feature, and they are located at the base of the blade, at the top of the petiole, or uncommonly at both locations. Leaves are generally elliptical and have numerous small teeth. Several species of escaped *Prunus* are difficult to identify to genus, for the glands are tiny or may be missing. Study the leaf shapes carefully to help with difficult specimens. Positive identification of most escaped species depends on a mature fruit, but our two native species of *Prunus* are not difficult to differentiate. The twigs of most species of *Prunus* have a distinctive odor—that of bitter almonds or peach pits. Try scarring a young twig with a fingernail and give a sniff. Our two native cherries can be differentiated by odor, but odors are hard to explain in words.

Technical description: Leaves deciduous, simple, alternate, elliptical to broad-oval, often with a sharp tip, margin with many small teeth. Small knobby glands (1 to 6) are often located at the base of the blade or at the top of the petiole. Flowers: showy, white or pale pink in few- to many-flowered clusters. Fruit: a drupe—a cherrylike fleshy fruit containing a stone or pit; in Idaho trees these fruits are ¼ to 3 inches. Bark: on several species smooth and shiny, marked with horizontal scars (lenticels), something like birch bark.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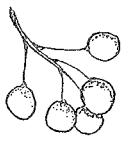
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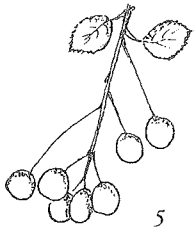
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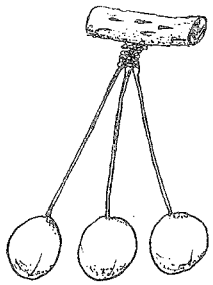
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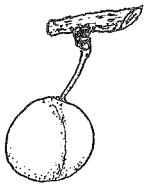
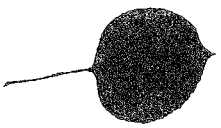
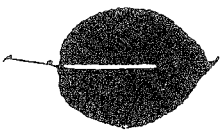

4 6 7 8 9

Numbers refer to species listed on the next page.

CONSPECTUS OF IDAHO NATIVE AND ESCAPED PRUNUS

Name/Status	Fruit Characteristics		Quick Identification
1. chokecherry (page 64) native statewide	many, in 4 to 6" cylindrical clusters; ¼", dark red to black when mature; bitter. Autumn.		cylindrical fruit clusters; unlike any other wild *Prunus;* glands on leaf petiole
2. bittercherry (page 66) native north of Snake River Plain	several, in rounded clusters; ¼", red when mature; very bitter. Autumn.		bark like birch; rounded leaf tip; glands at base of leaf blade
3. bird cherry (page 68) naturalized western Idaho	1 to 3 on long, unbranched stems, ½", dark red when mature; sweet. Mid-summer.		bark like birch; pointed leaf tip, glands on petiole; straight trunk
4. apricot (page 70) naturalized western Idaho canyons	single, 1 to 2"; pubescent; yellow with red cheek; sweet. Mid-summer.		wide leaves, larger than mahaleb; fuzzy fruit
5. mahaleb cherry (page 72) naturalized western Idaho canyons	few, in loose bunch; ¼", black when mature; bitter. Late summer.		leaves wide, shiny above; large gland may be on petiole
6. cherry plum (page 74) naturalized western Idaho canyons	single, 1"; yellow, red, or dark red when mature; sweet. Late summer.		short trunk; small leaves, glands small or absent; thorns may be present
7. garden plum (page 76) escaped western Idaho canyons	Single, 1 to 2"; dark blue, glaucous when mature; sweet. Early autumn.		several trees in a group; large leaves, little pubescence; fruit large
8. Damson plum (page 78) escaped western Idaho canyons	1 (or 2); 1", dark blue, glaucous; bitter or sweet. Early autumn.		several trees in a group; small leaves, densely pubescent below; fruit small
9. peach (page 80) rarely escaped western Idaho canyons	single, 2" (or larger); pubescent; yellow with red cheek; sweet. Late summer.		long, narrow, curved leaves; fuzzy fruit

BLACK CHOKECHERRY

GROUP I
Broadleaf, alternate, simple

Prunus virginiana
variety *melanocarpa*

NATIVE
virginiana means "of Virginia," where it was first named

FAMILY — ROSACEAE

GROUP I

This small tree or tall shrub is one of the most widespread woody plants in North America, growing in all of the western states and in almost every eastern state. In Idaho it can be a small tree, reaching 12 inches in diameter, but is more commonly a medium to tall shrub. It occupies a very wide variety of habitats. In the sagebrush zone it ranges from snowbank communities to streambottoms. It is common along streams in the bunchgrass zone. Chokecherry is often an important component of mountain shrub communities of eastern and southwestern Idaho. In some ponderosa pine and Douglas-fir forests it is a climax understory plant. In grand fir-cedar-hemlock forests, chokecherry is an uncommon seral species, usually confined to southerly or westerly slopes. This far-ranging plant even occurs in the lower spruce-fir zone, where it almost always develops as a shrub on steep, rocky, southerly slopes. From streambottoms to rocky outcrops, from Canada to Utah, from the lowest elevations to the subalpine zone, chokecherry is one of Idaho's most ubiquitous shrubs.

To form a tree it demands high heat loads, hence chokecherry trees are found at lower elevations. Some of the largest black chokecherries in the U.S. are found in the low valleys of northern Idaho, where trees 9 to 12 inches in diameter can be found. Both elk and deer find chokecherry twigs palatable, but the leaves, particularly after frost, are high in prussic acid and are poisonous to livestock.

The cherries are quite bitter until very ripe. Many people collect them and with sufficient added sugar make jelly, syrup, or wine. Birds, of course, love the fruits, and chokecherry is a perfect example of a bird-disseminated fruit. Most Idaho plants have cherries that are a deep mahogany red, almost black when mature. *Melanocarpa* means "black fruit." Occasional plants have bright red mature fruit—these have sometimes been labeled variety *demissa,* which is mainly west of the Cascades. None of our Idaho chokecherries have the pubescent leaves of the variety *demissa;* thus the occasional bright red fruits are likely but a color phase of black chokecherry. Chokecherry is the only Idaho member of the *Prunus* genus, either native or escaped, that has numerous flowers in cylindrical clusters. The flower stalk often remains attached well into winter and is an important reference for positive identification.

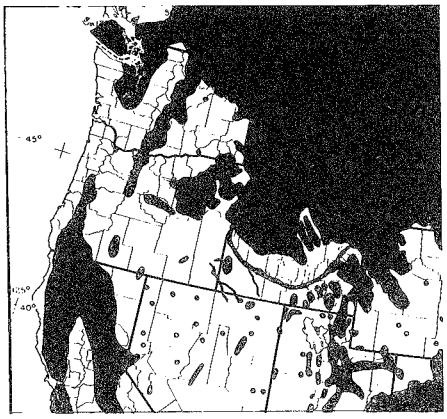
Flowers/fruits in 4 to 6 inch cylindrical clusters; leaves with glands on petiole, with small, sharp-pointed teeth; petiole short, leaf tip pointed, leaves glabrous or with vein-axil pubescence on underside; bark smooth and grey.

Smith's Ferry to Horseshoe Bend, U. S. 95; Kootenai River edge near Bonners Ferry; Ponderosa Pine Scenic Route, Boise to Lowman. Present in almost all lower elevation shrub communities and along most streams from Douglas-fir forests to the sagebrush and bunchgrass zones.

Diameter 17.1 inches, height 73 feet, near Coeur d'Alene, Kootenai County, the largest in the country.

Note glands on leaf petiole;

Note distinctive cylindrical cluster of flowers.



gland

flower stalk

X 1

leaf variations

BITTER CHERRY

GROUP I
Broadleaf, alternate, simple

Prunus emarginata
variety *emarginata:* interior bitter cherry
variety *mollis:* Pacific bitter cherry

NATIVE

emarginata means "with a slight notch at the tip of the leaf"

FAMILY — ROSACEAE

GROUP I

Bitter cherry is a small tree or medium-sized shrub that has a split personality. In western redcedar and hemlock forests it establishes itself after fire and quickly becomes a slim tree. This is particularly evident in the Clearwater River drainage. At the other extreme, it forms dense communities of shrubs about 6 feet tall on rocky slopes in the bunchgrass zone. Between these extremes bitter cherry often occurs with other shrubs in or near conifer forests, but it cannot tolerate much shade.

In northern Idaho, particularly in disturbed grand fir-cedar-hemlock forests, bitter cherry becomes more treelike, with leaves pubescent beneath. This is the variety *mollis.* At lower elevations, particularly among the shrubby plants of the bunchgrass zone, bitter cherry has leaves without pubescence below and appears as the shrubby variety *emarginata.*

Bitter cherry is a western relative of the eastern *Prunus pensylvanica* (fire cherry or pin cherry) so common in seral forests of northeastern North America. There is evidence that, like fire cherry, our bitter cherry has seeds that remain buried for many decades in the soil. After a forest fire, these buried seeds germinate to produce dense stands of small trees. This can be seen in the Pacific bitter cherry populations that have developed after logging above the North Fork Clearwater and Selway rivers on western redcedar habitat types.

Prunus pensylvanica occurs in southern British Columbia and in western Montana. Some of our Pacific bitter cherry populations have narrower leaves and more-pointed leaf tips than average. This is noticeable around the north side of Lake Pend Oreille and in the Kootenai Valley. These leaf forms suggest an expression of *P. pensylvanica* genes.

As with chokecherry, the fruit is bitter, and as far as I know, no amount of sugar makes it palatable to people. Birds eat the fruit and spread the seeds. Deer and elk browse the nutritious twigs. Ripe fruits are bright red, like domestic sour cherries.

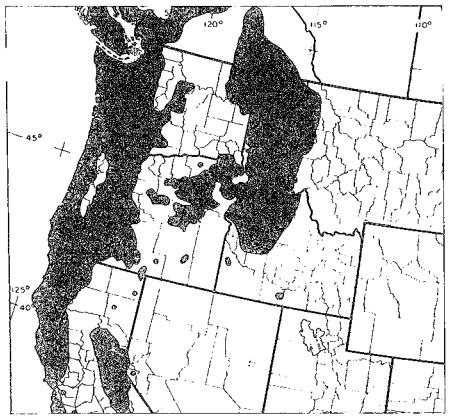
Flowers/fruits in small, open, few-flowered clusters; leaves with small glands at base of blade, tip of leaf rounded; bark red-brown and shiny, birchlike.

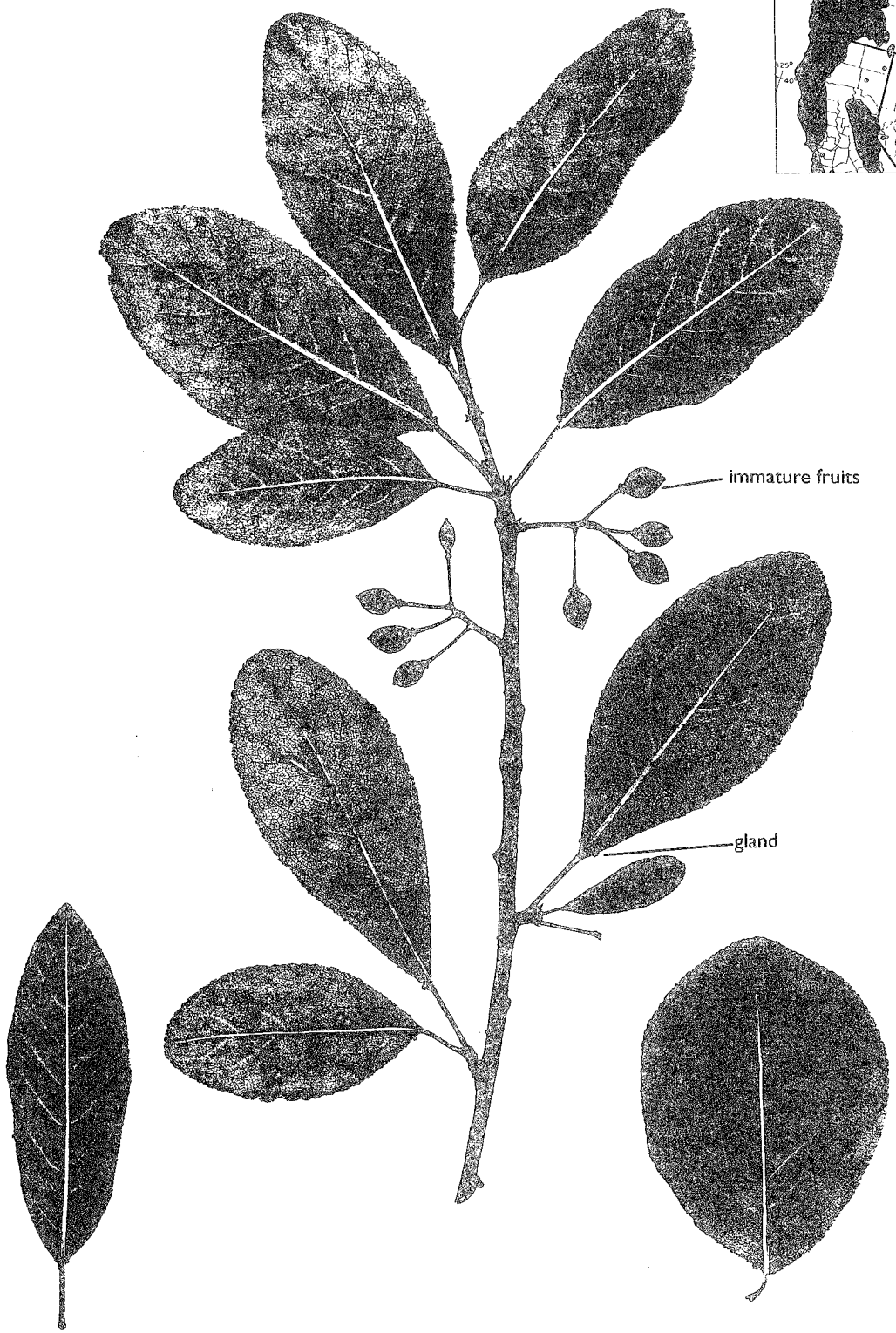
At base of slopes, Hells Canyon Reservoir, Snake River (var. *emarginata*); lower Selway River near U. S. 12 (var. *mollis*); slopes just above Lucky Peak and Arrow Rock reservoirs, east of Boise (var. *emarginata*); Potlatch River Canyon, Nez Perce County (var. *mollis*), Priest River Valley (var. *mollis*).

Variety *mollis:* diameter 12.3 inches, height 57 feet, near Lowell, Idaho County.

Note flower clusters are similar to mahaleb cherry;

Note glands on base of leaf blade.





X 1

BIRD CHERRY

GROUP 1
Broadleaf, alternate, simple

Prunus avium
Also known as mazzard or sweet cherry

NATURALIZED
avium means "bird"

FAMILY — ROSACEAE

This large cherry tree is native to western Asia and Europe, where it has been cultivated for centuries. It is the parent of the sweet cherries commonly grown in the warmer parts of Idaho. Birds have carried the seeds from orchards and yards, and now bird cherry trees and seedlings are so common in the wild that the plant is definitely naturalized. Look for it in the warmer western parts of the state. It occurs along streams and in forests of ponderosa pine, Douglas-fir, and lower-elevation western redcedar and grand fir (35). In riparian habitats in Hells Canyon and along the lower Salmon and Clearwater rivers, *P. avium* is common and shows promise of becoming a very important tree. The fruits are often quite edible, but they are much smaller than commercial sweet cherries. Both dark red and pale yellow fruits occur on wild trees.

Prunus avium is considered by most authorities to be one of the parents of sour cherries (*Prunus cerasus*). Sour cherries, also known as pie cherries, are generally not thought to be native trees anywhere. Check the leaves of sweet and sour cherry and see how similar they are. Then look at the fruits and notice how similarly they are borne.

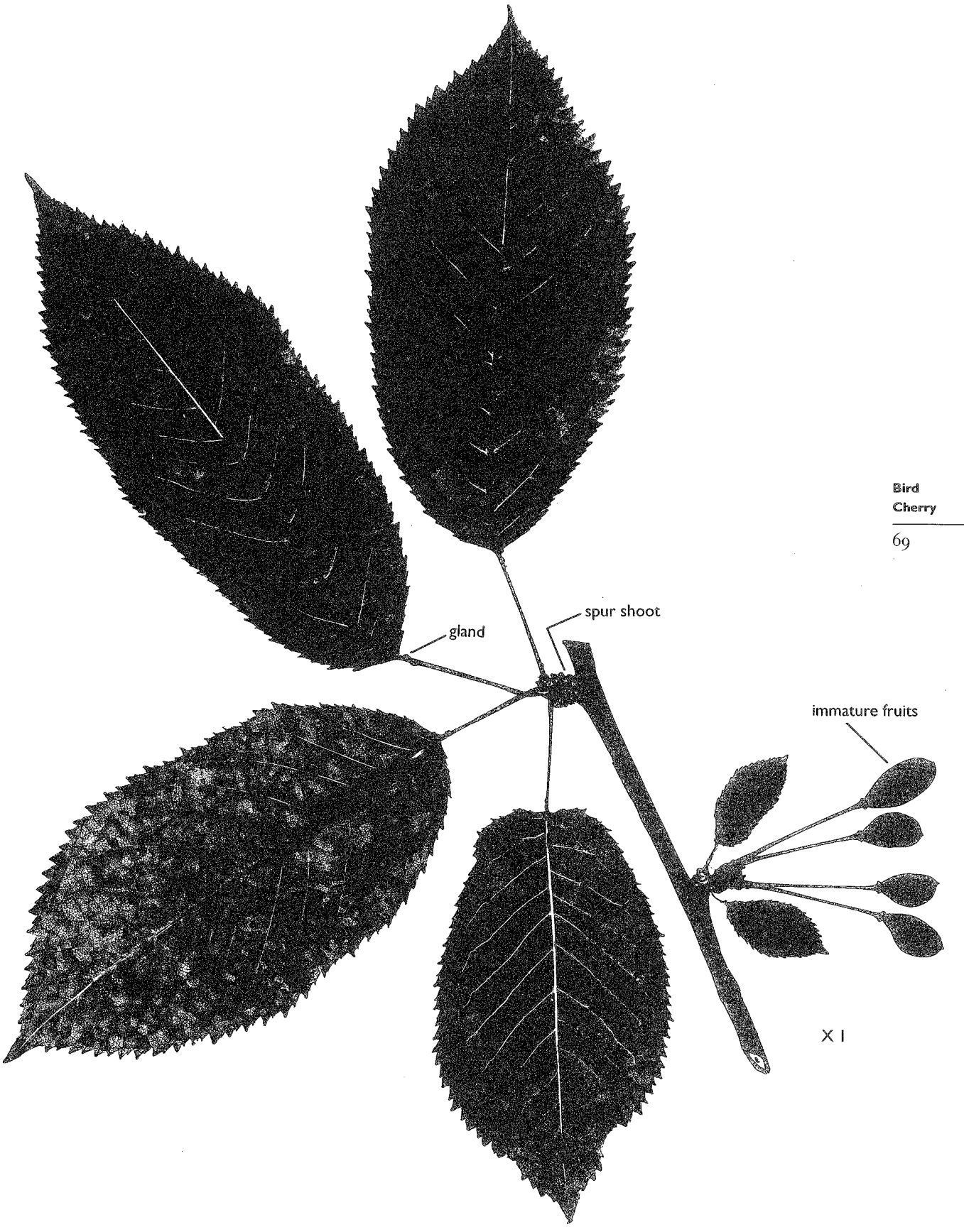
Sweet cherries may grow to be very large trees, and escaped trees are going to be more and more evident in Idaho forests. Already, escaped trees over 24 inches in diameter have been found; such trees are 40 to 50 feet tall and still going strong.

Straight, single-stemmed tree with leaves somewhat similar to chokecherry but with larger, rounded teeth, long petiole, and larger and more numerous glands; fruits are 2 to 4 in a cluster with long stems, borne on a short spur shoot; bark is very similar to birch but dark reddish brown.

Greer Grade, State Highway 11, Greer to midway up grade; streambottoms flowing into lower Little Salmon and main Salmon River along U. S. 95; foothills and streambottoms near Kamiah and Kooskia; scattered populations near both Pend Oreille and Coeur d'Alene lakes.

Note fruits are like garden sweet cherries only smaller;

Note flowers on a spur shoot.


gland
spur shoot
immature fruits
X 1

APRICOT

GROUP I
Broadleaf, alternate, simple

Prunus armeniaca

NATURALIZED
armeniaca means "from Armenia"

FAMILY — ROSACEAE

GROUP I

Apricots are certainly one of Idaho's most interesting escaped trees. Of course, they are well known for their fruits, which if anything are more delicious from wild trees. But it is hard to realize how tough these pampered garden trees are. They do need much heat, and since they flower very early, they cannot tolerate spring frosts if fruit is to develop. Apricots can be found doing well as escaped trees in Hells Canyon, along the lower Salmon River, and in a few places along the lower Clearwater River. They are rare in sagebrush/grass vegetation, but isolated escaped trees do occur. They grow and thrive on bunchgrass slopes—in fact, in places they have naturalized where no other trees are present! They also occur in shrubfields near where Douglas-fir forest meets grassland. On one slope on the lower Salmon, I counted 27 wild (escaped) apricot plants within a 100-foot radius, growing in a dense tangle of shrubs! Apricots also thrive on gravel bars on the lower Salmon River—areas that yearly are covered with water during the June floods.

When the first forest ranger explored Hells Canyon in the early 1900s, he discovered an apricot tree he estimated to be over 100 years old. This would mean that the tree's establishment predated the first canyon settlers by 50 years or more. Whence the seed? We can but speculate, but since apricot fruits dry very well, Indians could have brought them through trade routes from California, where apricots were established by the Spanish in the 1700s.

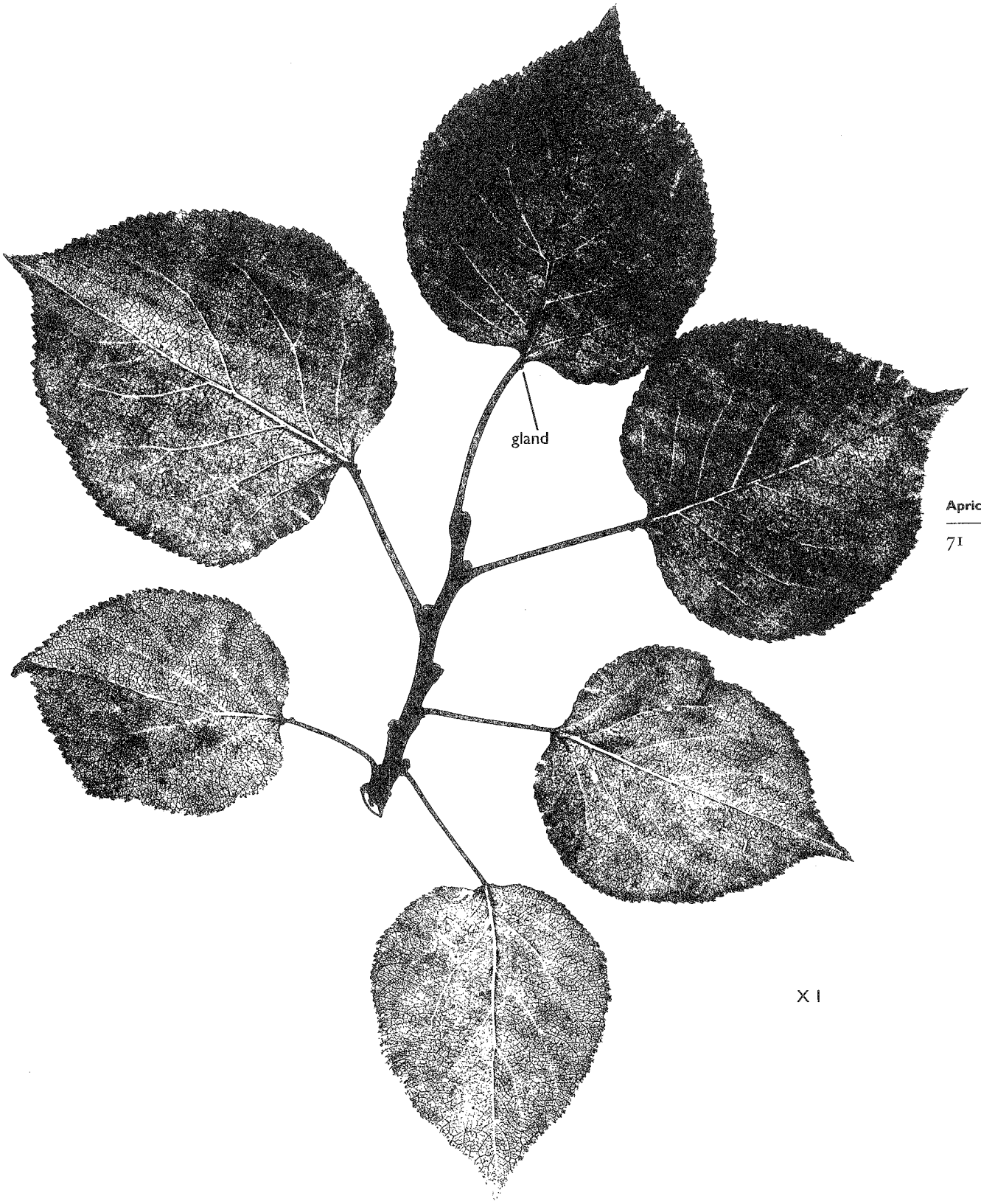
Which animals eat fruits from the wild trees and spread the seed? From evidence, coyotes and raccoons are suspected, and bears most certainly spread the seeds. Some animal is depositing seeds as much as half a mile from parent trees. Apricots are surely one of the most beautiful, edible, and interesting of Idaho's new natives. Despite the scientific name, apricots are not native to Armenia, but they do appear to be native farther east in Asia (but apparently not in China, as is often claimed). They were brought to the eastern Mediterranean by early traders, and later made their way to western Europe. This brings us to the very word "apricot," which is derived, through a long lineage, from a Byzantine word roughly meaning "cooked beforehand," which probably compared apricots to the later-ripening peaches.

Leaves are very broad for *Prunus,* almost heart-shaped, with rounded teeth 2 to 3 inches long and 1 to 4 glands near the top of the petiole; fruit is a small yellow-orange apricot about 1½ inches in diameter (delicious!).

Along the Salmon River, and side streams between White Bird and Riggins; major side streams in Hells Canyon; occasional along lower Clearwater River.

Note escaped apricots in 1961, now considered naturalized in Hells Canyon;

Note naturalized apricots are smaller but tastier.



X 1

MAHALEB CHERRY

GROUP I
Broadleaf, alternate, simple

Prunus mahaleb

NATURALIZED

mahaleb is the ancient Persian name for this tree

FAMILY — ROSACEAE

GROUP I

Almost every year we find more of these small trees that have escaped, but in only a few places are escaped trees common. As far as people are concerned, this tree has inedible fruits—small, black, and bitter. But birds like them and spread the seeds. Mahaleb cherry grows in disturbed Douglas-fir forests and in shrub communities on forest edges. It is also found in shrub communities in the bunchgrass zone in western Idaho canyons, and beneath ponderosa pine near Post Falls.

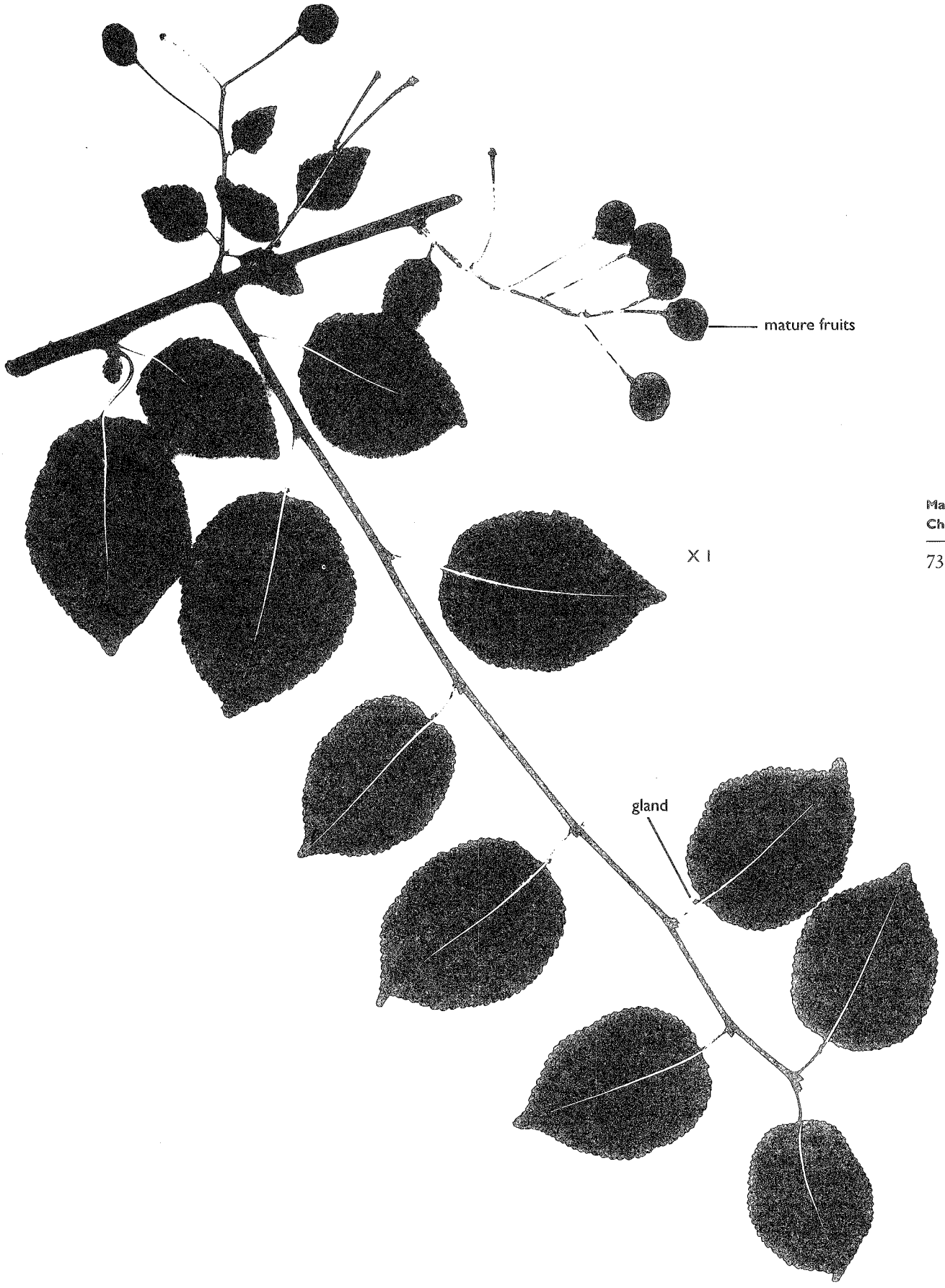
Mahaleb cherry, native to Europe and western Asia, was probably brought into Idaho as rootstock for grafted cherries. In the grafting process the tough roots of mahaleb cherry support a top of some cherry with desirable fruit. As orchards are abandoned and the roots sprout, new mahaleb cherry trees arise and eventually bear fruits, which are carried by birds to new habitats.

Even though the fruits aren't edible, mahaleb cherry has redeeming features. The clusters of small white flowers appear just as the leaves come out, and trees are often nearly white with the thousands of blossoms. The rounded leaves are small, the limbs are nicely twisted, and the total effect is a pleasant change from native species of *Prunus*.

This and apricot are the only *Prunus* in this book that have leaf blades about as wide as long. Mahaleb cherry has leaves 1 to 2 inches long, and almost as wide, on older twigs, leaves are borne in clusters. Leaves on vigorous twigs may have one or more large glands on the petiole, while the leaves of slower-growing branches often have two or more minute glands on the base of the blade (you may need a hand lens); fruits are borne in small clusters like bitter cherry, with a few leaves on the same stem; cherries are about ¼ inch and black when ripe.

Stites Grade between Grangeville and Kooskia along State Highway 13; along lower slopes of Salmon River near White Bird along U. S. 95; Spokane Valley, vicinity of Post Falls; Potlatch River Valley near Juliaetta, Latah County.

Note bitter, black fruits.


mature fruits
X 1
gland

CHERRY PLUM

GROUP I
Broadleaf, alternate, simple

Prunus cerasifera
Also known as myrobalan plum

NATURALIZED
cerasifera means "cherry-bearing"

FAMILY — ROSACEAE

GROUP I

This interesting small tree is common in our lower western canyons. It is easily found in disturbed streambottoms and lower-slope shrub communities in the bunchgrass zone and in disturbed Douglas-fir forests. Plants of different age classes occur over a wide range of divergent environments, competing with many native trees and shrubs. This is why cherry plum is considered to be naturalized.

Cherry plum trees have white flowers about 3/4 of an inch across. Flowers appear very early in spring, blooming before serviceberry, which is the earliest flowering native Idaho tree or shrub with white flowers.

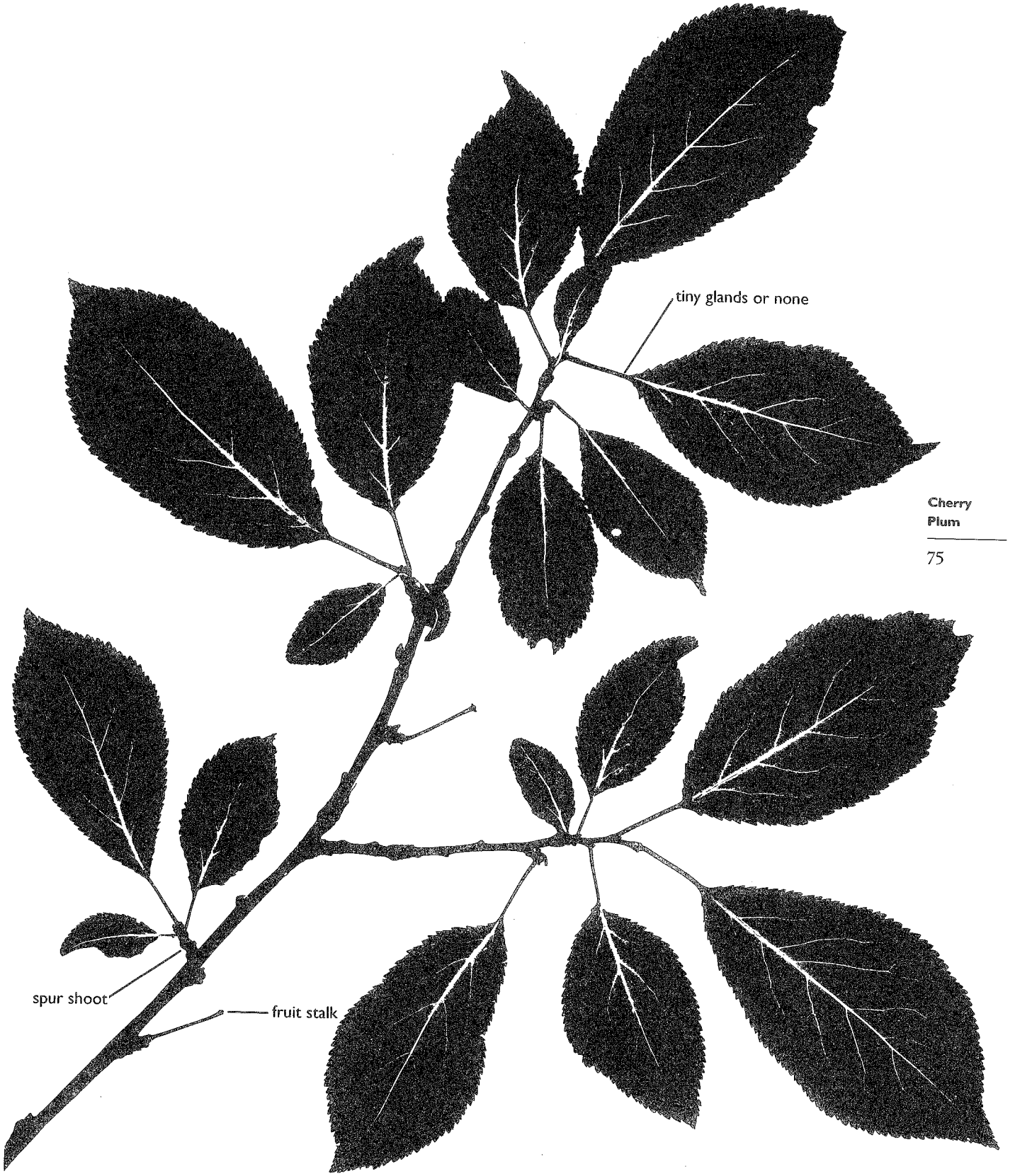
The spherical fruits are larger than a big sweet cherry, averaging a little over 1 inch. With a flat pit and a smooth skin, they fall into that group of *Prunus* called plums. They are unique in having two color phases; some fruits are a dark, deep red, and on other trees the fruit is bright yellow. The fruits of both colors have a glaucous bloom. When a bit immature they are tart and tasty; when dead ripe they are very sweet. In the hot summer of Hells Canyon, ripe cherry plums may remain on the tree and dry, becoming delicious natural "prunes." Occasional trees have purple leaves; these are *Prunus cerasifera* variety *atropurpurea.* The common ornamental purple-leaved plums seen throughout Idaho are either this variety or hybrids between this purple leaf variety and other species of *Prunus.*

Spread of this plum may be slowed in some areas because of heavy browsing by wintering mule deer and elk, which reduces fruit and seed production. This little tree is closely related to blackthorn plum (*Prunus spinosa*). Blackthorn has been reported as escaped in Idaho, but the report was based on misidentified cherry plums (30). This is quite forgivable given the difficulty in segregating these two, especially when dealing with a vigorous cherry plum with menacing thorns.

Small trees with somewhat upright branching, dark red or yellow fruit 1 inch in diameter; young trees may have thorns on some branches.

Clearwater River between Kooskia and Kamiah on U. S. 12; streams and hillsides along U. S. 95 between Riggins and White Bird; streams along Hells Canyon of the Snake River; Stites Grade between Grangeville and Kooskia, State Highway 13; Potlatch River bottom and nearby hillsides, State Highway 3.

Note dark red phase of cherry plum fruits.



X 1

GARDEN PLUM

GROUP 1
Broadleaf, alternate, simple

Prunus domestica
Also known as prune plum
Italian plum

ESCAPED
domestica means "of the home"

FAMILY — ROSACEAE

GROUP 1

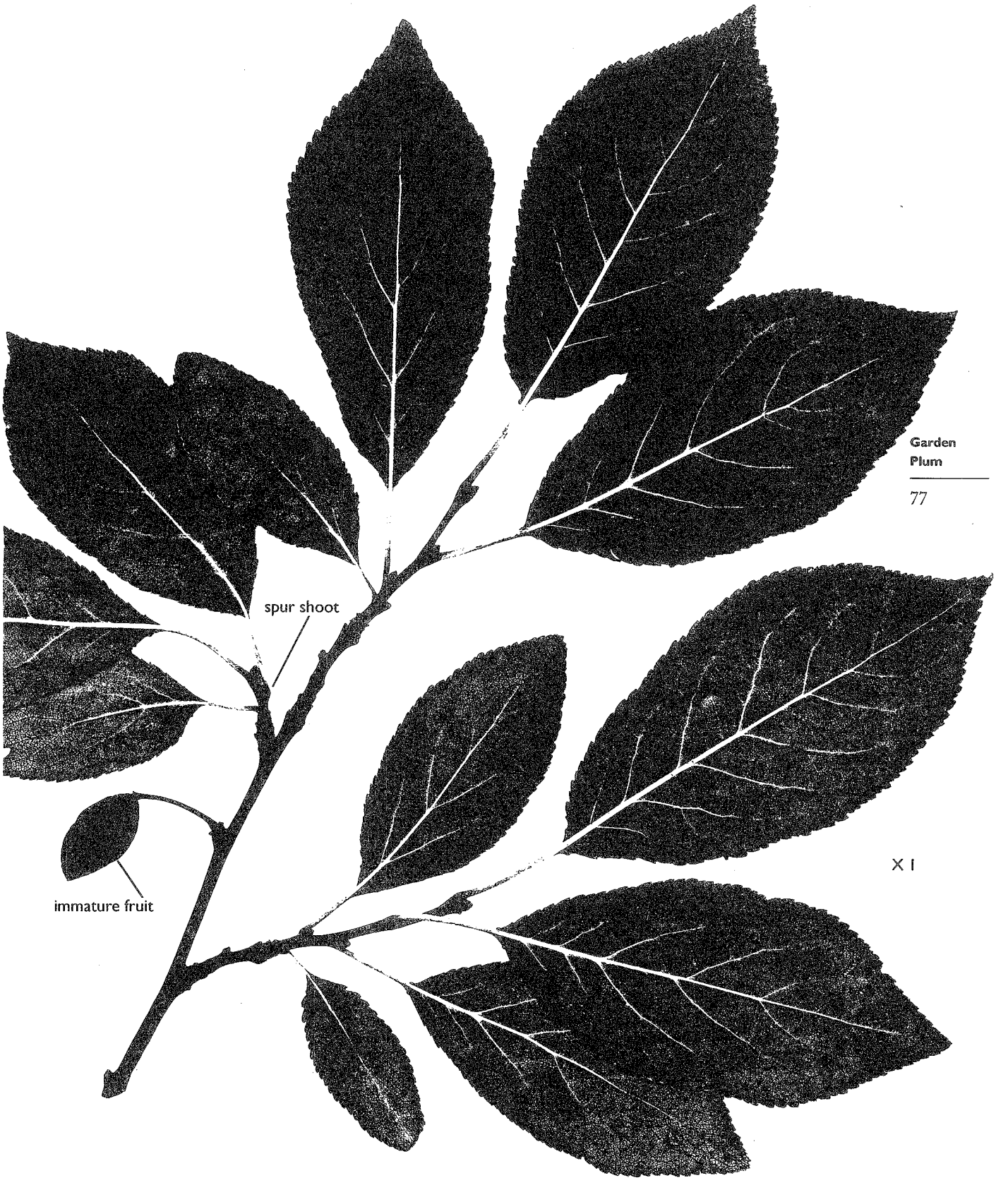
This is the parent of many of our common edible plums—the big sweet ones that are called "table plums." Garden plum is most likely a native of southern Europe and western Asia, but wild parents have never been located. The Lake Bank dwellers of Neolithic Switzerland knew of this tasty plum, so it has obviously been cultivated for centuries. There are literally dozens of forms of garden plum, as well as numerous hybrids between *P. domestica* and various other plums, producing in total, most of the table plums we enjoy today. The garden plum has escaped and invaded streambottoms in the western canyons of Idaho and adjacent Oregon and Washington. The fruits resemble small Italian plums, the fall plums we sometimes call "prune plums." There is considerable variation in fruit color and size, but this is the only escaped tree described here that has a large plum—over 1½ inches long.

Damson plum (*P. institia,* see p. 78) is often treated as a variety of garden plum and certain escaped trees seem midway between garden plums and the smaller-fruited Damsons. The following conspectus will help to separate the two.

Species	Leaf Size	Leaf Pubescence	Fruit Size	Ripe Fruit Flavor	Fruit Color
garden plum	2–5"	sparse on underside	1½–3"	sweet	dark blue with silvery wax layer
Damson plum	1–2"	dense on underside	½–1"	tart	dark blue with silvery wax layer

Large leaves (2 to 4 inches long), heavily net-veined below, fruit large (1½ to 2½ inches), dark blue with silvery (glaucous) wax coating and with large flat pit.

Look in streambottoms in the bunchgrass zone, especially along the Clearwater River and its tributaries; Harpster Grade, State Highway 13; Potlatch Canyon, State Highway 3.



Garden Plum

77

X 1

DAMSON PLUM

GROUP 1
Broadleaf, alternate, simple

Prunus insititia
(Prunus domestica
variety *insititia)*
Also known as bullace

ESCAPED
insititia means "used in grafting"

FAMILY — ROSACEAE

GROUP 1

The little blue Damson plum was well known to Idaho pioneers as a favorite jelly plum. Like the mahaleb cherry, it was also used for rootstock; desirable plum tops were grafted to Damson roots.

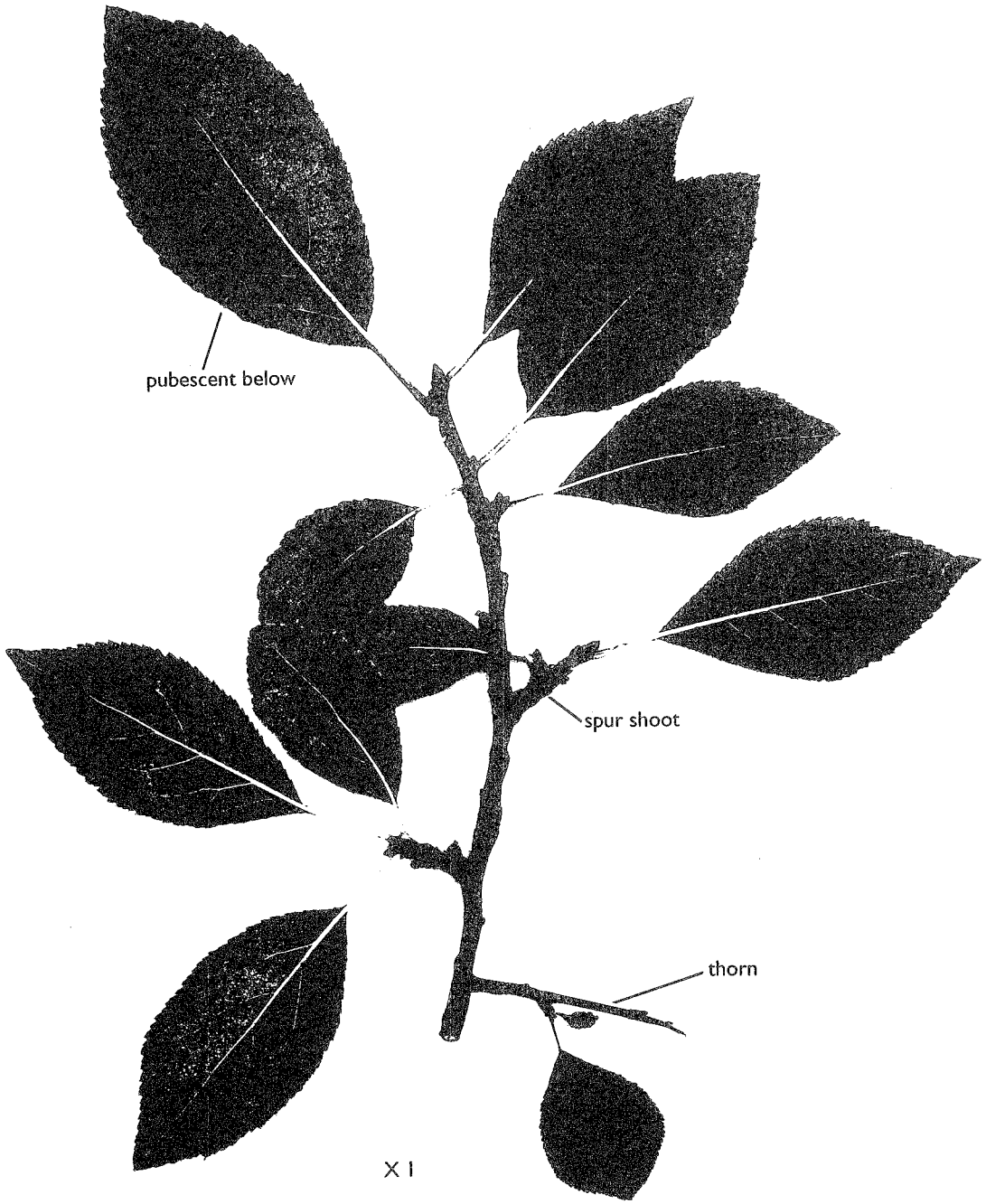
In Idaho, escaped Damson plums grow in shrubfields, particularly with Douglas-fir and usually near old orchards or towns. It also occurs near streambottoms in the bunchgrass zone of western Idaho canyons. It is usually found in dense colonies, the shrubby trees averaging 8 to 15 feet in height.

