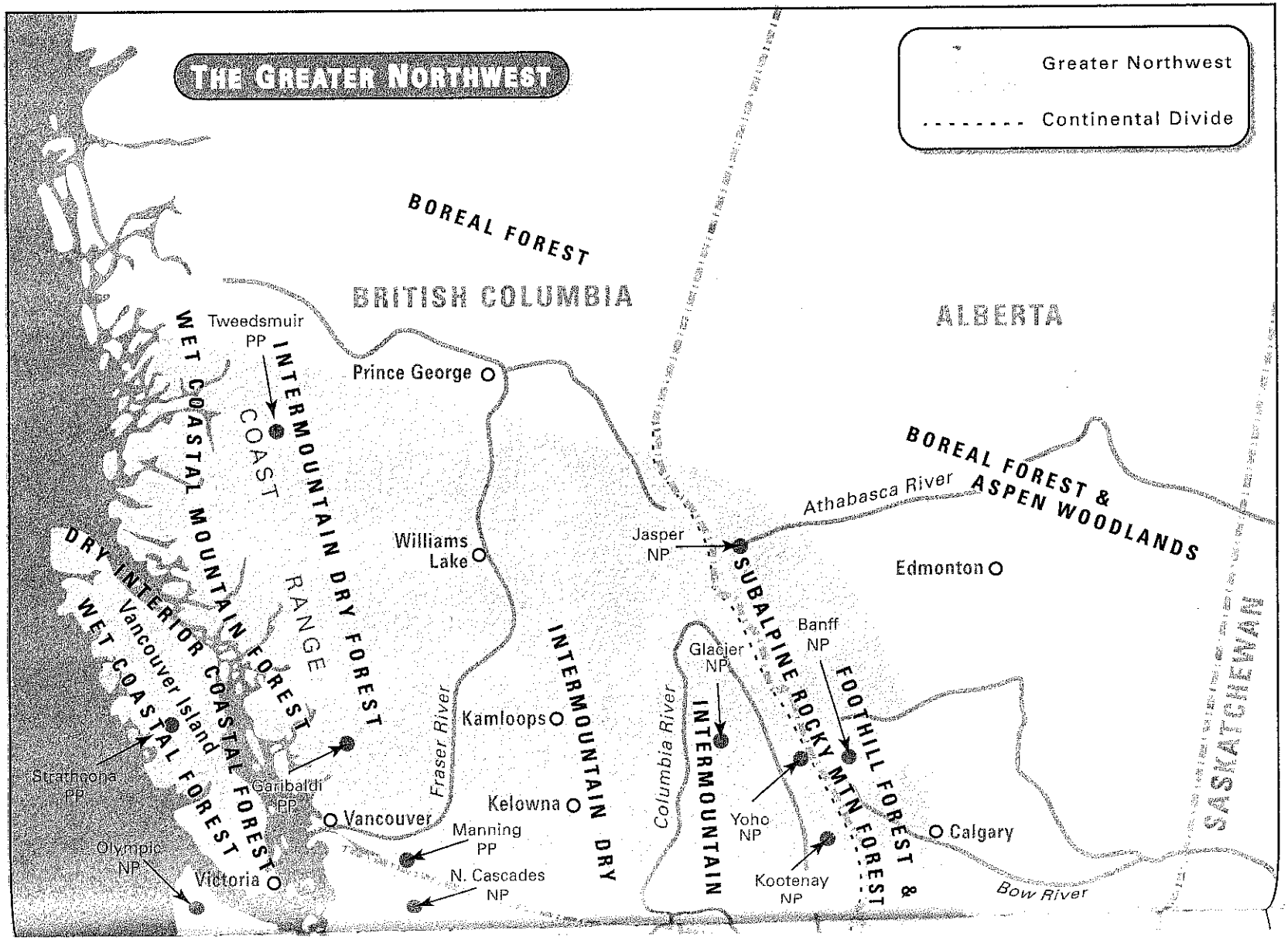
ANNIVERSARY EDITION

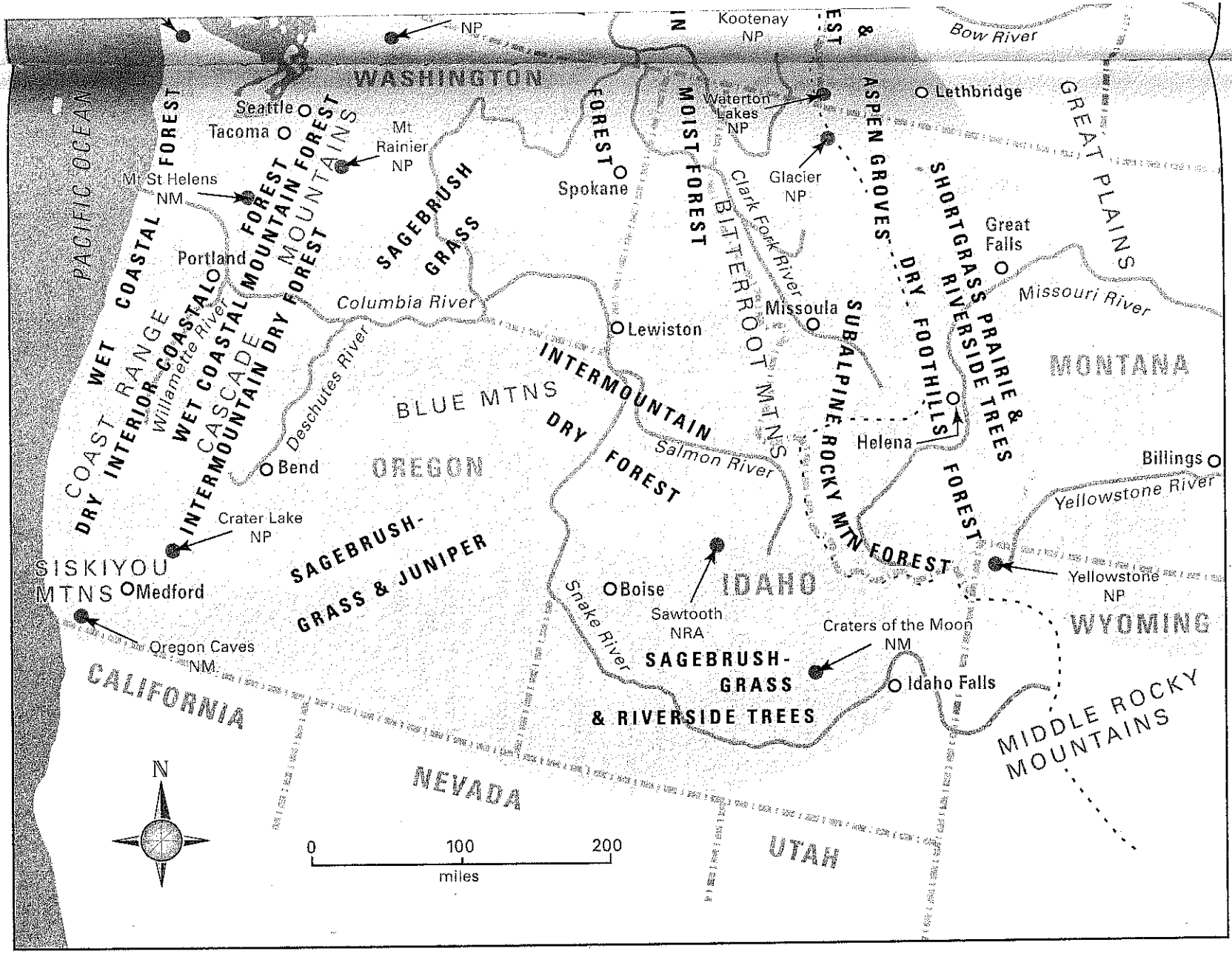
NORTHWEST TREES

Identifying and Understanding the Region's Native Trees

STEPHEN F. ARNO & RAMONA P. HAMMERLY

THE MOUNTAINEERS BOOKS


THE GREATER NORTHWEST
Greater Northwest
Continental Divide
BOREAL FOREST
BRITISH COLUMBIA
ALBERTA
Tweedsmuir PP
Prince George
WET COASTAL MOUNTAIN FOREST
COAST RANGE
INTERMOUNTAIN DRY FOREST
DRY INTERIOR COASTAL FOREST
WET COASTAL FOREST
Vancouver Island
Williams Lake
Jasper NP
Athabasca River
BOREAL FOREST & ASPEN WOODLANDS
Edmonton
SUBALPINE ROCKY MTN FOREST
Banff NP
Glacier NP
FOOTHILL FOREST &
Strathcona PP
Garibaldi PP
Kamloops
Fraser River
INTERMOUNTAIN DRY
Columbia River
INTERMOUNTAIN
Vancouver
Kelowna
Yoho NP
Calgary
Manning PP
Olympic NP
Victoria
N. Cascades NP
Kootenay NP
Bow River
CANADIAN SHIELD