Damson plum is easily confused with cherry plum (*Prunus cerasifera*), although the mature fruits are different in size, taste, and ripening time. Two things are important to identification: first, Damson plum leaves are densely white pubescent on the underside; second, Damson plum is usually found in dense patches, since it spreads from root sprouts, like smooth sumac and aspen. Fruits of Damson plum ripen in early fall, while those of cherry plum are ripe in mid-summer.

Some authorities include this little plum as a variety of garden plum. For the escaped plum trees in Idaho there seems a fairly clear difference, and many European authorities view this as a distinct species, so I have retained it as a separate species (38).

Leaves hairy on the underside, more so than any other *Prunus* in this book (except *P. emarginata* var. *mollis*); fruit less than 1 inch, dark blue; plants tall shrubs or small trees in dense clumps.

Kendrick Grade, State Highway 99; South Fork Clearwater River, Kooskia to Golden; Salmon River Canyon, White Bird to Riggins.


pubescent below
spur shoot
thorn
X 1

PEACH

GROUP 1
Broadleaf, alternate, simple

Prunus persica

ESCAPED
persica means "from Persia"

FAMILY — ROSACEAE

GROUP 1

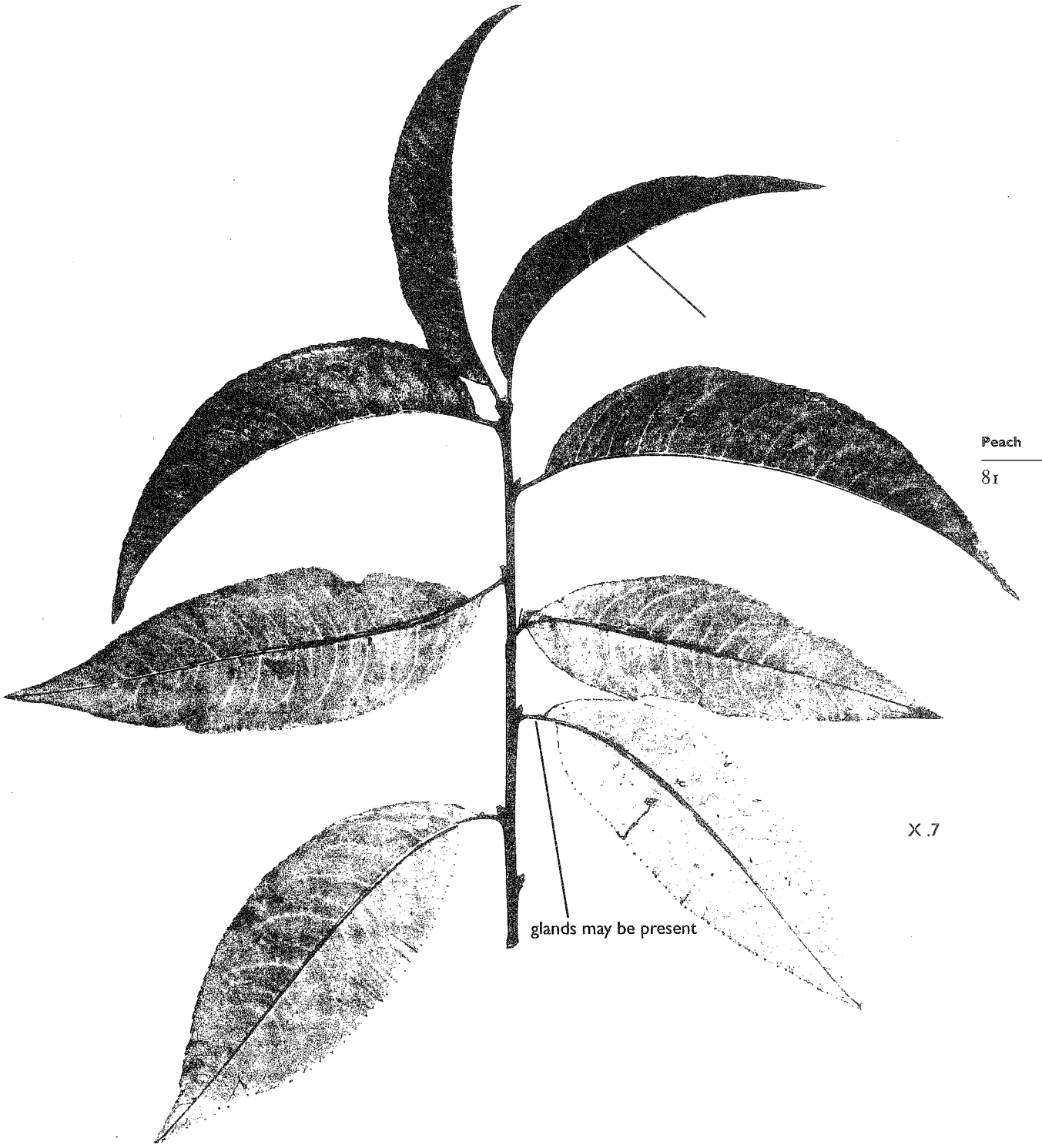
The common peach is one of the least common of the escaped members of the genus *Prunus* in Idaho. It sometimes grows away from cultivation, but its very large seed, in part, probably accounts for its slow spread. It is an easily identified *Prunus*. Peach trees have large, sickle-shaped leaves, which feature a permanent curve unique in Idaho's trees. Furthermore, the leaves are generally folded so that flattening them out is impossible. The fruits on escaped peaches are small—about 1½ to 3 inches in diameter—and, of course, quite fuzzy.

While *persica* indicates this plant is native to Persia (now Iran), it is actually from China. Along the ancient trade routes, the famous "silk roads," one route to the west terminated in the flourishing early civilization of the eastern Mediterranean. Here peach cultivation thrived, but over hundreds of years its Chinese origin was forgotten. The scientific name denoting Persia as its home was applied by a European, Carolus Linnaeus.

In northern China, wild peach trees are quite competitive in secondary forests, where shrubs and small trees thrive on eroded soil with a long history of misuse. This may portend eventual greater numbers of wild peaches in Idaho, for as escaped trees produce seed over several generations, their wild offspring are likely to become better adapted to local conditions and hence better able to compete with native vegetation (35).

Long, curved, often folded leaves; glands present on petiole; fruits are typical peaches, but small, not over 3 inches in diameter.

Look for it in disturbed areas in the lower western Idaho canyons—lower tributaries in the Salmon, Clearwater, and Middle Snake canyons.


glands may be present
X .7

APPLE

GROUP I
Broadleaf, alternate, simple

Malus pumila
(*Pyrus malus*)
(*Malus sylvestris*)

ESCAPED
pumila means "small"

FAMILY — ROSACEAE

GROUP I

Along roadsides in many parts of Idaho, apple trees are so commonplace that one may fail to think of them as "wild" trees. Surely no one has planted apples in such unlikely places. Wild apples are so abundant in many areas that bushels are collected each fall, used especially for making cider.

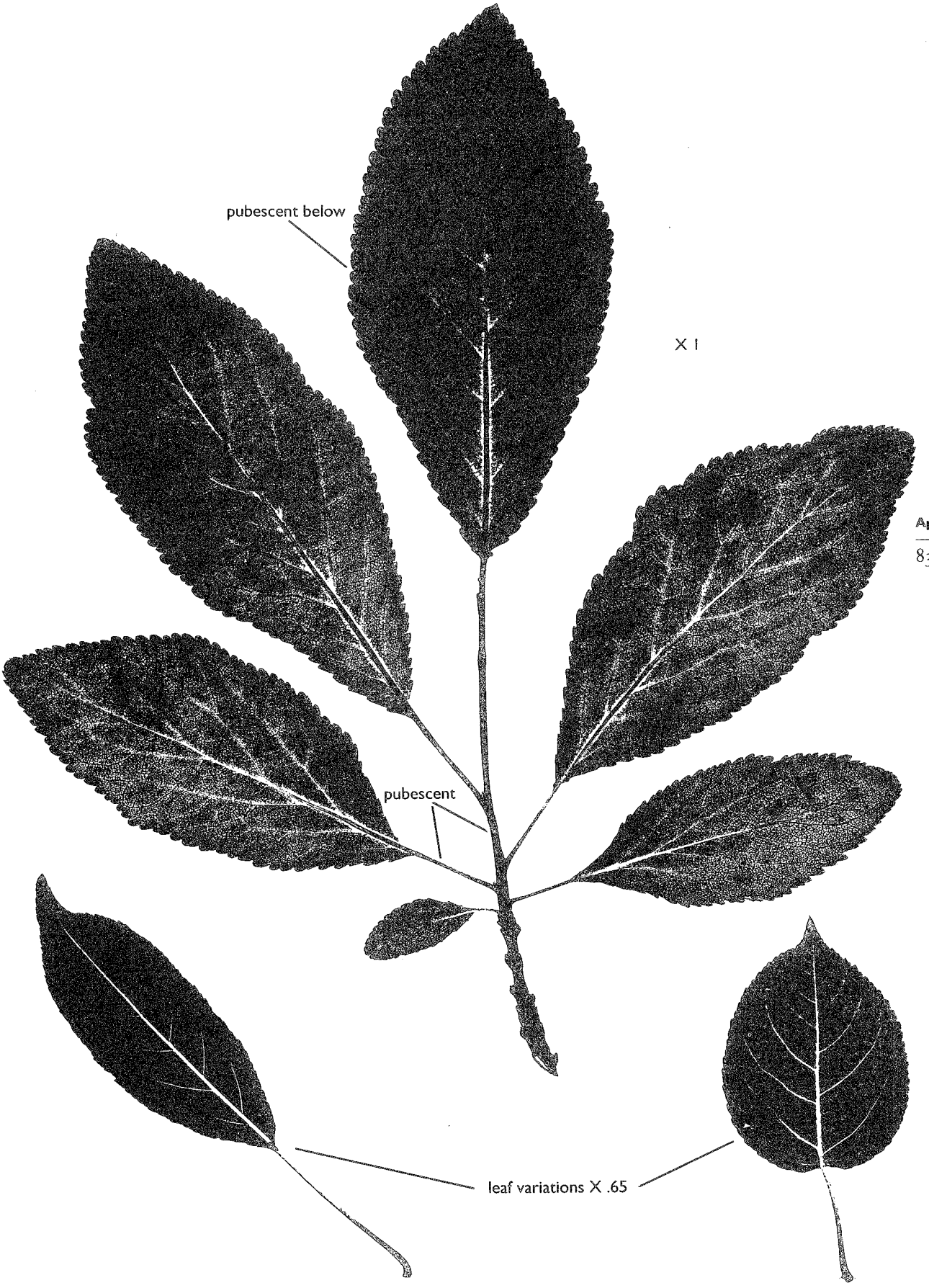
Apples are quite possibly the result of long hybridization by man and nature, and there is speculation that the genes of perhaps as many as seven wild species have combined into the modern-day polished apples of the supermarket. Today's apples have never been found in the wild as a species. It is certain that the modern apple had its origin in Europe and western Asia. *Malus pumila* is one likely parent, though *Malus sylvestris,* a wild crabapple, seems to be involved also. Apples are generally self-incompatible, that is, they need another tree to provide pollen. This and their varied genetic background account for the large variation in fruit size, color, and taste, as well as such things as the extraordinary variation in leaf form and pubescence. *Malus pumila* is nothing more than a convenient name for our modern apples of complex parentage.

Apple trees have been found in streambottoms and in disturbed forests of every zone in Idaho but spruce-fir. These are cool-climate trees, and, thus, unlike many of the escaped cherries and plums (see *Prunus,* p. 62), escaped apples more often exist at elevations above 2,000 feet in northern Idaho, higher still in the south. In the sagebrush and bunchgrass zones they occur only in streambottoms or where patches of tall shrubs occur on hillsides. Apples are common escapes along roads on the Palouse Prairie and in disturbed low-elevation forests. Despite being very widespread escaped trees, apples have rarely naturalized, that is, few large populations have been located that are competing with native vegetation.

Apples, closely related to pears (*Pyrus communis*) and more remotely to cherries and plums, are easily identified. Apple leaves lack the glands characteristic of cherry and plum leaves. They usually have white pubescence on the leaf undersides, petioles, new twigs, and buds. Pears lack this white woolly hairiness, as do all *Prunus* except Damson plums and Pacific bitter cherry, both of which have much smaller leaves.

Dense, moderate, or scanty pubescence on leaves, young twigs, and buds; leaves with long petioles, of many shapes; fall color dull to bright yellow; mature bark broken into loose, irregular plates; fruit an apple, borne on short, stout, fruiting spurs.

Near old abandoned orchards or homesteads; along roads in the farmlands of northern Idaho; in disturbed areas at lower elevations; upper Snake and Henrys Fork valleys; along U. S. 12 in toeslope shrubs or forests, Spaulding to Lowell; around Coeur d'Alene Lake and lower Coeur d'Alene River in the lakes chain, State Highway 37.


pubescent below
X 1
pubescent
leaf variations X .65

PEAR

GROUP I
Broadleaf, alternate, simple

Pyrus communis

ESCAPED

communis means "common"

FAMILY — ROSACEAE

GROUP I

84

Pears have not frequently escaped; nonetheless, sharp eyes will find them every now and then. Pear trees are more narrow-crowned than apples—this, combined with shiny leaves, may help find escaped pear trees in the field. In autumn pear leaves often turn orange or red or a deep maroon, in contrast to the dull to bright yellow fall color of apple leaves. Branchlets on some trees develop into a thorn from 2 to 4 inches long. Thorns do not occur on apple twigs. Pears are borne on a stout, short fruiting spur, similar to apples.

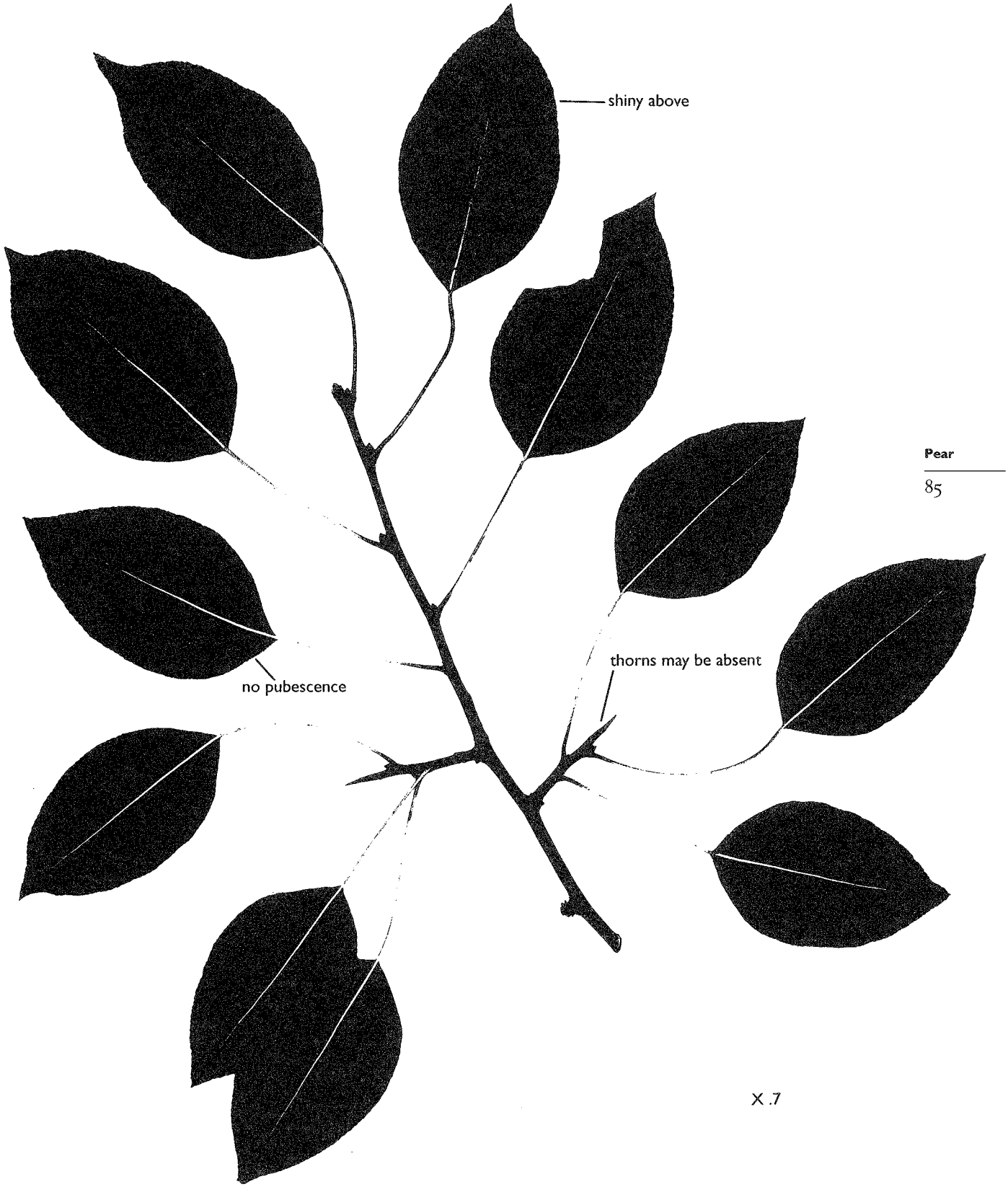
Pears, like apples, have been cultivated for thousands of years. The modern pear has a European lineage that likely includes hybridization of a half-dozen species. The discussion on the apple complex (see p. 82) explains a pattern very much paralleled by pears, and *Pyrus communis* is the generally recognized name for the product we know as the common edible pear.

Pears do best in a cool climate and are more abundant in the Douglas-fir and grand fir-cedar-hemlock zones, in disturbed forests and forest edges, or near streambottoms (but not in wet soil). They have less commonly been found in shrub communities on lower bunchgrass slopes.

Shiny leaves with little or no pubescence and rather long petioles, fall color is orange to red; fruit a pear, spherical to typically pear-shaped.

Occasional trees—Potlatch River canyon along State Highway 3; Clearwater Canyons Scenic Route; Salmon River along U. S. 95, White Bird to Riggins.

Note small fruit and shiny leaves of escaped pear.



X .7

ELMS

GROUP I
Broadleaf, alternate, simple

Ulmus

ESCAPED
ulmus is the classical Latin name for elm

FAMILY — ULMACEAE

GROUP I

There are no native elms in Idaho, but nonetheless you might find an elm growing wild. Most of the elms in Idaho's towns are either of European or Asiatic origin, although one eastern North American species, American elm (*Ulmus americana*), is reasonably common. Elms are primarily grown as shade trees, though their dry fruits, which appear early in the season, are sought by seed-eating birds. Siberian elm (*Ulmus pumila*), the toughest of its breed, was brought from the interior of Asia to the interior of western North America. From these cultivated seed sources, the papery, wind-borne seeds have spread to a number of areas, mainly in riparian habitats and along forest margins.

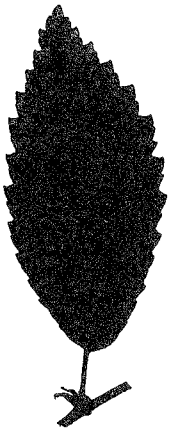
In the 1930s, Dutch elm disease was introduced into eastern North America. The spores were carried by elm bark beetles hiding in elm logs imported to make furniture. American elm is very susceptible to the disease, while European elms are less susceptible to damage and death and Siberian elm is one of the few classed as resistant (none are immune) (64). Dutch elm disease is discussed in the sections on American and Siberian elms.

Elms have very characteristic leaves. The base is usually not symmetrical, leaf margins are toothed, and the veins are prominent. Elm fruits are small, whitish papery discs (samaras), which in species grown in Idaho are shed in late spring.

Elms and hackberries are in the same family. This close relationship may confuse identification, since there are escaped elms in places where the native netleaf hackberry grows. Here are ways to tell them apart quickly:

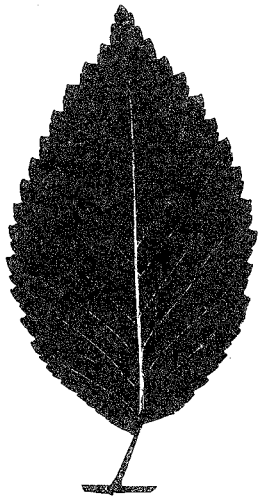
Species	Leaves	Leaf Margin	Fruit
elms	numerous large side veins	toothed or double- toothed	papery disc
netleaf hackberry	3 main veins from base, side veins obscure	remote teeth or none	small, spherical

Technical description: Leaves: alternate, simple, toothed and with a strong vein pattern, short petioles and commonly with an uneven base. Twigs: on vigorous shoots have a distinctive zig-zag pattern. Flowers: tiny and inconspicuous borne in very early spring. Fruit: a papery disc 1/2 inch or less long shed in late spring.



variety pumila

Siberian elm



variety arborea

American elm

SIBERIAN ELM

GROUP 1
Broadleaf, alternate, simple

Ulmus pumila
variety *pumila*
Ulmus pumila
variety *arborea*

ESCAPED
pumila means "small"

FAMILY — ULMACEAE

GROUP 1

Siberian elm is the most common elm planted in the interior of the western United States, and it is by far the most abundant elm in Idaho. From eastern Siberia and northern China, we have brought it to use in windbreaks, around farms and ranches, and as an ornamental. Siberian elm is drought-resistant and can endure very cold weather. As an ornamental it is fast-growing, with small leaves, but it is short-lived and has brittle branches like most elms. Its recommendations are tolerance to heat, cold, drought, and alkaline or saline soils, plus high resistance to Dutch elm disease (see p. 86). It has escaped widely in Idaho, particularly near farms in the sagebrush zone and along drier streambanks and riverbanks in bunchgrass areas.

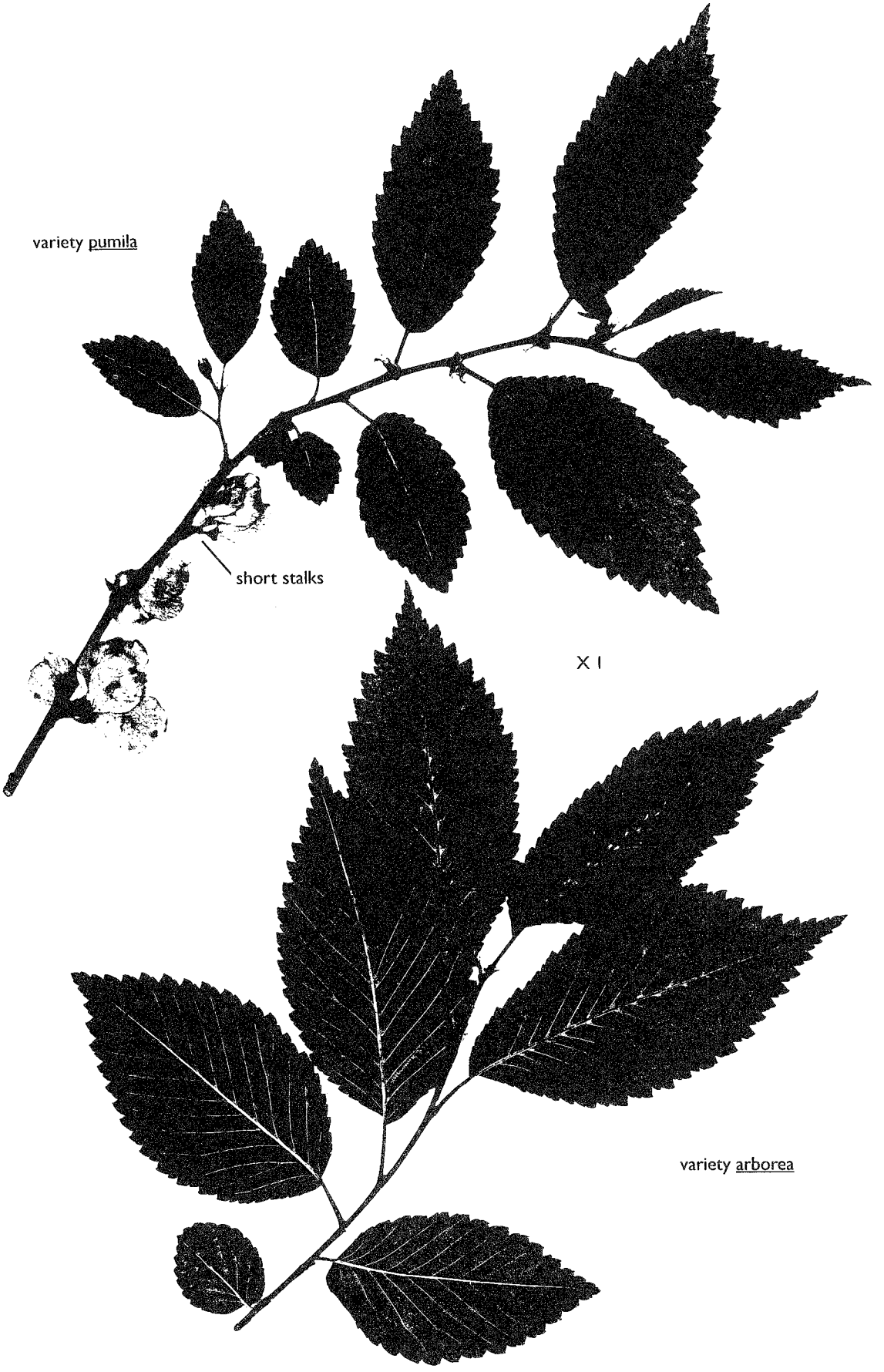
Siberian elm is often called "Chinese elm." This misnomer could cause confusion, because Chinese elm is not reliably cold-hardy in Idaho. Chinese elm (*Ulmus parvifolia*) requires a much warmer climate and bears its seeds in the fall. Chinese elm is nearly evergreen and is commonly grown in southern California and Arizona.

Two varieties of Siberian elm occur in the wild in Idaho. The variety *pumila* has smaller leaves, usually under 1 1/2 inches long, with a more symmetrical base than most elm leaves. The variety *arborea* has larger leaves, 1 1/2 to 2 1/2 inches long, with a somewhat asymmetrical base.

A note on elms: These trees hybridize easily, and hybrid elms are prevalent in the escaped Siberian elm populations. Often a larger leaf (over 3 inches long) indicates that American elm or some European elm may be involved as one parent. These elms produce seed in late spring and early summer; seeds are helpful for positive identification.

Leaves small, mostly under 2 inches long, base even or slightly asymmetrical, teeth single or slightly double; fruits are ¼-inch paper discs shed in late spring.

Along U. S. 12, Clearwater River, from Lewiston to Orofino; lower Little Salmon River, Pollack to Riggins, U. S. 95; along and near Snake River, Weiser to Pocatello.


variety pumila
short stalks
X 1
variety arborea

AMERICAN ELM

GROUP 1
Broadleaf, alternate, simple

Ulmus americana

ESCAPED
americana means "from America"

FAMILY — ULMACEAE

GROUP 1

American elm was one of the best known trees of the eastern United States, for its graceful, arching branches once shaded miles of streets in cities and towns alike. Many millions of these beautiful trees in the eastern United States died of Dutch elm disease in the past few decades. Actually, this disease is likely of Asian origin. It was first reported in France in 1818 and gradually spread through western Europe. It came to America years ago but did little real harm until the 1960s when a more virulent form came to light in America and made its way back to Europe. There it was discovered on a tree called Dutch elm (*Ulmus* X *hollandica*), and from that time on it has been known as Dutch elm disease. American elm unfortunately is very susceptible. Siberian elm, of the common elms cultivated in the West, is least susceptible (64). The disease is spread by elm bark beetles, which carry the fungus spores. The disease has reached Idaho, and without stringent control methods, many susceptible elms will die (see p. 86).

In Idaho, American elm has long been planted as a shade tree, as have several species of European elms. Today wild American elms grow scattered along streams and rivers in northern, western, and southern Idaho. Rarely do more than a few appear in any one area, but in total, it appears escaped American elms are well scattered. In its native habitat, this beautiful tree often grows along streams and rivers. It releases its winged seeds in early summer.

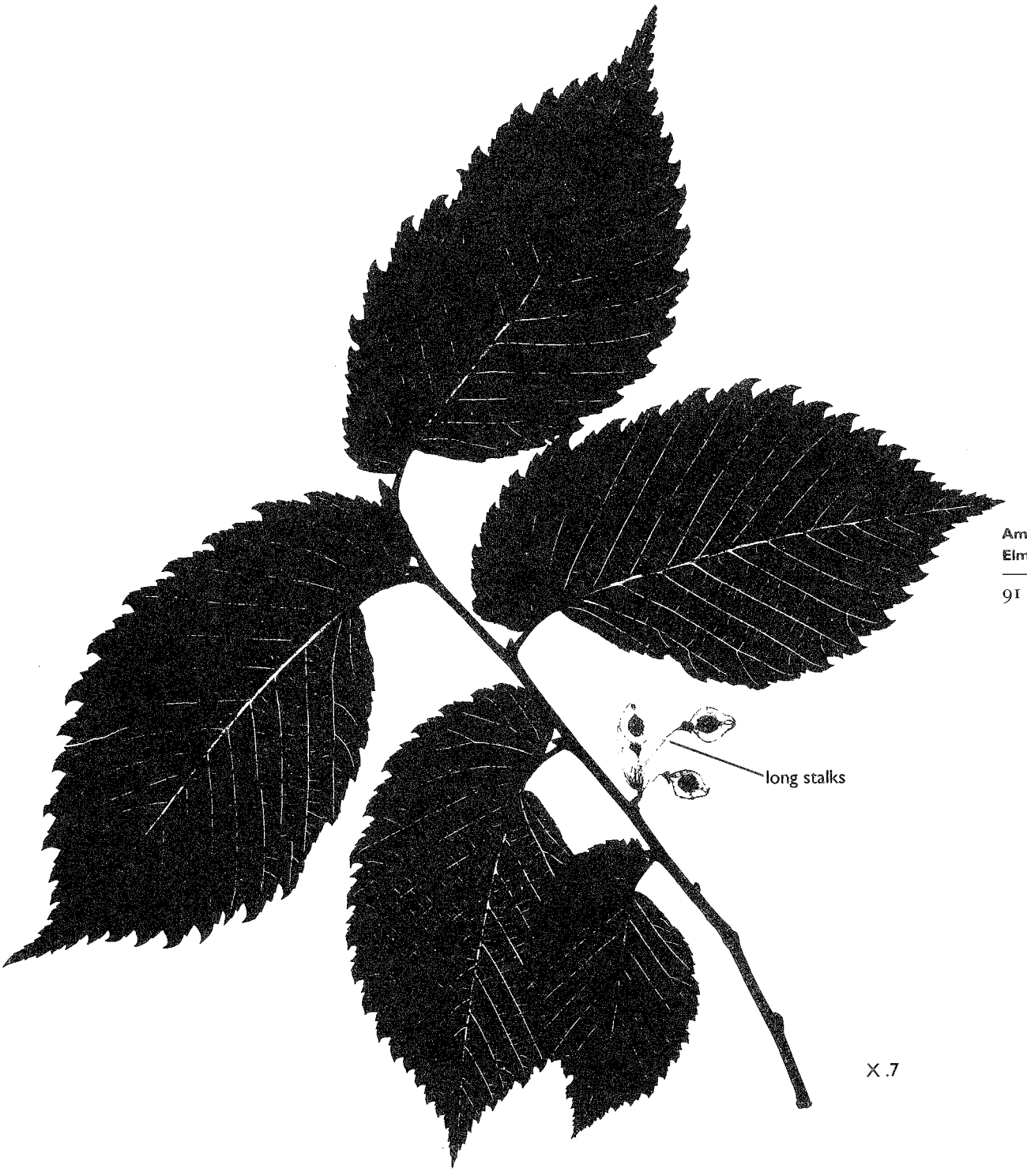
Many of the escaped elms in Idaho are not typical American elm. Some escaped trees are almost certainly hybrids, crosses between American and some other elms. Such trees are very difficult to identify accurately, and until more is known such trees will have to be called "hybrid elms."

Leaves 3 to 5 inches long with a very uneven base, double-toothed with the larger teeth near the sharply narrowed and slightly curved tip; seeds on long stalks and with a deep notch at the tip and many long hairs along the margin, shed in early summer; positive identification requires both leaves and seeds.

Along U. S. 12, Clearwater River, from Spalding to Kamiah; in riparian forests of the lower Boise, Payette and Weiser Rivers; riverbottoms in vicinity of Blackfoot and Pocatello.

Co-champions: diameter 53.2 inches, height 97 feet, near Lapwai, Nez Perce County; diameter 52.5 inches, height 94 feet, in Emmett, Gem County (both cultivated).

Note long-stalked seeds which are shed in early summer.



X .7

NETLEAF HACKBERRY

GROUP 1
Broadleaf, alternate, simple

Celtis reticulata
(*Celtis douglasii:* Douglas hackberry)
(*Celtis laevigigata* var. *reticulata*)

NATIVE

reticulata refers to netlike veination of the leaves

FAMILY — ULMACEAE

The main range of netleaf hackberry is in southern Arizona, New Mexico, and northern Mexico. Sometime in the distant past when the climate was warmer the population migrated north. As the climate cooled, a large population was stranded in the lower bunchgrass canyons of the middle Snake, lower Salmon, and lower Clearwater rivers. In fact, its distribution in Idaho is very similar to that of white alder, with which it often associates. Its range overlaps *Celtis laevigigata* (sugar berry) in Texas, and some consider this to be a western form of that widespread eastern species.

Netleaf hackberry is the most common tree seen from the river in Hells Canyon, yet in the rest of its wide range, populations are quite localized (51). It occupies a wide variety of habitats in Idaho's western canyons. On rocky outcrops it may be a gnarled, twisted shrub, but in streambottoms it has reasonably straight stems and may be 20 to 30 inches in diameter. On river bars, dwarf forests of almost pure hackberry occur, while all along the river a garland of hackberries trace a line along the high-water mark.

Hackberry seems to be a favorite food for bank beavers. Mule deer and bighorn sheep browse the young twigs. Birds seek the thin but sweet flesh of the small fruits, while rodents eat the seeds. Insects that cause disfiguring galls on twigs and leaves infest most Idaho hackberries—a number of dead gall leaves remain on most trees at all times. The bark on mature hackberry trees has peculiar corky ridges, which is unique among Idaho trees.

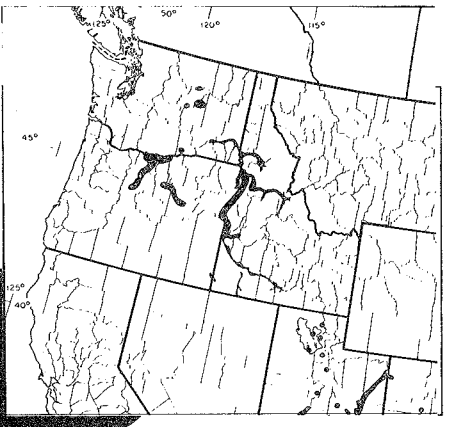
Technical description: Leaves: 1½ to 3 inches long, entire or with a few scattered teeth (or with numerous large teeth on vigorous shoots); green and very rough above, yellow-green below; leathery, with three prominent veins from the base. Fruit: a dry drupe, ¼ inch in diameter, brown to yellow when mature in fall. Bark: very distinctive, smooth and grey, with projecting corky ridges.

Bark with corky ridges; triangular leaves, very rough to touch, with 3 veins from the base, entire or irregularly toothed; fruits are small, dry, brown drupes.

Salmon River along U. S. 95, White Bird to Riggins; Clearwater River, U. S. 12, Lewiston to Spalding and near Kamiah; Snake River along Hells Canyon Reservoir; Snake River bottoms near Twin Falls; Hells Gate State Park, Lewiston, along Snake River.

Diameter 45.4 inches, height 38 feet, near Lenore, Nez Perce County.

Note unique ridges on hackberry bark.



3 veins at base

very rough

X 1

Netleaf Hackberry

93

CASCARA

GROUP I
Broadleaf, alternate, simple

Rhamnus purshiana
Also known as cascara buckthorn
chittum

NATIVE
Frederic Pursh, an early eastern U.S. botanist, first described this plant

FAMILY — RHAMNACEAE

GROUP I

Cascara is a medium to tall shrub over most of its range in Idaho. But, like many other species in this book, it becomes a tree up to 20 to 30 inches in diameter in western Idaho canyons. Cascara is primarily a Pacific coastal plant. Needing plenty of water and quite a bit of heat, it thrives at lower elevations along streams. In northern Idaho, it may also occur in shrubfields in the lower elevations of western redcedar and western hemlock forests.

Cascara twigs are a favorite browse of deer and elk, while birds and bears eat the fruit. From the bark, the laxative *cascara sagrada* is extracted. *Cáscara* means "bark" in Spanish. Local Indians in colonial California revealed the secret of its medicinal properties to Jesuit missionaries. The bark, harvested commercially along the Oregon and Washington coasts, is used to produce laxatives, hence the common name "chittum." Fruits shouldn't be eaten, as they may produce toxic effects (28).

Cascara has a close relative common in Idaho, called alderleaf buckthorn (*Rhamnus alnifolia*). A low shrub, up to 4 feet tall, it occurs in dense patches. It is most common in sunny streambottoms, often with thinleaf alder and always in the middle or upper forest zones. Alderleaf buckthorn leaves have only 5 to 7 pairs of veins, about half as many as cascara.

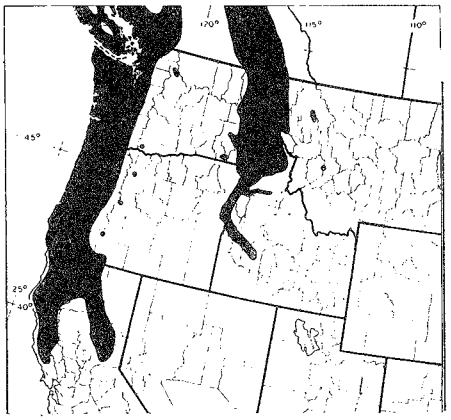
Technical description: Leaves: deciduous, alternate, simple, elliptical, 4 to 7 inches long with finely toothed margin and 10 to 12 pairs of parallel veins. Leaves on new growth may appear opposite. Flowers: tiny, greenish, inconspicuous. Fruit: shiny black berries about 1/3 inch in diameter. Buds: there are no true buds on the branch tips—instead find a small cluster of tiny leaves clothed in short brown hairs.

Alternate elliptical leaves with strong parallel vein pattern, entire or with small teeth along the margins; winter buds consist of tiny, closely grouped, fuzzy brown leaves.

Lower Lochsa River, shrubfields along U. S. 12; streambottoms in Hells Canyon; near Arrowrock Reservoir, Boise River; Coeur d'Alene River, Enaville to Shoshone Station.

Diameter 26.7 inches, height 33 feet, near Riggins, Idaho County.

The shiny black fruits of cascara should *not* be eaten.



X 1

Cascara

95

10-12 vein pairs

cascara

5-7 vein pairs

alderleaf buckthorn

RUSSIAN-OLIVE

GROUP I
Broadleaf, alternate, simple

Elaeagnus angustifolia

NATURALIZED

angustifolia means "narrow leaf"

FAMILY — ELAEAGNACEAE

GROUP I

Russian-olive, from the steppes of central Asia, was brought to the interior of the western United States for use as a drought-resistant windbreak tree. Commonly cultivated in southern Idaho, it has escaped and naturalized, particularly where the soil is wet in the spring, for example, along small streams, irrigation ditches, and on river terraces and bottomlands. In some parts of southern Idaho, Russian-olive is so prevalent along irrigation ditches that it has been declared a noxious weed, and efforts are directed to controlling the spread of this tree. Apparently it has escaped and naturalized mostly in the sagebrush/grass and salt desert shrub zones in southern Idaho. Occasional escaped trees may be seen in the north near Lewiston, the eastern limits of an extensive naturalized population in eastern Oregon and Washington (48). The small, silvery berries are edible, and they are sought by birds and rodents, who spread the tiny seeds.

Identification is generally quite easy: look for a small tree with alternate silvery leaves. Two other members of the same family may cause confusion, however. The leaves on young Russian-olive plants are ovate in outline and look quite different from the narrow adult leaves. Thus, young Russian-olive plants might be mistaken for *Elaeagnus commutata* (silverberry or wolf-willow), an uncommon native shrub. *Elaeagnus commutata* is a boreal species with two known disjunct populations in Idaho: one is in the Salmon River canyon and adjacent streams in the vicinity of Challis, and a larger population can be seen beneath narrowleaf cottonwood stands along the Snake River below Palisades Reservoir. Another silver-leaved plant is *Shepherdia argentea* (wolf-willow or silver buffalo-berry), which is a large shrub or small tree sometimes reported as native in Idaho. This plant has *opposite* silvery leaves and usually has thorny branches. We have no valid record for this tree being native in Idaho. Since *S. argentea* occurs in western Montana and eastern Oregon, it has been erroneously assumed to be native in Idaho.

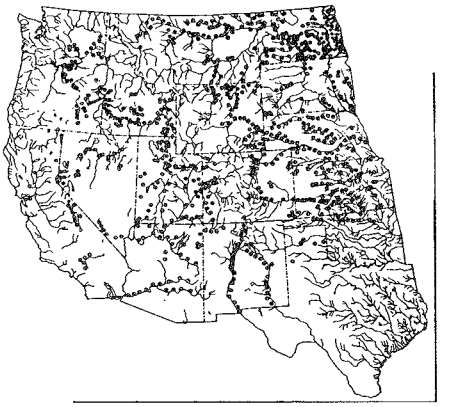
Technical description: Leaves: silvery on top and bottom, with a metallic luster; mature leaves narrow, about 3 inches long, juvenile leaves ovate, about 2 inches long. Twigs: young trees often have sharp thorns, all new twigs are white with dense hairs. Flowers: small, yellow, very fragrant. Fruit: 1/4 inch, oval, silver, berrylike.

Tree form and silvery leaves are important; found along rivers, Russian-olive could be mistaken for coyote willow (see p. 34). Young plants with juvenile leaves could be confused with *Elaeagnus commutata,* an uncommon shrub found in southeastern Idaho and along the upper Salmon River.

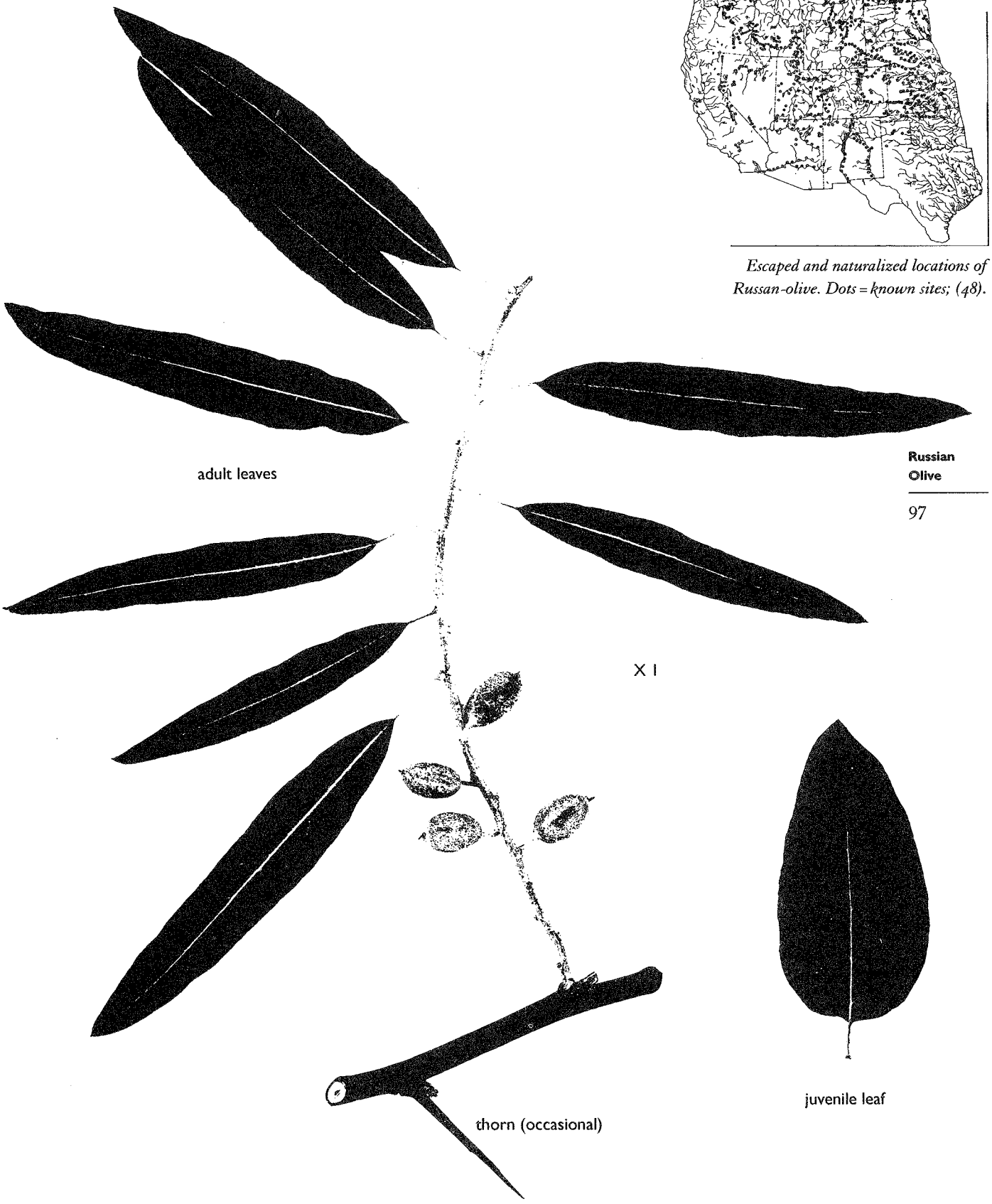
Common along streams, rivers, and irrigation ditches on the entire Snake River Plain; Hells Gate State Park near Lewiston; Bruneau Dunes State Park, Owyhee County.

Diameter 33.6 inches, height 42 feet, in Lewiston, Nez Perce County (this tree died in the 1990 hurricane).

32 33 Naturalized Russian-olive in southwestern Idaho; note silver fruits and willowy leaves.



Escaped and naturalized locations of Russan-olive. Dots = known sites; (48).



WHITE MULBERRY

GROUP I
Broadleaf, alternate, simple

Morus alba

NATURALIZED

alba means "white," referring to the fruit

FAMILY — MORACEAE

White mulberry is native to eastern Asia. The Chinese have cultivated these trees for centuries, for mulberry leaves are almost the only food for silkworms. The trees were brought to the American colonies in hopes of establishing a silk industry. The fruits are good to eat, although when fully ripe they are very sweet. White mulberry is used extensively in the Great Plains for windbreaks, but this is a rare use in Idaho. The trees were probably brought to Idaho for the fruit, although they are also an attractive ornamental. While mature fruits are quite edible, immature fruits when eaten in quantity may cause hallucinations or upset stomach (28).

Birds relish the fruit and spread the seed. Bears have been seen high in escaped mulberry trees eating the sweet fruit. White mulberry are common in the lower canyons of the middle Snake, Salmon, and Clearwater rivers and near farms in southwestern Idaho. They appear along streams, only occasionally invading the lower edges of forests where forests meet bunchgrass. They also grow along the rivers, on gravel bars, sandbars, in rocks near the high-water mark, and occasionally in shrub communities in draws. Along the Snake River above Lewiston, white mulberry is one of the most common riverbottom trees.

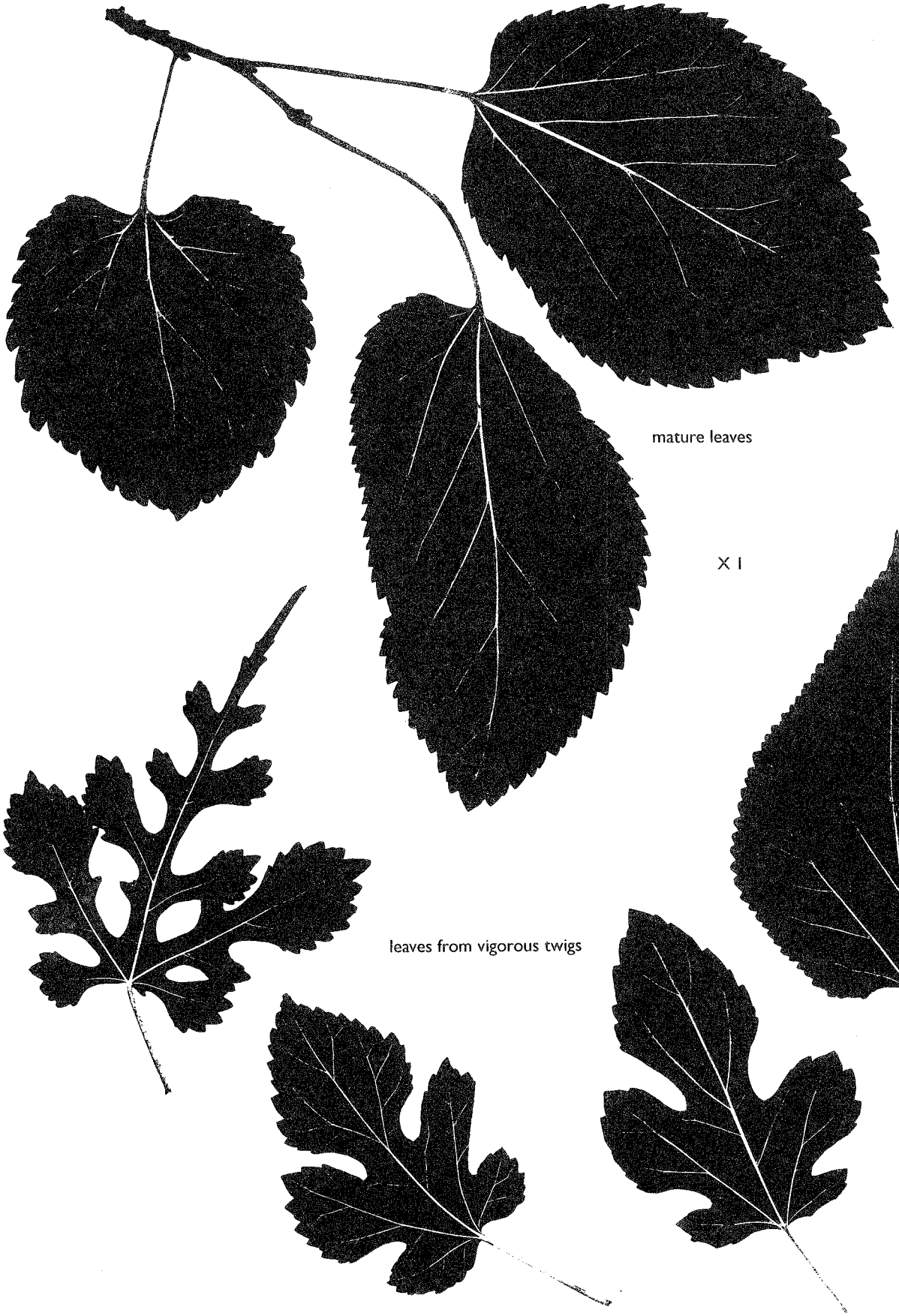
To identify white mulberry look for the lobed leaves, especially the ones with the deep indentations, which often do not appear until late in the season. These are found on young vigorous twigs, so look in sunny parts of the tree or on sprouts near the ground. Lobed leaves may also appear near the base of shaded branches on vigorous new shoots. Despite the name, white mulberry fruits may be black, red, purplish white, or white when mature.

Technical description: Leaves: simple, alternate, ovate in shape with rounded teeth; with or without deep indentations on margins. Flowers: inconspicuous, white in dense catkinlike clusters. Fruit: a small multiple fruit similar to a raspberry, sweet and edible, white, pale purple-white, red, or black when ripe, about ½ inch long.

Leaves with deep lobes, in several different patterns; fruits like a small raspberry, white to black when mature.

Snake River, Lewiston to Oxbow Dam; Hells Gate State Park, Lewiston; along Clearwater Canyons Scenic Route, Lewiston to Kooskia; Payette River, Horseshoe Bend to Payette.

28 Note black fruit phase of white mulberry.


mature leaves
X 1
leaves from vigorous twigs

OSAGE-ORANGE

GROUP I
Broadleaf, alternate, simple

Maclura pomifera
Also known as bowdark (*bois d'arc*)
hedge-apple

ESCAPED
pomifera means "bearing apples"

FAMILY — MORACEAE

GROUP I

"Horse-high, bull-strong and pig-tight "—that's a farmer's description of a hedgerow of *Maclura pomifera.* These fast-growing, thorny trees were once planted in the eastern and plains states as living fences to keep livestock in (or out). In Kansas alone, some 40,000 miles of single-row Osage-orange hedges were planted for windbreaks and as living fences. But long before this, American Indians knew this tree was exceptionally useful. Most important was the strong, elastic wood, which made excellent archery bows. This use prompted the name French explorers applied—"*bois d'arc.*" This in turn explains the name "bowdark," still used in the rural central United States. Indians also utilized the yellow wood to produce a dye for fabrics, and early settlers came upon this tree far from its Oklahoma/Texas home, planted by Indians. Now it has widely escaped and naturalized in the eastern United States (51).

The use of this tree by American Indians no doubt accounts for its current popular common name of "Osage-orange," named for the Indian tribe of its native range. The fruit does look a bit like an orange—a yellow-green, wrinkled orange about 3 to 6 inches in diameter. Despite its name, it is *not* edible. The trees also look like real orange trees, with dark green leaves similar in size and shape to citrus leaves. Needle-sharp thorns are borne near the base of the leaves on vigorous branches.

There are a few Osage-orange trees to be found in cultivation in Idaho; more rarely, a row of trees can be located. From some of these planted trees a few small escaped trees have been located, especially in Hells Canyon. While inedible to humans, the fruits, each with hundreds of corn-sized seeds, are taken by a wide variety of birds as well as by deer and squirrels, so a means of seed dispersal seems to be present. Since escaped Osage-oranges have also been seen in the Snake River Canyon in Oregon and Washington, I'll be optimistic, bet on its potential, and include *Maclura pomifera* as an escaped tree for Idaho.

There is only one species of *Maclura* in the world. The fruit is technically a multiple fruit, as is that of white mulberry. They are both in the same family, Moraceae, which includes the famous breadfruit of the tropics, which looks strikingly like an oversized Osage-orange.

Leaves 3 to 4 inches long, with pointed tip and entire margin; twigs often with thorns 1 to 3 inches long; fruits 3 to 6 inches in diameter, wrinkled, yellow-green, often under old trees as dried brown "mummies."

Nowhere easily seen in the wild. Present along Kurry Creek on road to Pittsburg Landing, Idaho County.

Note strange fruit, shiny leaves, and sharp thorn.

Osage-Orange

101

XI

BASIN BIG SAGE

GROUP 1
Broadleaf, alternate, simple

Artemisia tridentata
variety *tridentata*
Also known as big sage

NATIVE
tridentata means "three teeth"

FAMILY — COMPOSITAE (ASTERACEAE)

GROUP 1

The vast flat valleys of southern Idaho are dominated by vegetation known as sagebrush/grass communities. Numerous species of shrubby *Artemisias* dominate this vegetation at climax; most common, and tallest, are varieties of *Artemisia tridentata.* Sagebrush vegetation covers almost as much of Idaho as all of the conifer forests combined (Figure 4). When one thinks of the gnarled, grey sagebrush, which averages about 4 feet in height, it is surprising to find this plant in a tree book. Nonetheless, when big sage grows in the proper habitat, it occasionally becomes a small tree. Sage trees occur in streambottoms, not next to water but on rocky soil next to the stream, where the roots can get a bit of extra water, but not too much. Big sagebrush reaches diameters of 6 or 8 inches and heights of 10 to 15 feet. As a tree, it usually occurs in the mountains, not far from where the sagebrush/grass zone meets the timber. We lack an accurate record of a big sage reaching tree size in Idaho. However, a number of plants have dimensions very close to the critical 3 inches by 13 feet. In eastern Washington, a sage tree of 5 inches by 17 feet has been recently discovered—certainly Idaho can top that!

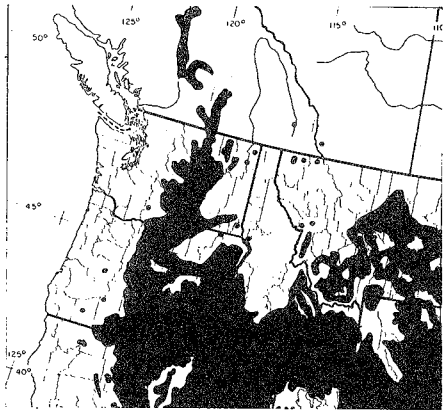
Big sage in Idaho consists of three recognized variations (subspecies), with a fourth likely: *Artemisia tridentata* var. *tridentata*—basin big sage—is the only one likely to occasionally reach the minimum size for a tree. The other two are: variety *vaseyana*—mountain big sage, so common to higher elevations south of the Salmon River, and variety *wyomingensis*—Wyoming big sage—which shares the Snake River Plain with basin big sage (65).

There are at least 23 species of native *Artemisia* in Idaho, 13 of these are the small, silvery shrubs called sagebrush. All have small, grey leaves that are usually deeply lobed or toothed near the tip and have the aromatic sage odor. Basin big sage is one of many similar-looking shrubs in Idaho; however, it is the only one that becomes a small tree and is the only sage to reach heights of over 5 feet.

Technical description: Leaves: small (1 inch long), with grey hairs on both surfaces, much larger at the tip and with 3 (usually) well-defined rounded teeth at the tip. Odor of sage is distinctive. Flowers: dense clusters of small, pale yellow flowers in late summer. Fruit: tiny, hairy seeds in fall.

Small, grey, tall shrub or small tree; leaves small, silvery, with 3 large teeth at tip and the odor of sage. Could be confused with bitterbrush (see p. 104).

Tree-sized big sage is very rare in Idaho and elsewhere. Information on locations of big sage trees is needed. The map reflects the range of variety *tridentata* as both a shrub and possible tree.



grey both sides

X 1

Basin
Big Sage

ANTELOPE BITTERBRUSH

GROUP I
Broadleaf, alternate, simple

Purshia tridentata
Also known as bitterbrush

NATIVE
tridentata means "three teeth"

FAMILY — ROSACEAE

Bitterbrush is not related to the sagebrushes, but it is often confused with them. To make matters more complicated, big sage and bitterbrush often occur together. It's surprising to most folks familiar with this shrub to find it in a tree book, but it does rarely become a tree. A bitterbrush (shall we call it a bittertree?) found in Owyhee County was large enough to meet the minimum size accepted for a tree.

Why bitterbrush? The fruit is reddish and quite fleshy when immature. A favorite farm-boy trick is to fake eating some of these fruits, thus enticing a newcomer to try them. Bitter, bitter, bitter! They pucker the mouth for hours to come. Eventually the fruit dries, and when mature it is a single, brown, pointed-at-both-ends structure. The leaves and twigs constitute one of the best browse plants in the West for deer, elk, and antelope, as well as for sheep and cattle. Bitterbrush is often planted on the winter ranges of deer and elk.

The leaves are similar to big sagebrush (see p. 102) but easily separated by two distinctive characteristics: the leaves of bitterbrush are greener (especially on top) than those of the sages, and they don't have the sage odor. Bitterbrush 6 to 8 feet in height are not uncommon, but these are still classed as shrubs. This important browse plant is common in most of Idaho's mountain shrub communities, often accompanied by mountain-mahogany, chokecherry, or serviceberry.

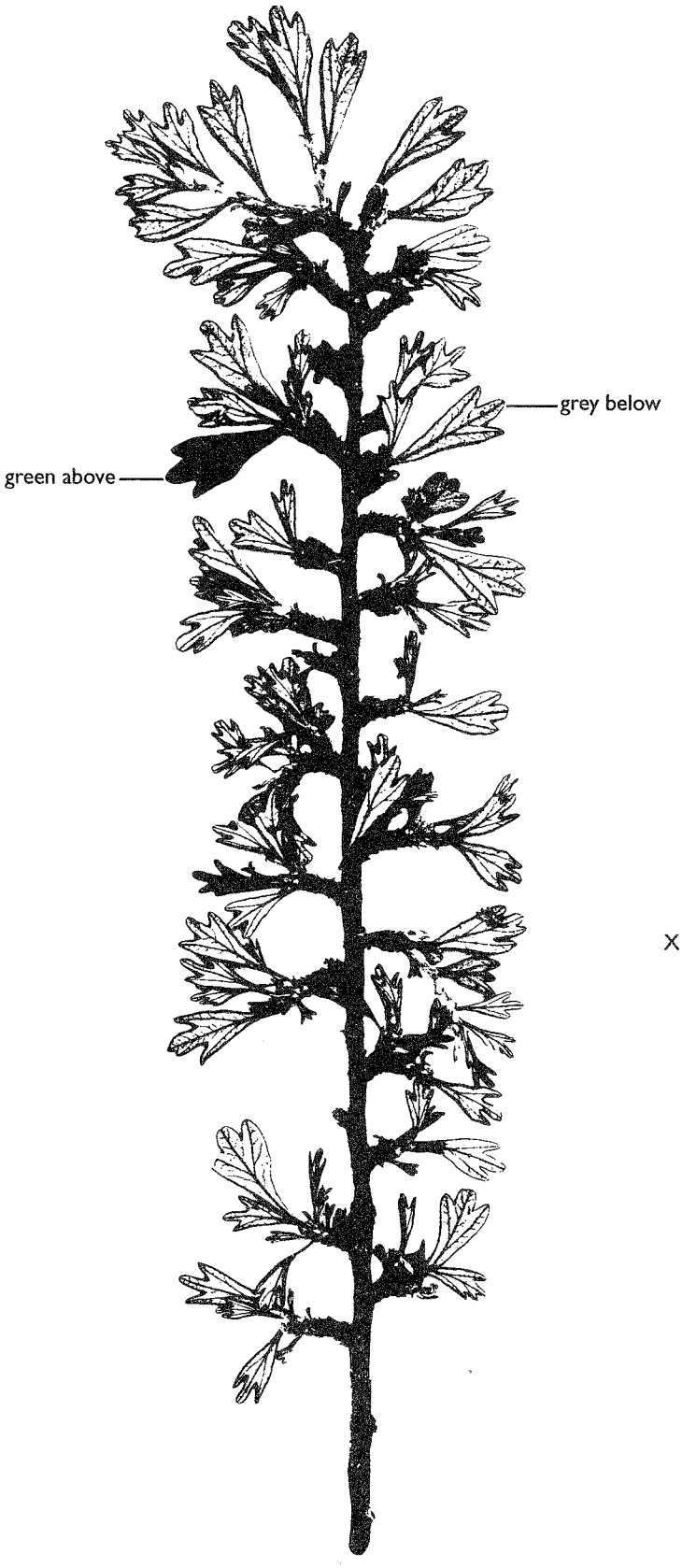
Technical description: Leaves: small (½ inch long or less), grey-green above, grey pubescent below, widest near the tips with 3 rounded teeth, no sage odor. Flowers: typical of "rose" family, 5 yellow petals, about ½ inch across, flowering in late spring. Fruit: dry, brown, pointed, single-seeded; fleshy and reddish when immature.

Small greyish tree (usually a shrub); leaves small, greenish above, 3 large teeth at tip, no sage odor.

Diameter 7.7 inches, height 13.5 feet, near Oreana, Owyhee County; the national record.

Treelike specimens have been found in Owyhee County. The map reflects the range of bitterbrush as both a shrub and tree. Information on locations of bitterbrush trees is needed.

Note small flowers and three-toothed leaves.



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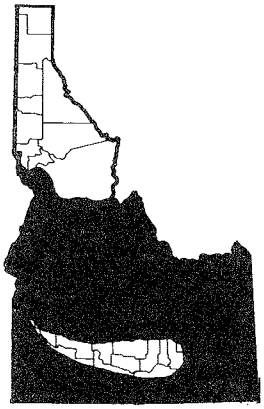


Antelope Bitterbush

EUROPEAN MOUNTAIN-ASH

GROUP 2
Broadleaf, alternate, compound

Sorbus aucuparia
Also known as rowan tree

ESCAPED

aucuparia refers to catching birds (the fruits were used as bait)

FAMILY — ROSACEAE

This tree is native to western Eurasia. It is probably the most widely cultivated mountain-ash in the United States and is grown primarily as an ornamental. It forms a medium-sized tree, often up to 20 inches in diameter. One can easily recognize mountain-ash in the fall when the clusters of orange-red fruits make an outstanding color display. Since the tree bears heavy crops every year, many people plant it to attract birds, which love the fruits. Leaves turn red or orange in the fall, adding to this tree's beauty.

European mountain-ash has escaped over most of the eastern United States and in the Puget Sound area of Washington. In Idaho, it has occasionally escaped in the lower-elevation areas of the grand fir-cedar-hemlock or Douglas-fir forests, but only relatively close to towns and farms.

Technical description: Leaves: alternate, pinnately compound, about 8 inches long, with 11 to 15 leaflets, each narrow, toothed (at least the upper two-thirds of margin), dull on top, usually hairy below. Flowers: small, white, in dense flat-topped clusters, ill-smelling. Fruit: a little soft apple (pome), berrylike, about ¼ inch, spherical, red-orange when mature, not edible. Bark: smooth, grey, with prominent horizontal lenticels.

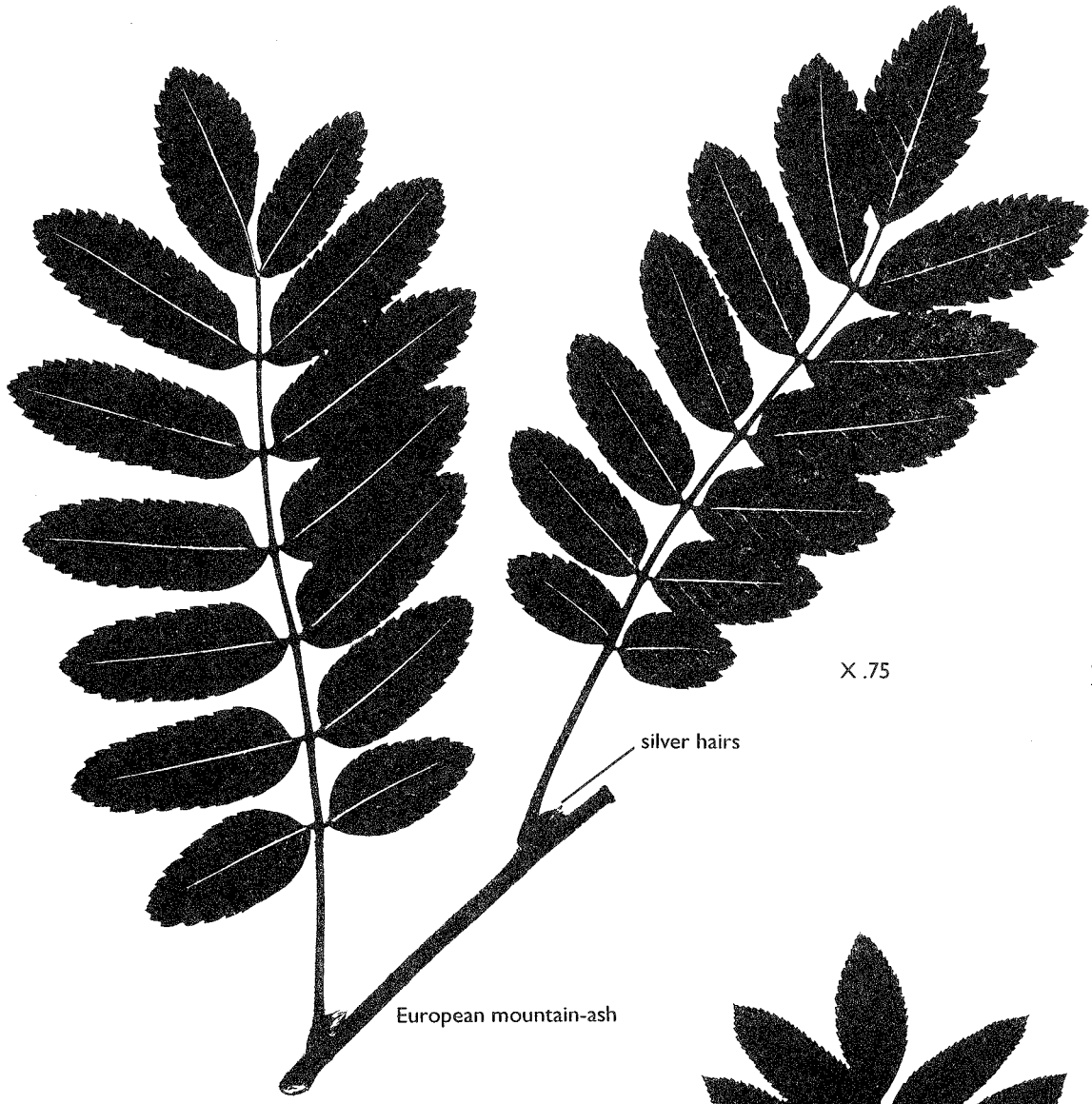
Rocky Mountain mountain-ash (*Sorbus scopulina*) is the common native mountain-ash of Idaho. It occurs chiefly in the spruce-fir and grand fir-cedar-hemlock zones. Sitka mountain ash (*Sorbus sitchensis*) is similar but confined to the subalpine zone of far northern Idaho. These two native mountain-ashes are sometimes listed as trees, but there are no records of either of them becoming a tree in Idaho. They could be confused with escaped European mountain-ash. Here is a means of separating them:

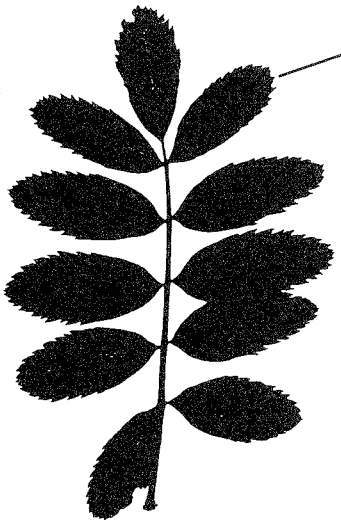
Species	Form	Leaflets	Buds	Wild Distribution
European mountain-ash	single-stem tree	11–15, dull on top, pointed tip	non-resinous, with silvery hairs	scattered, northern Idaho
Rocky Mtn. mountain-ash	multiple stems, shrub	9–13, shiny on top, pointed tip	resinous, with few hairs	statewide at higher elevations
Sitka mountain-ash	multiple stems, shrub	7–11, shiny on top, rounded tip	red-hairy	Clarkia northward, subalpine

Alternate, pinnately compound leaves with toothed, narrow leaflets 1 1/2 inches long; buds with white hairs; fruits are small, applelike in dense clusters, ¼ inch, orange-red when ripe; tree form.

Occasionally near Pend Oreille and Coeur d'Alene lakes; Moscow Mountain; vicinity of junction of Lochsa and Selway rivers; expected near towns in northern Idaho.

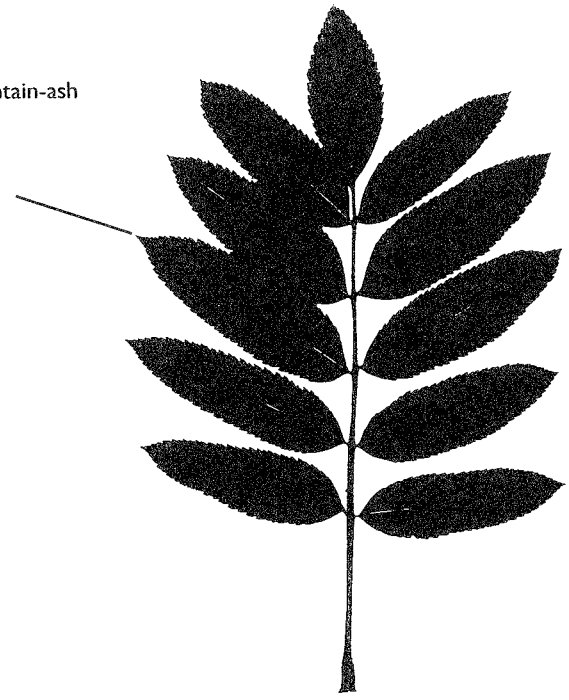
Many birds relish the red-orange fruits.





Sitka mountain-ash

X .5



Rocky Mountain mountain-ash

SMOOTH SUMAC

GROUP 2
Broadleaf, alternate, compound

Rhus glabra

NATIVE

glabra means "without hairs"

FAMILY — ANACARDIACEAE

Smooth sumac is a close relative of poison-ivy (*Rhus radicans*) and often grows in the same habitat. Unlike poison-ivy, its leaves are not reported to cause a skin rash. It appears on dry open hillsides in the bunchgrass and sagebrush/grass zones. It exists most often as a shrub, 2 to 6 feet high, with a single stem. Smooth sumac spreads underground by sprouts from the roots, thus forming dense colonies. In streambottoms it may become a small tree up to 6 or 7 inches in diameter and perhaps 20 feet tall. Smooth sumac occurs in all of the eastern U. S. and in all western states except Alaska; for years the largest known has been in Hells Canyon, about 9 inches in diameter.

The common cultivated sumac in Idaho is *Rhus typhina,* native to eastern North America. It is more tree-like than smooth sumac, and there are a number of horticultural varieties. *Rhus typhina* twigs are covered with a dense brown pubescence, similar to deer antlers in velvet, hence the common name, "staghorn sumac." *Rhus glabra* has no hairs, and is called "smooth sumac."

In fall, smooth sumac turns a brilliant red, and one can see the bright red patches on the canyonsides for miles. The mature fruits are actually little hairy nutlets. The hairs have a curiously tangy taste; in fact, this plant in eastern United States may be called lemonade sumac. The nutlets are eaten by a wide variety of birds, but the leaves and twigs are apparently unpalatable to game animals.

Technical description: Leaves: alternate, pinnately compound, composed of 7 to 31 opposite, coarsely-toothed leaflets, green above, whitish below, leaf sap milky and sticky. Twigs: thick with soft interior pith, new twigs pink with a thin white waxy covering (glaucous bloom). Flowers: inconspicuous, but in a dense, terminal cluster. Fruits: in a terminal, coneshaped cluster, 3 to 6 inches long, composed of numerous tiny, red, hairy nutlets.

Smooth sumac has long, alternate, pinnately compound leaves; so do black walnut and tree-of-heaven, both escaped trees. Here are ways to tell them apart:

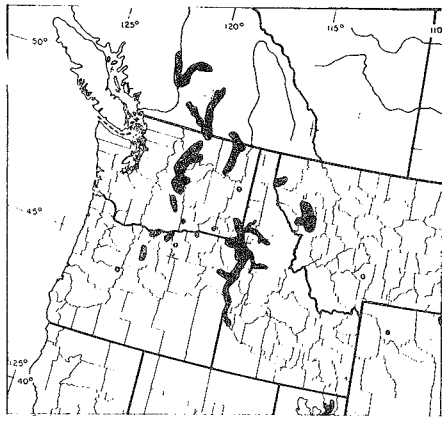
Species	Leaves	Leaflet Margin	Fruit
smooth sumac *(Rhus glabra)*	8–12", milky sap	toothed	dense clusters of red nutlets
black walnut (p. 114) *(Juglans nigra)*	8–15", clear sap	toothed	1" round, woody nut
tree-of-heaven (p. 110) *(Ailanthus altissima)*	12–48", clear sap	no teeth except 1–4 near base of leaflet	twisted-winged seed

Plants generally in groups; pinnately compound leaves with toothed leaflets; look for milky sap.

Diameter 8.9 inches, height 28 feet, near White Bird, Idaho County; the national record.

Potlatch Canyon near Juliaetta; Salmon River between Riggins and White Bird, U. S. 95; Clearwater Canyons Scenic Route, Lewiston to Kamiah along U. S. 12.

Dense clusters of tiny, hairy fruits mark smooth sumac from late summer through winter.



Smooth Sumac

109

X .75

large teeth

milky sap

TREE-OF-HEAVEN

GROUP 2
Broadleaf, alternate, compound

Ailanthus altissima

ESCAPED
altissima means "very tall"

FAMILY — SIMAROUBACEAE

GROUP 2

The name *Ailanthus* is derived from the Moluccan word for tree-of-heaven. It was introduced from northern China to the eastern United States before 1800, primarily to serve as a food source for silkworms, though it quickly gained acceptance as an ornamental. Its resistance to tough environmental conditions soon became apparent. This reputation brought it to the West.

This is a "city tree," for it thrives in almost impossible environments. In towns it remains green and serene breathing air laden with smoke and noxious fumes. Cracks in pavement, niches next to building foundations, and empty lots—almost anywhere the small wind-borne seeds can blow—are all places where this tough tree takes its start. It is very common in eastern U.S. cities, often growing where other trees have little success (67). In Idaho, tree-of-heaven has escaped from town trees particularly along roads, but also occurs in streambottoms in the sagebrush and bunchgrass zones and occasionally in ponderosa pine forests. It generally appears in groups, for it sprouts vigorously from underground roots, like quaking aspen.

This unusual tree has male and female flowers on separate trees. Flowers are tiny but borne by the hundreds in large, open clusters. Male flowers give off a putrid odor, and hence should be avoided. Female flowers produce mature fruit, even if unfertilized by male pollen, but unfertilized seeds won't germinate. The variety *erythrocarpa* ("red fruit") has attractive reddish fruits in late summer. This variety is reputed to have less tendency to root-sprout, and it develops into a rather pretty tree (67).

Tree-of-heaven is easy to identify, for no other Idaho tree, native or cultivated, has such long leaves. The 2- to 4-foot leaves, held high on the trunk, give this tree an exotic, tropical appearance. The leaves are similar to both smooth sumac and black walnut, neither of which have leaves with the distinctive unpleasant odor of tree-of-heaven, and both have teeth on the leaflets. See smooth sumac (p. 108) for a conspectus that differentiates these three trees.

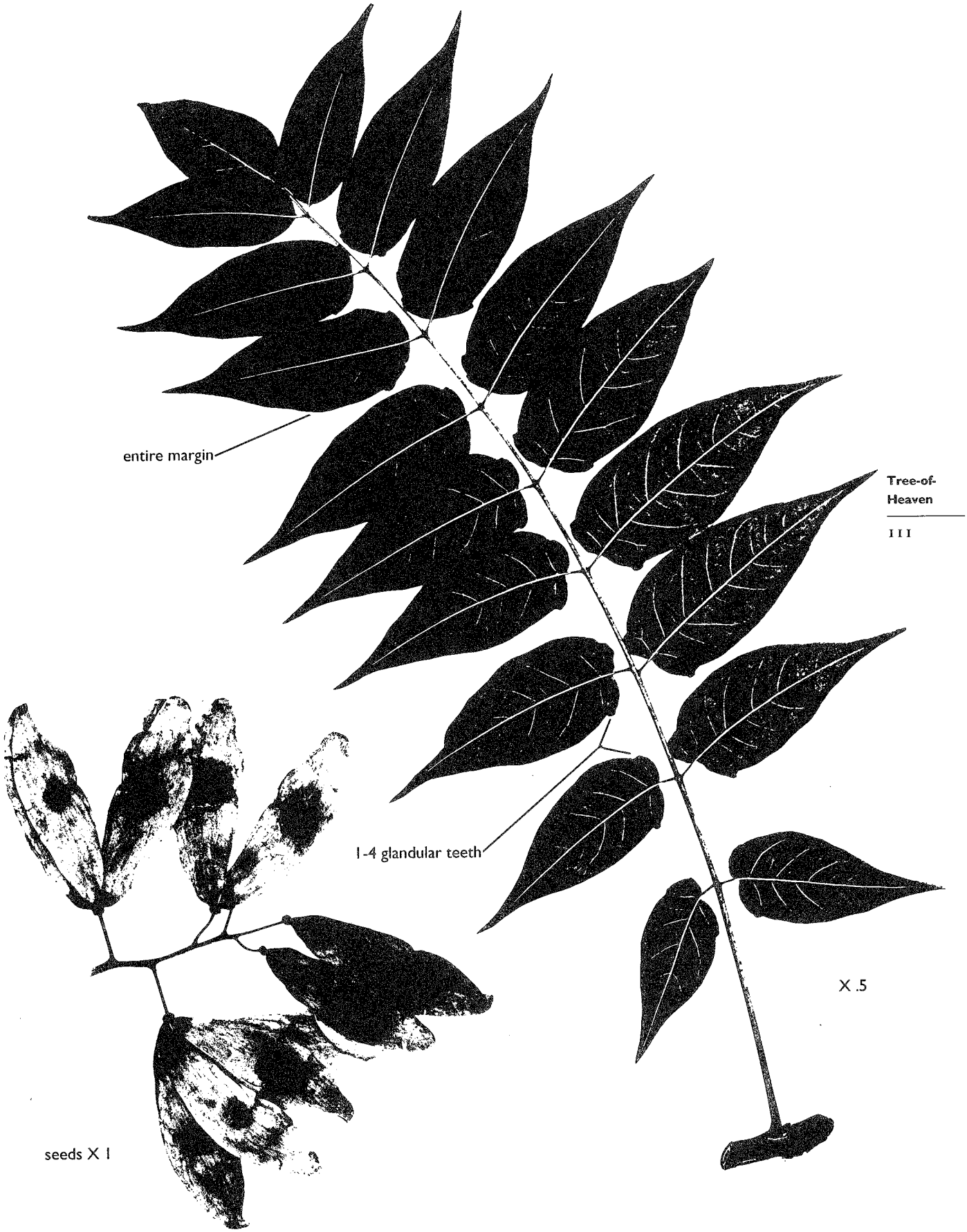
Technical description: Leaves: very long (2 to 4 feet), pinnately compound with many leaflets; each leaflet with entire margin except for one to four basal, rounded teeth; often ill-smelling when crushed. Flowers: tiny, in large, loose clusters. Fruit: large, dense clusters of papery, light brown, twisted seeds. Bark: thin, unplated; with wavy, vertical, orange furrows.

Pinnately compound leaves 2 to 4 feet long with many leaflets, which have entire margins; brown, papery, twisted seeds in dense clusters.

Downtown Lewiston; along U. S. 12 west of Orofino; lower Boise and Payette river valleys; most towns in southwestern Idaho; scattered escapes along southwestern Idaho streams and irrigation ditches.

Diameter 47 inches, height 53 feet, Lewiston, Nez Perce County (cultivated).

Note long leaves and dense clusters of twisted, papery seeds.



Tree-of-Heaven

111

WALNUTS

GROUP 2
Broadleaf, alternate, compound

Juglans

Juglans is the classic Latin name for walnut; it means "nut of Jupiter"

FAMILY — JUGLANDACEAE

Walnuts are widely renowned for their excellent wood, which is particularly prized for furniture. Most species have edible nuts, and all are good shade trees. There are some 15 species of *Juglans* native to temperate Europe, Asia, and America, with some species even found in tropical America. They share the same family with hickories and pecans (*Carya*), another genus with excellent wood and tasty nuts. Four native species of walnuts grow in western United States, but none are native north of California.

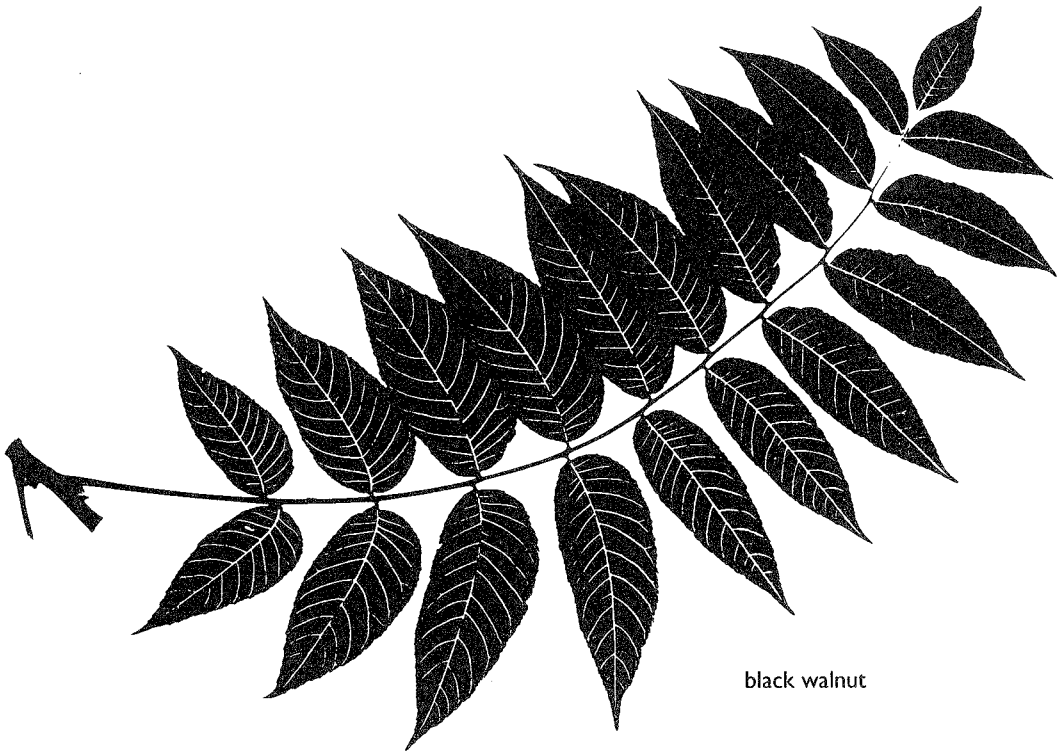
Split an older twig of any walnut down the middle; what you see is called a chambered pith. The center is hollow, yet separated into numerous tiny segments. This is a peculiarity of *Juglans* and is a quick way to separate them from the closely related hickories and pecans and from all other genera in this book.

Two species of walnut, black walnut and Persian walnut, have escaped in western Idaho, adding considerable interest to our tree flora.

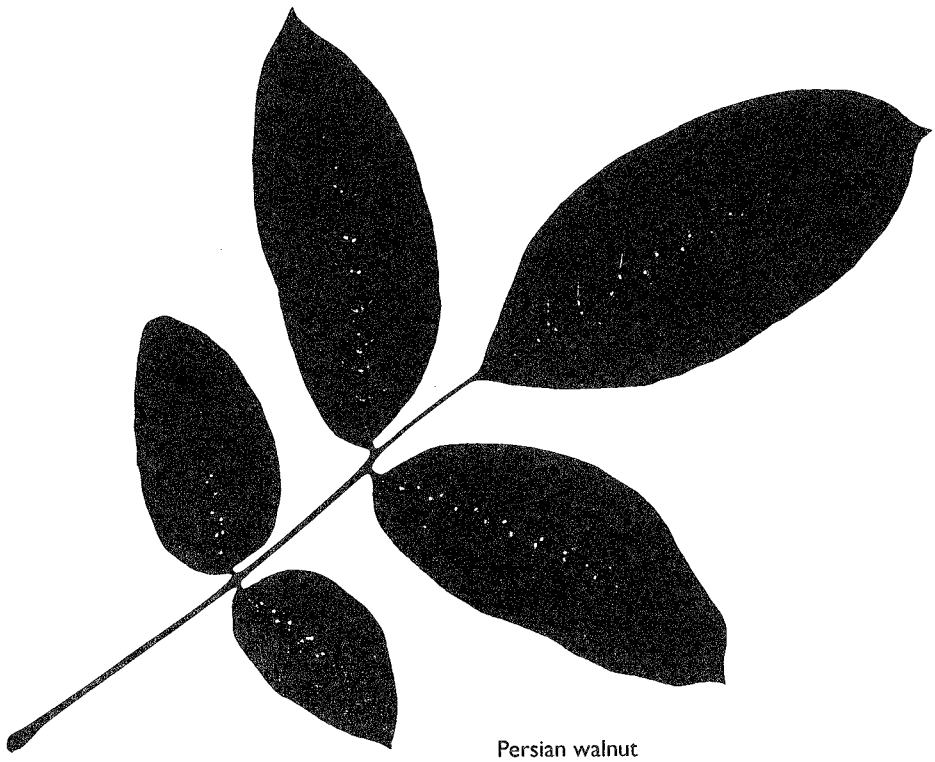
Technical description: Leaves: alternate, pinnately compound, with 5 to 21 finely toothed or entire leaflets; aromatic. Flowers: inconspicuous, males in drooping green catkins; females are a bulbous ovary topped by a feathery pink stigma. Fruit: a 1-inch spherical nut enclosed in a leathery aromatic rind.

Species	Leaflets
black walnut	15 to 21 elliptical leaflets with finely toothed margins; all leaflets about the same size.
Persian walnut	5 to 9 ovate leaflets with entire margin (or a few obscure teeth); basal leaflets much smaller than terminal.

See smooth sumac (p. 108) for a quick means of differentiating black walnut from tree-of-heaven and smooth sumac, all of which have alternate, pinnately compound leaves with many leaflets.



black walnut



Persian walnut

BLACK WALNUT

GROUP 2
Broadleaf, alternate, compound

Juglans nigra

ESCAPED

nigra means "black"

FAMILY — JUGLANDACEAE

Black walnut thrives over a wide area in the eastern United States, but it is not native to the West. It furnishes one of the finest cabinet woods in the world. Many homes have a fine piece of black walnut furniture, for everything from bookends to tables is made from this beautiful, dark wood. Individual trees have been sold for $20,000, while the fine veneers cut from a single tree may exceed $100,000 in value. The nuts are also greatly prized. While hard to extract because of thick, woody shells, they have fine flavor (4).

Brought to Idaho as shade trees, black walnuts provided the extra bonus of a delicious crop of nuts. Despite the fact that the fruits are as large as golf balls, these trees have escaped in several places and compete well with native trees. I expect they are primarily spread by squirrels. They occur mainly in the low-elevation streambottoms of western canyons, where moist, deep soil is available.

The unripe fruits are green, spherical, and about 2 inches in diameter. In autumn they turn yellow and fall to the ground, where they turn quite black. Examine one and you will find an outside layer of black, fibrous, somewhat juicy material. This black rind will stain the hands and clothing a black that is very difficult to remove. Pioneers in the eastern United States used the black hulls to stain wool or cotton from grey to jet black. Hulls were also reputed to cure ringworm and skin diseases (62). In the center, a 1-inch, deeply ridged nut is found. To help in identification, look for nuts or bits of nutshell under the tree. Nuts ripen in late fall, but must be stored in a dry place to after-ripen before reaching peak edibility. To germinate in the spring, the nuts must be kept cold and moist all winter.

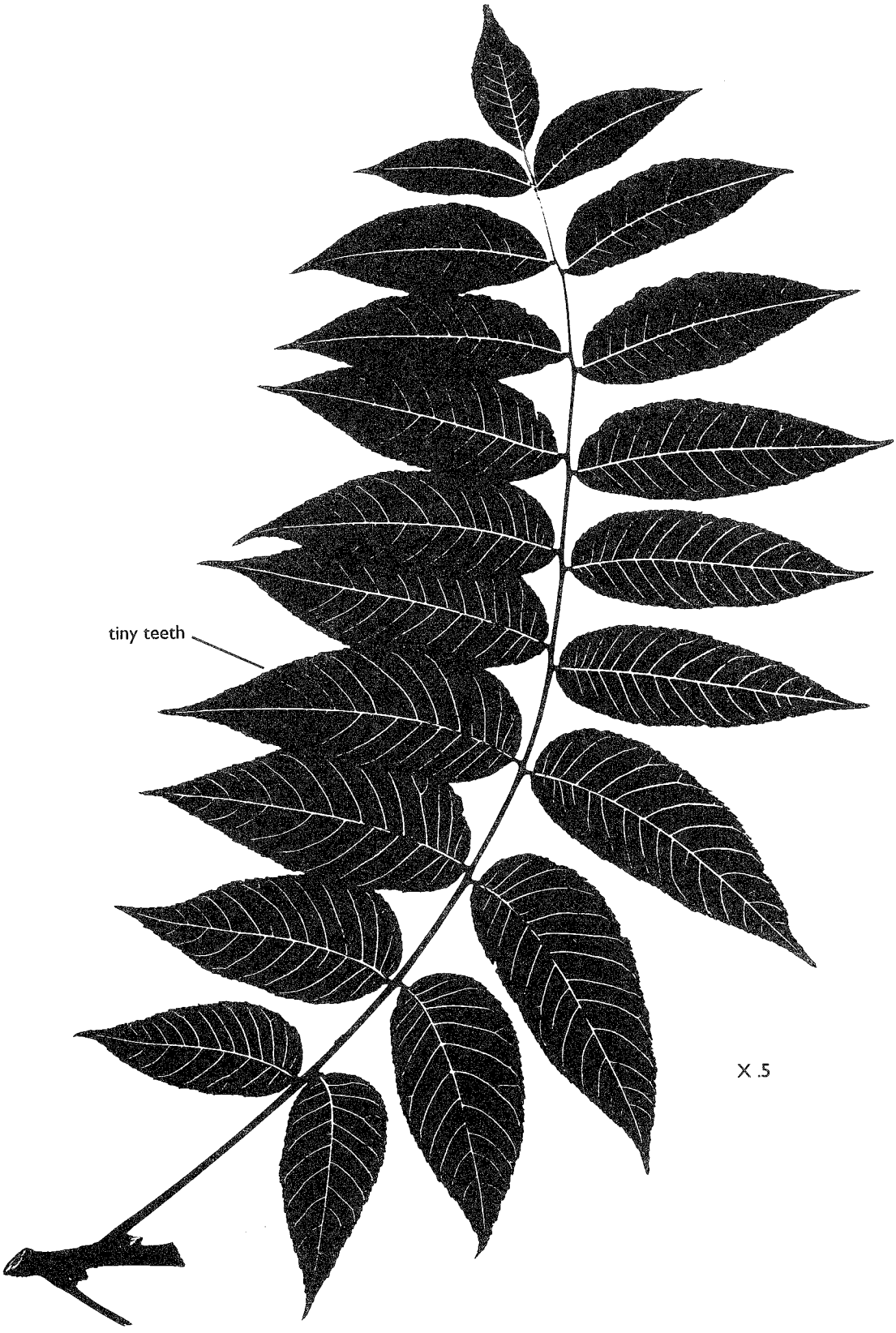
Black walnut leaves contain a toxic compound called "juglone," which is injurious to nearby crops such as tomatoes, potatoes, apples and blackberries. The leaves look superficially like smooth sumac, but black walnut twigs and leaves lack milky sap and are somewhat hairy with a distinctive aroma. Black walnut becomes a large tree and has a straight trunk. Smooth sumac is a small, shrubby tree with a crooked trunk. Black walnut also looks like an escaped tree-of-heaven, but tree-of-heaven lacks the numerous teeth along the leaflets, as well as the dark, deeply ridged bark.

Leaves pinnately compound with numerous, finely toothed, aromatic leaflets; fruits about size and shape of golf balls, with a thick rind that doesn't peel off, nuts eventually black with numerous ridges and thick shell.

Potlatch Canyon along State Highway 3, Kendrick to Spalding; John Day Creek, Salmon River near White Bird.

Diameter 64.6 inches, height 103 feet, in Slate Creek Village, Idaho County (cultivated).

Note immature fruits and long leaves.


tiny teeth
X .5

PERSIAN WALNUT

GROUP 2
Broadleaf, alternate, compound

Juglans regia
Also known as English walnut

NATURALIZED
regia means "royal"

FAMILY — JUGLANDACEAE

Persian walnut is native to the eastern Mediterranean region. After making its way to Italy, it was taken to England by Roman legions. The name walnut literally meant "foreign nut." It was introduced to America from England—hence the more popular, but inappropriate, common name "English walnut." It bears the familiar light brown, thin-shelled walnuts found in Thanksgiving and Christmas whole-nut mixes. Most Persian walnuts on the United States market are grown in California. The wood is of excellent quality, though lacking the dark color of black walnut. It is sold as white walnut or Circassian walnut. Large timber trees are grown in Turkey and Iran, where it is native.

The nut tree most commonly planted in Idaho is Persian walnut. It thrives chiefly in the warmer western part of the state and at lower elevations. Like black walnut, it has escaped in the lower western canyons. While we aren't certain what carries the seeds away from parent trees, we have found walnut shells over a mile from, and sometimes several thousand feet above, parent trees. In other areas, crows, ravens, and magpies have been observed carrying mature nuts some distance. Coyotes and bears may also be involved in walnut dissemination. There are well established populations in streambottoms of the bunchgrass zone, competing with white alder and water birch, and in places Persian walnut has become naturalized.