NP
Kootenay NP
Bow River
WASHINGTON
Seattle
Tacoma
Mt Rainier NP
Waterton Lakes NP
Lethbridge
GREAT PLAINS
PACIFIC OCEAN
WET COASTAL FOREST
Mt St Helens NM
FOREST
MOUNTAIN FOREST
Spokane
MOIST FOREST
Clark Fork River
Glacier NP
ASPEN GROVES & DRY FOOTHILLS
SHORTGRASS PRAIRIE & RIVERSIDE TREES
Great Falls
Portland
SAGEBRUSH GRASS
Columbia River
BITTERROOT MTNS
Missoula
Missouri River
COAST RANGE
DRY INTERIOR COASTAL FOREST
Willamette River
WET COASTAL MOUNTAIN FOREST
CASCADE MOUNTAINS
INTERMOUNTAIN DRY FOREST
Lewiston
SUBALPINE ROCKY MTN FOREST
MONTANA
Deschutes River
BLUE MTNS
INTERMOUNTAIN DRY FOREST
Salmon River
Helena
Billings
Bend
OREGON
Yellowstone River
Crater Lake NP
SAGEBRUSH-GRASS & JUNIPER
SISKIYOU MTNS
Medford
Boise
IDAHO
Yellowstone NP
Sawtooth NRA
WYOMING
Craters of the Moon NM
Oregon Caves NM
SAGEBRUSH-GRASS & RIVERSIDE TREES
Snake River
Idaho Falls
CALIFORNIA
MIDDLE ROCKY MOUNTAINS
NEVADA
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INTRODUCTION: THE WHY AND WHAT OF THIS BOOK

Nearly three decades after it first appeared, *Northwest Trees* continues to be in demand despite the advent of many new books focusing on tree identification. Evidently people value a book that delves deeper, capturing the character of native trees in beautiful, meticulously accurate drawings and conveying the qualities of each species in an engaging account. New knowledge of native trees spurred us to develop this updated edition, which we also expanded to encompass the "Greater Northwest." Our 1977 book covered southern British Columbia, Washington, and northern parts of Oregon and Idaho. We now include southern Oregon with its rich assortment of interesting trees, and we extend eastward through the Rockies to include trees of southwestern Alberta, most of Idaho and Montana, and the Yellowstone Park area of northwestern Wyoming (see map).

This book profiles more than sixty native species that commonly attain treelike stature, defined as 20 feet (6 m) or taller. Drawings and narrative portray each tree's general characteristics, where it lives, its appearance, how it fits into the environment, how it responds to natural and man-made disturbances, and how people have used and valued it through the ages.

For example, western redcedar was "the tree of life" to coastal Native peoples, who used it for clothing, shelter, and transportation and to procure and preserve food. We note how Natives of the interior Northwest peeled bark from ponderosa pines to obtain the sugary inner bark and that some bark-peeling scars made a few hundred years ago can still be seen on living trees. Douglas-fir is well-known, but how many people realize that this exceptional species adapts to habitats ranging from coastal rain forest to high mountain sites and arid plains east of the Rockies? Readers meet our region's two species of deciduous conifers called larch—one a towering tree that survives great fires, the other a short, sturdy dweller of alpine peaks so hardy it leafs out in June while still standing in snow. Its companion, whitebark pine, bears nutlike seeds that birds and squirrels compete to harvest—the birds ultimately "planting" new seedlings, while the squirrels' seed caches provide essential food for grizzly bears. The little Pacific yew supplied bows for Northwest Natives, but in the 1990s it became famous, and threatened with overexploitation, as the prime source for a cancer cure. In parts of Idaho, this low-growing tree can outcompete and ultimately replace the spruce and fir that soar high above it.

The Northwest's broadleaf trees are also intriguing. They include the broad-crowned bigleaf maples in coastal rain forests that are laden with thick drapes of hanging moss, which in turn support a crop of ferns—a photographer's delight. In contrast, hunched-over netleaf hackberry trees provide welcomed shade in the barren bottom of torrid Hells Canyon. Hackberry is one of the many fruit- and nut-bearing broad-leaved trees we profile.

The identification guide, or "key," uses the simplest, most-reliable characteristics and nontechnical language to help distinguish each species. However, keys are artificial constructs aimed at helping people sort out the messy, often intergrading divisions in nature that we call "species." For our key, we have used the best information available from various sources and translated it from technical features and terminology, but we cannot make it *perfect*, nor can we construct it so that people can apply it without reading and study of a tree's most accessible features. However,

we believe this is a superior key to Northwest trees for general audiences.