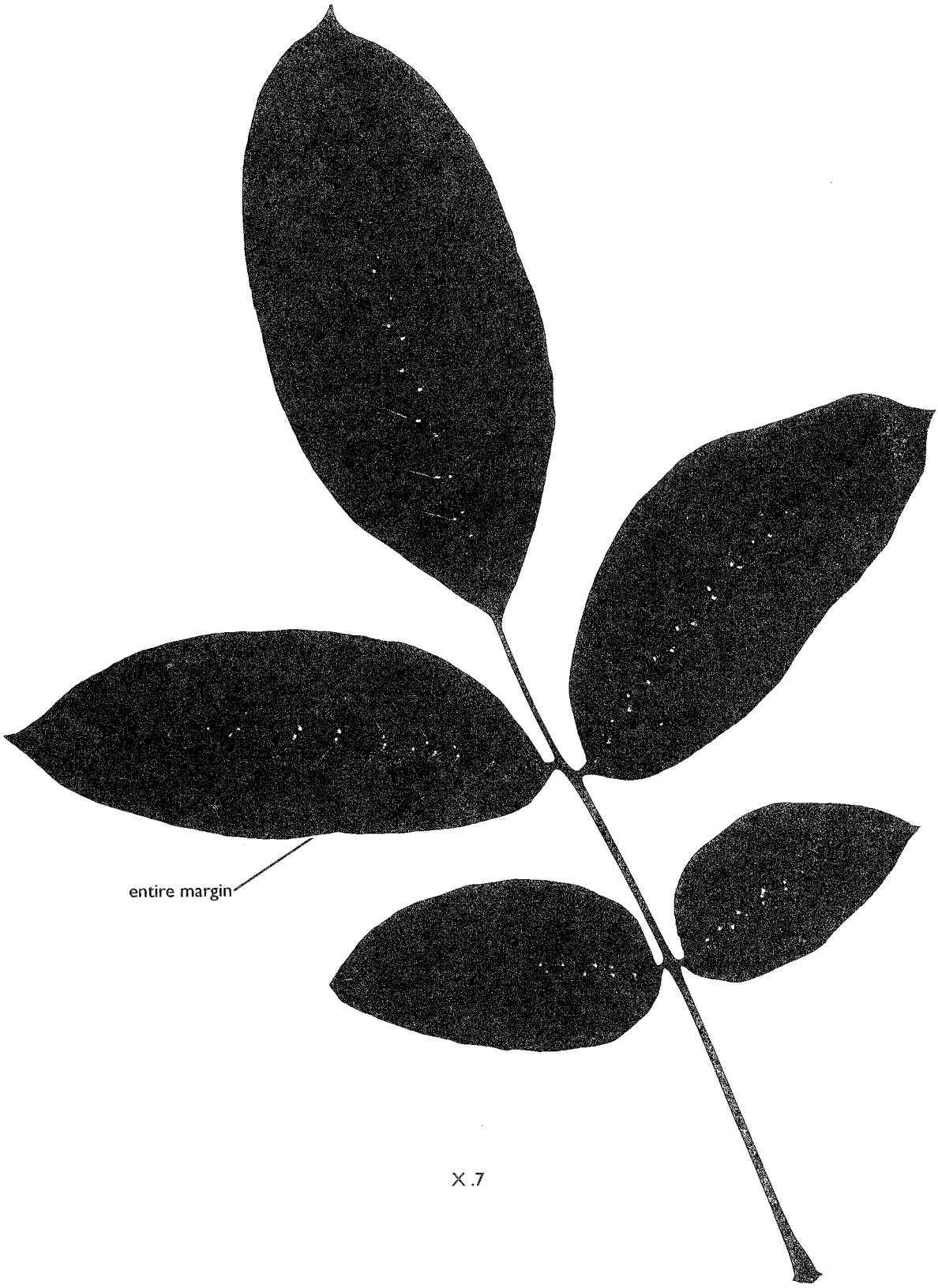
Persian walnut and green ash (see p. 142) have similar leaves and are found in the same areas. Here's how to tell them apart:

Species	Leaflets	Leaves	Fruit
Persian walnut	5–9, usually without teeth	alternate	1" nut
green ash	5–9, toothed near apex	opposite	winged seed

Leaves pinnately compound, 5 to 7 leaflets generally with entire margin and always with smaller basal leaflets; fruit a thin-shelled nut, 1 inch in diameter, the rind peeling off when mature.

On the side streams of Hells Canyon, such as Granite Creek about 1 mile above Snake River; Inca Creek on Hells Canyon Reservoir; Salmon River side streams Riggins to White Bird, as on John Day Creek.

Note opening fruit and unique leaves.



X .7

BLACK LOCUST

GROUP 2
Broadleaf, alternate, compound

Robinia pseudoacacia

NATURALIZED

pseudoacacia means "false acacia" (the leaves look somewhat like those of acacias)

FAMILY — LEGUMINOSAE (FABACEAE)

Black locust was brought west from its native eastern United States to use as a windbreak tree and as a drought-resistant, but beautiful, ornamental. The wood is very resistant to decay when in the ground, and near many of the early farms in Idaho groves of black locust were planted as a source of fence posts. A saying from colonial times proclaimed that fence posts of black locust should last "two years longer than stone." Black locust is very cold-hardy; it also resists drought, excessive wind, and poor soil. The wood is very hard and strong and when dry it makes excellent firewood. There are only a few towns in Idaho without black locusts, for it is probably the most commonly planted hardwood tree in the state. Moreover, its fame has spread, and it is one of the most commonly planted trees in the temperate areas of the world.

From extensive plantings, black locust has escaped in Idaho to the extent that now it prospers in the wild throughout the mid and lower elevations of the state. It generally appears in groves, sprouting from widespread roots like quaking aspen. In Idaho, naturalized black locusts are mainly streambottom trees; this species shows little inclination to climb very far up the hillsides.

No one is really certain whether the name "locust" was first applied to insects or to plants. It is said that the "locust" of biblical times was a desert tree (*Ceratonia silique*), now known as carob, whose leaves are similar to *Robinia*. The name "locust" was thus applied to this native tree of the eastern United States. It is not closely related to the honey-locust (*Gleditsia triacanthos*), which is so frequently planted in Idaho, although they are in the same family (see p. 120).

Black locust, like many members of the legume family has many parts that are poisonous. The young leaves, inner bark, and seeds are considered most toxic, and eating them can cause vomiting, diarrhea, weak pulse, or coldness. Young children have been affected by sucking on green twigs (28, 62).

Technical description: Leaves: pinnately compound with 5 to 10 pairs of elliptical, entire leaflets. Flowers: showy, white, in dense hanging clusters 4 to 6 inches long; individually they look like sweet-peas; very fragrant. Fruits: a flat pod 2 to 4 inches long (like a dry pea pod), brown when mature; many remain on the tree all year. Twigs: at the base of the leaves a pair of triangular, sharp-pointed spines is usually present—these are modified stipules.

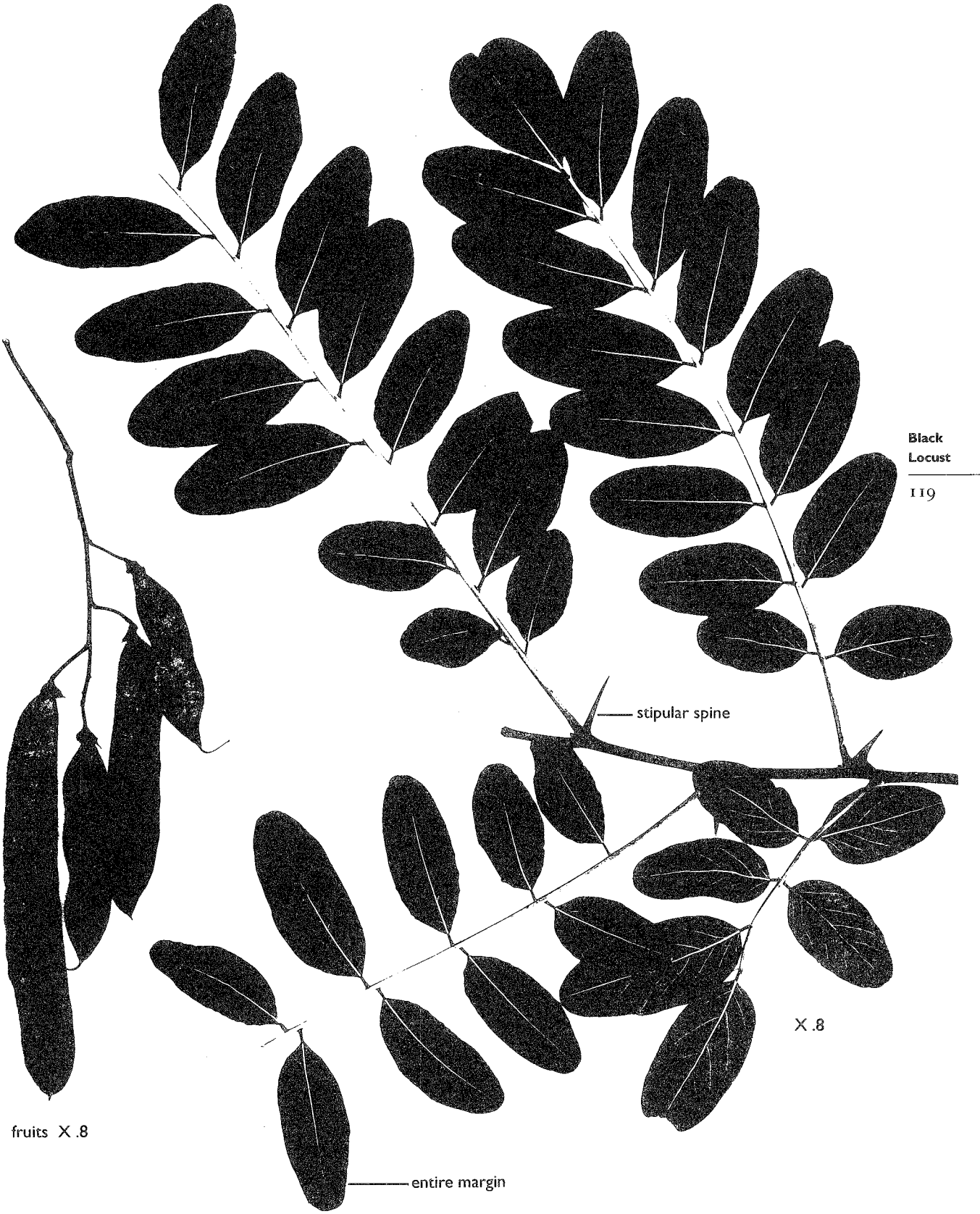
Pinnately compound leaves, round or elliptical, entire leaflets; the pair of triangular, stipular spines at the base of the leaves help positive identification.

Payette River Scenic Route, U. S. 95, Banks to Boise; Clearwater Canyons Scenic Route, Lewiston to Spalding; lower Weiser, Payette, and Boise rivers; Snake River, Bruneau to Rupert.

Diameter 50.3 inches, height 87 feet, Lapwai, Nez Perce County (cultivated).

Naturalized black locust in s.w. Idaho;

Note beautiful fragrant flowers and distinctive stipular spines.


stipular spine
X .8
fruits X .8
entire margin

HONEYLOCUST

GROUP 2
Broadleaf, alternate, compound

Gleditsia triacanthos

ESCAPED
triacanthos refers to the 3–pointed thorns

FAMILY — LEGUMINOSAE (FABACEAE)

The origin of the name "locust" as applied to American trees is discussed in the section on black locust. *Gleditsias* are more deserving of the name since, like the carob of the Mediterranean region, the probable place of origin for the locust name, the pods of honeylocust have a sweet, brown, edible "jam" between the seeds in the thin-walled pods. Cattle, horses, hogs, deer, bears, and many other animals greedily devour the pods, later voiding the hard-coated seeds, thus disseminating them.

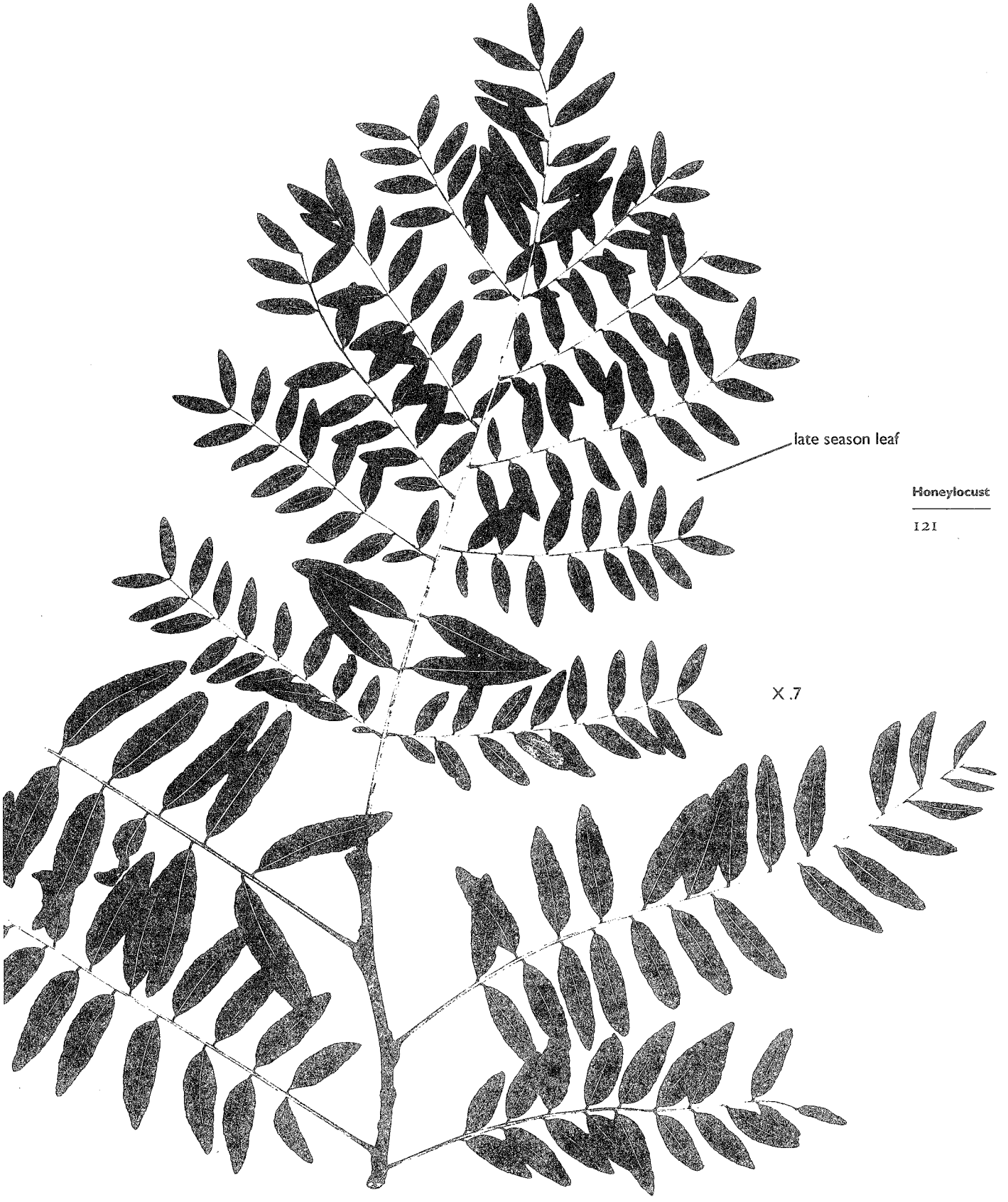
Americans plant trees in flurries of enthusiasm over a particular tree. Honeylocust is a tremendously popular tree and has been since the late 1950s. Millions upon millions have been planted around homes, in parks, along streets, and outside businesses. There are many reasons for the sudden fervor extended to this native of the eastern United States. The leaflets are so small they need not be raked. Left in place, fallen leaves literally fertilize the lawn each autumn. The trees have a pleasing, lacy crown that casts a moderate shade—but not so dense that grass won't grow well beneath them. Flowers are small and inconspicuous, but at least they aren't messy. But wild honeylocusts have two big drawbacks: they usually have horrible thorns and they shed large pods by the basketful. *Triacanthos* means "3-pointed thorns" and on young branches they are about 4 inches long. These thorns are actually modified branches, and honeylocust thorns grow, and branch, and grow some more. Some trunks are so closely beset with foot-long thorns that even a desperate squirrel won't try the climb. Pretty dangerous for an ornamental tree. From the wild population of thorny trees, some were found with no thorns; these were variety *inermis* ("unarmed"). Still, there were those 1- to 2-foot pods dropped by the thousands from a moderate-sized tree. They defy raking and just about have to be picked up by hand (or by a friendly goat).

In the late 1940s, a mutation appeared on a thornless tree—sterile flowers, but no fruit. Those long messy pods were gone, and gone too were the menacing thorns. The honeylocust boom was launched. Next came a series of patented selections, trees with special attributes: one has a pyramidal crown, another yellow foliage on branch tips, still another has a dense, rounded crown of green foliage—and there are others. Add these things together and you can understand the popularity of thornless, podless honeylocusts. Look around almost any Idaho town and see that big, old trees of honeylocust are pretty rare; young trees abound near newer homes, along streets, and in newer parks (67).

Obviously the current planting of sterile honeylocusts won't result in seeds developing into escaped trees. But pod-bearing trees are still seen here and there, mostly of the old variety *inermis,* thornless but fertile. From these parents, occasional escaped trees are established along riverbottoms in southwestern Idaho, some with thorns, most without.

Early leaves are pinnate compound, late-season leaves are either single or bipinnate; leaflets about ½ inch long, gradually tapered to a rounded tip; pods 1 to 2 feet long, thin, brown, unopening and twisted; thorns (if present) are excellent features for positive identification.

Rare on bottomlands of the Boise, Payette, and Weiser rivers.


late season leaf
X .7

MAPLES

GROUP 3
Broadleaf, opposite, simple

Acer

Acer is the classical Latin name for maple

FAMILY — ACERACEAE

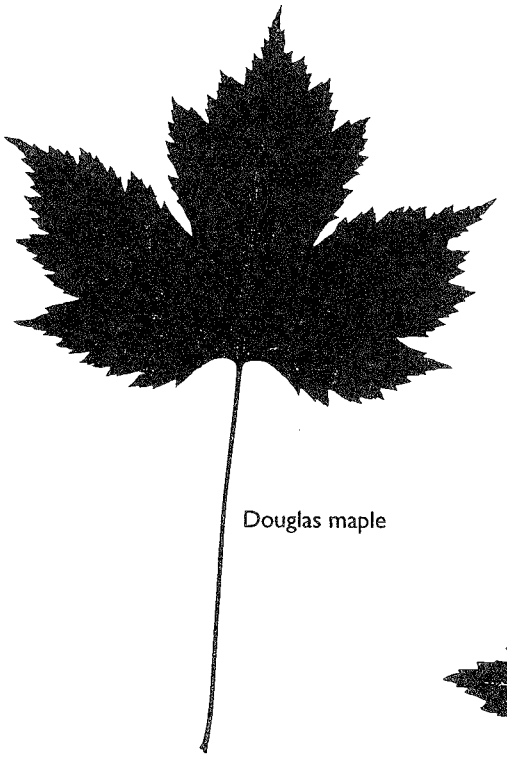
GROUP 3

Almost everybody recognizes maples. There are more kinds of ornamental maples in Idaho than any other genus of trees except the cherry genus (see *Prunus,* p. 62). Idaho native maples are small trees compared with their larger relatives, which are grown as shade trees. It will be interesting to see if the three maples that have escaped will grow to the great size they attain in the eastern United States and Europe. Five species of maple may be found in the wild in Idaho:

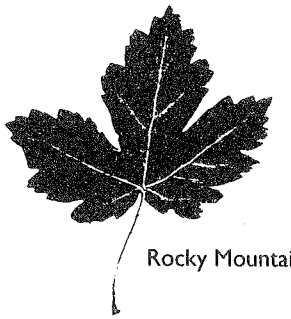
Species	Leaves	Leaf size	Status
Rocky Mountain maple	3-lobed; numerous sharp teeth	3–5"	native
bigtooth maple	3-lobed; few large rounded teeth	2–4"	native
silver maple	3–5 deeply lobed; few large pointed teeth	4–8"	naturalized
Norway maple	3-lobed; few large taper tipped teeth	5–9"	escaped
bigleaf maple	3-lobed, large center lobe; large rounded teeth	6–12"	escaped

Box-elder *(Acer negundo)* is also in the maple genus, but it has compound leaves and is rarely called a maple (see p. 140).

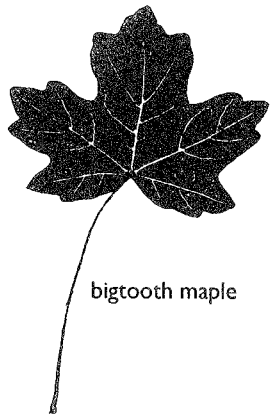
Technical description: Leaves: opposite each other on the twig, 2 to 12 inches long, 3- to 5-lobed, with veins meeting at the petiole (palmate venation), margins irregularly toothed or lobed. Fruit: two broad-winged seeds, joined at the base (a double samara).



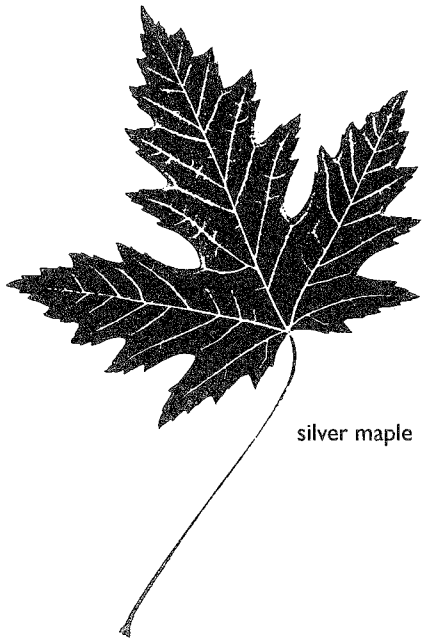
Douglas maple



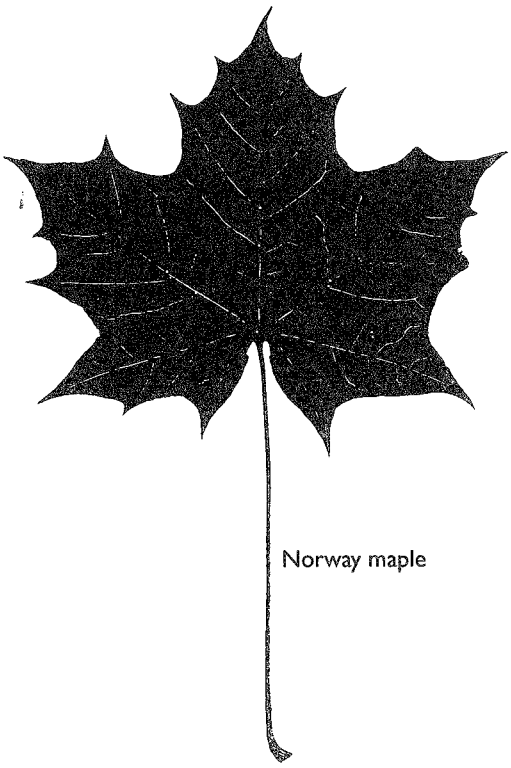
Rocky Mountain maple



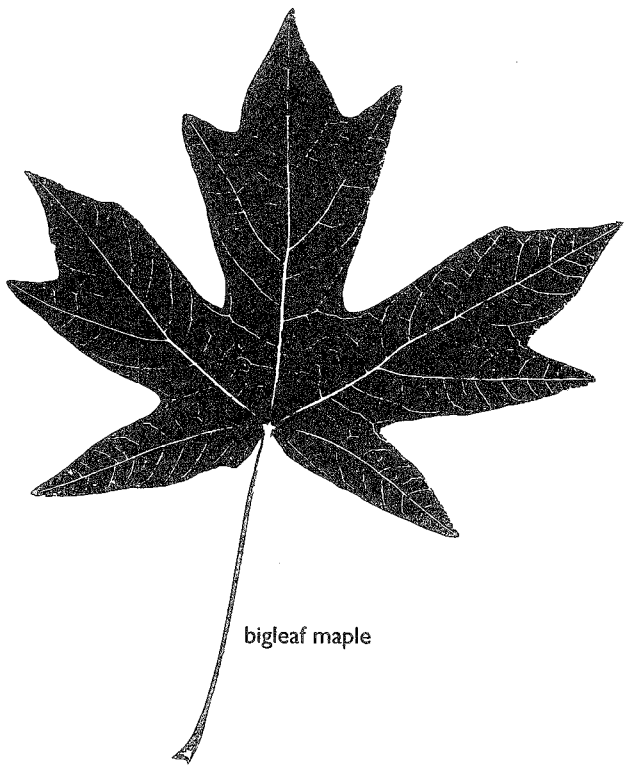
bigtooth maple



silver maple



Norway maple



bigleaf maple

ROCKY MOUNTAIN MAPLE

GROUP 3
Broadleaf, opposite, simple

Acer glabrum
variety *glabrum*
variety *douglasii*—Douglas maple
Also known as vine maple

NATIVE
glabrum means "without hairs"

FAMILY — ACERACEAE

This maple flourishes throughout the forests of Idaho. Usually a large shrub beneath coniferous forests, it is also common in streambottoms of forested areas. It appears as a disturbance species after fire or logging in both the Douglas-fir and the grand fir-cedar-hemlock zones. In extensive brushfields, often shared with serviceberry and Scouler willow, it is an important winter food for deer and elk.

Because the wood is hard and tough, early settlers used Rocky Mountain maple for all sorts of implements. Some is now cut for firewood and for smoking fish and meat. Douglas maple, the northern variety, reaches diameters of 15 inches or more and heights of 40 feet. Usually it has several stems. Some call this "vine maple," which is confusing, because *Acer circinatum,* native west of the Cascades, is more commonly called vine maple. Since *Acer circinatum* is becoming a popular ornamental in Idaho, "vine maple" should be applied only to this West Coast native.

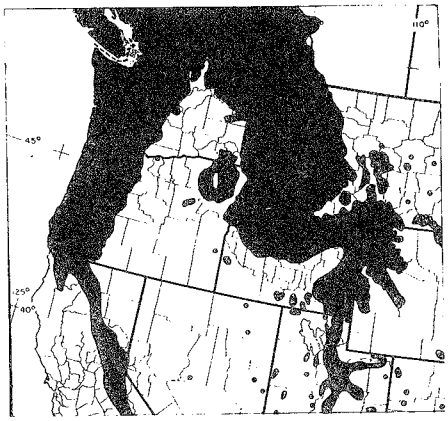
There are two poorly defined varieties of *Acer glabrum* in Idaho. Rocky Mountain maples of northern Idaho are larger plants, with leaves 3 to 5 inches long that have sharp-pointed teeth; this is called variety *douglasii,* and is sometimes called Douglas maple. The two largest known Douglas maples in the United States are thriving near Ahsahka and Sandpoint. Southern Idaho trees are smaller, with leaves 2 to 3 inches long whose teeth are either sharp or somewhat rounded; these are called variety *glabrum.*

A third variety, *Acer glabrum* var. *tripartitum* is found in extreme southeastern Idaho. This shrub has very small leaves that are always trifoliolate, that is, with 3 separate leaflets. It occurs on rocky outcrops and talus slopes associated with such plants as mountain-mahogany and chokecherry. This variety is a many-stemmed shrub and is not expected to be large enough to be classed as a tree (37).

Leaves opposite, 2 to 5 inches long, 3-lobed (or rarely, trifoliolate) with numerous small, pointed, or slightly rounded teeth on margins.

Small tree, var. *glabrum,* common throughout Idaho in forested areas except in range of var. *douglasii.* Small tree common in Idaho north of the Salmon River in grand-fir, western redcedar, or western hemlock forests—var. *douglasii.* Shrub confined to extreme southeastern Idaho— var. *tripartitum.*

National co-champions: variety *douglasii*—diameter 19.7 inches, height 65 feet, near Ahsahka, Clearwater County; diameter 16.8 inches, height 80 feet, near Sandpoint, Bonner County. Variety *glabrum*—diameter 5.4 inches, height 25 feet, near Oakley, Cassia County.



Rocky Mountain maple

X 1

Douglas maple

BIGTOOTH MAPLE

GROUP 3
Broadleaf, opposite, simple

Acer grandidentatum
(*Acer saccharum* var. *grandidentatum*)
Also known as canyon maple

NATIVE

grandidentatum means "large tooth"

FAMILY — ACERACEAE

GROUP 3

In eastern North America, sugar maples (*Acer saccharum*) are prized for fall color, valuable wood, and, of course, for maple sugar. Bigtooth maple, closely related to sugar maple, is a western dwarf, struggling in less hospitable environments. Throughout the foothills of the Rockies from Idaho southward, bigtooth maple is found in mountain shrub communities, although it also appears along rocky streams. In Idaho it grows only in the southeastern section. Along stream courses trees may reach 50 feet in height and 2 feet in diameter, and generally have several stems. On steep hillsides, bigtooth maple is often associated with Idaho's native box-elder, Rocky Mountain juniper, chokecherry, or mountain-mahogany in mountain shrub communities. Less commonly, it can be found in open lower-elevation Douglas-fir forests.

Bigtooth maple groves turn a brilliant red or orange in the fall; it is Idaho's largest red-foliaged native tree. It has been found that fall color is genetically controlled. Thus, a tree with particularly brilliant red leaves will have red leaves each fall, although the intensity varies with weather patterns—rainy weather produces less-dramatic colors. This is the reason we're now seeing a surge of interest in specially selected red maples (*Acer rubrum*) and Amur maples (*Acer ginnela*). Bright fall color, with each tree the same, makes rows and groups of these trees particularly attractive. There is growing interest amongst nurserymen for bigtooth maple, and it has great potential (40).

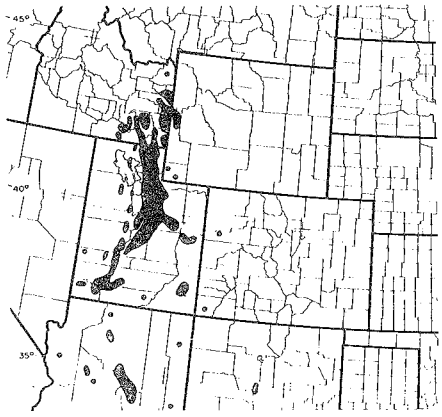
When the leaves turn in autumn, the foothills of southeastern Idaho are ablaze with color that rivals the best of the famed eastern deciduous forests. The scarlet of bigtooth maple is set off by the brilliant yellow of quaking aspen; amongst them are patches of maroon-leaved chokecherry, while the somber dark greens of Douglas-fir and limber pine contrast with the silver-green of Rocky Mountain juniper. This display of color continues southward from Idaho and is one of the glorious sights of the West. The sap of bigtooth maple can be used to make maple sugar, but recent studies found the quantity and quality lower than that produced by the famous eastern sugar maples.

Opposite leaves, 2 to 4 inches long, usually 3-lobed, with large, rounded teeth on margins, southeastern Idaho.

Cub River road, Franklin County; along the Snake River near Pocatello; Georgetown Canyon, Bear Lake County; along Palisades Reservoir, Bonneville County; foothills near Ashton, Fremont County; scattered along the Bear Lake-Caribou Scenic Route.

Diameter 24.1 inches, height 49 feet, near Preston, Franklin County.

Red bigtooth maple contrasts with aspen and Douglas-fir in Bear Lake County.

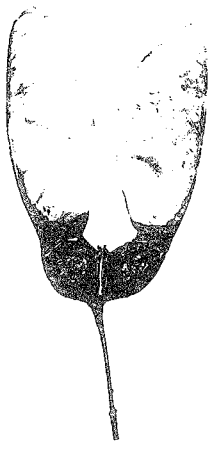


Bigtooth Maple

127

large, rounded teeth

X 1



SILVER MAPLE

GROUP 3
Broadleaf, opposite, simple

Acer saccharinum

NATURALIZED
saccharinum means "sweet"

FAMILY — ACERACEAE


GROUP 3

It's late February and you have a bad case of late winter blahs: "Will spring never come?" Look for silver maple flowers, likely the earliest of all tree flowers in Idaho. They are tiny but in dense clusters and are different, charming. Track them for a few weeks and you'll see the seed wings begin to form.

Silver maple occurs as a common ornamental tree in Idaho. It is one of the fastest-growing broadleaf trees in the state. In most towns, the older sections have a few huge silver maples. From these town trees, seeds have dispersed to the wild. Silver maple is now well-established along many Idaho rivers. The seeds of silver maple mature in April and May, while those of all other maples in this book mature in the fall. They will not travel far by wind, but they do float well. When floodwaters swell our rivers, silver maple seeds drift downstream. The seeds really prefer mud for germination, but in Idaho large rivers do not often have the muddy banks so common to eastern rivers. Nonetheless, silver maples have become established in rocks along rivers, usually near the high-water mark. On many miles of the lower Boise and Payette rivers, silver maple is one of the more common trees.

Despite its scientific name, this is not the sugar maple of syrup fame. Most maples, and many other trees, have slightly sweet sap in spring. Pioneers used sap from whatever trees were most plentiful to make sugar and syrup. Silver maple was used to produce sugar long ago, but sugar maple (*Acer saccharum*) is used exclusively today.

The wood of silver maple is brittle, and branches frequently break off under the weight of wet snow or ice from a "silver thaw." Large branches that are cut or broken off don't heal quickly. Fungi enter, and since the wood decays easily, old trees frequently become hazardous due to large, hollow branches weakened by decay.

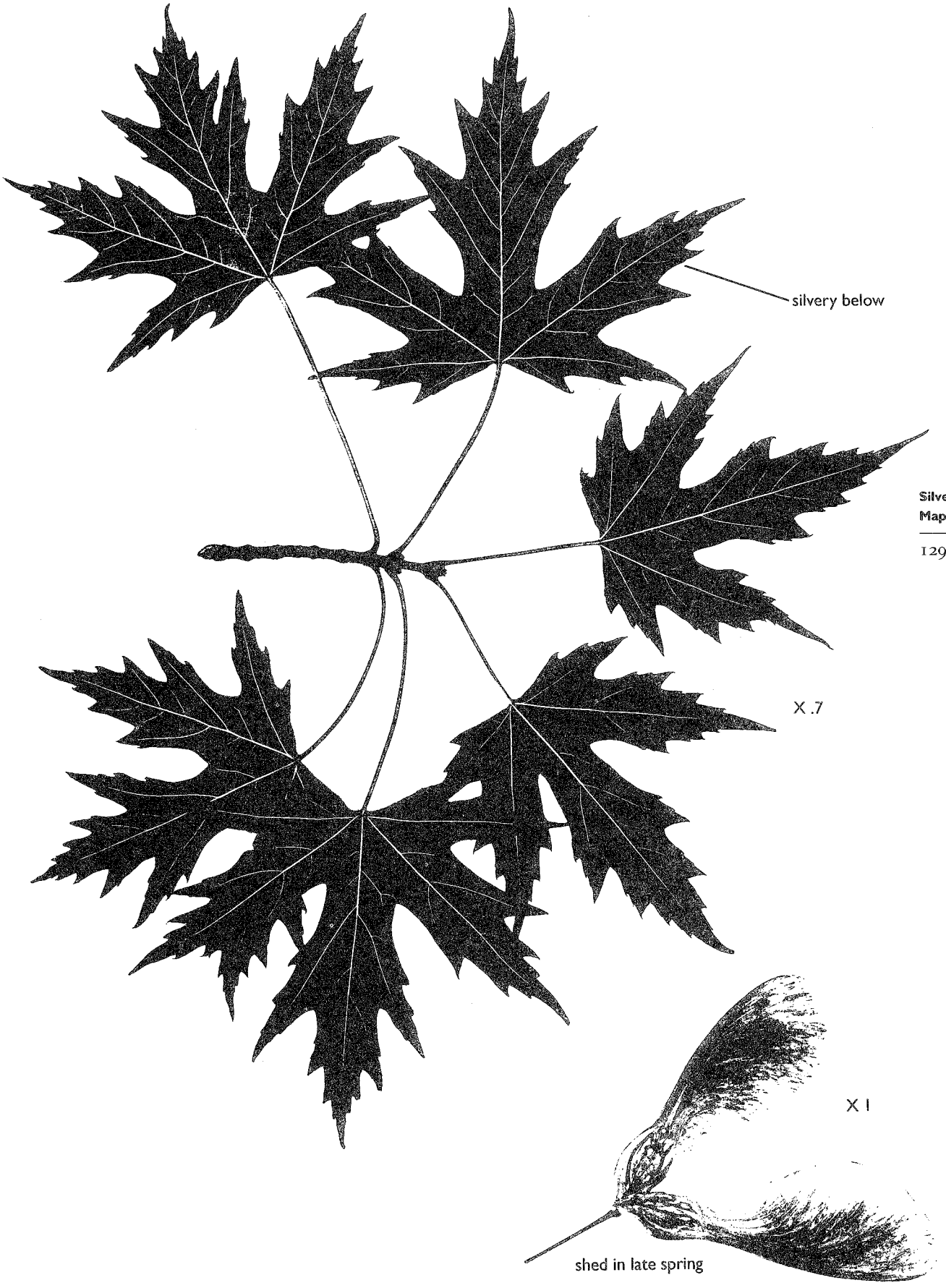
Silver maple is a beautiful tree with deeply lobed or "cut" leaves. This is the only wild maple that has leaves with bright silvery undersides. In fall, trees in towns turn pale yellow, but many wild trees turn brilliant red and orange, a colorful addition to Idaho's tree flora.


Leaves 4 to 8 inches long, deeply lobed with a few large, pointed teeth on the margins, silver below.


Clearwater Canyons Scenic Route, from Spalding to Orofino; common along the lower Boise, Payette, and Weiser rivers.


Co-champions: diameter 59.5 inches, height 105 feet, in Montour, Gem County (cultivated); and diameter 66.5 inches, height 74 feet, Lapwai, Nez Perce County.

Many wild silver maples turn red in the fall.


silvery below
X .7
X 1
shed in late spring

NORWAY MAPLE

GROUP 3
Broadleaf, opposite, simple

Acer platanoides

ESCAPED

platanoides means "like *Platanus*" (the sycamores)

FAMILY — ACERACEAE

GROUP 3

Norway maple is a beautiful tree native to northern Europe and western Asia. It is one of the most common Idaho shade trees. This plentiful tree is one of the few maples that are beautiful in flower. Just as the leaves burst forth, Norway maples are lighted by thousands of yellow-green flowers—a brave show of blossoms in the cold spring weather. In summer it typically has dense, dark green foliage; in fall the contrast of the near-black bark and brilliant yellow leaves presents a colorful spectacle. A recent work on cultivated trees lists 50 cultivated varieties of Norway maple; most common of these in Idaho are numerous forms with deep red leaves (38).

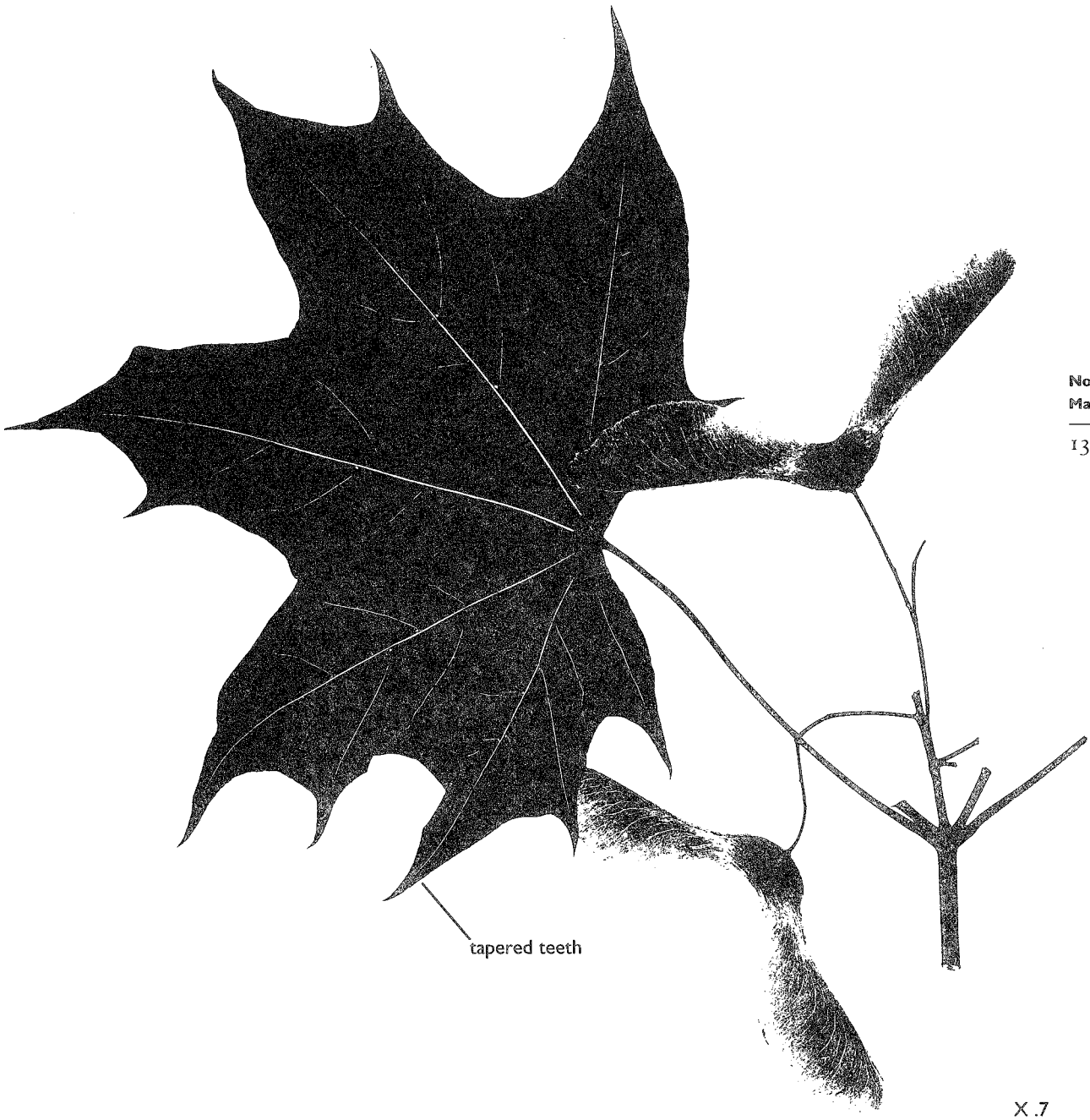
From the plentiful supply of seeds, this maple has escaped into forest areas near a number of towns. Judging from my experience at the University of Idaho Arboretum, this could be a very successful tree in Idaho's moist, lower-elevation forests, for it produces a bountiful crop of viable seeds. Most gardeners who have Norway maples nearby have to continually pull young maples out of nooks and crannies in the yard. In towns, Norway maples are common escapes in empty lots, alleys, along fences, and other untended places.

Escaped Norway maples are rather scattered in northern Idaho, primarily in Douglas-fir or grand fir-cedar-hemlock forests and along forested streams at low elevations. One moderate-sized population, which seems to be reproducing, has been located in a ponderosa pine forest. In the wild it is most easily found in fall, when the large, bright gold leaves differentiate it from most native shrubs and trees. During summer, the large leaves will quickly differentiate it from the native Douglas maples with which it is often associated. But, just in case you're confused, look at the teeth: Norway maple has a few remote, large, sharp-pointed teeth, while Douglas maple has numerous small teeth.

Opposite leaves, 5 to 9 inches long, 3-lobed with a few taper-tipped teeth on margin.

Scattered on Ahsahka Grade, State Highway 7, Clearwater County; rare on north bank of St. Joe River, along State Highway 3 near St. Maries, Benewah County; Lake Coeur d'Alene Scenic Route.

Note fall-gold leaves.



Norway Maple

131

X .7

BIGLEAF MAPLE

GROUP 3
Broadleaf, opposite, simple

Acer macrophyllum

ESCAPED

macrophyllum means "big leaf"

FAMILY — ACERACEAE

GROUP 3

Bigleaf maple grows as a native mostly west of the Cascade Mountains from British Columbia to California. It is one of the most common trees in the lower forests of western Oregon and Washington (51). With hundreds of species of hardwood trees in the east, it's interesting to note that few broadleaf trees in North America grow larger than this giant maple, which may be 9 feet in diameter with a crown-spread of over 100 feet in coastal Washington and Oregon. One recent book on Pacific Northwest plants reports this tree as a native in Idaho; however, the evidence shows clearly that this tree is not native but has escaped from cultivation (30). It is established along the lower Potlatch River, grows along other side streams of the Clearwater River, and also occurs near Coeur d'Alene Lake. Nowhere have we found it to be common in the wild.

Bigleaf maple is a glorious shade tree, with big, dark green leaves growing thickly on a broad crown. Many leaves will be a foot or more across, a great clue to identification. Fall color varies from a rather dull yellow to a bright, clear yellow, almost as grand as that of Norway maple. When the buds break in the spring, the tips of the bud scales often develop into a small leaf, presenting clear evidence that bud scales are nought but modified leaves, reduced to protect the new shoot from winter's onslaughts. Since this tree is occasionally found on the east side of the Cascades, for instance, near Lake Chelan and Wenatchee in Washington, cold-hardiness genes are present in the species. This fact and other indications lead me to believe that bigleaf maple will be successful in naturalizing in northwestern Idaho.

Opposite leaves, 8 to 12 inches long, 3-lobed with a prominent central lobe, with a few large, rounded teeth.

Potlatch River along State Highway 3, south of Juliaetta; lower Selway River near Fenn Ranger Station, eastern shores of Coeur d'Alene Lake.

Diameter 55.5 inches, height 38 feet, near Juliaetta, Latah County (cultivated).

In fall bigleaf maple leaves turn a dull yellow.

1. Douglas-fir replacing quaking aspen (see *pp. xxviii, 4*)

2. Eastern cottonwood (see *p. 12*)

3. Coyote willow (see *p. 34*)

4. White alder (see *p. 46*)

5. Narrowleaf cottonwood (see *p. 16*)

6. Thinleaf alder (see *p. 44*)

7. Red alder (see *p. 48*)

8. Scouler willow (see *p. 22*)

9. Peachleaf willow (see *p. 30*)

10. Water birch (left), paper birch (see *pp. 38, 40*)

11. Bitter cherry (see p. 66)

STEVEN BRUNSFELD

12. Riparian fringe of thinleaf alder, water birch and whiplash willow in sagebrush zone. Custer County. (see p. xxii-iii)

13. Bitter cherry (see p. 66)

14. Chokecherry (see p. 64)

15. Bird cherry (see p. 68)

16. Chokecherry (see p. 64)

17. Bird cherry (see p. 68)

18. Black hawthorn (see p. 54)

19. Suksdorf hawthorn (see p. 56)

20. Columbia hawthorn (see p. 58)

21. Escaped apricots, Snake River, 1961. This area now beneath Hells Canyon Reservoir.

22. Serviceberry (see p. 50)

23. Escaped pear (see p. 84)

24. Naturalized apricot (see p. 70)

25. Serviceberry (see p. 50)

26. Naturalized mahaleb cherry (see p. 72)

27. Antelope bitterbrush (see p. 104)

28. Naturalized white mulberry (see p. 98)

29. Curlleaf mountain-mahogany (see p. 60)

30. Naturalized cherry plum (see p. 74)

31. Netleaf hackberry (see p. 92)

32. Russian-olive (see p. 96)

33. Russian-olive (silver) and black locust. Naturalized in Canyon County. (see pp. 96, 118)

34. Smooth sumac (see p. 108)

35. Osage-orange (see p. 100)

36. American elm (see p. 90)

37. Black locust (see p. 118)

38. Locust spines

39. European mountain-ash (see p. 106)

40. Cascara (see p. 94)

41. Tree-of-heaven (see p. 110)

42. Flaming bigtooth maple, aspen and Douglas-fir. Bear Lake County. (see *pp. xxviii, 126*)

DONALD HANLEY

43. Norway maple (see *p. 130*)

46. Silver maple (see *p. 128*)

44. Pacific dogwood, June, 1975. (see *p. 136*)

45. Red-osier dogwood (see *p. 134*)

47. Bigleaf maple (see *p. 132*)

48. Pacific dogwood, Lochsa River, 1961. (see *p. 136*)

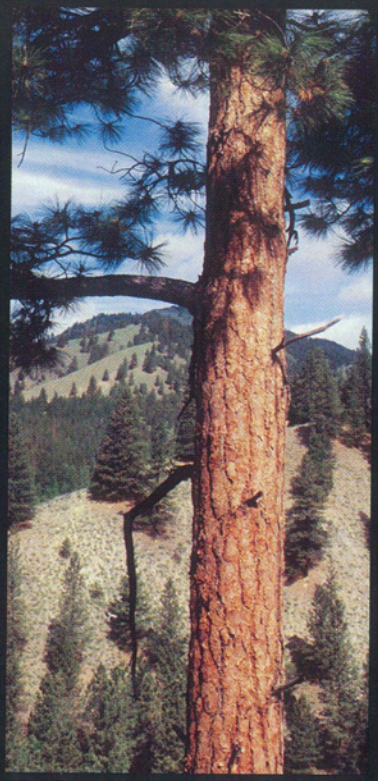
49. Catalpa (see *p. 138*)

50. Blueberry elder (see *p. 144*)

51. Black walnut (see *p. 114*)

52. Persian walnut. (see *p. 116*)

53. Idaho Native pines. White pine (L). Top (L to R): limber, whitebark, singleleaf pinyon. Bottom: two ponderosa, three lodgepole. (see p. 146)



55. Ponderosa pine. Salmon River Canyon. (see p. 154)

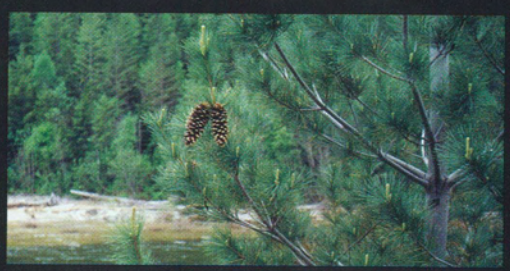
56. Ponderosa pine. Male cones (L), first year female cones (R). (see p. 154)

54. Clark's nutcracker (see p. 152)

57. Whitebark pine (see p. 152)

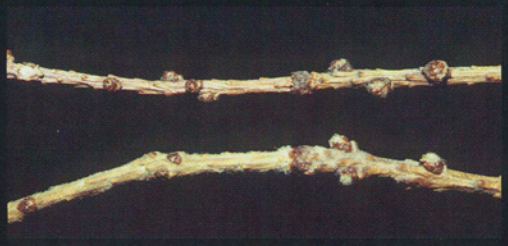
58. Western white pine (see p. 148)

59. Lodgepole pine (see p. 156)

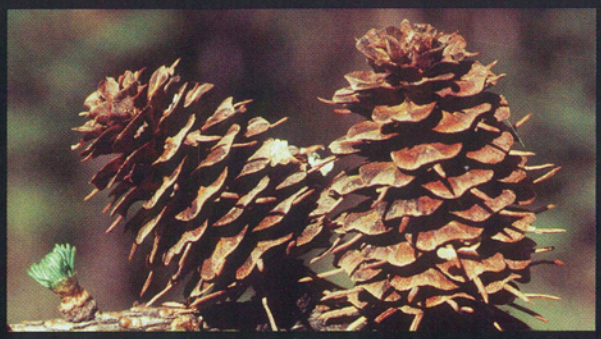


60. Western white pine (see p. 148)

61. Singleleaf pinyon, first year female cone (see p. 164)



62. Western larch (top), subalpine larch (see p. 158)



63. Western larch (see p. 160)

64. Golden subalpine larch in September. Salmon Mountain. (see p. 162)

65. Douglas-fir (see p. 182)

66. Pacific yew (see p. 174)

67. Engelmann spruce (L), blue spruce (see p. 168)

70. White spruce (see p. 172)

68. Western hemlock (see p. 178)

69. Pacific yew (see p. 174)

71. Grand fir (see p. 188)

72. Blue spruce (see p. 170)

73. Concolor fir (see p. 190)

74. Mature subalpine fir cones (see p. 186)

TRACEY PARKER

75. Giant western redcedar. Heritage Grove, Clearwater County. (see p. 192)

76. Western juniper (see p. 202)

77. Utah juniper (see p. 200)

78. Rocky Mountain juniper (see p. 196)

79. Tamarisk in flower (see p. 204)

80. Naturalized tamarisk. Bruneau Dunes State Park. (see p. 204)

Bigleaf Maple

RED-OSIER DOGWOOD

GROUP 3
Broadleaf, opposite, simple

Cornus stolonifera
var. *stolonifera*
var. *occidentalis:* western dogwood
(*Cornus sericea*)
(*Cornus occidentalis*)

NATIVE

stolonifera means "bearing stolons," a reference to the tendency for lower branches to root when covered with soil

FAMILY — CORNACEAE

GROUP 3

This distinctive red-twigged shrub thrives throughout northern North America and Eurasia. It has numerous variations, most based on small differences. In Idaho, some authorities recognize two closely related species, *Cornus stolonifera* and *Cornus occidentalis,* others recognize a single species with two varieties.

The name red-osier has European roots. Osiers were the thin, supple branches used to weave baskets and other articles. *Salix alba,* the white willow of Europe, furnished "white osiers," while *Cornus stolonifera's* European counterpart furnished "red osiers." This distinction focuses on one of the easiest means of identification, the bright red twigs. Many shrubs and some trees in Idaho have new twigs that are red, but only red-osier branches remain red for several years. Look for red-osier in spring before the leaves come out along almost any stream in Idaho. Redtwig dogwood is another common name.

Red-osier dogwood is usually a shrub with many stems, ordinarily under 10 feet tall. But in Idaho's warm western canyons, either of our two varieties may rarely reach the 3 inch diameter and 13 foot height needed to be classified as a tree. It is commonly used as an ornamental because of the red stems and the red-orange fall color of the leaves.

The variety *occidentalis* is restricted to the northern part of Idaho, generally in association with western redcedar or western hemlock and primarily at lower elevations. The variety *stolonifera* is found throughout Idaho where it is one of the most common woody plants. Both varieties prefer a moist habitat and are usually streamside species. In northern Idaho, either variety is occasional in lower-elevation western redcedar or western hemlock forests, particularly in shrub communities.

Here's how to differentiate these two closely related varieties:

Species	Twigs	Seed	Usual Size
red-osier dogwood	red, for several feet below the tip	smooth	seldom over 10 feet
western dogwood	green, yellow-green, maybe reddish at the tip	grooved	often 10 to 20 feet

Leaves opposite, elliptical, with curved veins (arcuate) and entire margin; flowers in 4-inch, open, rounded inflorescences, no bracts; fruit spherical, white or bluish drupe, ¼ inch with a hard seed inside; twigs red, 4 to 6 feet from tip (var. *stolonifera*), twigs mostly green (var. *occidentalis*).

Along most Idaho streams, especially in forested areas—var. *stolonifera.* Streamsides in northern Idaho—var. *occidentalis.*

Red-osier dogwood (var. *stolonifera*): diameter 4.1 inches, height 26 feet, near White Bird, Idaho County; the National record. Western dogwood (var. *occidentalis*): diameter 3.5 inches, height 16 feet, near Lowell, Idaho County.

Note typical curved veins of dogwoods seen in autumn.

curved veins

flower cluster

Red-Osier Dogwood

135

X .9

PACIFIC DOGWOOD

GROUP 3
Broadleaf, opposite, simple

Cornus nuttallii

NATIVE

Named for Thomas Nuttall, one of the first botanists to explore Idaho

FAMILY — CORNACEAE

This is one of Idaho's rarest and most unusual trees, and one of the most beautiful flowering trees in the world. A small population of Pacific dogwood is found in the lower Lochsa and Selway Rivers and the adjacent Middle Fork Clearwater River. In the early 1970s I mapped a range of some 51 miles, from below Syringa village to the Black Canyon of the Lochsa. A natural area on the Clearwater National Forest has been established along the Lochsa principally to recognize these rare plants. Pacific dogwood appears nowhere else east of the Cascades or the Sierra Nevada. This small tree grows in shrubfields and beneath grand fir and western redcedar forests. Red alder and many other coastal plants occur near this beautiful dogwood. These "coastal" plants are evidence of a past climate that was similar to the climate west of the Cascades today (45). Such plants are termed "relics"—the last remnants of a flora that flourished in Idaho several million years ago.

Most of our Pacific dogwoods are seriously threatened—dead or dying from a fungal anthracnose. Undeniably, extinction of this population would be a significant loss to Idahoans and to the world—annihilation of a unique gene pool of one of the world's most spectacular flowering trees.

Several hundred years ago in northern Europe, nails for construction were made of the very hard wood of certain species of *Cornus*. Such nails were called "dags." From "dagwood" the name evolved to "dogwood." *Cornus* means "horn," and all species of dogwood have tough, hard, horn-like wood.

Pacific dogwood has a relative named *Cornus florida* that is native throughout much of the eastern United States. This species is the common flowering dogwood cultivated in the warmer towns of Idaho. Pacific dogwood, by contrast, is very difficult to grow as a yard plant. *Cornus florida,* simply called "flowering dogwood," has a notch at the tip of each of four white (or pink) bracts that form below the flower cluster, while our native dogwood lacks notches and the bracts are more-or-less pointed. (Bracts are really modified leaves, as you can see if you look closely at the flowers of Pacific or flowering dogwood.) Pacific dogwood flowers are tiny, white and form a dense, circular cluster in the center of the white bracts; these develop into a scarlet half-inch drupes.

In Idaho, Pacific dogwood does not grow as large as it does on the West Coast. While generally a tall shrub in Idaho, it used to become a small tree, 6 to 8 inches in diameter and 20 to 25 feet tall, but no more—larger plants have either died or are severely injured. To add to its beauty, Pacific dogwood leaves turn a brilliant red-orange in the fall. The ripe, scarlet fruits are eaten by many birds, and although terribly bitter, seem to be a great favorite with bears.

Only in lower Lochsa or Selway canyons and becoming very rare. Opposite, elliptical leaves with entire margin, clustered at the branch tips; large flowers with white bracts, large flower buds; new twigs often in fours. Flowers mid-May to mid-June.

Lewis and Clark Highway (U. S. 12) between Lowell and Boulder Creek Camp, Lochsa River; Selway River at O'Hara Camp and Rackliff Camp.

Diameter 7.6 inches, height 35 feet, near Lowell, Idaho County (this tree died of anthracnose in 1992).

44 Note gorgeous flowers in 1975 photo on the Selway River;

48 This 1961 photo along the Lochsa River illustrates the once-thriving population that is now close to extinction.

Pacific Dogwood

137

curved veins

X 1

CATALPA

GROUP 3
Broadleaf, opposite, simple

Catalpa speciosa
Also known as northern catalpa
hardy catalpa
indian-bean

ESCAPED

speciosa means "splendid," referring to the flowers

FAMILY — BIGNONIACEAE

GROUP 3

Think of catalpa as a misplaced tropical tree—it has leaves too large and flowers too showy to be typical of the north-temperate region. Almost all of its relatives in the family are tropical. Nevertheless, it is a favorite shade tree in the warmer parts of the United States (67). The wood is exceptionally resistant to decay, and older farm woodlots often include a catalpa grove as a source of fence posts.

The tree is native to the central Mississippi Valley, and the name "catalpa" is derived from the Cherokee Indian name for this handsome tree. In Idaho it has been extensively planted but seems most popular in southwestern Idaho, where catalpas are now found in the wild along rivers and irrigation ditches. These trees have escaped from cultivation. A few escaped trees have also been discovered in the lower Clearwater Valley. In some places, a few smaller trees around a larger escaped tree suggest that seedlings are originating from wild parents, and thus there is definite potential for catalpa to naturalize. Expect to see increasing numbers of these beautiful trees along our major southwestern rivers.

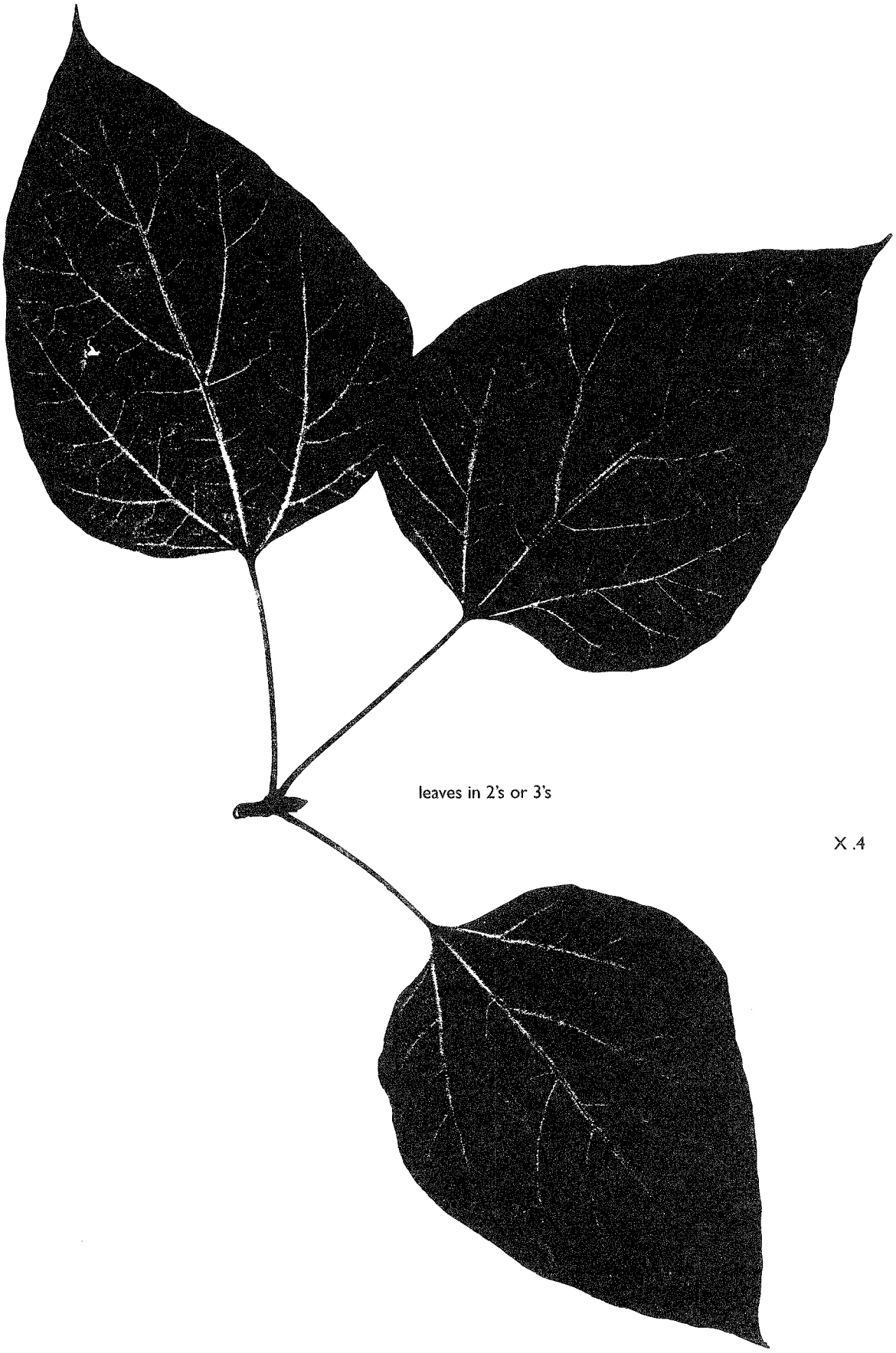
The leaves are large, up to 15 inches long but usually about 10 to 12 inches. They are often rather yellow-green, with an easily recognized heart-shaped blade. Flowers are large and white, in dense upright clusters over a foot high, and have a delicious aroma. Perhaps the fruits of this tree are the most readily recalled feature—they are slim, bean-like, cylindrical capsules, some over a foot long. Hundreds of flat, papery, white seeds are released when the "pods" open. Parts of the capsule remain attached to the tree over winter and well into the next season. Thus, on mature trees capsule parts are frequently a good means of identification. In all, these natives of the eastern United States bring an exotic touch to Idaho's wild tree flora.

Large, heart-shaped, yellowish leaves, opposite or in whorls of three; long, slim capsules.

Scattered along rivers in southwestern Idaho, especially the lower Boise, Payette, and Weiser.

Diameter 57.6 inches, height 71 feet, Lapwai, Nez Perce County (cultivated).

Large flowers of catalpa appear almost tropical.



leaves in 2's or 3's

X .4

BOX-ELDER

GROUP 4
Broadleaf, opposite, compound

Acer negundo
variety *interius:*
interior box-elder

NATIVE (var. *interius*)

Acer negundo
variety *violaceum:*
violet box-elder

NATURALIZED (var. *violaceum*)

negundo is the name of a European tree

FAMILY — ACERACEAE

GROUP 4

Box-elders are maples' poor relatives, yet they are common because they are tough and grow quickly. They are small- to medium-size trees, usually growing with one to several irregular, curved main trunks and often supporting many dead branches. They withstand variations in heat and cold well but need a reasonably constant supply of water.

Box-elder is native to all but two eastern states and every western conterminous state except Oregon and Washington (44, 51). In Idaho, variety *interius*, interior box-elder, is native in southeastern Idaho, and the introduced variety *violaceum*, violet box-elder, is native from the northern Great Plains eastward. Pioneers brought it west to provide quick shade. It is common in farming areas, throughout southern Idaho, and in the canyons of western Idaho. Violet box-elder has escaped along streams and irrigation ditches and prospers so well that most people think it is a true native. It has also naturalized along most lower-elevation rivers, and like silver maple, often appears near the high-water line. Where the native variety is found, it is not uncommon to see the escaped violet box-elder growing nearby.

I recently discovered a population of *interius* downstream from Salmon on the floodplains and banks of the Salmon River. It is possible that this disjunct population is escaped, the seeds coming from cultivated trees in Salmon, for the *interius* seems absent upstream.

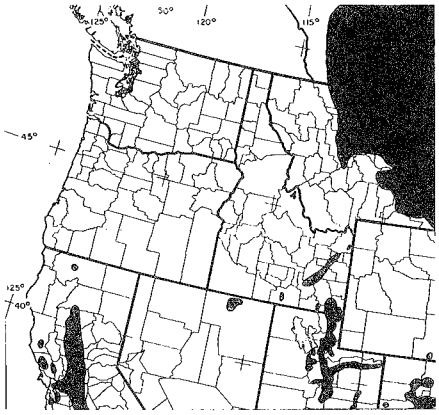
Twigs are the most reliable means of separating the two varieties. A hand lens may be necessary to examine surface differences.

Species	New Twigs	Range
interior box-elder	with dense, short, grey pubescence; silvery color	restricted to southeastern Idaho and near town of Salmon
violet box-elder	with white, waxy coat, easily removed with fingertip; violet color late in season	statewide at lower elevations

Opposite leaves, pinnately compound, with large teeth near tip of leaflets; maple fruit—a double samara.

Cub River road, Bear Lake County (var. *interius*); Weston-Malad City road, Oneida County (var. *interius*); Snake River bottomlands, Pocatello to Caldwell (var. *violaceum*); streambottoms off lower Clearwater River (var. *violaceum*); Salmon River not far below town of Salmon, both varieties.

Interior box-elder (var. *interius*): diameter 52.3 inches, eight 46 feet, near Malad City, Oneida County. Violet box-elder (var. *violaceum*): diameter 57.6 inches, height 72 feet, Idaho Falls, Bonneville County (cultivated).



Idaho, Utah, Colorado=interior box-elder; California=California box-elder; Montana=interior and violet box-elder.

large, irregular teeth

X .7

X 1

GREEN ASH

GROUP 4
Broadleaf, opposite, compound

Fraxinus pennsylvanica

NATURALIZED

FAMILY — OLEACEAE

Fraxinus pennsylvanica is the most widely distributed ash in North America. It is native throughout the eastern United States and extends west to the Black Hills and to central Montana. Green ash has been used in windbreaks and as a street tree in Idaho for many years, for it is a tough tree, resistant to cold and heat. It is a good shade tree for cold areas, for it leafs out late in spring and sheds its leaves promptly in early fall after turning a wonderful gold color. Male and female flowers of ashes are on separate trees. A number of forms of male plants are for sale in nurseries and are preferred for shade trees since female plants produce so many seeds. Wood of ash excels in wearing smoothly, and yet is high in strength and elasticity, hence a great deal of the wood is manufactured into shovel handles, oars, and similar items. Some goes into making furniture, for ash wood has a pleasing grain quite similar to oak.

For years two varieties of *Fraxinus pennsylvanica* were recognized: variety *pennsylvanica* (red ash) with nonpubescent leaflets, and variety *lanceolata* with leaflet undersides pubescent, particularly along the main veins. More recently, it was demonstrated that populations of the two "varieties" are intermingled. Furthermore, seedlings of one variety fit the descriptions of both varieties. Clearly the "varieties" were invalid and the name "green ash" has been retained. In Idaho the escaped green ashes have both pubescent and glabrous leaflets, a representation of native populations in eastern North America.

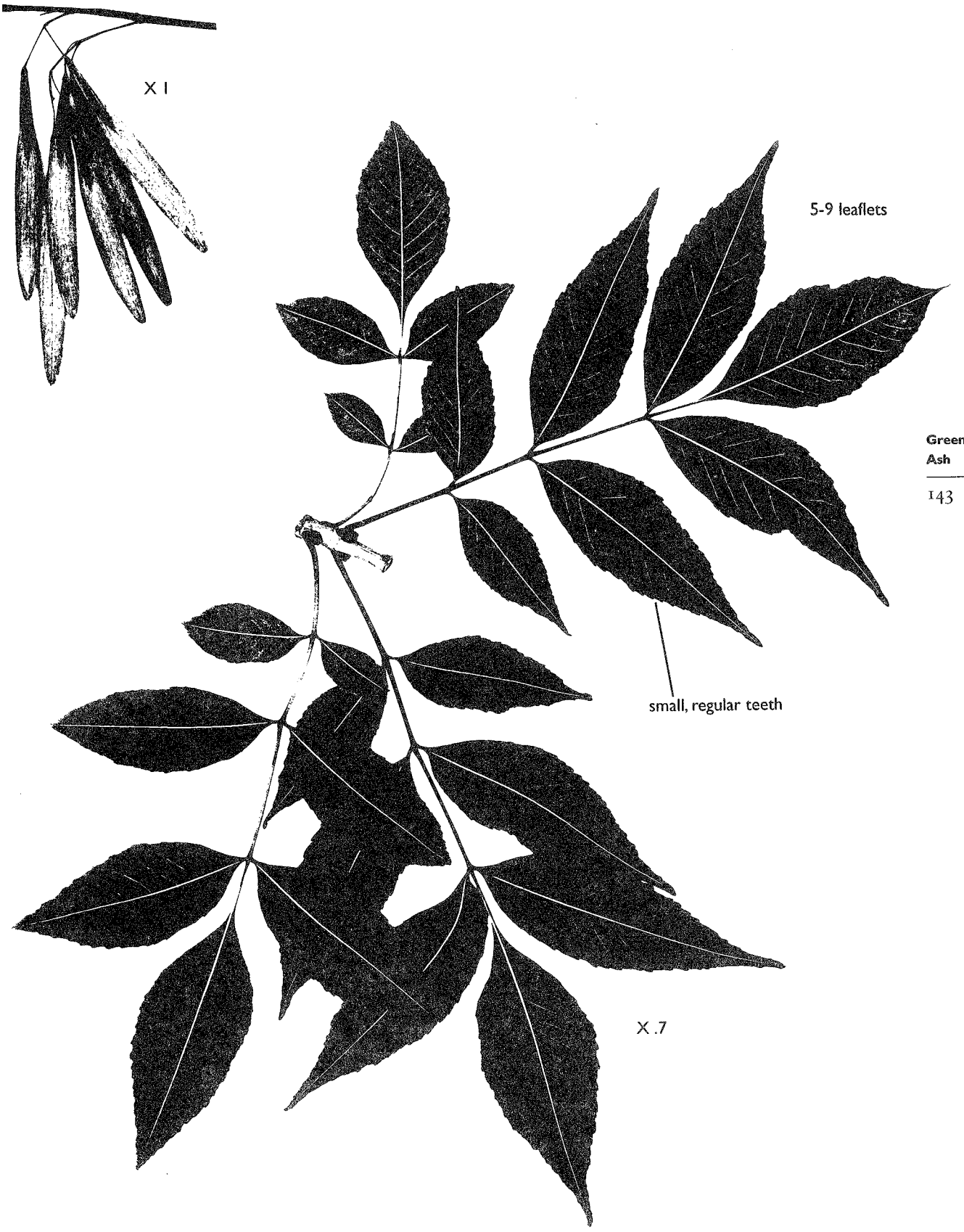
Green ash has escaped in Idaho along the major rivers—a tree here and a few trees there, occasionally a line a quarter-mile long. It may appear near or below the high-water line in very rugged habitat. It also grows along side streams in the bunchgrass and sagebrush/grass zones, as well as in lower- elevation coniferous forest areas.

Technical description: Leaves: opposite, pinnately compound, 5 to 9 leaflets, each spearhead shaped (lanceolate) with a few small teeth along the outer portion of the leaflet; undersides with or without pubescence. Flowers: very inconspicuous, early spring. Fruit: a single long-winged seed (samara), shaped like a broad baseball bat, about 1 inch long.

Persian walnut and box-elder have leaves that might be confused with those of green ash. Persian walnut has *alternate* compound leaves, and leaflets are almost always entire with larger leaflets near the tip of the leaf (see p. 116). Like ash, box-elder has *opposite* compound leaves, but the teeth on the leaflets are large, and the fruit is a double samara with a relatively broad wing (see p. 140).

Opposite, pinnately compound leaves, 5 to 9 leaflets, with small, regular teeth. Fruit is a thin, winged seed, about 1 inch long.

Along the lower Boise, Payette, and Weiser rivers; Salmon River, vicinity of Salmon town; Hells Canyon of the Snake River; Snake River bottoms, Pocatello-Blackfoot area.


X 1
5-9 leaflets
small, regular teeth
X .7

BLUEBERRY ELDER

GROUP 4
Broadleaf, opposite, compound

Sambucus cerulea
(*Sambucus glauca*)

NATIVE

cerulea means "sky blue," referring to the color of the ripe fruit

FAMILY — CAPRIFOLIACEAE

GROUP 4

This is one of two elder species native to Idaho. Blueberry elder grows most commonly at low to mid elevations, generally below the subalpine zone, and is particularly abundant along road edges. It occurs as either a tall shrub or small tree, usually not over 10 inches in diameter. Side streams along the lower Salmon River and Hells Canyon have the largest trees. It is a poor-looking plant because it has numerous dead stems and branches.

The fruits of blueberry elder are edible for most people, but recent reports suggest that one should eat cautiously the first time, for elder fruits cause some people an upset stomach. Nonetheless, the berries are picked by many folks in late summer or even after frost. They are used for pies and jellies, and are an old favorite for homemade wine. Birds enjoy them too, and toward dusk in the fall elderberry bushes are a common place to find woods grouse. Leaves and stems are poisonous, and children have been poisoned by sucking on twigs while at play (28).

Another scientific name often used is *Sambucus glauca,* as the silver-white, waxy coating on the blue berries is called a "glaucous bloom."

Only three trees in this book have opposite *and* pinnately compound leaves—bluberry elders, box-elders, and the escaped green ashes. They are easily distinguished. Green ash and box-elders are clearly trees with one to a few trunks. Blueberry elder almost always has several stems, even when they are 8 or 10 inches in diameter. The fruits of the three trees are also very different: box-elder has two long-winged seeds joined at the base, green ash has a single long-winged seed, and blueberry elder has clusters of blue berries.

Technical description: Leaves: opposite, pinnately compound, composed of 7 to 11 opposite leaflets, leaflets pale green, long and narrow, toothed; glands or rudimentary leaves are usually found at the base of the leaflets. Twigs: large, weak with spongy interior pith, new twigs glaucous. Flowers: white, small, borne by hundreds in flat-topped clusters. Fruit: many small (1/8-inch) light blue berries in a dense, flat-topped cluster.

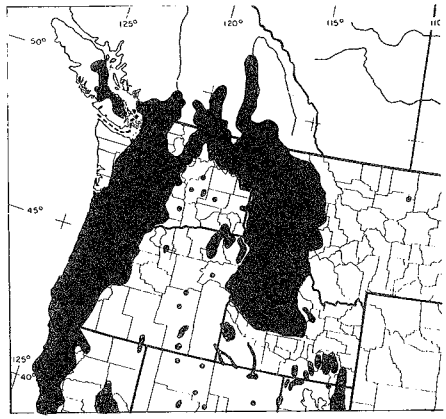
Two other native elders are always shrubs in Idaho; both have flower/fruit clusters that are conical. Blackbead elder, *Sambucus racemosa* var. *melanocarpa,* is common in the higher elevations north of the Snake River Plain. Fruits are a shiny jet black. Redbead elder, *Sambucus racemosa* var. *microbotrys,* occurs in the forest areas of southeastern Idaho. It has shiny purple-red to red berries. Both of these elders generally have two glands on the twig between the petiole bases; blueberry elder lacks glands on the twigs.

Shrubby tree with large, weak twigs; opposite, large, pinnately compound leaves with glands or miniscule leaves between the leaflets; numerous small white flowers or sky-blue berries in a dense, flat-topped cluster.

Along U. S. 95, between Riggins and White Bird; Clearwater Canyons Scenic Route, Spalding to Kooskia; Silent City of Rocks, Cassia County; Bear Lake-Caribou Scenic Route.

Diameter 19.7 inches, height 35 feet, near White Bird, Idaho County.

Note clusters of light-blue ripe berries.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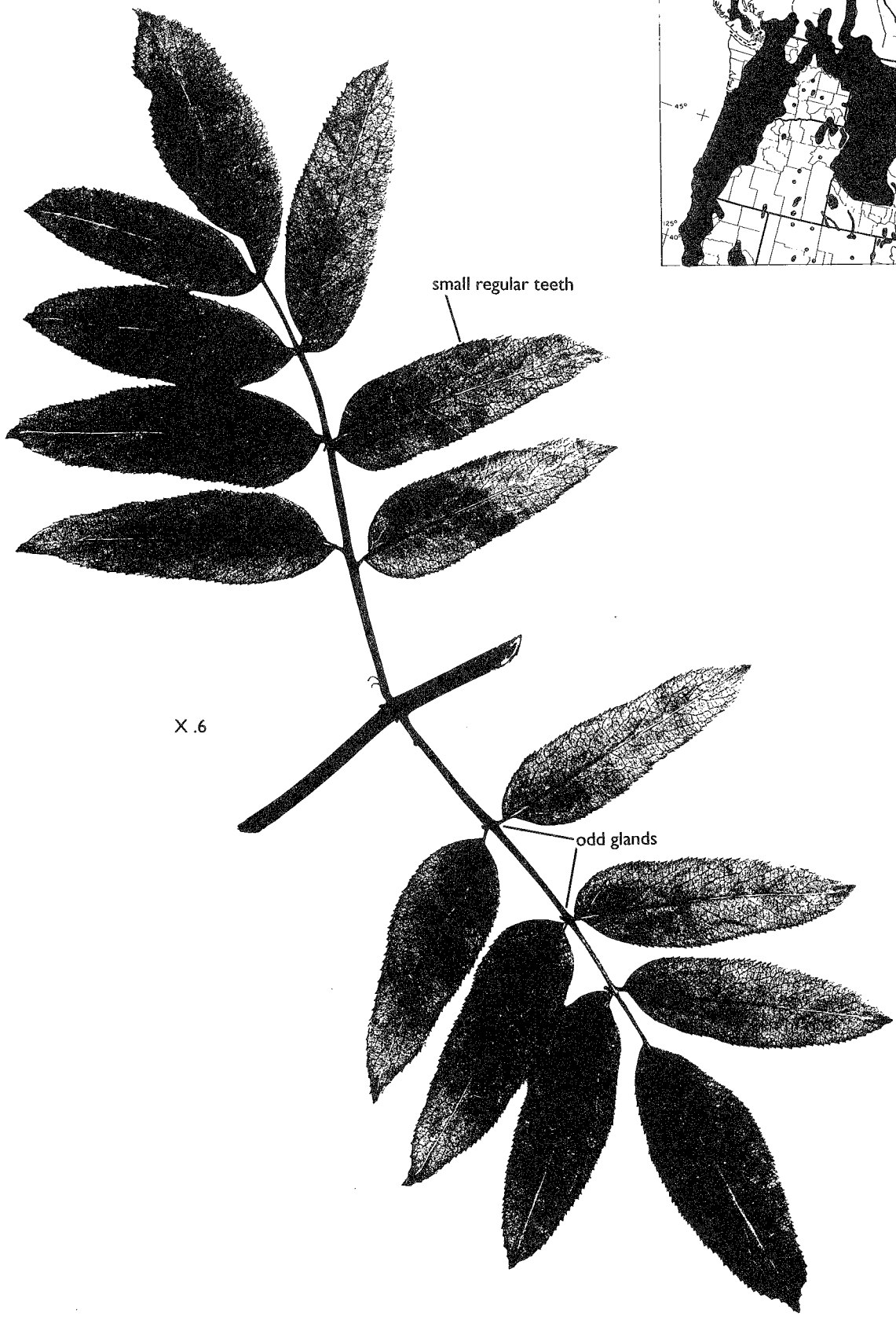

small regular teeth
X .6
odd glands

PINE

GROUP 5
Needleleaf, in bundles

Pinus

FAMILY — PINACEAE

With 95 species, pines rank as the largest genus of coniferous trees in the Northern Hemisphere. They are very important because they are generally fast-growing and produce some of the most useful wood. Pines abound as a common feature of western forests; 22 species are native in western North America. Six grow in Idaho, more than in most surrounding states (43, 47).

As a group, pines are one of the easiest genera of coniferous trees to identify, for, with one exception, pines have long, narrow, needlelike leaves grouped in bundles, usually with 2, 3, or 5 needles per bundle. At the base of the needle group there is a membranous structure called a bundle sheath. If you carefully peel off this sheath and examine the very base, you'll see that it is circular. Each single needle divides portions of a full circle. With a 2-needled pine, each needle in cross-section is a half-circle, a 3-needled pine a third-circle, and so on. Each bundle of needles is borne just above a small, papery nonfunctional leaf called a primary leaf. In reality, each needle bundle is on a short "branch" that is buried by the base of the sheath. Carefully remove a bundle of needles from a ponderosa pine and peel off the sheath. You should see a tiny white structure about a millimeter long sticking out from the bottom of the needle group. This is a minuscule woody "branch," which leaves a diminutive "knot" in a center-cut pine board.

Pines are also distinctive in having cones that have woody tips on the cone scales and cones that take 2 years to mature. Small, immature cones seen late in the season are first-year cones that will mature and shed their seeds the next fall.

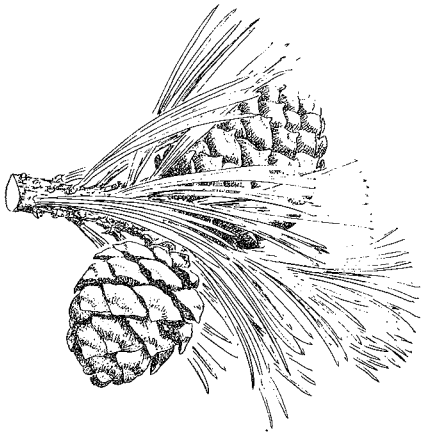
Pines are divided into two major subgenera—"soft" pines and "hard" pines. Soft pines have wood that is easily worked, white, and relatively less strong. Soft pines generally have five needles per bundle, smooth twigs, and no prickles on the cone scales. Hard pines have wood that is darker and stronger, and most hard pines in western North America have either 2 or 3 needles in each bundle, rough twigs, and prickles on the cones. In the following conspectus, the first four species are soft pines, while the last two are hard pines.

53 Cones of all Idaho native pines.

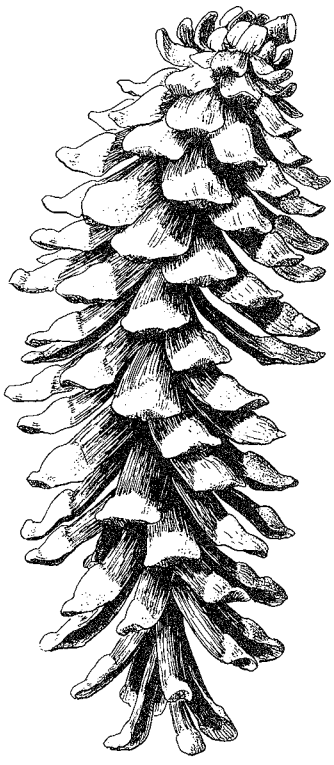
IDAHO PINES

Species	Needles/Length	Cone Shape	Cone Prickles	Forest/Habitat
western white pine	bundles of 5; 2–4" long	6–10"; cylindrical	none	grand fir-cedar-hemlock
limber pine	bundles of 5; 2–3" long	3–5"; tapered, cylindrical	none	subalpine to pinyon juniper
whitebark pine	bundles of 5; 2–3" long	2–3"; egg-shaped	none	subalpine
singleleaf pinyon*	single; 1–2" long;	1–2½"; short and wide	none	juniper forest
ponderosa pine	bundles of 3; 4–10" long	2–6"; conical	present	low to mid-elevations
lodgepole pine	bundles of 2; 1–3" long	1–2"; conical	present	mid- to upper-elevations

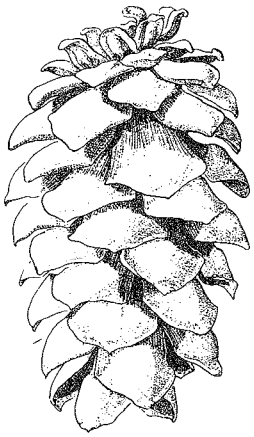
* see group 6 for description.



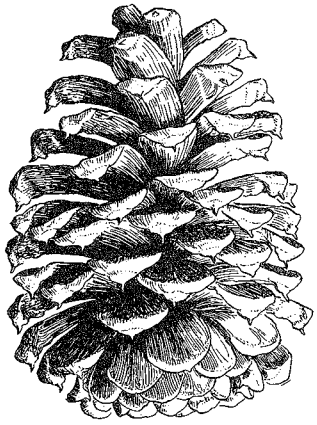
whitebark pine



western white pine



limber pine



ponderosa pine

lodgepole pine

WESTERN WHITE PINE

GROUP 5
Needleleaf, in bundles

Pinus monticola

NATIVE

monticola means "of the mountains"

FAMILY — PINACEAE

GROUP 5

The Idaho legislature officially designated western white pine as the state tree in 1935. Its valuable wood made this tree tremendously important in the settling of northern Idaho, where white pine wood has, with rare exceptions, always brought the highest price of any Idaho tree. By the early 1900s, the east-west railroads had pushed across northern Idaho. The Lakes States' stands of eastern white pine had been depleted, and the lumber business moved west when eastern markets opened to northern Idaho due to the development of railroads (56, 60). Western white pine, one of the largest pines in the world, was also largely responsible for the starting of a forestry curriculum at the University of Idaho in 1909, the second-oldest forestry school in the West.

Idaho's white pine ranges chiefly from the Clearwater-Lochsa River northward, where it commonly occurs following fire or logging. Disturbance creates the mineral soil seedbed and plentiful sunlight needed for its early growth. Before settlement, wildfires provided the needed disturbance. Since modern fire protection drastically reduces wildfire, foresters may now provide good growing conditions for the young white pines by removing most or all of the old trees, then burning the site to remove competing undergrowth. Idaho's state tree has little chance of successful growth if timber harvest methods leave trees that shade the area. White pine often grows mixed with grand fir, western larch, and Douglas-fir as a seral tree on habitats that eventually will support stands dominated by climax western hemlock or western redcedar.

Millions of white pines have been killed and are still being attacked by white pine blister rust. This fungus was accidentally introduced from Europe in the early 1900s and has slowly spread through valuable stands of Idaho white pine. The fungus enters the tree through the needles and often spreads down to the trunk, where it forms a canker, killing the top of the tree. The fungus needs wild currants and gooseberries (species of *Ribes*) to complete its life cycle. A long-term breeding program has provided foresters with more disease-resistant nursery seedlings which are now being used for virtually all white pine plantings.

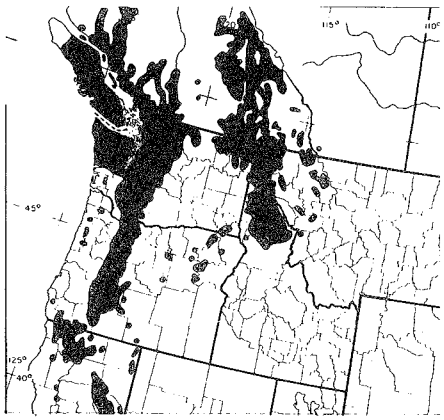
Five needles per bundle, blue-green, about 4 inches long; cylindrical cones 5 to 8 inches long with thin scales, no prickle.

White Pine Scenic Route, north of Potlatch; along U. S. 12, lower Lochsa River; common near Sandpoint, Wallace, Bonners Ferry; Lake Coeur d'Alene Scenic Route; Priest Lake State Park.

Diameter 81.8 inches, height 214 feet, Giant White Pine Campground, Latah County.

Old-growth western white pine;

Note cones, foliage, and smooth bark.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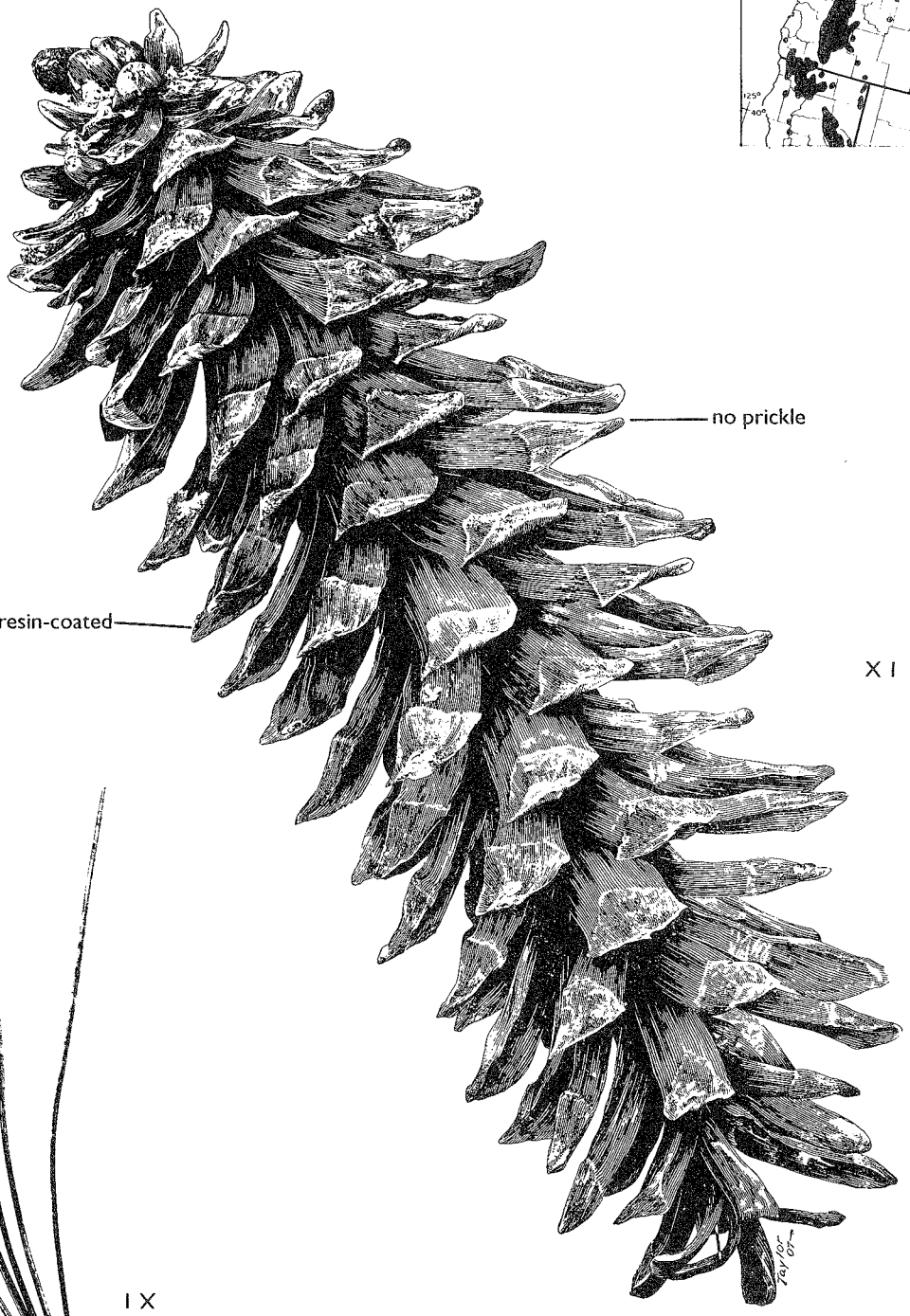

no prickle
tip usually resin-coated
X I


I X

LIMBER PINE

GROUP 5
Needleleaf, in bundles

Pinus flexilis

NATIVE
flexilis means "flexible"

FAMILY — PINACEAE

GROUP 5

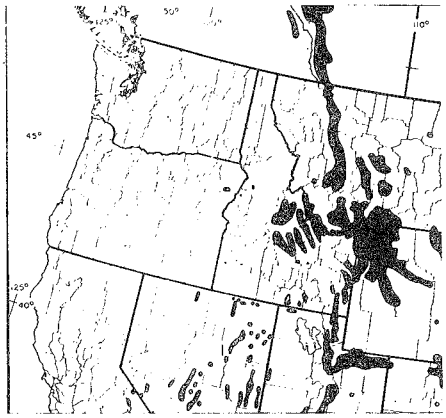
Limber pine is common in the Rocky Mountains from Canada to Colorado, but in Idaho it occurs chiefly east of the middle fork of the Salmon River and south of the town of Salmon on rocky slopes and in valley bottoms. Limber pine and whitebark pine are good examples of the numerous species of high-elevation pines found throughout the Northern Hemisphere. Mature trees have long branches and a rounded crown; the flexible branches bend under heavy loads of snow. Limber pine needs sunlight and rocky soil. It thrives on broken rocks and talus slopes in the spruce-fir zone, but will follow a rocky ridge down into the Douglas-fir zone. In some places it acts like a pinyon and appears in the juniper woodland, as it does near Soda Springs. Limber pine can endure severe environments. Famous trees appear at Craters of the Moon National Monument growing on recently formed lava rock. The seeds of limber pine are wingless, hence seed dissemination depends primarily on Clark's nutcracker and similar birds (see whitebark pine, p. 152).

Whitebark pine and limber pine are very similar in needle and bark characteristics, as well as some habitats. Where both exist in the same area, examination of cones is the only reliable way to differentiate the two species. If a tree has no cones present, search in the fallen needles for old cones or cone scales. Cones of limber pine decay with scales attached, whereas beneath whitebark pine only the cone scale tips and central stalks remain. Note also that while limber pine may be found at elevations lower than the spruce-fir zone; this is rarely true of whitebark pine. In east-central Idaho where both occur, whitebark pine is found at higher elevations. Notice the range map—there is no limber pine in Idaho north of the Salmon, although there is a small relict population just east of the Little Salmon River.

Many-branched tree of rocky habitats, 5 short needles; cones are cylindrical, brown, 4 to 6 inches long with woody scales and rounded scale tips, open at maturity.

Craters of the Moon National Monument; Trail Creek Road east of Sun Valley; lower slopes along State Highway 28 between Leadore and Blue Dome; Silent City of Rocks, Cassia County; Teton Scenic Route.

Diameter 56.5 inches, height 73 feet, near Preston, Franklin County.



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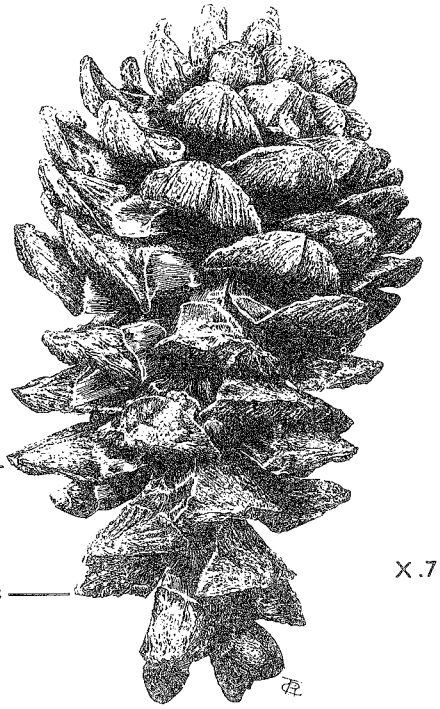
Limber Pine

151



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WHITEBARK PINE

GROUP 5
Needleleaf, in bundles

Pinus albicaulis

NATIVE
albicaulis means "white stem"

FAMILY — PINACEAE

GROUP 5

Whitebark pine thrives in the high-elevation spruce-fir forests. Like limber pine, it needs a stony soil and plenty of sunlight. On the exposed ridges of our highest mountains, the bark of this and other conifers, including limber pine and lodgepole pine, is a silvery white, for the outer bark is worn off by the abrasion of millions of snow particles blown by winter winds. Young whitebark pines near timberline often have pinkish bark. Unlike limber pine, whitebark pine rarely leaves the high mountains because it needs cold temperatures. Extensive stands of dead whitebark pine are mute testimony to the virulent attacks of the same deadly blister rust that attacks white pine, augmented by onslaughts of mountain pine beetles (6).