THE GREATER NORTHWEST: HOME OF REMARKABLE TREES

This book covers trees of the Greater Northwest, a region nearly twice the size of Texas. Our region's abundance of trees developed under the influence of a climate spawned in the North Pacific Ocean. Oceanic air masses dry out as they push inland through rugged mountains, mixing with air masses from the center of the continent that are hotter in summer and colder in winter. Still, our region is the only place in North America where Pacific coast tree species spread inland to the crest of the Rocky Mountains. Highly variable geology and soils also contribute to the diversity of the Northwest's trees. Although our region has about equal numbers of conifer and broad-leaved species, conifers dominate the forests and are among the largest and oldest of their kind in the world. In contrast, most other temperate-zone forests worldwide are made up mostly of deciduous broad-leaved trees such as oaks and maples.

Ecologists explain why this is so (Waring and Franklin 1979): Conifers are better adapted to the Northwestern climate, which has ample moisture in the cool part of the year followed by drought in summer. Most other temperate regions have higher rainfall and humidity during summer. Our conifers are leafed out and ready to begin growth processes in the cool, wet seasons that abut winter—whenever temperatures stay mostly above freezing. Coastal conifers become active during mild periods in winter, while inland conifers activate in spring well before broad-leaved trees dare leaf out and expose tender shoots and new leaves to a sharp frost or snow. On the other hand, during hot, dry periods in summer, conifers can go dormant to conserve moisture while broad-leaved trees have their succulent foliage exposed to the drought.

The gigantic proportions attained by many Northwest conifers provide a buffer against environmental stress including drought and limited supplies of nutrients (Waring and Franklin 1979). Large, fire-resistant trees can survive low-intensity fires, which were common until the early 1900s in some of our inland forests. Many of our tree species are adapted to age-old patterns of fires, be they stand-replacing fires at intervals of a century or more; frequent, low-intensity fires perhaps once a decade; or mixed-severity fires occurring at irregular intervals. Other tree species take over in the absence of fire and other disturbances.

Several species of trees and associated undergrowth plants are essentially confined to the Greater Northwest: western larch, alpine larch, Pacific silver fir, noble fir, and grand fir. Others are restricted to our region except that they also extend southward into the mountains of California: western white pine, whitebark pine, coastal Douglas-fir, Pacific yew, bigleaf and vine maples, Pacific dogwood, Pacific madrone, and cascara. North of our region, boreal forests dominate, including white spruce and black spruce. South of our region, forest types associated with California (such as redwood, gray pine, and Jeffrey pine), the Great Basin (for example, pinyon and bristlecone pines), and the central Rocky Mountains (for instance, blue spruce and Rocky Mountain white fir) appear.

Some Northwestern species are confined to the coastal environment west of the Cascades (for example, Sitka spruce, Pacific silver fir, bigleaf maple, and several other broad-leaved trees). Others are coastal but also occupy the wet "inland maritime" area centered on northern Idaho (western hemlock, western redcedar, red alder, and cascara). Some are inland species (western larch, western juniper, water birch, and netleaf hackberry). Others are widespread geographically (Douglas-fir, subalpine fir, and black cottonwood). However, nearly all species are confined to one or

two of the three elevational zones: low, middle, and high altitudes.

We—the author, artist, and publisher—hope this book will stimulate readers to investigate the broader subjects of forest ecology and stewardship. Many publications provide additional information. See References at the back of this book.

HOW TO USE THE KEYS

Nontechnical keys (like the ones in this book) rely on simple, accessible characteristics to help people identify what botanists have designated as individual species, based on technical characteristics. There is considerable variation within a species, and similar species often intergrade. Thus, keys are not infallible, but the ones presented here, used carefully, should correctly identify the vast majority of native trees most of the time.

1. The first key that follows is for conifers (having leaves that are needle- or scalelike), and the second key is for broad-leaved trees. Start at the top of the appropriate key for the specimen you wish to identify. Read the first set of paired, alternative statements and choose the one that fits best.
2. Then read the paired statements below that alternative (or branch) in the key. Again, choose the statement that fits the tree you are trying to identify.
3. Continue to follow the best alternatives downward through the key (noting that the keys' pages are numbered separately from the rest of this book's pages) until you arrive at a species name and page number.
4. Turn to that page in the main text and read the species description to see if it matches the tree in question.
5. If it doesn't match, go back to the beginning of the key and try again. If the key doesn't lead to a species whose description fits, perhaps the tree is an introduced species. A local horticulturist or extension forester may be able to identify the species.