Whitebark pine has a most interesting method of seed dispersal. The cones do not open as do those of all other native pines in North America. Rather, they fall from the tree unopened and roll down to a crevice where the bases of the cone scales shrink, the woody tips fall off, and release the seeds. How then do they get from one mountaintop to the next? One bird in particular is fond of whitebark seeds—we call it Clark's nutcracker (*Nucifraga columbiana*) or "camp robber." This grey, black, and white bird has a special pouch beneath its tongue. With its strong beak it pecks open the purple cones on the tree, arranges several seeds in its mouth, and then flies away to bury some for later use. The whitebark pine has, over millions of years of evolution, become solely dependent on birds for its spread to far mountains. Incidentally, *nucifraga* means "nut eater." Grizzly bears also relish the nutritious seeds. On years with heavy cone crops, a significant part of a grizzly's late-summer diet may be whitebark pine seeds.

Limber pine and whitebark pine are very similar in appearance (see p. 150). Where both may occur, we must use cone features for accurate identification. A beautiful trait of whitebark pine is the male cones. They are a brilliant red-purple, while most pines have yellow or brown male cones.

High-elevation pine with 5 stout, short needles. Mature cones with opened scales not present. Cones with pointed scale tips that, detached from the cone, remain for years under the tree.

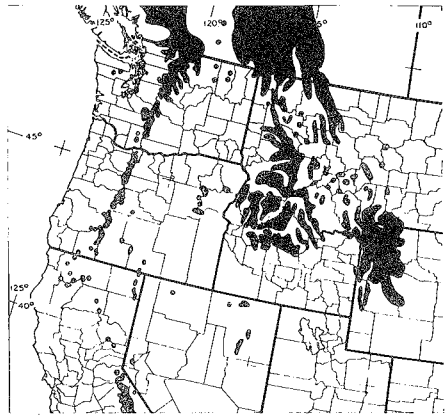
Galena Summit, Sawtooth Scenic Route; Lick Creek Summit east of McCall; above most any subalpine lake in northern or central Idaho; Meadow Lake west of Gilmore Summit, State Highway 28.

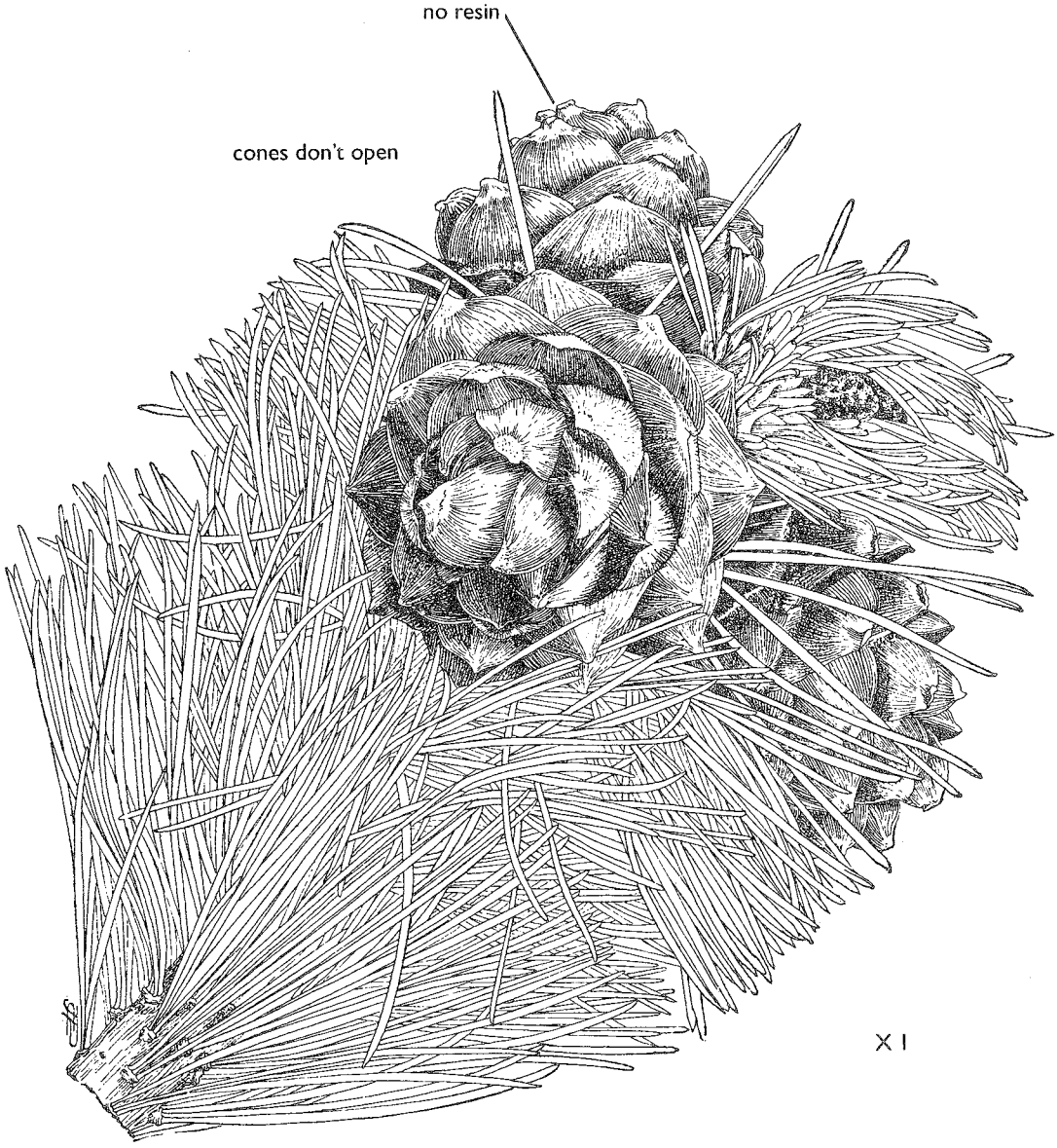
Diameter 105.4 inches, height 69 feet, near Stanley, Custer County; the largest in the United States.

Clark's nutcracker;

Note purple, mature cones opened by Clark's nutcracker;

Note typical rounded crown.





X 1

PACIFIC PONDEROSA PINE

GROUP 5
Needleleaf, in bundles

Pinus ponderosa
variety *ponderosa*
Also known as yellow pine
blackjack pine
pondosa
bull pine
ponderosa pine

NATIVE
ponderosa means "large"

FAMILY — PINACEAE

GROUP 5

Ponderosa pine is well named, for it is one of the largest pines in the world. One of the most common trees in western North America, it ranges from Alberta to central Mexico, from Nebraska to the Pacific Ocean, and from near sea level to over 10,000 feet elevation. Its large size, long needles, and mature cinnamon-brown bark make it one of the first trees westerners get to know by name (51). Despite its wide range, ponderosa pine does not exist as a native tree in most of eastern Idaho. It is simply missing, possibly due to some ancient distribution pattern. Farther east, in Wyoming, Rocky Mountain ponderosa pine (variety *scopulorum*) is found; this variety stretches from central Montana south to Arizona (43, 44).

Ponderosa pine has excellent wood and stands out as one of Idaho's most valuable timber trees. While ponderosa is the only tree in the ponderosa pine zone, it also is very common as a postfire species in the Douglas-fir zone, and even in forests where grand fir is climax. Young trees need plenty of light, so in planning logging, silviculturists must provide high light intensities if they wish to encourage strong-growing young ponderosas for the next crop.

The bark on young trees, those up to about 10 to 20 inches in diameter, is dark, almost black, and papery-scaly. These trees are often called "black pine," "blackjack pine," or "bull pine." Many people think they are a different tree from larger, older trees, which have orange-yellow or light brown bark. Very old ponderosas are often called "yellow pine" or "bull pine," or, by foresters, "punkins" or "yellow-bellies."

Ponderosa pine is often used in farm windbreaks in Idaho. When open-grown, this pine retains a bushy crown with branches almost to the ground, providing an effective barrier to the wind.

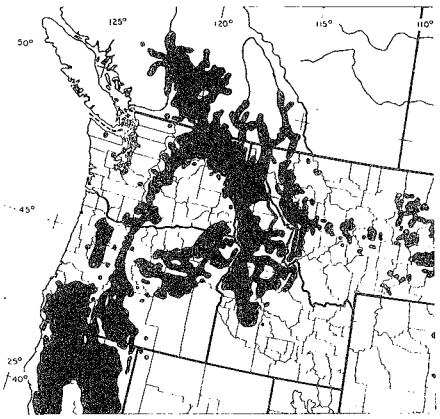
Only long-needled pine native in Idaho, needles in bundles of 3, about 6 to 10 inches long. The yellow-brown bark on older trees is unique.

Ponderosa Scenic Route, Boise to Lowman; Little Salmon River Canyon north of Riggins along U. S. 95; Lewiston to Kamiah along U. S. 12; Coeur d'Alene to Post Falls on Interstate 90; Farragut State Park, Lake Coeur d'Alene Scenic Route; Ponderosa State Park, McCall.

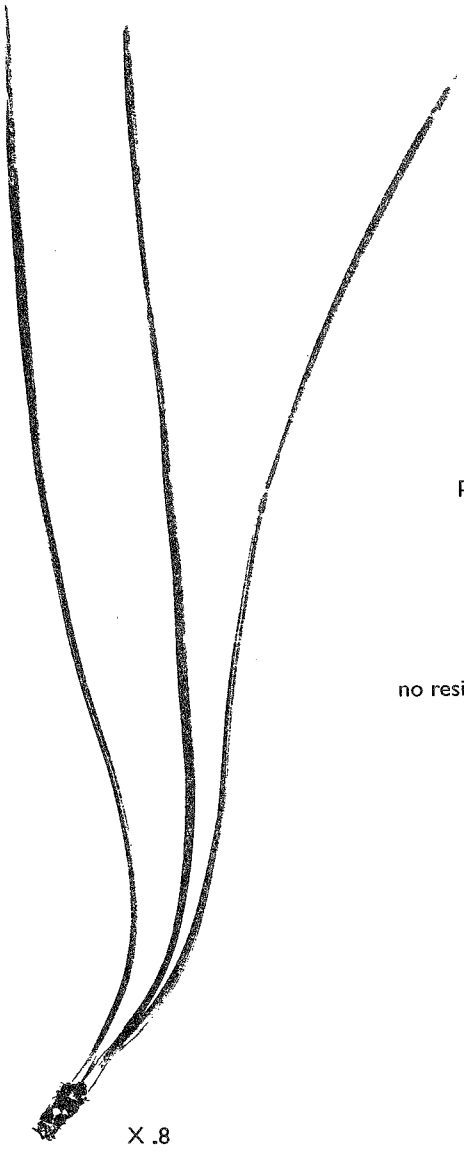
Diameter 87.4 inches, height 182 feet, east of Boise, Elmore County. Died by wildfire, 1994.

Note distinctive bark;

Note male cones (left) and first-year female cones.



Ponderosa pine: Central Montana
south=variety scopulorum;
remainder=variety ponderosa.



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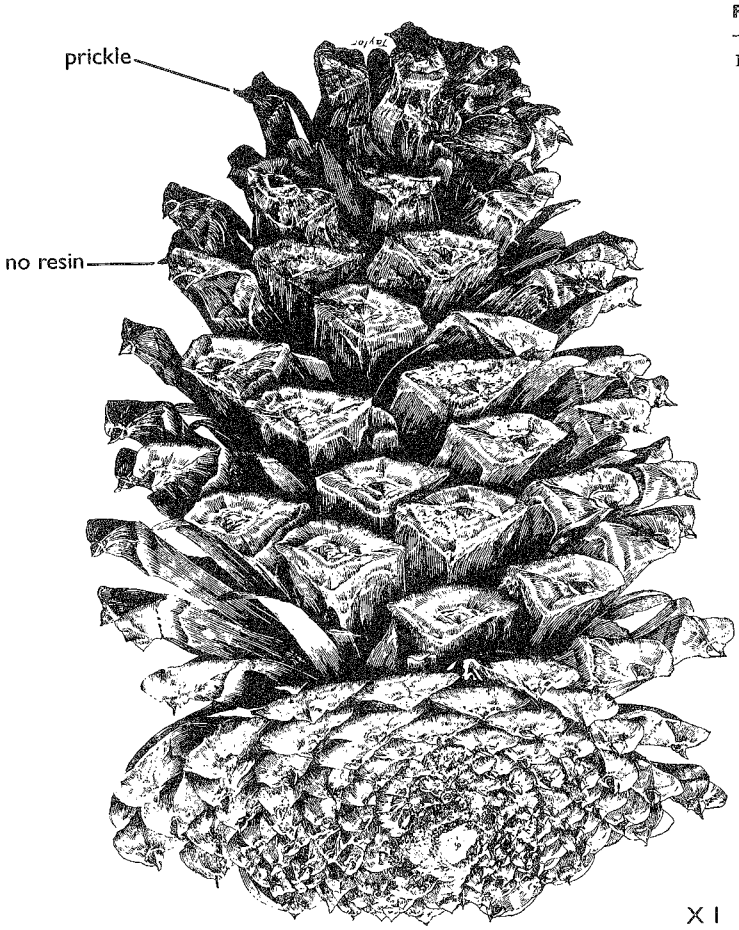


X 1

ROCKY MOUNTAIN LODGEPOLE PINE

GROUP 5
Needleleaf, in bundles

Pinus contorta variety *latifolia*
Also known as lodgepole pine
jackpine
black pine

NATIVE

contorta means "twisted," while *latifolia* means "wide leaf," wider than some varieties

FAMILY — PINACEAE

The Plains Indians made forays into the Rocky Mountains to cut the long, slim saplings of this tree as supports for their buffalo-hide lodges, hence "lodgepole pine." The specific name *contorta* was given by David Douglas, who saw them as gnarled, twisted trees growing along bluffs over the Pacific shoreline in the early 1800s. Lodgepole pine is one of the more widely distributed trees in Idaho, found just about wherever the mountains reach high enough to have a well-developed spruce-fir zone.

Lodgepole is a fire-dependent species. On some trees, cones do not open until heated by fire, and the unopened (serotinous) cones remain on the tree for many years. After a fire, millions of seeds from past years are released on the still-smoldering ashes, and soon a dense new stand of lodgepole is on the way (51, 62). This feature is particularly well illustrated in the Island Park area of Fremont County and in Yellowstone National Park.

Lodgepoles love the cold and are found in the cooler parts of the Douglas-fir and cedar-hemlock-grand fir zones, as well as in the spruce-fir zone, where they are most common. Lodgepole pine is about as unfussy as a tree can be as to soil—from ground-up granite and obsidian sands to mossy bogs, it makes little difference as long as it's *cold* (18).

The tall, slender, straight trunks make good fence posts when treated with preservatives. They are also used for fence and corral rails. The wood makes good pulp for paper and other products, and often grows large enough for small sawn products such as two-by-fours. Unfortunately, millions of lodgepole pines turn red and die each year, victims of attacks by bark beetles. Dead lodgepole pines left standing for a few years until the bark peels off make excellent and favorite house logs.

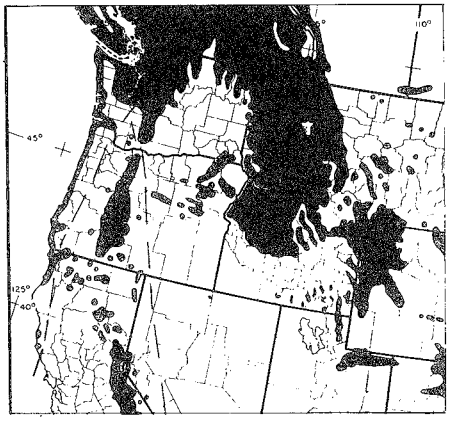
Two types of bark are encountered on Idaho lodgepole pines. In subalpine situations throughout the state, bark is thin, grey to sometimes orange, and has small papery scales. In the moist low-elevation forests of northern Idaho, lodgepole has thick, corky, black bark. There are other minor differences in these populations. Thick-barked trees are very short-lived; in mixed stands of white pine, Douglas-fir, and other conifers they die at about 40 to 100 years. These thick-barked lodgepoles exhibit several characteristics of shore pine (*P. contorta* variety *contorta*), which is confined to the Pacific shoreline. This may represent an ancient genetic linkage, perhaps another example of the relict coastal forests of northern Idaho. By contrast, trees in the high subalpine areas may live many hundreds of years.

Two short needles, 1 to 2 inches long, per bundle; small cones with a prickle, exceptionally variable in color and in degree of opening at maturity. Cones persist for many years, a feature easily seen against the sky. The cone silhouettes are a quick way to tell lodgepole pine from either whitebark or limber pine.

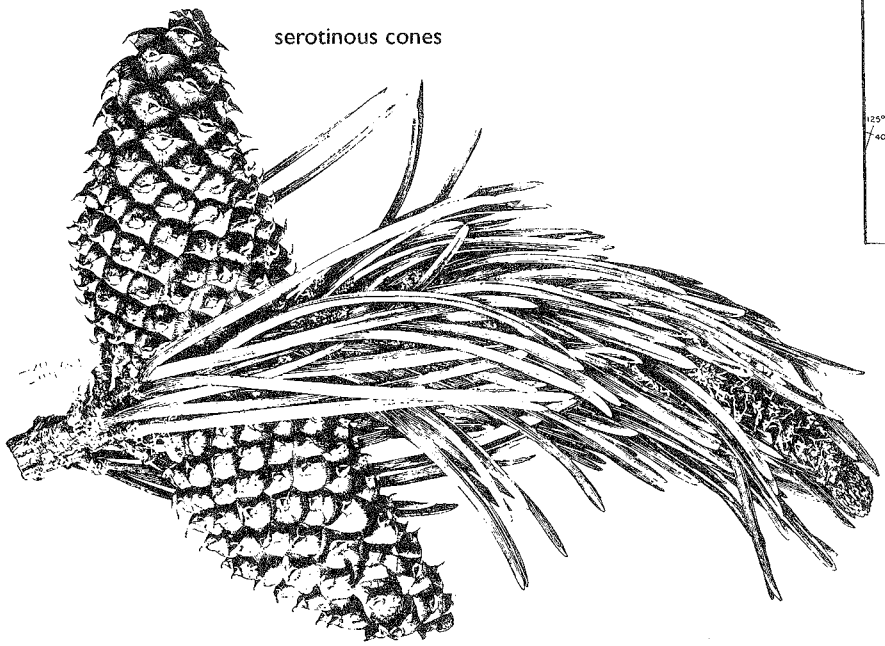
Island Park to Henrys Lake along U. S. 20/191; Harriman State Park, Fremont County; Sawtooth Scenic Route, Ketchum to Stanley; Jack Pine Flats south of Priest Lake; Teton Scenic Route, Swan Valley to Victor; Long Valley, State Highway 55, Cascade to McCall.

Diameter 43.6 inches, height 135 feet, near McCall, Valley County; national co-champion.

59 A mature serotinus lodgepole pine cone.



Lodgepole pine: coastal area=variety contorta; *Oregon Cascades and California=variety* murrayana; *remainder=variety* latifolia.



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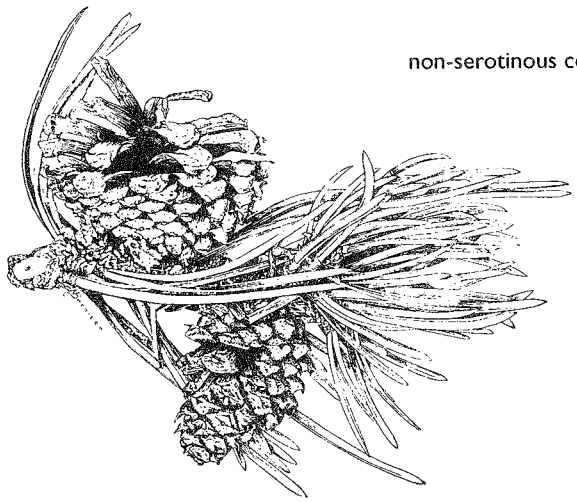
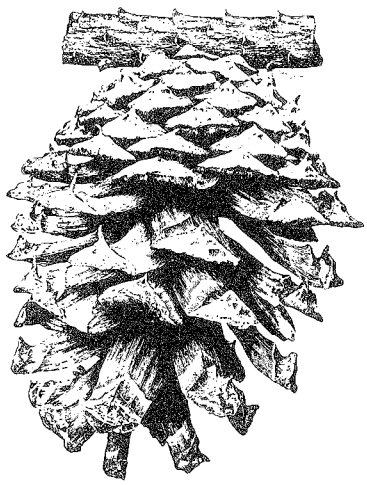




LARCH

GROUP 5
Needleleaf, in bundles or GROUP 6—Needleleaf, single

Larix

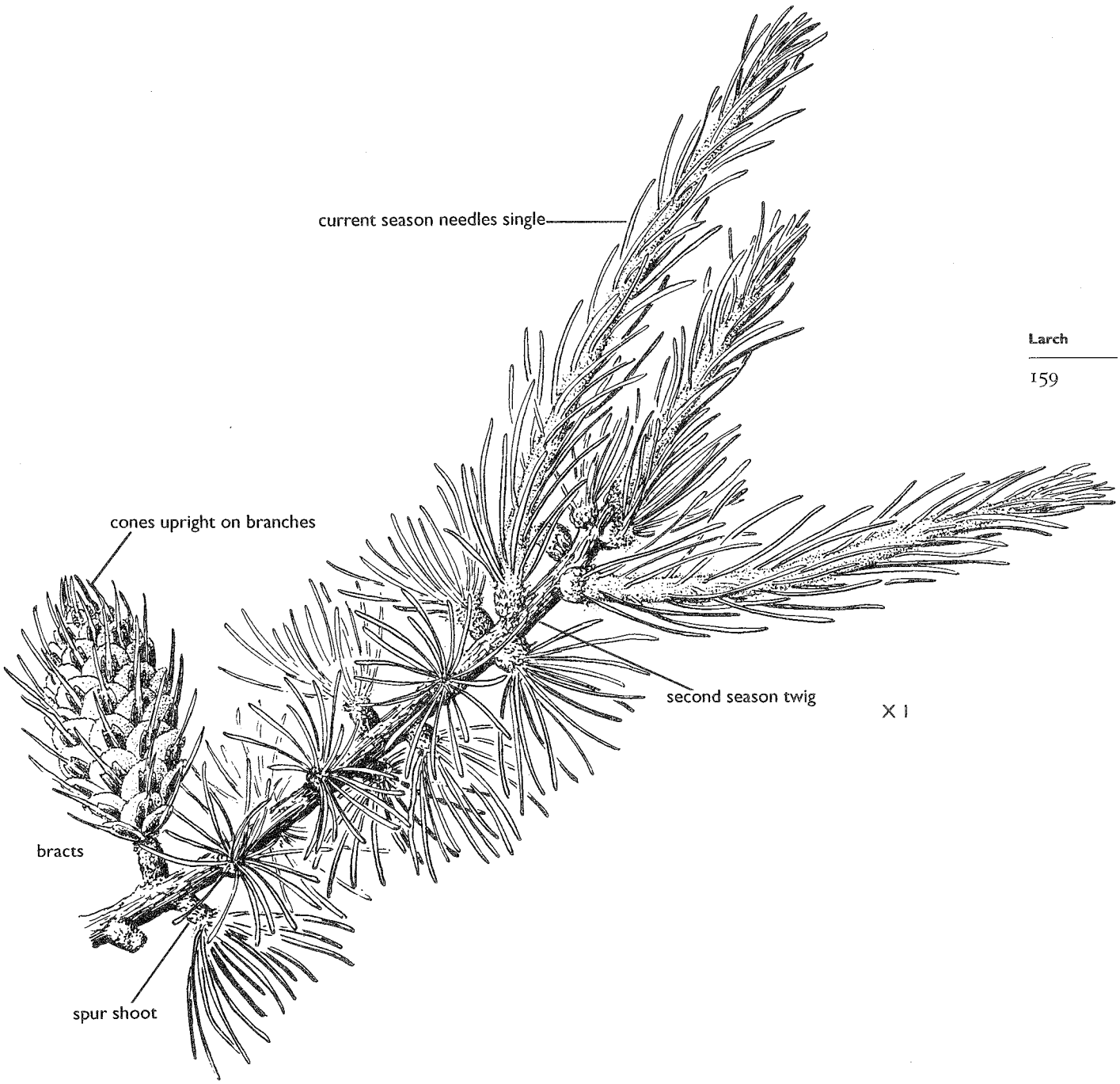
FAMILY — PINACEAE

Larches are the only native conifers in western North America that shed all their leaves in the fall. The somber green forests of northern and west-central Idaho take on a new look in October and November when the larches turn to brilliant gold before the leaves drop. To the unknowing person, larches look quite dead in winter, for they have the appearance of a conifer, and there is an expectation that conifers are green all year. There are but three native larches in North America. Eastern larch (*Larix laricina*) is a boreal species, ranging from Alaska eastward through the far-northern United States. The other two larches are essentially northern Rocky Mountain species, both found in Idaho.

Species	Twig Pubescence	Habitat
western larch (*Larix occidentalis*)	very sparse, only on very new twigs	in western redcedar, western hemlock, grand fir, or Douglas-fir habitats—usually under 5,500 feet
subalpine larch (*Larix lyallii*)	dense, dusty yellow to golden on new twigs and tips of spur shoots	high subalpine, in open areas with whitebark pine and subalpine fir, usually over 7,000 feet

Technical description: Leaves: about 1 inch long, needle-like, thin and light green; borne singly the first year, after that in whorls of many needles near the tip of a woody knob—a modified branch called a spur shoot. Needles turn yellow and drop off in autumn. Twigs: slender, brown to grey—unique because of the spur shoots. Cones: about 1 inch long, upright, with brown, woody scales; long, pointed bracts protrude from between the scales. Larch cones remain attached to the tree for many years. Bark: thick with scaly plates, grey-brown to purplish. Similar to mature ponderosa pine bark but with more linear scales and a purplish interior color. Form: slender trees with small branches and a very small crown of foliage. The light green color contrasts in summer with the dark greens of neighboring conifers. Yellow in autumn.

62 63 Larch twigs in winter; note cones showing the fragile bracts.


current season needles single
cones upright on branches
second season twig
bracts
spur shoot

X 1

WESTERN LARCH

GROUP 5
Needleleaf, in bundles or GROUP 6—Needleleaf, single

Larix occidentalis
Also known as tamarack

NATIVE
occidentalis means "western"

FAMILY — PINACEAE

GROUP 5

Western larch is an excellent timber tree and reputedly the largest larch in the world. A tree in Montana has a circumference of over 24 feet, while the present Idaho record is some 20 feet in girth. Western larch is one of the tallest conifers in the world, with a recorded height, in the past, of 250 feet. The wood is one of the heaviest and strongest of the conifers, and edge-grain larch was used for flooring in many older Idaho homes. Now larch wood is used mostly where strength is important. Naturally slender and branchless below the crown, larch is also used extensively for power and telephone poles (53).

Larch seedlings need a disturbed habitat and full sunlight to start life; in fact, no Idaho conifer is more light-demanding. Older trees with thick bark and leaves held high in the tree are very resistant to fire. Near-pure stands of larch probably result from two or more forest fires passing over an area in close succession, killing all trees but larch. Nonetheless, fire does kill some western larch, and the tall silvery larch snags remain as mute testimony to fire for many, many decades. Larch is preferred by many for firewood in central and northern Idaho, and long-dead snags provide choice fuel.

It's perplexing why more larches aren't used as ornamental trees. In the wild or near a home they are truly beautiful. They have pale green foliage, a rather "feathery" graceful arrangement of branches, and an open crown. Brilliant yellow in late fall, the leaves drop in November. I've heard folks say they won't plant larch because they shed their leaves, yet they have maples, elms, and other deciduous trees in abundance—at least with larch one doesn't have to rake the leaves.

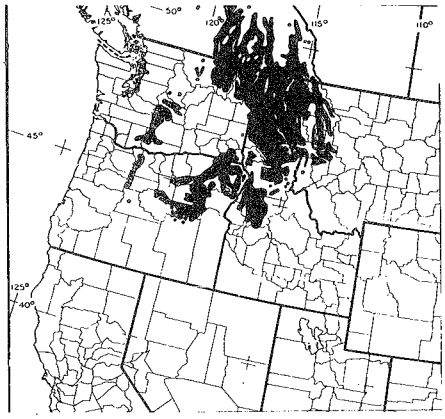
Slender tree with light green color and thin crown of foliage; older needles in dense clusters on short spur shoots; golden yellow in the fall; new twigs with little or no pubescence; in mid-elevation forests, mostly north of Cascade in Valley County.

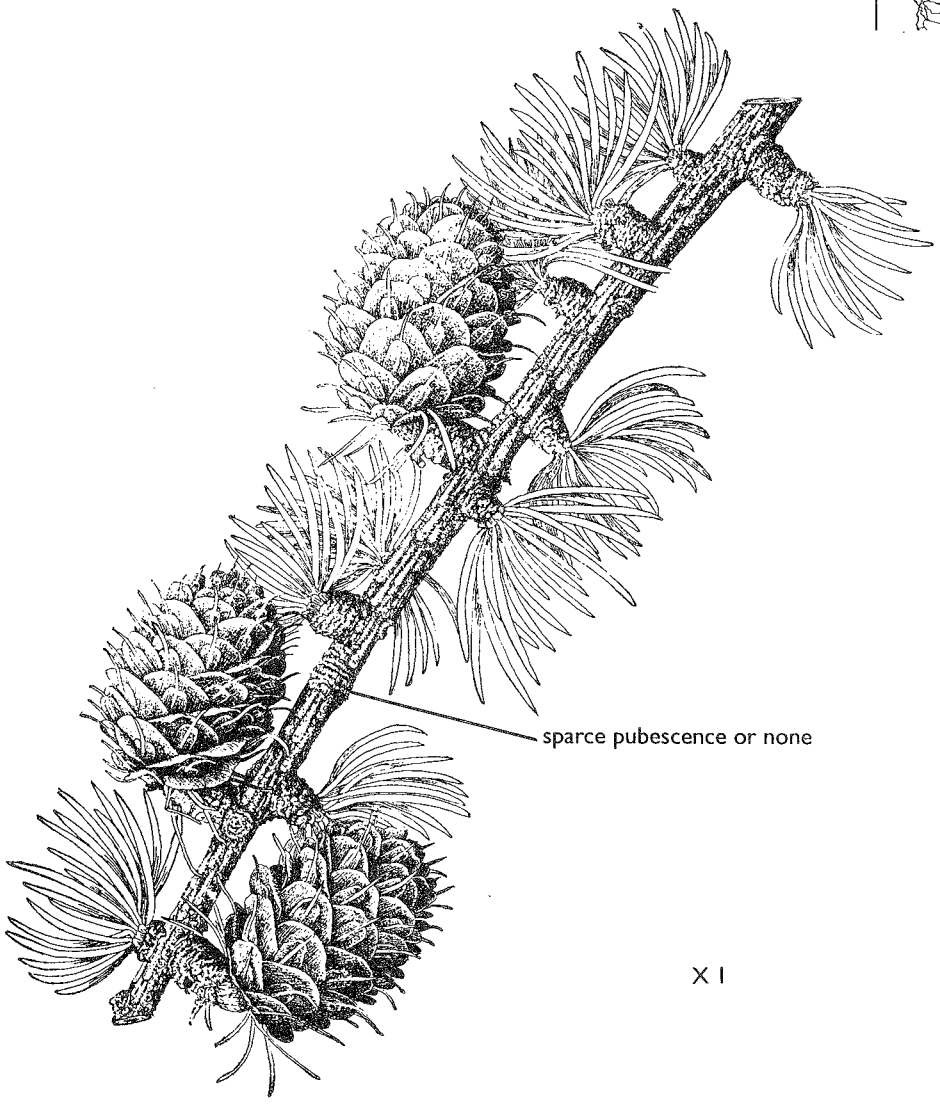
Along St. Joe River above St. Maries; Priest Lake State Park; Payette River Scenic Route, New Meadows to Cascade; U. S. 12, Lochsa River, east of Lowell.

Diameter 76.2 inches, height 142 feet, near Princeton, Latah County.

62 Note new twigs lack pubescence (top);

63 Note upright cones.





X 1

SUBALPINE LARCH

GROUP 5
Needleleaf, in bundles or GROUP 6—Needleleaf, single

Larix lyallii
Also known as Lyall larch

NATIVE
Named for David Lyall, an early western plant collector

FAMILY — PINACEAE

GROUP 5

Few, if any, Idaho native trees have been seen less by people who know Idaho forests than has subalpine larch. I know of only two places in the state where this larch can be reached by road. One is at Salmon Mountain on the famous Magruder Road between Darby, Montana, and Elk City, Idaho. Here, at some 9,000 feet, a beautiful stand of this unique larch mixed with whitebark pine has been preserved as a natural area. The other location reachable by road is at Roman Nose Lakes in the Selkirk Mountains north of Sandpoint. Part of this stand of subalpine larch was burned during the spectacular Sundance Fire of 1967. At Upper Roman Nose Lake is the largest known subalpine larch in Idaho, a tree over 13 feet in circumference.

Subalpine larch requires very specific habitats. Like its downhill cousin, western larch, it requires full sunlight. It also demands a degree of cold that few conifers in Idaho can tolerate. Thus, it appears only on our highest peaks north of the Salmon River. In the Selkirks of northern Idaho, it occurs only above about 7,000 feet in elevation, while near its southern limit, near Allen Mountain north of the town of Salmon, it doesn't exist much below 8,000 feet. The leaves turn to a blaze of gold in September, a striking contrast to the dark greens of its usual tree associates, whitebark pine and subalpine fir (5).

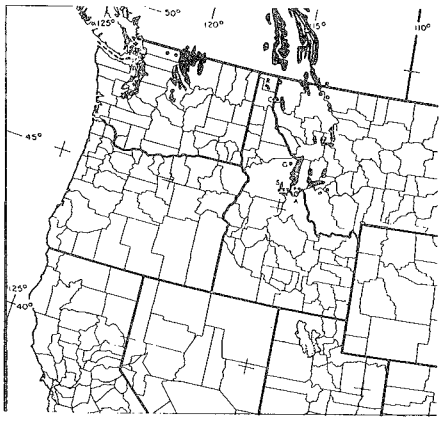
Larch restricted to high mountaintops, above 7,500 feet; young twigs densely yellow pubescent.

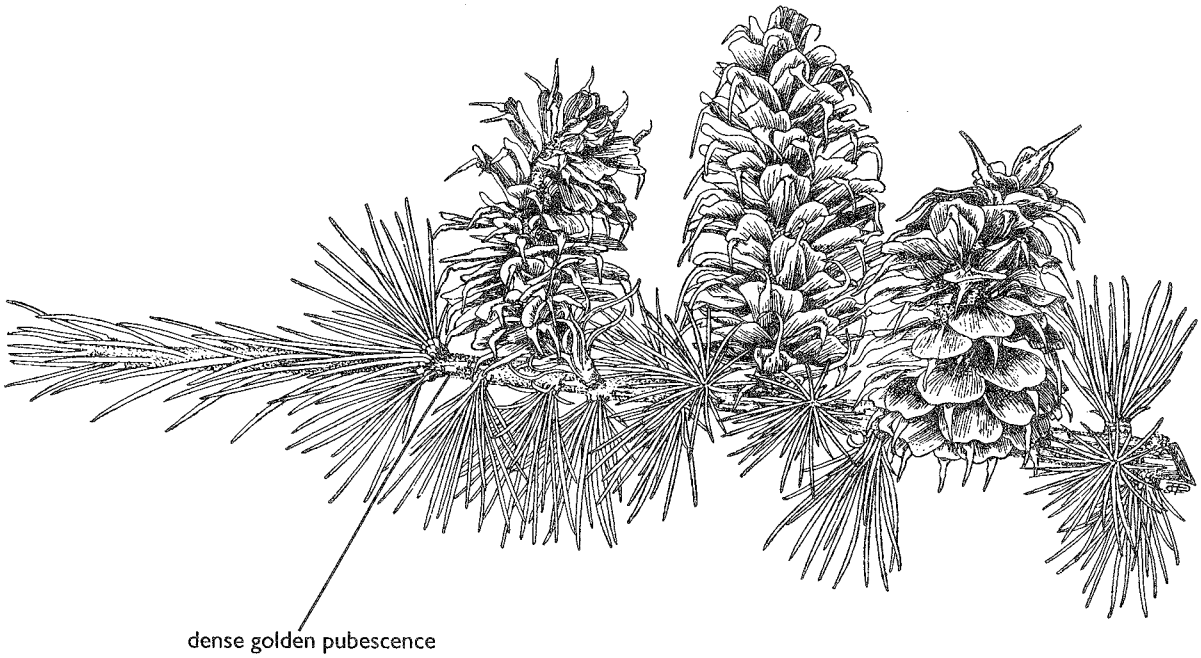
Refer to the map symbols: R = Roman Nose Lakes, C = Cabinet Mountains, G = Graves Peak, S = Salmon Mountain, A = Allen Mountain.

Diameter 50 inches, height 95 feet, near Bonners Ferry, Boundary County.

Note yellow pubescent twigs;

Subalpine larch in September, Salmon Mountain, Idaho County.





X 1

SINGLELEAF PINYON

GROUP 6
Needleleaf, single

Pinus monophylla
Also known as nut pine

NATIVE
monophylla means "one leaf"

FAMILY — PINACEAE (SEE DISCUSSION OF *Pinus,* P. 146)

On January 24, 1844, John C. Frémont described in his diary an Indian who came to his camp on the east slope of the Sierra Nevada: "He brought with him in a little skin bag a few pounds of the seeds of a pine tree, which today we saw for the first time . . . in popular language it might be called the *nut pine.* We purchased them from him. The nut is very oily, of very agreeable flavor, and must be very nutritious, as it constitutes the principal subsistence of the tribes among which we are now travelling. . . . When roasted, their pleasant flavor made them an agreeable addition to our now scanty store of provisions. . . . The Indians informed us that in certain seasons they have fish in their waters . . . for the remainder of the year they live on pine nuts . . ." This is one of the most descriptive early records of what we now call singleleaf pinyon.

This interesting tree reaches its northern limits in Idaho. It is a Great Basin species that is generally associated with Utah juniper in juniper woodlands just above the sagebrush/grass vegetation of the broad valleys (1, 40). It develops in mountain foothills of southern Cassia County, where it may be seen easily at the scenic Silent City of Rocks. A natural area has been established near the City of Rocks to, in part, preserve this uncommon Idaho tree in a relatively undisturbed habitat. The cones are quite resinous, and the sticky resin gives off a delightfully sweet odor. The pinyons are the only pines whose resin contains ethyl caprylate, a compound also present in oranges (47). The large seeds do not have the wings generally found on pine seeds; they are spread chiefly by pinyon and Steller's jays, Clark's nutcracker, and other birds. These seeds are called pinyon nuts, or *piñones,* and are delicious either raw or lightly roasted.

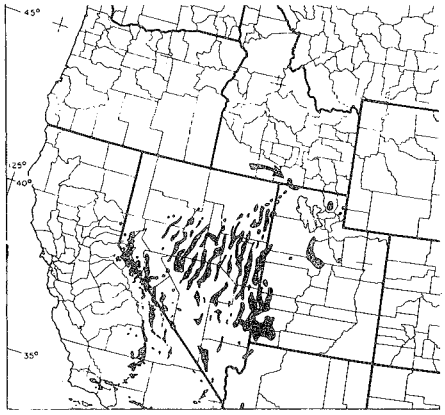
Unlike any other pine in the world, the tree has but a single needlelike leaf, which is thus round in cross-section. The leaves are very blue in color, making singleleaf pinyon easy to separate at a distance from the yellowish Utah junipers with which they associate. The trees are beautiful as Christmas trees, but a tree 7 feet tall may be 70 years old, so in Idaho only a few are allowed to be taken each year. *Piñon* in Spanish means "little pine." The spelling has been Anglicized, as it has been for *cañon.*

Leaves: 2 inches long, sharp-pointed, bluish, single. Cones: 2 to 3 inches long with knobby cone scale tips, about as wide as long when open, without prickles.

Silent City of Rocks National Reserve, Cassia County.

Diameter 26.6 inches, height 55 feet, near Almo, Cassia County.

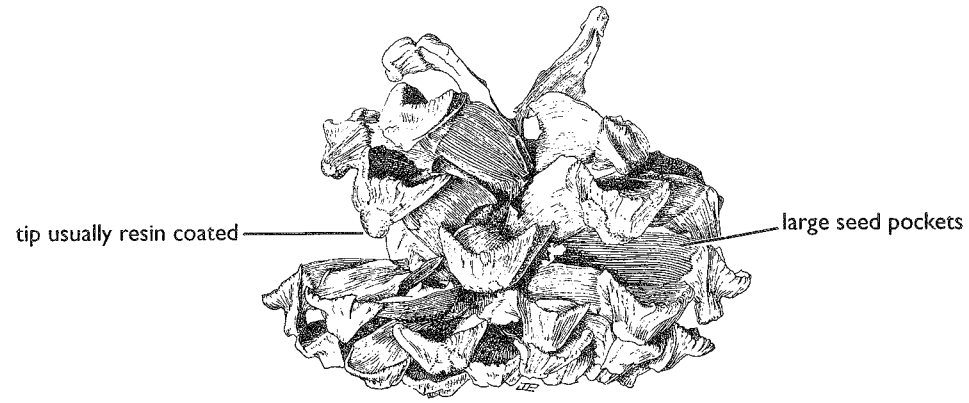
Note blue-green single needles and first-year female cone.



Singleleaf Pinyon

165

X 1



SPRUCE

GROUP 6
Needleleaf, single

FAMILY — PINACEAE

Many species of spruce are found throughout the Northern Hemisphere, particularly in the cold interiors of continents. They are particularly common in the subalpine zone of the mountains of Eurasia and North America, and in the boreal forest that stretches around the earth just south of the Arctic Circle.

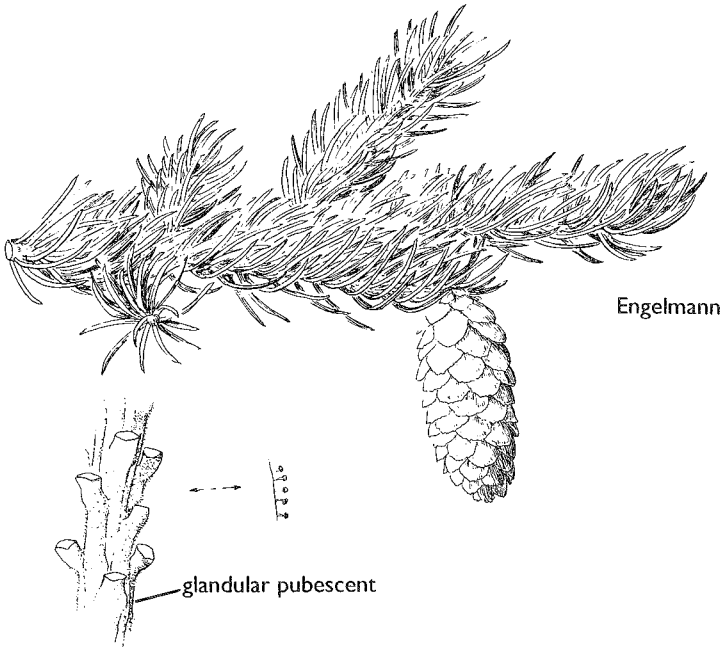
Spruce wood is of excellent quality, very strong, yet very lightweight. It has dramatic musical qualities—guitar tops and piano sounding boards are often made of spruce. Spruce wood has long fibers that make excellent wood pulp. Spruces are noted for being handsome, geometrical trees—hence our saying "to spruce up." The word "spruce" has its roots in Prussia, in northwestern Europe. Prussia was known for its spruce trees, and "prussia" became "pruce" in English, which then evolved to "spruce," and was applied to the genus of trees.

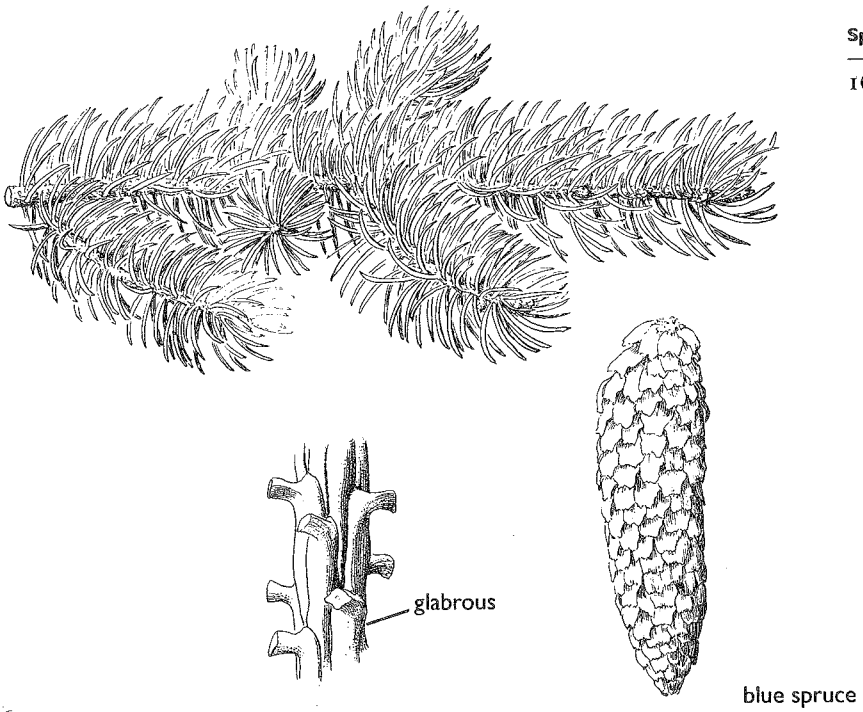
Idaho has three native spruces, one common, one quite uncommon, and one rare:

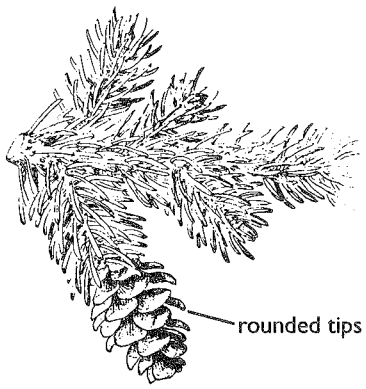
Species	Leaves	Cones	New Twigs	Habitat
Engelmann spruce	about 1", brushed to top of twig; tip sharp-pointed	1–1½", medium brown; ragged cone scale tips	glandular pubescent, brown	statewide in spruce-fir zone and in cold stream bottoms just below
blue spruce	about 1", at right angles to twig all around; tip very sharp	2–4" yellow-brown; ragged cone scale tips	glabrous, brown	extreme southeastern Idaho, in lower spruce-fir zone or moist sites in Douglas-fir zone
white spruce	about ½", brushed to top of twig; sharp-pointed	1–1½", brown; rounded cone scale tips	glaucous, glabrous	restricted to cold, damp sites; in Idaho known only from Fremont County

Technical description: Leaves: needlelike, about 1 inch long, new leaves bluish, square in cross-section, usually with a sharp tip; borne on a brown, woody peg that remains attached to the twig when the needles fall. Twigs: older twigs without needles have numerous short woody pegs. Cones: 1 to 3 inches long, cylindrical with papery scales. Bark: older bark has thin, silver-grey papery scales that flake off easily.

All spruce cones hang down in contrast to true firs, which are upright.


Engelmann spruce
glandular pubescent


glabrous
blue spruce


rounded tips
white spruce

ENGELMANN SPRUCE

GROUP 6
NEEDLELEAF, SINGLE

Picea engelmannii

NATIVE

named for George Engelmann, an early western botanist

FAMILY — PINACEAE

This spruce ranges throughout the Rocky Mountains as a near-constant co-climax associate of subalpine fir (24). Idaho has a large supply of this fine timber tree. The best trees come from the west-central part of the state, where they grow on moist soils in the subalpine zone. The largest known Engelmann spruce in the United States is north of McCall: it's about 180 feet tall and almost 8 feet in diameter. Engelmann spruce is also very common in high-elevation streambottoms, as well as being a frequent long-lived seral tree on habitats where grand fir, redcedar, or western hemlock are climax. As the Pacific coastal influence diminishes to the south, Engelmann spruce becomes more important in subalpine forests, often occupying drier habitats than subalpine fir. This is seen in southeastern Idaho. Just beyond the border in Utah and Wyoming, Engelmann spruce is found as an important climax species (58, 72).

Engelmann spruce and subalpine fir frequently occur together. Both have slim, rapidly tapering crowns that shed the heavy snows of the high mountains. The discerning hiker will notice that Engelmann spruce branches are more drooping, the tree crown is a bit wider, and the branches are farther apart than those of subalpine fir. Note also the cones—spruce cones hang downward, while subalpine fir cones sit straight up on the branches.

Needle color in Englemann spruce, and also blue spruce, is quite variable—from intense green through shades of grey-green to a striking silver-blue. Time and again we have inquiries from people who have found a single Englemann of a silver-blue color so intense that they're nearly certain they've discovered a blue spruce far north of its known range. Look for the cones, under 2 inches long and brown in Engelmann.

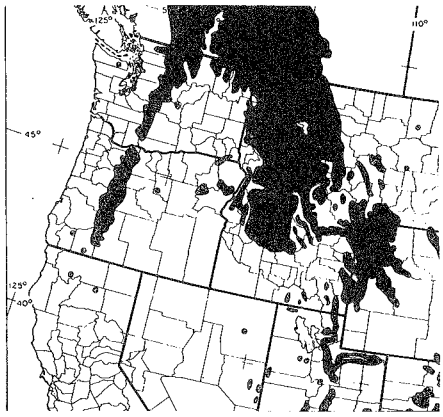
The wood of Engelmann spruce rivals white pine in high quality. It is extraordinary strong for its weight, white, and very low in resins. It is used for millwork, lumber, pulp, and even musical instruments, such as guitars.

Inch-long needles, square in cross-section, with sharp-pointed tips. Twigs have minute hairs with a sphere of resin on the tip (must be seen with a hand lens). Cones about 1 to 1½ inches long, brown with irregularly toothed cone scale tips.

Warren Wagon Road, McCall to Burgdorf; along St. Maries River, State Highway 3; Lost Trail Pass, U. S. 93; Lolo Pass, U. S. 12, Lookout Pass, Interstate 90; Priest Lake State Park; Sawtooth Scenic Route, Ketchum to Stanley; near almost any high mountain lake in Idaho.

Diameter 92.4 inches, height 179 feet, near McCall, Valley County; the largest in the United States. Consumed by wildfire, 1994.

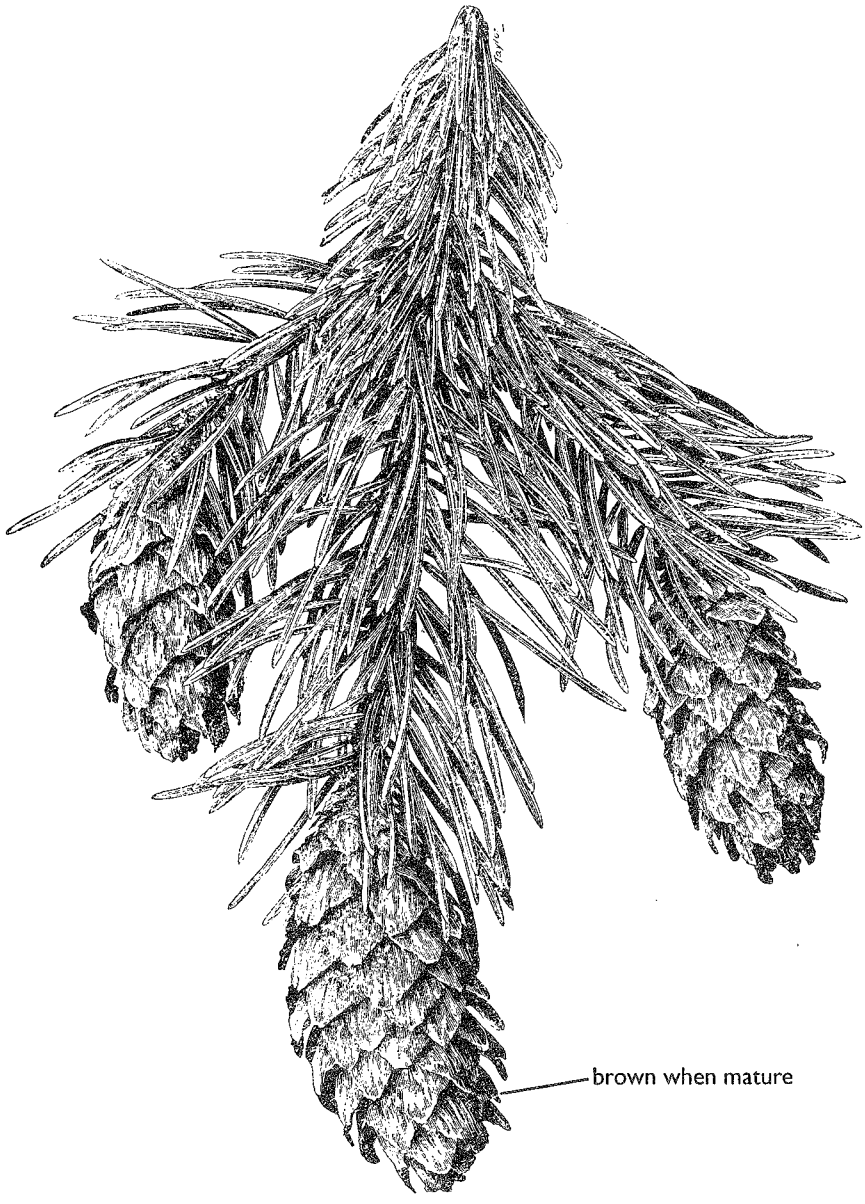
Note Engelmann spruce is generally greener than blue spruce.

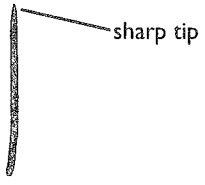


Englemann Spruce

169

X 1





BLUE SPRUCE

GROUP 6
Needleleaf, single

Picea pungens

NATIVE

pungens means "to penetrate," referring to the needle tips

FAMILY — PINACEAE

GROUP 6

This spruce is one of the least common naturally occurring trees in the state, yet it is a tree almost everyone recognizes. Blue spruce is one of the most familiar ornamental conifers in Idaho, in fact, in the northern United States. There is hardly a city block in the state without at least one blue spruce in front of a house. The symmetrical, conical shape is very stiff and formal and the new needles are most often a bright silver-blue. The blue spruces grown as ornamentals are selections, clones from trees chosen from a population, in this case for intense blue color and longer needles. To retain these characteristics, such trees are propagated vegetatively. If one were to plant a thousand seeds from an intensely blue spruce, only a few would have the most desirable traits of its parent. Various selections are very popular ornamentals, with 37 named forms that reflect needle size and color and tree form (39).

Needles 1 to 1 1/2 inches long, square in cross-section, with very sharp pointed tips; no hairs on twigs; cones 2 to 4 inches long, yellow-brown with irregularly toothed cone scale tips.

Lower Indian Creek and Big Elk Creek Camp ground near Palisades Reservoir, Bonneville County; Game Creek, upper Teton River, Teton County.

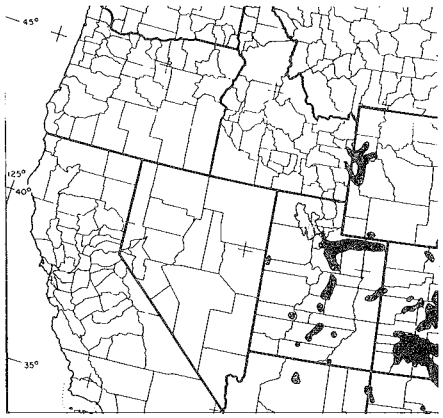
Blue spruce twigs lack the glandular hairs (seen through a hand lens) almost always found on Engelmann spruce twigs. Blue spruces in the wild, like Engelmann, exhibit great variation in needle color—from green to silver. Better check the range map and also be certain that cones are 2 to 4 inches long and yellow-brown for blue spruce.

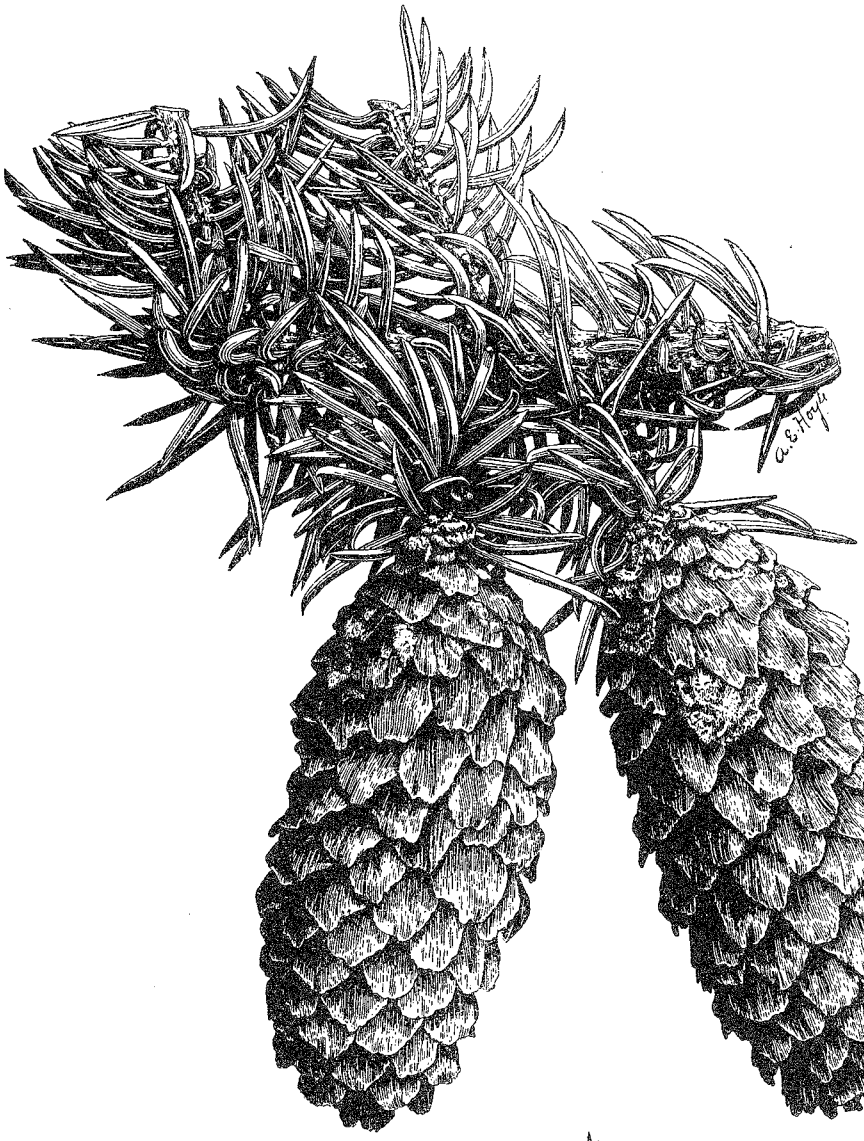
Blue spruce, which reaches its northern limits in southeastern Idaho, is a common tree of the central Rocky Mountains. There are few reports and fewer specimens from Idaho. Anyone finding native blue spruce in Idaho outside of the mapped locations would extend our knowledge. Send a new branch and a few cones to the author, along with good location and habitat information, if you find one. Blue spruce hybridizes with Engelmann spruce, and hybrids have been found in eastern Idaho as far north as the North Fork of the Salmon River in Lemhi County.

Diameter 42.7 inches, height 123 feet, near Swan Valley, Bonneville County.

Note blue spruce is generally bluer than Engelmann;

Note long yellow-brown cones.





Blue Spruce

171

X 1

yellow-brown when mature

very sharp tip

WHITE SPRUCE

GROUP 6
Needleleaf, single

Picea glauca
(*Picea glauca* X *engelmannii*)

NATIVE

glauca means "silvery," referring to the needle color

FAMILY — PINACEAE

During a glacial period, perhaps some 10,000 to 20,000 years ago, the climate of Idaho was much cooler than today. Plants from northern Canada migrated south with the cooler weather. When the climate warmed, the glaciers melted and most northern plants gradually moved back to their present position. However, small populations of northern plants remained in the south in specialized habitats. Thus, the recent discovery of white spruce in the area around Henrys Lake in Fremont County is not surprising. Isolated pockets of white spruce also occur in adjacent Montana and Wyoming.

White spruce hybridizes readily with Engelmann spruce. The result is often a stand where there are a few white spruce and a few Engelmann spruce, while most of the trees have characteristics of both. Properly cited, these hybrid spruce become *Picea glauca* X *engelmannii*. In technical terms, such stands may be referred to as introgressed hybrid populations. Picture two spruces, one Engelmann, one white. They hybridize, producing offspring with characteristics of both parents. One of these second generation trees backcrosses with Engelmann; the third generation will have much Engelmann but still some white spruce characteristics. Another second-generation tree backcrosses with the white spruce parent—the third generation will have much white but still some Engelmann characteristics. Extend this scenario to a large group of trees over a march of thousands of years—the result is a population that contains individuals from near-pure Engelmann to near-pure white spruce, with most trees falling between the extremes. With different actors, this is the play that explains Idaho's concolor firs (see p. 190).

In Idaho, the single known stand of white spruce occurs in a swampy area where water is near the surface even in late summer. It is reasonable to expect more stands of white spruce and white-Engelmann hybrids in moist habitats in northeastern Idaho. I would appreciate receiving reports of such occurrences, along with new branches and cone specimens.

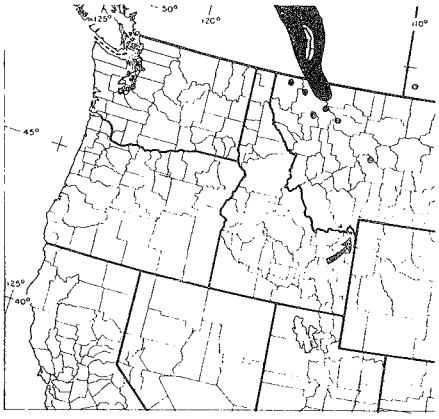
Technical description: Leaves: 1/2 inch long, blue-green. Twigs: silvery, glabrous. Cones: 1 to 1½ inches long, cylindrical, cone scale tips rounded (shiny when fresh in autumn).

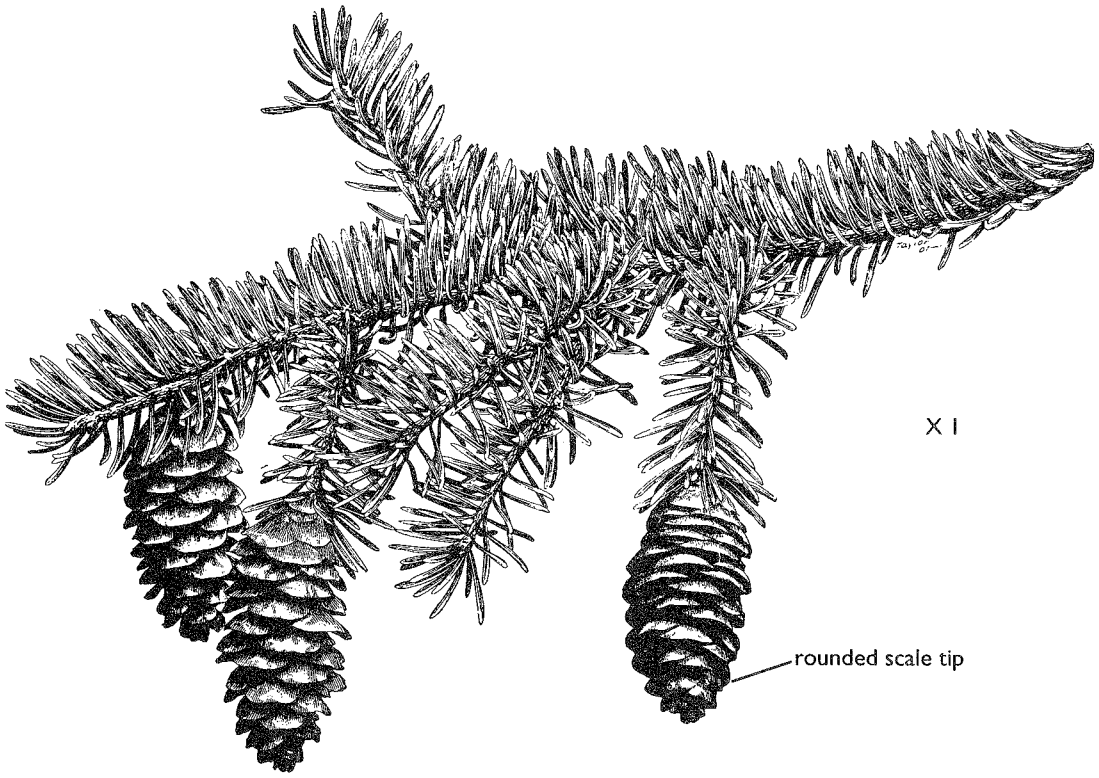
Short needles, silvery twigs; cones with rounded scales.

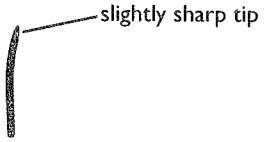
Northeastern shore of Henrys Lake, Fremont County, near Henrys Lake State Park.

No record.

Note round-tipped cones.







White Spruce

173

PACIFIC YEW

GROUP 6
Needleleaf, single

Taxus brevifolia

NATIVE

brevifolia means "small leaf"

FAMILY — TAXACEAE

Pacific yew is generally an understory shrub in conifer forests, but becomes a small tree in favorable habitats. It is most common in the shade of the grand fir-cedar-hemlock forests of northern Idaho. At lower elevations where there is abundant moisture, it commonly forms a tree from 10 to 20 inches in diameter 20 or 30 feet tall. The greatest density occurs on the Nez Perce National Forest, Idaho County, where, above Elk City, yew achieves such dominance that it may be considered the climax tree (17). In this area is Idaho's largest-known yew, just over 10 feet in circumference. One Idaho yew reached 58 feet in height!

Pacific yew bark contains taxol, an anti-carcinogen that slows tumor growth. Yew wood is very heavy, dense, and elastic and was famous for making archery bows. Yew leaves are considered poisonous to people and livestock, but deer, elk, and moose browse them readily (28). Yew fruits, borne only on female trees, are edible when red and ripe; they taste like mild cherry jello. *Do not* swallow the seeds, as they're poisonous. Birds eat the fruits almost as quickly as they turn pink, so finding the mature fruits is not common. Small rodents eat the seeds, but leave the pink flesh. Yew shrubs cultivated in Idaho are mostly of Asiatic origin, seldom Pacific yew.

Pacific yew leaves are flat, about 1 inch long, and lie all in one plane on either side of the twig. They are easily confused with those of western hemlock or grand fir. The following table will help to separate them:

Species	Leaf Base	Leaf Tip	Shape
Pacific yew *Taxus brevifolia)*	with petiole	sharp tip	
western hemlock *(Tsuga heterophylla)*	with petiole	rounded tip	
grand fir *(Abies grandis)*	no petiole	rounded or notched tip	

Technical description: Leaves: 3/4 to 1 inch long, flat, dark green above (rarely blue green), pale green below; borne on a short petiole and with a very sharp-pointed tip. Fruit: no cones are formed—the fruit is a single seed about 1/8 inch long surrounded by fleshy pulp, open at the tip. The mature fruit looks like a ¼ inch red berry. Bark: reddish purple with large papery scales that peel off easily.

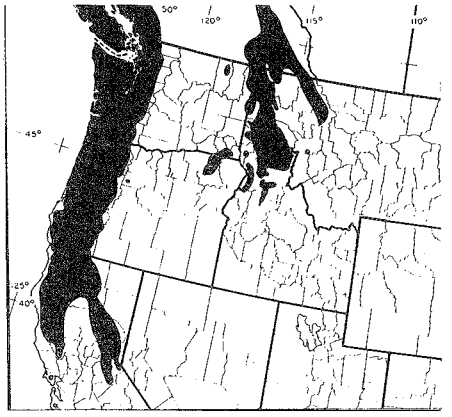
Small tree or shrub, purple-red bark with papery flakes, leaves sharp-pointed with petiole.

Lower Selway River, Lowell to Selway Falls, Idaho County; Coeur d'Alene River upstream from Prichard, Shoshone County; Heyburn State Park, Benewah County; abundant in grand fir stands above Elk City, Idaho County; along lower Wind River (near Salmon River), Idaho County.

Diameter 38.9 inches, height 44 feet, near Lowell, Idaho County.

Note unusual bark;

Note fleshy fruit, which are misnamed berries.



pale green below

Pacific Yew

175

X 1

HEMLOCK

GROUP 6
Needleleaf, single

Tsuga

tsuga is the Japanese name for hemlock

FAMILY — PINACEAE

GROUP 6

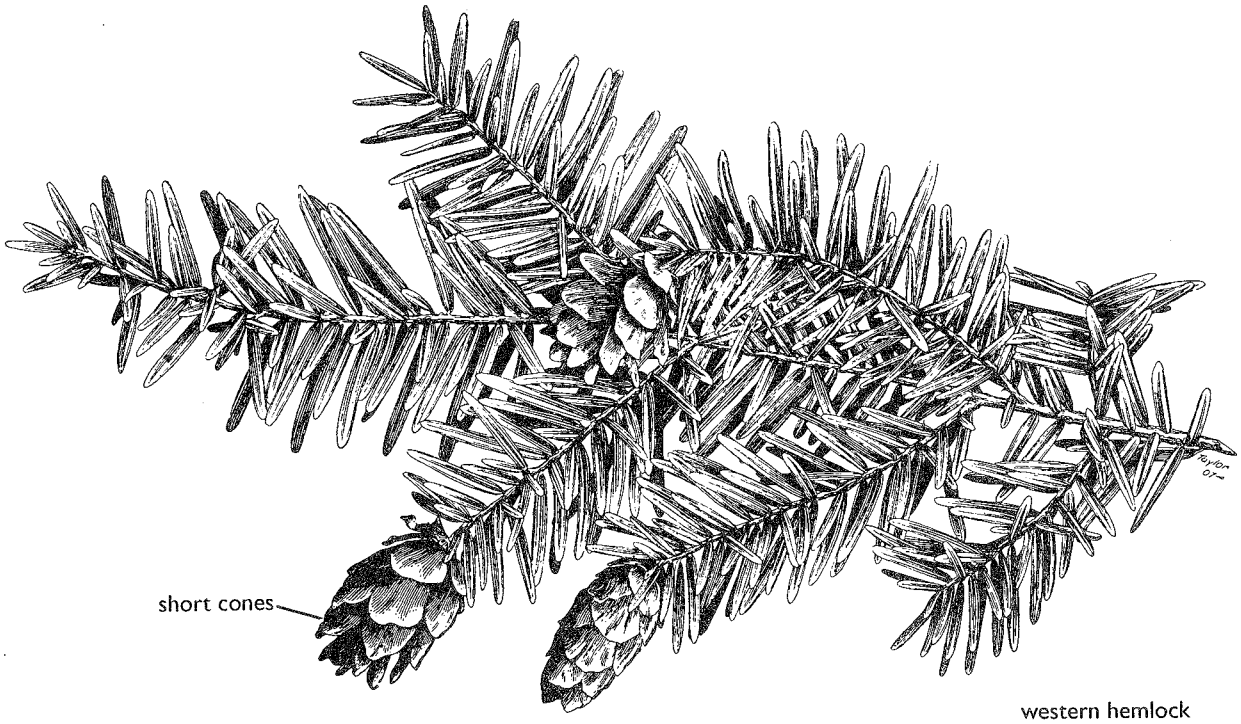
Hemlocks are the queens of the forest. Most of our conifers are rather stiff and formal trees, but hemlock branches bend downward, giving them a much more graceful appearance than other conifers and making them very easy to recognize. Western redcedar branches also have this quality, but hemlocks have definite needlelike leaves about 1 inch long, whereas redcedar has scalelike leaves that look "ferny" from a distance. All Idaho hemlocks are north of the Clearwater-Lochsa River, which roughly follows U.S. Highway 12. Hemlocks may be confused with yew (see the conspectus on p. 174).

Of the 14 species of hemlock in the world, 4 are native in North America—2 in the east and 2 in the west—the remainder are natives in Asia. Hemlocks are considered the most elegant of the conifers, yet since they require a cool climate, high humidity, and plenty of moisture, there are many places in Idaho where it is nearly futile to try growing them. Thus, they appear as ornamentals in many northern Idaho towns in forested areas, yet they are difficult to find in southern Idaho yards. The wood of hemlocks was once considered near-worthless, but now we find abundant uses for it, such as interior moldings and frames, lumber, and some of the highest-quality pulp produced in America (24).

IDAHO HEMLOCKS

Species	Leaves	Cones	Habitat
western hemlock	thin, flat, green on top	½–1" long	mid-elevations; with western redcedar, western white pine, grand fir
mountain hemlock	thick, slightly silvery on top	1–2" long	subalpine; with Engelmann spruce, subalpine fir

Technical description: Leaves: ½ to 1 inch long, of uneven lengths, with a definite petiole and a rounded tip. Cones: Small, 3/4 to 1½ inches, light brown, with papery scales. Form: The only members of the pine family that have branch tips and tree tip drooping.



western hemlock

X 1

mountain hemlock

WESTERN HEMLOCK

GROUP 6
Needleleaf, single

Tsuga heterophylla

NATIVE

heterophylla means "different leaves," referring to the variable leaf lengths

FAMILY — PINACEAE

GROUP 6

Stepping into the dark, somber hemlock forests around Priest Lake is like taking a trip to the Washington coast, so similar are appearances. Delicate ferns are scattered about, moss covers both the ground and dead logs, and you have the feeling that if you do not move soon moss will grow on your boot toes. Western hemlock requires a cool, moist climate. In Idaho it is found only in the northern part of the grand fir-cedar-hemlock forests. Imagine a line from Moscow to Elk River and then east—almost all of Idaho's western hemlock is north of that line (see Figure 5).

Western hemlock is the major climax conifer west of the Cascade Mountains in Oregon and Washington. The gloomy, mossy forests extend northward through coastal British Columbia into the Alaskan panhandle, where it is an important source of wood pulp and controversy. It seems probable that the Northern Rockies population migrated into Idaho and adjacent states from coastal sources after glaciation. Further discussion on postglacial migrations appears in the Introduction in the section titled "Origins" and in the summary of the grand fir-western redcedar-western hemlock forests (45, 63).

Western hemlock wood is of good quality, but it is seldom used in Idaho except for pulp. Due to a heart-rot fungus, timber-sized hemlocks are as hollow as a tom-tom. The fungus responsible for this heart-rot is called the "Indian paint fungus" (*Echinodontium tinctorium*) due to the dull red interior of the conks. This material was ground to powder, mixed with animal fat, and used for ceremonial face paint by many Indian tribes. Through trade routes, the "conks" made their way as far east as the Lake States. As we remove large hollow hemlocks, they will be replaced by trees that in the future will be harvested before heart-rot makes them near worthless.

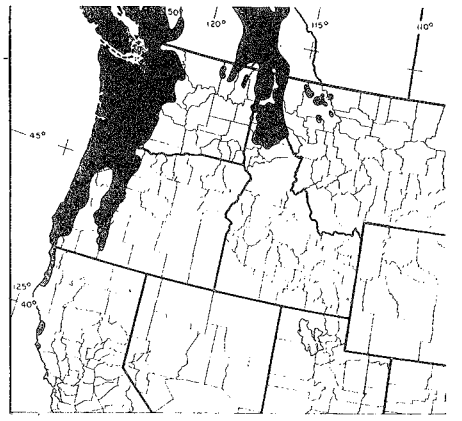
Young hemlocks grow in the dense shade of the mature forests, a characteristic shared by most climax tree seedlings. After the dense stands of climax hemlock are cut or burned, the new forests contain fast-growing western white pine, western larch, and other seral trees. After several hundred years without disturbance, almost all seral trees have died, leaving mostly western hemlocks of various ages, while here and there an ancient western redcedar shares the forest. To walk in such a forest is like a trip to some mystic place—one expects elves to be perched on the occasional mushroom.

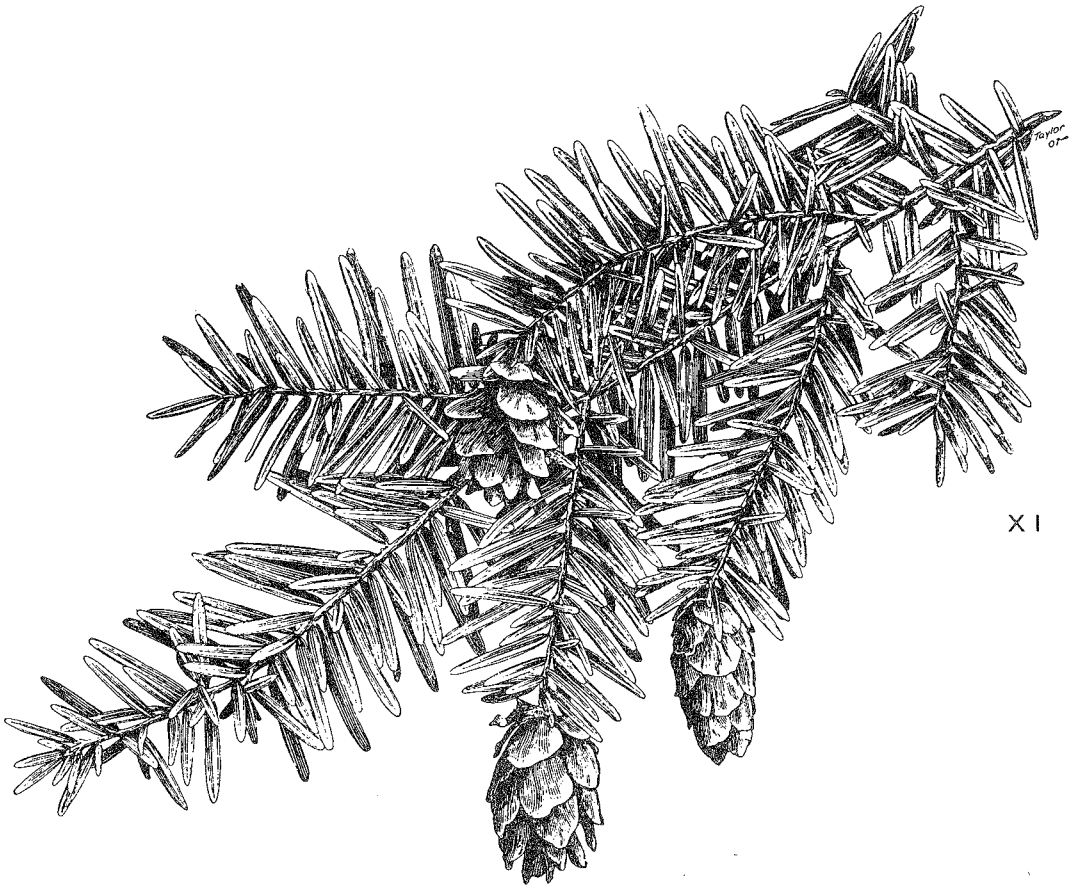
Drooping tip and branches; leaves ½ to 1 inches long of uneven lengths with distinct petiole and rounded tip; cones about 1 inch long.

Priest Lake State Park; Interstate 90, Coeur d'Alene to Mullan; White Pine Scenic Route; St. Joe River road, Calder to Red Ives; Lake Coeur d'Alene Scenic Route; Heyburn State Park.

Diameter 58.0 inches, height 165 feet, near Nordman, Boundary County.

Note small cones that are usually abundant on the forest floor.





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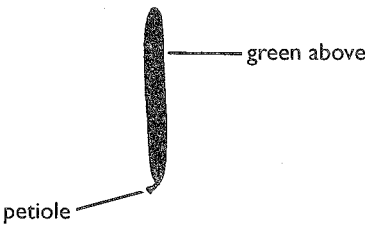


Western Hemlock

179

MOUNTAIN HEMLOCK

GROUP 6
Needleleaf, single

Tsuga mertensiana

NATIVE

named for naturalist Karl Mertens, who discovered this species near Sitka, Alaska

FAMILY — PINACEAE

Mountain hemlock is one of our largest subalpine trees, reaching diameters in excess of 5 feet. It grows primarily on moist north- or east-facing slopes in areas that have heavy snowfalls. Generally, mountain hemlock does not occur unless average snow depths reach over 10 feet, with annual precipitation of over 50 inches. In a dense mature forest of this uncommon tree, little light reaches the ground. The shade is too deep for subalpine fir to grow, but a few small mountain hemlocks scattered through the stand indicate this tree as the climax species on this habitat (25) (68).

Despite their appreciable size, mountain hemlock is seldom harvested by loggers. Mature trees have the same heart-rot as western hemlock and are seldom merchantable. Besides, they are usually too high in elevation, and often on land too valuable for recreation and watershed protection for them to be a prime timber species.

The branch tips tend to droop, but not as much as western hemlock branches. Mountain hemlock has a definite bluish or silvery color due to the white glaucous bloom on the upper leaf surface. Cones are about twice the length of western hemlock cones and can be found beneath older trees if they cannot be seen on the tree.

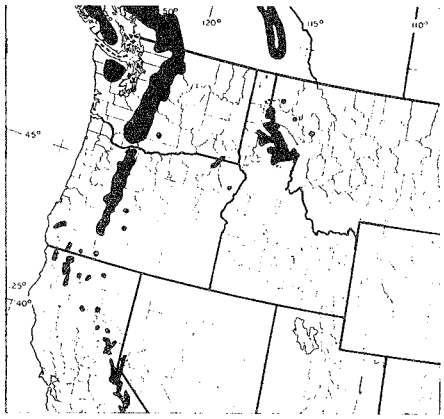
There is substantial evidence that mountain hemlock may be the result of intergeneric hybridization between *Picea* and *Tsuga*. Many characteristics of *Tsuga mertensiana* are more like *Picea* than *Tsuga,* and none of the other 13 *Tsugas* in the world have these characteristics. Mountain hemlock characteristics that are more like spruce would include larger cones, needles not 2–ranked and thick with silvery stomatal bands on the upper side, and somewhat scaly bark. There are even scientific names proposed to support this possibility—*Tsugo-Picea hookeriana,* for example (42).

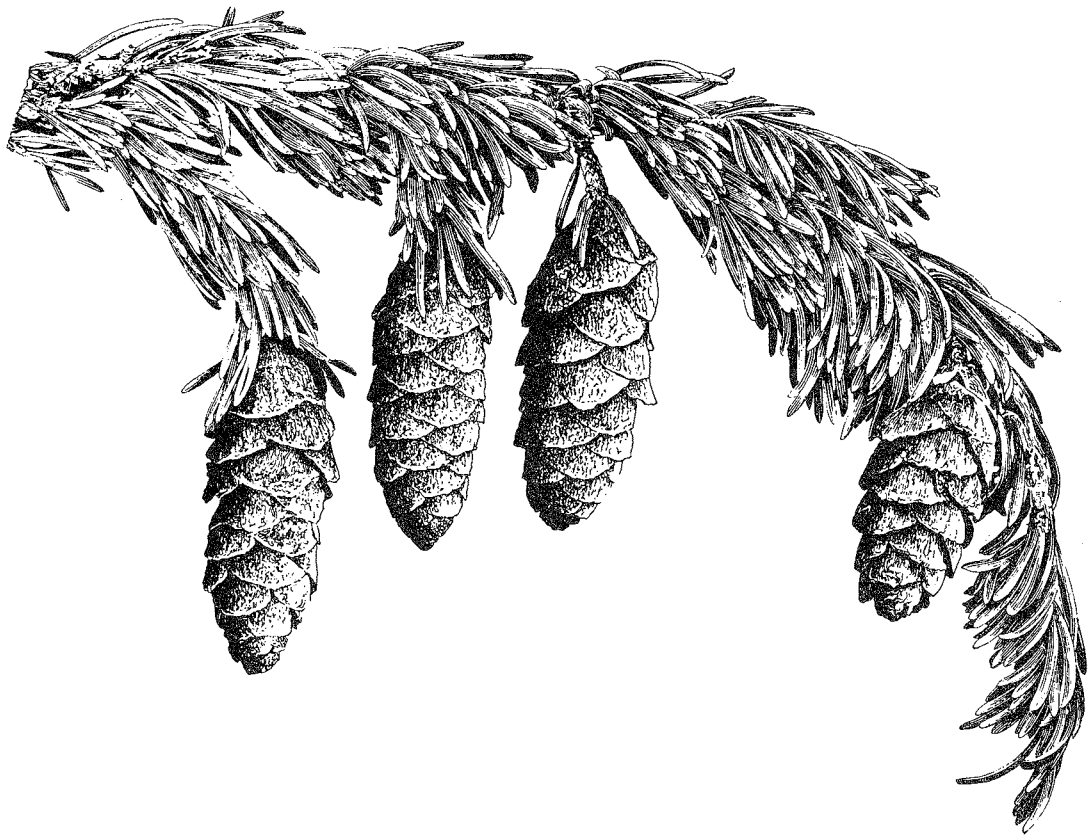
Many people think mountain hemlock is Idaho's most beautiful conifer, and I certainly agree. It is seldom seen in cultivation in Idaho, for the summer climate of most towns is too warm and dry. Homeowners in northern Idaho who live in towns that are in forest might want to try this handsome tree.

Subalpine zone only; silvery leaves with definite petiole; drooping tips on branches; cones 1½ inches long.

Sunset Peak north of Wallace; Freezeout Ridge road east of Clarkia, Shoshone County; Lolo Trail north of the Lochsa River, Clearwater County; Gold Pass, between the upper St. Joe River and St. Regis, Montana; Hemlock Butte, north of Elk River, Clearwater County.

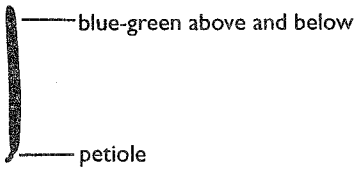
Diameter 64.3 inches, height 136 feet, east of Clarkia, Shoshone County.





Mountain Hemlock

181



X 1

ROCKY MOUNTAIN DOUGLAS-FIR

GROUP 6
Needleleaf, single

Pseudotsuga menziesii variety *glauca*
Pseudotsuga taxifolia
Also known as Douglas-fir
red-fir
Doug-fir

NATIVE

pseudotsuga means "false hemlock"; *taxifolia* means "yew-leaf"; *glauca* means "silvery"

FAMILY — PINACEAE

GROUP 6

The names of this famous tree reflect the history of its discovery. Archibald Menzies, a botanist sailing with Captain George Vancouver, discovered this tree on the shores of Vancouver Island in 1791. David Douglas was a naturalist who walked much of the Pacific Northwest in the 1820s and named many trees, such as western white pine, grand fir, and bitter cherry. Thus, one man is memorialized in the scientific name, the other in the common name.

The scientific names also reveal the unique position of this tree in the pine family. When European botanists first saw the specimens of Douglas-fir they were perplexed because the tree was something very new to them. There are no native *Pseudotsugas* in Europe, nor eastern North America. So the Europeans used characteristics of other conifers they were familiar with and named this strange new tree *Pseudotsuga* ("false hemlock") *taxifolia*("yew-leaf"), called it a fir (usually a name reserved for *Abies*), and then, to be sure Europeans understood, called the wood "Oregon-pine" (29)!

Douglas-fir is the most valuable timber tree species in the United States—about 20 to 25 percent of all the standing sawtimber in the entire country is Douglas-fir. In Idaho there is more timber volume in Douglas-fir and more Douglas-fir harvested than any other species. In addition, thousands of bales of young Douglas-fir are shipped each year for Christmas trees.

There are two varieties of Douglas-fir. The coastal form, ranging from British Columbia to California, grows from the Cascades and Sierra Nevada west. In the Rocky Mountains, the interior variety is found from Alberta south to Mexico. It is called variety *glauca* because it is more blue-grey than the green coastal trees. Douglas-firs are commonly called "red fir" to distinguish the reddish wood from species of *Abies,* which are called "white firs" (see discussion under *Abies,* p. 184).

In Idaho, Douglas-fir occupies millions of acres. As a disturbance species, it grows primarily in the grand fir-cedar-hemlock forests. For all but a very small portion of southeastern Idaho it is the only climax tree of the Douglas-fir zone. Occasionally trees grow to considerable diameters on south slopes in the spruce-fir zone.

Technical description: Leaves: about 1 inch long, pointed but not stiff, mostly blue-green (more green in the far north) with a very small petiole at the base. Buds: sharp-pointed, reddish brown when mature. Cones: 1 to 3 inches long, with brown, slightly woody scales; distinctive 3-pointed bracts protrude from between the scales. Bark: on older trees deeply furrowed, thick, corky; orange color in the deeper cracks on vigorous trees.

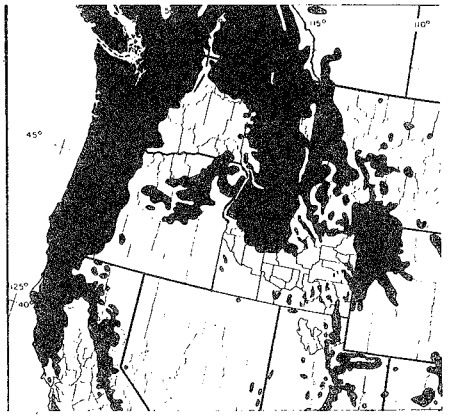
Needles: 1 inch long, with a slight petiole; pointed red-brown buds; cones 2 to 3 inches long with 3-pointed bracts.

Farragut State Park, Kootenai County; White Bird Summit along U. S. 95, Idaho County; Lake Coeur d'Alene Scenic Route; Ponderosa State Park; Ponderosa Scenic Route; Bear Lake-Teton Scenic Route.

Diameter 70.3 inches, height 209 feet, southeast of Clarkia, Clearwater County.

Douglas-fir replacing quaking aspen, Blaine County;

Immature cones best illustrate the 3-pointed bracts.



Douglas-fir: coastal poulations=variety menziesii*; interior populations=variety* glauca.

small petiole

pointed bud

3-pointed bract

X 1

TRUE FIRS

GROUP 6
Needleleaf, single

Abies
Also known as white firs

Abies is the classical Latin name for the European silver fir

FAMILY — PINACEAE

In western North America there are seven species of *Abies*. In the same area there are normally many Douglas-firs. To avoid confusion in the common names, we often refer to the *Abies* as the true firs, or "white firs," while Douglas-firs are known as "red firs." True firs have white heartwood, while the Douglas-firs have red-brown heartwood.

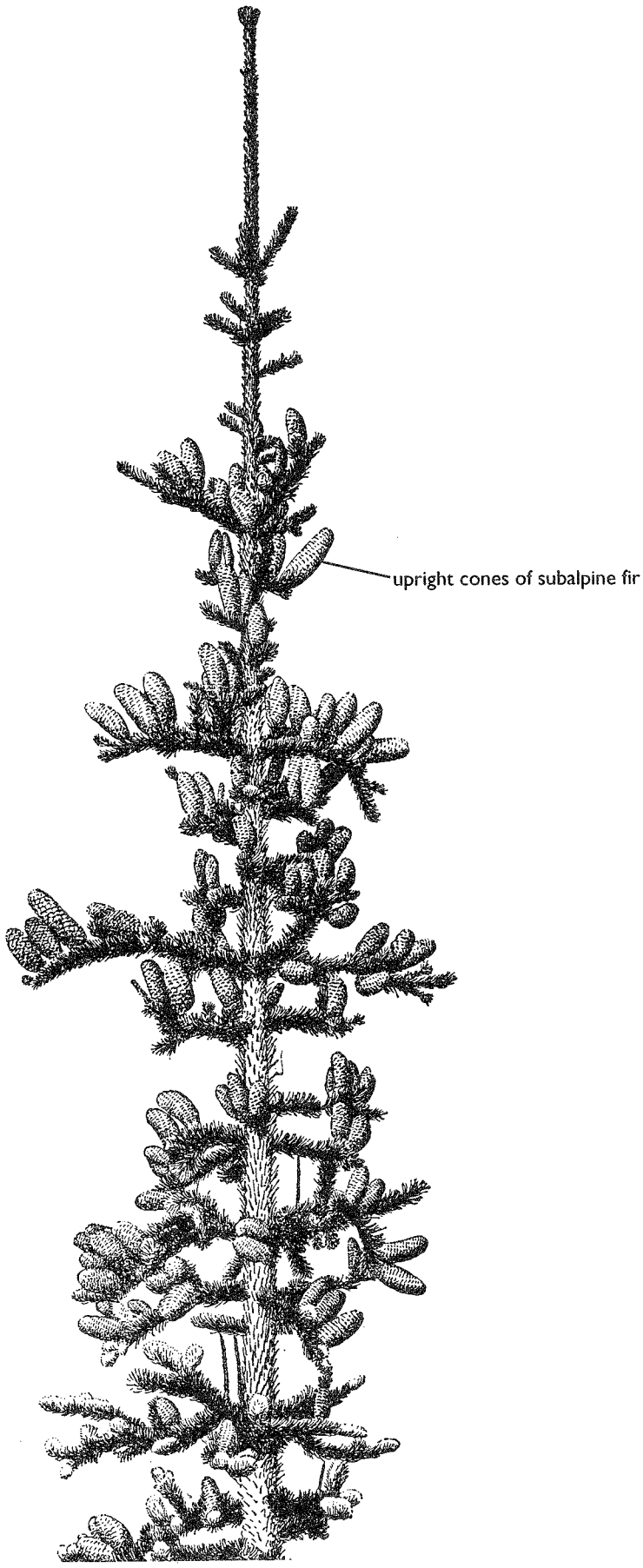
Species	Leaves	Cones	Buds	Twigs
true firs	no petiole	borne upright, cone scales fall off	rounded	opposite
Douglas-fir	with minute petiole	borne hanging, cone scales remain attached	pointed	alternate or random

The true firs have low-density wood with long fibers that make good pulp for paper and other products. The wood is also used for lumber and similar wood products. Fir needles have a distinctive fragrance, in fact, the "pine oil" odor of many commercial products may be distilled from fir needles.

Technical description: Leaves: needlelike, flat 1/2 to 3 inches long, flat, with slightly pointed to notched tip; no petiole. Twigs: opposite near branch tips, only group 6 trees with this character. Cones: somewhat barrel-shaped; borne upright on topmost branches. Cone scales fall when cone is mature, thus no entire cones are found unless they fall green from the tree.

IDAHO TRUE FIRS

Species	Leaves	Cones	Older Bark
subalpine fir	½–1" long, thin white bands in center of upper surface	2–4" long, purple when immature	grey and smooth, even on large trees; thin and unplated
grand fir	1–1½" long, blunt or notched tip; green above, silvery below	2–4" long, olive green when immature	grey-plated outer bark, reddish inside
concolor fir	1½–3" long, pointed tip; silvery blue on top	3–5" long, green to reddish	grey-plated outer bark, yellowish inside


upright cones of subalpine fir

SUBALPINE FIR

GROUP 6
Needleleaf, single

Abies lasiocarpa
Also known as alpine fir
balsam fir

NATIVE
lasiocarpa means "hairy fruit," referring to minute pubescence on the immature cone scales

FAMILY — PINACEAE

Few of our trees are more easily recognized from a distance than subalpine fir. The dense crown tapers to a sharp point, like a church steeple. The branches, bent downward by winter's snows, hug the trunk, giving the crown a dense appearance. This tree is common in subalpine forests; it is present on all but a few high mountains in Idaho. Subalpine fir is tolerant of cold, and also grows at lower elevations in "frost pockets" where cold air collects, for example, in meadows and streambottoms. It is the most prevalent climax tree in our high mountains, yet it almost always shares the forest with Engelmann spruce, lodgepole pine, and occasional whitebark pines.

Many people call this tree "alpine fir," but since ecologically alpine is defined as being above tree line (timberline), it is more appropriate to call it "*sub*alpine" fir.

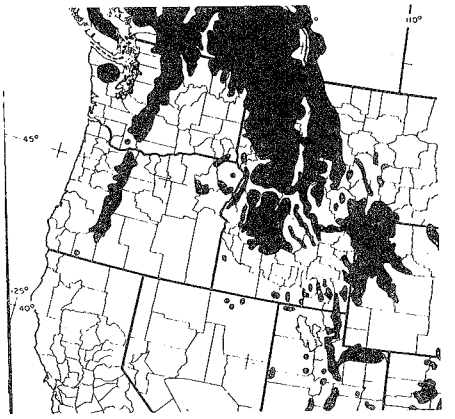
Despite having large wood volumes, subalpine fir is not an important commercial species due to the poor quality of its wood, coupled with its inaccessability. But it has special value for all who love the mountains, for the very smell of the tree tells you that you are in the high country. Groves of subalpine fir are the favorite haunt of the elusive pine martin, while blue grouse feast on the buds even in the dead of winter. Subalpine fir is gaining in popularity as an ornamental—it forms a beautiful specimen tree when open-grown in yards and parks, though there it's never so spire-like as it is in natural habitats.

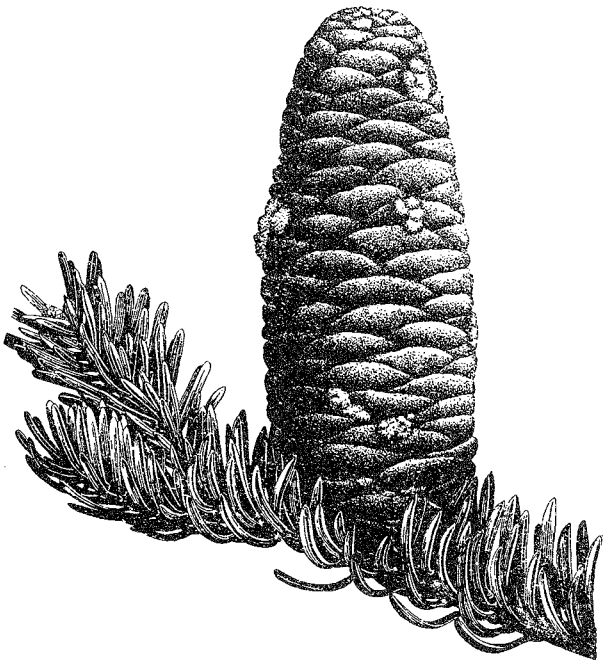
Needles about 1 inch long or shorter, brushed to the upper side of the twig, with faint white stripes (stomatal bands—use a hand lens) down the upper center; bark is smooth, grey, and unplated even on larger trees.

Lost Trail Pass, Salmon River Scenic Route; Lolo Pass, U. S. 12 west of Missoula; upper Snake River, U. S. 26 east of Idaho Falls, Bonneville County; Sawtooth Scenic Route, Stanley to Lowman; Targhee Pass, U. S. 20 north of Island Park, Fremont County; Teton Scenic Route, Swan Valley to Victor, State Highway 31, Bonneville County; around Silver City, Owyhee County.

Diameter 49.9 inches, height 137 feet, east of Pierce, Idaho County.

Like all true firs, subalpine fir cones disintegrate when mature.





IX

Subalpine Fir

187

white lines down center above

no petiole

old cone axis

GRAND FIR

GROUP 6
Needleleaf, single

Abies grandis
Also known as white fir
balsam fir

NATIVE
grandis means "grand"

FAMILY — PINACEAE

GROUP 6

Grand fir is most common in northern Idaho, although it appears throughout western Idaho to just a bit north of Boise. In the drier parts of the grand fir-cedar-hemlock zone it is the sole climax tree. Between the Clearwater and Salmon rivers, south of the range of western redcedar and western hemlock, grand fir exists as the only climax tree in this zone (Figure 5). In western redcedar and western hemlock forests, grand fir is a seral species; since it grows well in partial shade, it flourishes enthusiastically after selective logging has removed some of the overstory trees.

Grand fir is used for lumber and pulp and the demand for its wood is growing. Most of the older trees suffer from the heart-rot called the "Indian paint fungus," *Echinodontium tinctorium,* which also affects Idaho's hemlocks and leaves the trunks hollow and nearly worthless. However, grand fir grows quickly and will have higher value in the future as younger trees, lacking rot, are harvested (24).

Grand fir is often called "white fir," but this name is also used for *Abies concolor.* In fact, the name "white fir" is applied to most western true firs—to contrast them with Douglas-fir, which is frequently called "red-fir."

Needles average 1½ inches long, green on top, tips rounded or often notched, usually arranged in one plane on either side of the twigs on shaded branches.

Weippe to Headquarters along State Highway 11, Clearwater County; Payette River Scenic Route, State Highway 55, Cascade to Banks, Valley County; Coeur d'Alene to Sandpoint along U. S. 95, Lowell to Powell, U. S. 12, Idaho County; Sandpoint north by any route; Lake Coeur d'Alene Scenic Route; Priest Lake and Heyburn State parks.

Diameter 70 inches, height 181 feet, near Clarkia, Shoshone County.

Note flat arrangement of shade needles, green on top (left), silvery beneath.

Grand Fir

189

X 1

CONCOLOR FIR

GROUP 6
Needleleaf, single

Abies concolor
(*Abies concolor* variety *lowiana*)
(*Abies concolor* X *grandis*)
Also known as white fir

NATIVE

concolor means "uniform color"—needles are same color top and bottom

FAMILY — PINACEAE

GROUP 6

Many thousands of years ago, when the climate was cooler, California concolor fir (*Abies concolor* var. *lowiana*) apparently migrated east from the Cascades and Sierra Nevada via the mountains of central Oregon and reached west-central Idaho. Over the years, grand fir and concolor fir hybridized, producing new trees intermediate between the two parents (21). (See white spruce, p. 172). In many areas of west-central Idaho, at about 4,000 to 7,000 feet in elevation, it is difficult to find a "pure" grand fir and more difficult to find a "pure" concolor fir. For example, a tree may have grand fir needles and concolor fir bark. Many of these hybrid firs are cut for lumber—they are large and grow quickly. While most of the trees are hybrids, one can nonetheless find numerous individuals that fit the accepted description of concolor fir. Hybrid trees technically can be designated *Abies grandis* X *concolor.* The reports of Rocky Mountain concolor fir (variety *concolor*) occurring in the mountains of southeastern Idaho are erroneous.

It seems that the hybrid concolor fir in west-central Idaho grows on drier habitats and definitely is found in the spruce-fir zone (57). Grand fir, by contrast, needs more moisture, exists at lower elevations, and rarely grows in the spruce-fir zone. These grand fir-X concolor hybrids are a dandy example of a potential new species in the making. Should the hybrids become more competitive than grand or concolor fir, and should the population expand and the characteristics stabilize, then in several thousand years a new species of *Abies* will be recognized. We will have to wait patiently for the fullness of time to reveal the results.

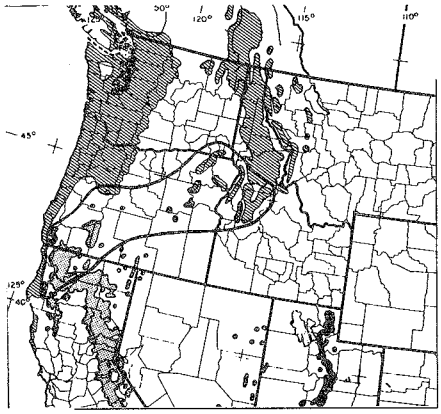
The very "blue," long-needled concolor firs cultivated in Idaho are selections of Rocky Mountain concolor fir. The common name "white fir" is most inappropriate, since most of the seven species of *Abies* in western North America are called "white fir" somewhere in their range; "concolor fir" leaves no doubt as to species.

Needles 1½ to 2½ inches long, with white stripes (stomatal bands) almost covering the top; bark deeply furrowed, corky and yellow inside (very similar to Douglas-fir bark).

McCall and Cascade areas, generally from 5,000 to 7,000 feet in elevation.

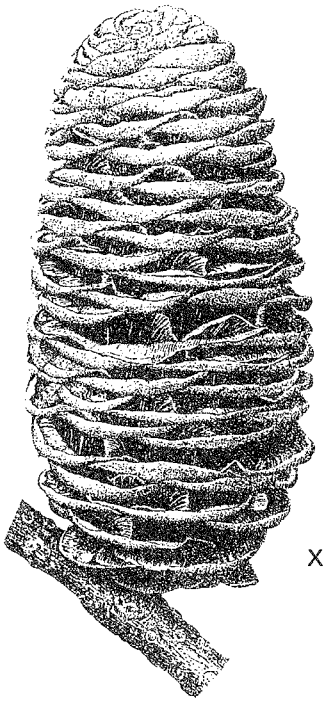
No record.

Note long needles.



Oregon, Washington, Idaho = Abies grandis; *Utah, Colorado, Nevada* = Abies concolor var. concolor; *southern Oregon, California* = Abies conclor var. lowiana; *within solid line* = Abies concolor X Abies grandis

X 1



X .75

blue-green above and below

WESTERN REDCEDAR

GROUP 7
Scaleleaf, tiny

Thuja plicata
Also known as giant arborvitae
cedar

NATIVE
thuja means "sweet-smelling"; *plicata* means "folded in patterns"

FAMILY — CUPRESSACEAE

"Cedar" is a confusing common name. In fact, just about any tree with fragrant wood might be called cedar. In the western United States there are at least five genera of native conifers that bear the name (43). For example, in southern Idaho, junipers are also called cedar. Western redcedar wood has a pleasant fragrance, as do the leaves. *Thuja plicata* literally means "sweet-smelling wood—leaves folded and interwoven." *Thuja* is from the Greek, and believe it or not, there's a tree in Morocco whose common name is "thuja" in the same family as our redcedar, and the wood has a great fragrance.

Western redcedar produces one of Idaho's most useful and valuable woods. Because the heartwood of this tree resists decay, it is used for almost every purpose requiring exposure to the elements. Shingles, shakes, utility poles, fence posts, house siding, and interior paneling are among the major redcedar products (51).

Redcedar is the giant of northern Idaho's forests, for it attains the largest diameter of any Idaho tree. A monster tree near Elk River is over 56 feet in circumference and is about as tall as a 17-story building! It is the largest known tree in North America east of the Sierra Nevada and the Cascade mountains. The largest western redcedars are found on moist habitats, where they dwell in groves. The ancient groves of giant cedars, composed of trees thousands of years old, are rapidly disappearing as more are cut to produce cedar products. Our largest redcedars are estimated to be well over 3,000 years old! Efforts are being made to preserve more of these noble giants in natural areas and other reserves (49, 50).

Redcedar is one of the climax trees in the middle elevations of the northern part of the state. Here its usual associates are western hemlock, grand fir, western white pine, and Pacific yew. Deer and elk browse the sweet-smelling leaves and twigs of this tree in winter.

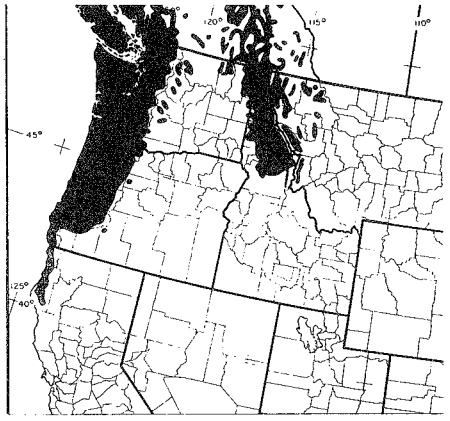
Technical description: Leaves: tiny, scalelike, in flat groups of four; arranged in flat "fernlike" branchlets; branch tips and branchlets drooping. Cones: ½ inch, with papery scales. Bark: fibrous, grey outside, red-brown beneath.

Branchlets flattened with scale-leaves in groups of four; pleasant, sweet odor.

Here are some of the more accessible Idaho cedar groves (north to south): Kaniksu National Forest: Roosevelt Grove (Washington), northwest of Nordman; Hanna Flats Botanical Area, west of Priest Lake Ranger Station. Coeur d'Alene National Forest: Settler's Grove, north of Wallace. St. Joe National Forest: Sandhouse Grove (Fishhook Creek), south of Avery; Hobo Botanical Area, northeast of Clarkia. Clearwater National Forest: Giant Cedar Grove, north of town of Elk River; Heritage Grove (Isabella Creek), north of Headquarters; DeVoto Grove, along U. S. 12, northeast of Powell Ranger Station. Nez Perce National Forest: O'Hara Grove, south of Fenn Ranger Station.

Diameter 216.6 inches, height 177 feet, Giant Cedar Grove north of Elk River, Clearwater County.

Western redcedar over 30 feet in girth, Heritage Grove, Clearwater County.



Western Redcedar

193

X I

underside of branchlet

JUNIPERS

GROUP 7
Scaleleaf, tiny

Juniperus
Also known as cedar

juniperus is the old Latin name

FAMILY — CUPRESSACEAE

People in the Rocky Mountains often call species of *Juniperus* "cedars." Idaho has four native junipers and one that has escaped. Three of the Idaho natives become trees. Juniper wood is very durable, but because the trees do not grow very large in the west, fence posts and firewood constitute their most common use. However, many novelty items—bowls, boxes, and candlesticks—are made of juniper wood. The wood, like that of most trees called "cedar," is fragrant; the burning wood gives off a wonderful odor. Juniper "berries" are used as a condiment and are used to flavor gin and wild meat.

Junipers prefer rocky soil and lots of sunlight. They are most abundant in the juniper woodlands in the foothills of southern Idaho above the sagebrush zone (40). The fleshy, modified cones, generally called "berries," are a favorite food of many birds. One often sees a line of junipers along a fence where birds have perched.

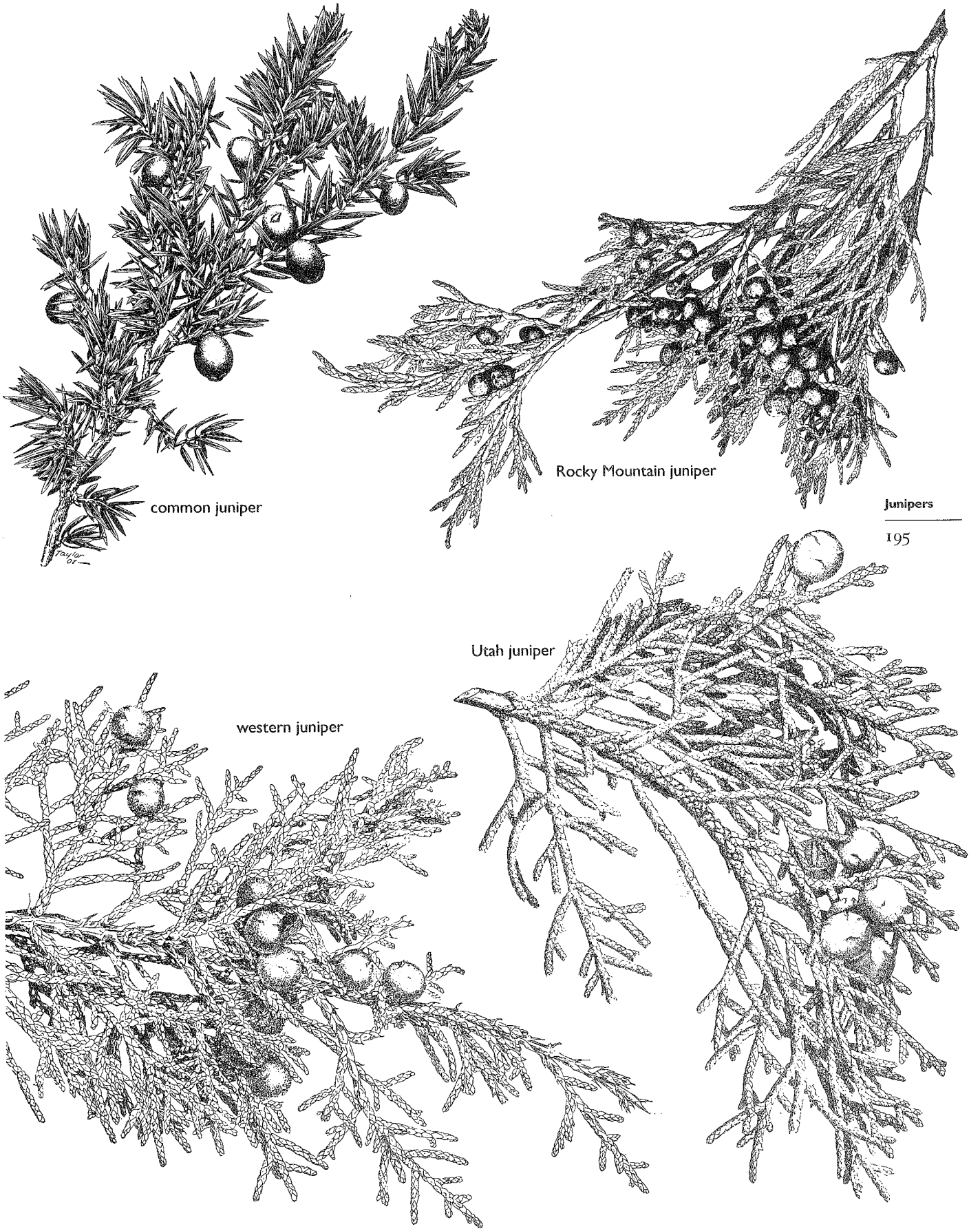
There are many kinds of ornamental junipers in Idaho, but most of the junipers growing as cultivated trees or shrubs are not native.

IDAHO TREE JUNIPERS

Species	Branchlets	Mature fruits
Rocky Mountain juniper	very slender, grey-green	4/16", silvery blue, matures in 2 years
eastern redcedar	very slender, green (rarely grey)	3/16", silvery blue, matures in 1 year
Utah juniper	thick, yellow-green	6/16" to 8/16", silvery brown
western juniper	thick, grey-green with white resin spots	4/16", silvery blue

Technical description: Leaves: often of two types—on young trees or on branch tips they are somewhat needlelike and sharp-pointed; older leaves are small and scalelike, consisting of alternate, overlapping sets of very small scales. The scales (leaves) are arranged so that they are round in cross-section, not flat as in western redcedar. Cones: small, round, fleshy, "berrylike," really a cone with fused scales; 3/16 to 1/2 inch in diameter, mostly with a single seed inside, generally covered with silvery wax (glaucous), pale brown or blue when mature. Bark: thin, fibrous, stringy—grey on outside, red-brown beneath.

Common juniper, *Juniperus communis,* is a widespread juniper that becomes a tree in a few other places in the United States. In Idaho the few *Juniperus communis* trees known from the wild are aberrant escaped plants; almost all plants of this species are shrubs. It lacks the scaly leaves typical of other junipers—instead the leaves are short, linear, very pointed, and arranged in threes. It is most easily recognized as a juniper by the "berries." Look for it among rocks in subalpine forests, where it is most prevalent. It also occurs beneath coniferous forests in eastern, southeastern, and extreme northern Idaho.


common juniper
Rocky Mountain juniper
Utah juniper
western juniper

ROCKY MOUNTAIN JUNIPER

GROUP 7
Scaleleaf, tiny

Juniperus scopulorum
Also known as cedar

NATIVE
scopulorum means "of the rocks"

FAMILY — CUPRESSACEAE

The most widespread of Idaho junipers has a peculiar distribution. It is abundant in eastern Idaho, missing from western Idaho, and appears again in the far north. Around Lake Pend Oreille it is scattered—the western tip of a population found along the Clark Fork River and east into Montana. One also encounters this juniper very near the Canadian border—the southern part of the large population of interior British Columbia. There is even an isolated population on the South Fork Clearwater River.

In southern Idaho, it occurs primarily in the juniper woodland zone, where it may be mixed with Utah juniper or limber pine, as it is near Soda Springs. However, more than any other native tree juniper, Rocky Mountain juniper is at home in the forest. One discovers this species along rivers and streams, particularly where there is sagebrush. It appears on the edges of Douglas-fir or quaking aspen forests, or in southeastern Idaho with bigtooth maple and box-elder. In far-northern Idaho it even occurs with grand fir and western redcedar in disturbed forests.

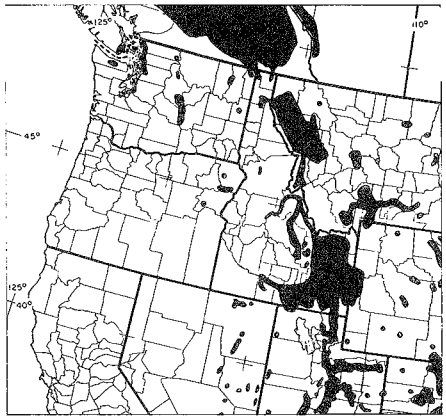
No other juniper in western North America exhibits so much variation in form and color. In fact, a stand of this juniper can be identified from quite some distance—shapes vary from rounded to conical to narrow cones, while colors range from silver-grey through a strange green with a bronze tinge to green. The colors also change in winter, some foliage becoming almost purple-brown. Rocky Mountain juniper and eastern redcedar (see p. 198) are part of a species complex that effectively covers North America from the Arctic Circle to the Caribbean Islands, and from Pacific to Atlantic. Unlike all other native Idaho junipers, it has reddish heartwood (the others have brown). The wood is extremely fragrant and may be used for small novelties that contrast the red heartwood and white sapwood.

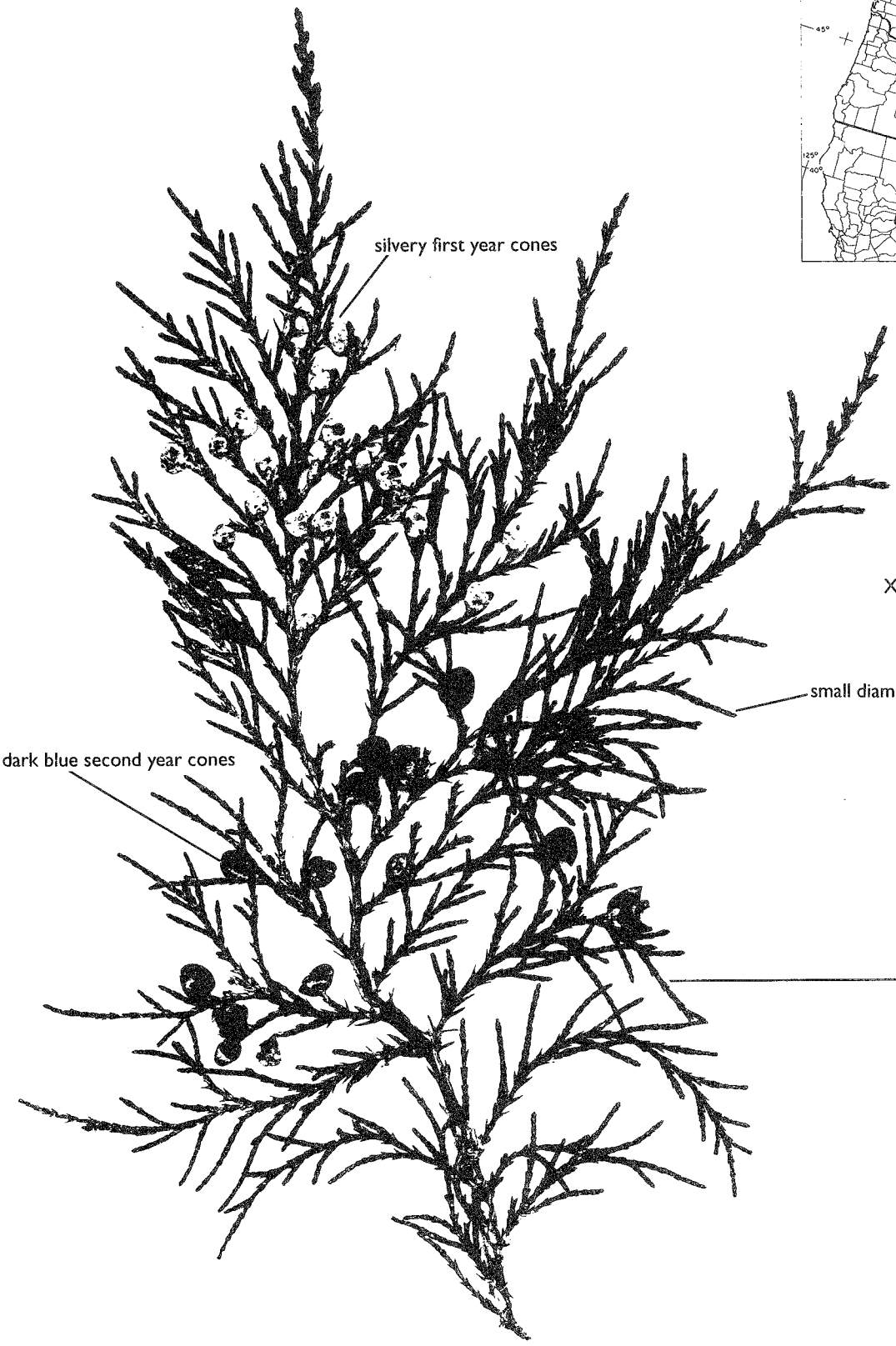
Slender foliage, grey-green; blue fruits are 3/16 inch and take two years to mature, so there may be two sizes (ages) of fruits on a tree at the same time; may inhabit forests, unlike other native junipers.

Silent City of Rocks, Cassia County; Sam Owen Campground, Lake Pend Oreille on beach sands; Lava Rocks northeast of Blackfoot along Interstate 15 Bingham County; Shoshone Falls at Twin Falls; above Palisades Reservoir, Bonneville County; Teton Scenic Route, Swan Valley to Victor, State Highway 31, Bonneville County.

Diameter 50.8 inches, height 26 feet, near Parry, Franklin County.

Note first and second year cones.





X 1

X 7

Rocky Mountain Juniper

EASTERN REDCEDAR

GROUP 7
Scaleleaf, tiny

Juniperus virginiana

ESCAPED

virginiana means "of Virginia," where this tree was discovered

FAMILY — CUPRESSACEAE

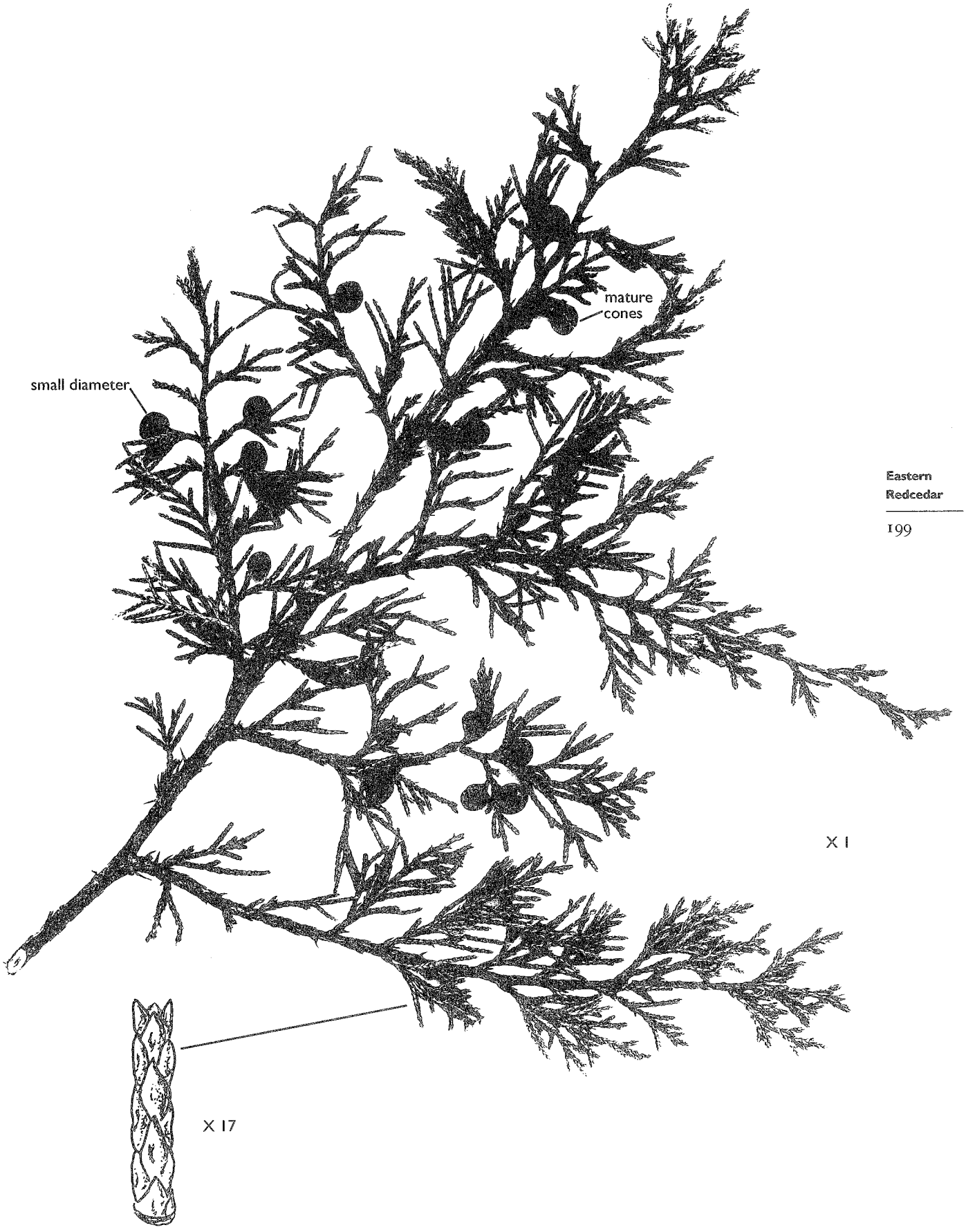
Rocky Mountain juniper has a relative called eastern redcedar. While it is obviously not closely related to western redcedar, this illustrates the confusion that may come with the common name of "cedar." *Juniperus virginiana* is found over most of eastern North America and extends west to the Great Plains, where it often grows with *Juniperus scopulorum* (Rocky Mountain juniper). The two trees are very closely related and quite similar in appearance.

Eastern redcedar has been grown as an ornamental in Idaho for many years. It is also used as a windbreak tree, for in the right habitat it grows faster than its western counterpart. From these ornamental and windbreak plantings it has very occasionally escaped. Thus far, it has been found only in northern Idaho and around Boise, with occurrences limited to ponderosa pine and Douglas-fir forests. It is never far from a farm, a town, or another source of cultivated seed. This tree is so well adapted to a variety of habitats that more escaped trees may be expected in the future.

Eastern redcedar grows larger in its native haunts, and is harvested commercially for a variety of uses. The reddish heartwood has a pleasant fragrance to people, but not to insects, and therefore, this is the wood of cedar chests. The wood is also extensively used for novelties and turned items.

Note carefully the range map of Rocky Mountain juniper, for it may help you decide on correct identification. Escaped eastern redcedar generally has green foliage and usually occurs as a single tree or in small groups, not in a large population. The fruits of Rocky Mountain juniper take two years to mature—thus one may find two sizes of "berries." Eastern redcedar fruits take just one year to mature, so only one size of "berry" is present.

Slender foliage, green; "berries" (cones) mature in one year, therefore there are not two sizes (ages) of fruits on the trees at once. So far, eastern redcedar has not been found as an escape where Rocky Mountain juniper is native (see map, p. 197).


mature
cones
small diameter
X 1
X 17

UTAH JUNIPER

GROUP 7
Scaleleaf, tiny

Juniperus osteosperma
(*Juniperus utahensis*)
(*Juniperus californica* var. *utahensis*)
Also known as cedar

NATIVE
osteosperma means "bony seed"

FAMILY — CUPRESSACEAE

Utah juniper is a small, round-topped tree with low branches that is found exclusively in the juniper woodlands. It is a Great Basin species, having its principal distribution between the Sierra Nevada and the Rocky Mountains. It extends northward into Idaho, principally south of the Snake River, but it does appear north of the Snake, mainly in Butte County. Through much of its range, it is commonly associated with singleleaf pinyon in a dwarf forest that characterizes the juniper-pinyon vegetation so common in the interior West. It is more drought-tolerant than the pinyon thus where both are found Utah juniper extends to lower elevations. Occasionally, Utah and Rocky Mountain junipers are associated—then the yellow-green foliage of Utah juniper is an obvious contrast to the greys and greens of Rocky Mountain juniper. Closer inspection will reveal that Utah juniper has thick, stiff foliage compared to the drooping, fine foliage of Rocky Mountain juniper in Idaho. The ranges of Utah and western juniper don't overlap.

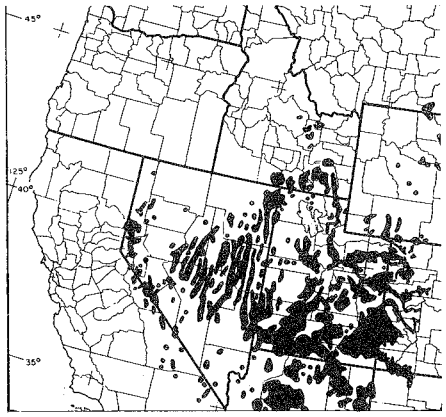
The mature cones are brownish with a thin, silver, waxy covering; they often reach ½ inch in diameter. Numerous birds feast on the mealy, drupelike cones, as do jackrabbits, coyotes, and mule deer. The large bony seed passes through their digestive system only to be voided and perhaps start a new juniper far from the parent. Heartwood is brown and very decay resistant. Fence posts and novelty items are about the only uses for the wood.

Yellow color, thick foliage, ½ inch silver-brown "berries."

State Highway 22/23, between Arco and Howe, Butte County; foothills around Pocatello; foothills near Almo, Cassia County; Massacre Rocks State Park, southeast of American Falls.

Diameter 19.4 inches, height 30 feet, near Burley, Cassia County.

Note yellowish foliage and large cones.



Utah Juniper

201

mature cones

large diameter

X 1

X 8

WESTERN JUNIPER

GROUP 7
Scaleleaf, tiny

Juniperus occidentalis
(*Juniperus occidentalis* var. *occidentalis*)
Also known as Sierra juniper
cedar

NATIVE
occidentalis means "western"

FAMILY — CUPRESSACEAE

The main range of this far-western juniper is the east side of the Sierra Nevada and the Cascade Mountains. It is common in central Oregon, with its eastern limits in Idaho. The Juniper Hills of Owyhee County take their name from this silvery grey tree. There it often grows mixed with mountain-mahogany in an open, shrubby woodland above the sagebrush (13). Western juniper is easily the largest of Idaho junipers, reaching diameters of 65 inches and heights up to 70 feet. Like Utah juniper, it does not thrive in forest conditions, but is restricted to the juniper woodland zone just above the sagebrush, and the very margins of the lowest forests.

Unlike the rest of Idaho's junipers, western juniper exudes a spot of resin from a gland on the scale leaves, leaving hundreds of little white spots—the dried resin—on the leafy branches. On very warm days the resin spots melt and the branches become sticky with resin. A sharp odor of creosote from the resinous leaves of these junipers can be detected from quite some distance on a hot summer's day.

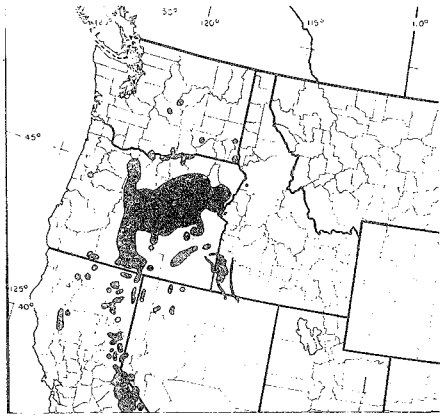
Juniperus occidentalis is really two different entities. A low-elevation variety (*occidentalis*) occurs just above the sagebrush zone, principally in eastern Oregon (as seen around Bend) and southwestern Idaho. A subalpine variety (*australis*) flourishes in the Sierra Nevada of California. This high-elevation variety has cinnamon brown bark and attains great sizes—up to 13 feet diameter and 90 feet tall.

Silvery foliage with white resin spots; fruits about ¼ inch and silvery blue.

Murphy to Silver City in Owyhee County; Triangle Basin, Owyhee County.

Diameter 65.2 inches, height 57 feet, near Silver City, Owyhee County.

Note white resin dots on leaves melt and turn dark on warm days.



white resin dots (dark when melted)

large diameter

X 1

X 8

Western Juniper

BRANCHED TAMARISK

GROUP 7
Scaleleaf, tiny

Tamarix ramosissima
(*Tamarix pentandra*)
Also known as salt-cedar
tamarisk

NATURALIZED
ramosissima means "many branches"

FAMILY — TAMARICACEAE

There are over 50 species of *tamarix,* all native to Eurasia and almost all from warm, dry climates. *Tamarix* are remarkably adapted to heat—some even grow along streambeds in Death Valley. They are difficult to identify to species, and their nomenclature is confusing.

Tamarix ramosissima has become established in southwestern Idaho, chiefly along the Snake River bottomlands or near the salt desert shrub type of vegetation. The naturalized population in southwestern Idaho is furnishing plentiful seeds to blow in the wind. Branched tamarisk is scattered from the lower Boise River eastward on the Snake River Plain to Cassia County. It is so aggressive in invading disturbed areas that it may spread considerably beyond these presently known limits. Increased numbers are certainly expected in southwestern Idaho. It sprouts from the roots, like aspen, and generally occurs in dense colonies instead of as single plants. It is quite possible that other species of *Tamarix* have escaped in southwestern Idaho.

It is primarily a tall shrub, 10 to 20 feet high. In Idaho it rarely becomes a small tree, but as the escaped plants grow older, more small tamarisk trees can be expected. The tiny, scalelike leaves look like those of juniper, hence the name "salt-cedar." But this is not a coniferous tree—it is related to the broadleaf trees, as seen by its flowers, which have tiny pink petals, and from them small capsules that release hairy-winged seeds.

The common name "salt-cedar" comes from two characteristics: it has leaves similar to junipers (cedar), and it grows where there is a high salt content in the soil—for this reason it is termed a "halophyte" (salt plant). The feathery sprays of branches have a distinctive grey color. Small white crystals of salt often form on the tiny leaves in hot, dry weather. The very small flowers are bright pink and rather showy in dense, cylindrical clusters 1 to 2 inches long. The seeds are also very small, under 1/10 inch, bearing a tuft of hairs like those of dandelion.

Juniperlike, grey foliage; dense colonies; pink flowers; shiny, brown, smooth bark.

Snake River near Marsing, Canyon County; lower Boise River; Bruneau Sand Dunes State Park, Owyhee County.

79 Note feathery branchlets and pink flowers;

80 Naturalized tamarisk, Bruneau Dunes State Park, Owyhee County.

Branched Tamarisk

205

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2. "Roadside geology of Idaho." D. D. Alt and D. W. Hyndman. 1989. Mountain Press, Missoula, Mont. (A book written with imagination to spark the interest of laymen. Excellent section on geological history. The diagrams, photos, maps and glossary help considerably. See #15 and 41.)

3. "Ponderosa pine bibliography," Anonymous. 1967, 1974, 1977. Intermountain Research Station Technical Reports, Ogden, Utah. (A series containing hundreds of citations on this, the most valuable and widespread pine in the United States.)

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6. "Silvics of whitebark pine." S. F. Arno and R. J. Hoff. 1989. USDA-Forest Service, Intermountain Research Station General Technical Report INT-253, Ogden, Utah. (A summary of ecological data.)

7. "North American terrestrial vegetation." Edited by M. G. Barbour and W. D. Billings. 1988. Cambridge University Press. (I list this book only because its title sounds so good and it is contemporary. The Rocky Mountain forests, from the Yukon to Mexico, constitute a single chapter, and thus, coverage of the Northern Rockies is skimpy—and of northern Idaho, very poor. Useful comparisons and an impressive list of literature are positive aspects.)

8. "Catkin-bearing plants of British Columbia." T. C. Brayshaw. 1976. British Columbia Provincial Museum Occasional Paper #18, Victoria, B. C. (An excellent treatment of poplars, willows, birches, and alders—especially good for northern Idaho.)

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10. "*Betula* series *Humiles* in Idaho." S. J. Brunsfeld and F. D. Johnson. 1986. Madroño 33: 2. (Clarification of the taxonomy of the three shrubby birches in Idaho.)

11. "Field guide to the willows of east-central Idaho."

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15. "Guidebook to the geology of northern and western Idaho and surrounding area." Edited by V. E. Chamberlain, R. M. Breckenridge, and B. Bonnichsen. 1989. Idaho Geological Survey Press, University of Idaho, Moscow. (A semitechnical guide done as a series of roadlogs, with specific mileposts for ease of discovery. Much local history included at interest points. Lacks a glossary. Good maps, photos, and diagrams. See #2 and #40.)

16. "Forest habitat types of northern Idaho—a second approximation." S. V. Cooper, K. E. Neiman, and D. W. Roberts. 1991. USDA Forest Service, General Technical Report INT-236, Ogden, Utah. (Detailed forest vegetation classification for Idaho north of the Salmon River.)

17. "Low tree dominance at climax, a synecological dilemma." R. C. Crawford and F. D. Johnson. 1985. Canadian Journal of Botany, Vol.63. (Synopsis of Pacific yew community classification on the Nez Perce National Forest, where yew density is amongst the highest in the world.)

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35. "New plant records from Idaho from Pacific Coastal refugia." F. D. Johnson and R. Steele. 1978. Northwest Science, 53: 3. (Describes Clearwater refugia and includes bird cherry and peach.)

36. "A disjunct population of *Ribes sanguineum* (red-flowering currant) in Idaho." F. D. Johnson and D. S. Ardema. 1983. Madroño 30: 3. (Describes a very small population of this relict coastal species on the lower St. Joe River.)

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44. "Atlas of United States trees." E. L. Little. Volume 1, Conifers and Important Hardwoods Department of Agriculture Miscellaneous Publication 1146. 1971. Volume 3,

Minor Western Hardwoods, Publication 1314. 1976. (A valuable set of maps of tree ranges of all trees in the checklist of 1979 [#43]. Volume 1 includes a set of overlays such as river systems, physiographic provinces, and glaciation. The maps in all volumes are to same scale. These two volumes include virtually all native trees in this book.)

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58. "Forest habitat types of eastern Idaho and western Wyoming." R. Steele, S. V. Cooper, D. M. Ondov, D. W. Roberts, and R. D. Pfister. 1983. USDA-Forest Service, Intermountain Research Station General Technical Report INT-144, Ogden, Utah. (Detailed forest vegetation classification for Idaho south of the Snake River Plain, far-eastern Idaho, and adjacent Wyoming.)

59. "Red alder habitats in Clearwater County, Idaho." R. W. Steele. 1971. Master of Science Thesis, University of Idaho, Moscow. (Forest vegetation classification and ecological conditions of relict vegetation often termed "coastal disjuncts.")

60. "White pine: king of many waters." C. C. Strong and C. S. Webb. 1970. Mountain Press, Missoula, Mont. (A good history of logging in northern Idaho; lots of great photos.)

61. "Sunset Western Garden Book." Lane Book Company, Menlo Park, Calif. Many available editions. (Covers all types of cultivated plants, including trees, listed alphabetically by scientific name. Contains charts of large genera such as maples, pines, etc., and the best plant-hardiness map for Idaho—even though Hells Canyon and Salmon River canyons are mismapped by 2 zones.)

62. "Trees." Laurence C. Walker. 1984. Prentice-Hall, Englewood Cliffs, N. J. (Subtitled "Introduction to trees and forest ecology for the amateur naturalist." This delightful paperback is an excellent value. It's crammed with history, uses, and ecological explanations. Especially valuable for teachers and group leaders since each chapter has a set of suggested projects.)

63. "An annotated bibliography of western hemlock." J. Walters, Faculty of Forestry. 1963. University of British Columbia, Vancouver, B. C. (Old and mostly coastal references, but still a valid starting point for detailed information.)

64. "Epitaph for the elm." G. Wilkinson. 1978. Hutchinson and Company, London. (Beautifully illustrated account of the importance of Dutch elm disease in Europe and America; much on history and uses; good layman's account of the disease.)

65. "Taxonomy of the *Artemisia tridentata* complex in Idaho." A. H. Winward and E. W. Tisdale. 1977. University of Idaho, College of Forestry Bulletin #19, Moscow. (A technical paper, illustrated, for those who wish to be more certain of differentiating this important group we call big sages.)

66. "Role and use of fire in sagebrush-grass and pinyon-juniper plant communities." H. A. Wright, L. F. Neuenschwander, and C. M. Britton. 1979. Intermountain Forest and Range Experiment Station, Technical Report INT-58, USDA Forest Service, Ogden, Utah. (A review of literature with section on autecology of major shrubs.)

67. "Trees for American gardens." D. Wyman. 1968. Macmillan Company, N. Y. (An excellent book by the dean of United States dendrologists. Uses both common and scientific names to describe trees for various purposes, with a few photos, best choices, and even a reasoned list of trees rejected. Not for identification.)

HABITAT-TYPE MANUALS—VEGETATION CLASSIFICATIONS

This series of bulletins, many available free, present detailed descriptions of Idaho plant communities as well as several border areas. There is a wealth of information in these manuals, including summaries of geology, soils, climate, and management of vegetation. They are usually written using only scientific names of plants, but even with knowledge of just the scientific tree names, much can be gained.

68. "Forest habitat types of northern Idaho." S. V. Cooper, K. E. Neiman, and D. W. Roberts. 1991. USDA-Forest Service, Intermountain Research Station General Technical Report INT-236, Ogden, Utah. (Idaho forests north of the Salmon River.)

69. "Steppe vegetation of Washington." R. Daubenmire. 1970. Washington Agriculture Experiment Station Technical Bulletin G2, Pullman, Wash. (Includes grasslands of the Palouse in Idaho.)

70. "Sagebrush-grass habitat types of southern Idaho." M. Hironaka, M. A. Fosberg, and A. H. Winward. 1983. Idaho Forest, Wildlife and Range Experiment Station Bulletin 35, Moscow. (Most of the common sagebrush communities, some bitterbrush, and a mountain-mahogany.)

71. "Plant associations of the Wallowa-Snake Province." C. G. Johnson and S. A. Simon. 1987. USDA-Forest Service, Pacific Northwest Region, RG-ECOL-TP-255A-86, Portland, Oreg. (Northeastern Oregon, and Idaho in the Hells Canyon National Recreation Area.)

72. "Coniferous forest habitat types of northern Utah." R. L. Mauk and J. A. Henderson. 1984. USDA-Forest Service, Intermountain Research Station General Technical Report INT-170, Ogden, Utah. (Includes southeastern Idaho, despite the title—specifically forests from Cassia to Caribou Counties.)

73. "Forest habitat types of Montana." R. D. Pfister, B. Kovalchik, S. F. Arno, and R. C. Presby. 1977. USDA-Forest Service, Intermountain Research Station General Technical Report INT-34, Ogden, Utah. (Montana forests west to east.)

74. "Forest habitat types of central Idaho." R. Steele, R. D. Pfister, R. A. Ryker, and J. A. Kittams. 1981. USDA-Forest Service, Intermountain Research Station General Technical Report INT-114, Ogden, Utah, (Idaho forests south of the Salmon and north of the Snake River Plain.)

75. "Forest habitat types of eastern Idaho and western Wyoming." R. Steele, S. V. Cooper, D. M. Ondov, D. Roberts, and R. D. Pfister. 1983. USDA-Forest Service, Intermountain Research Station General Technical Report 144, Ogden, Utah. (Idaho forests near the Wyoming and Utah borders.)

76. "Canyon grasslands and associated shrublands of west-central Idaho and adjacent areas." E. W. Tisdale. 1986. Idaho Forest, Wildlife and Range Experiment Station Bulletin 40, Moscow. (Includes Idaho's deep western canyons—middle Snake and lower Salmon and Clearwater. Mostly nonforest types, but includes smooth sumac and hackberry communities.)

77. "Forested plant associations of the Colville National Forest." C. K. Williams and T. R. Lillybridge. 1990. Colville National Forest, Colville, Wash. (Forests of northeastern Washington/Idaho border area.)

INDEX TO SCIENTIFIC NAMES

(Varieties are Not Included)

Index to Common Names appears on the inside of the front cover.

* indicates Idaho native