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SPECIAL FOREST PRODUCTS

Species Information Guide for the Pacific Northwest

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Disclaimer

This publication reports research and management information involving mushroom and plant harvesting. It neither recommends the use and ingestion of mushrooms and plants nor implies that using wild plants and mushrooms is without risks.

CAUTION: Mushroom and wild plant consumption can pose a serious, even fatal, risk to humans. It is strongly recommended that you spend your first collecting season using field identification guides and collecting with an expert if you intend to collect wild plants or mushrooms to eat.

Abstract

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This guide is a collection of information about economically important vascular and nonvascular plants and fungi found in the Pacific Northwest that furnish special forest products. Many of these plants and fungi are also found in Alaska, northern Idaho, and western Montana. They contribute to many botanical, floral, woodcraft, and decorative industries and to the rapidly growing medicinal, herbal, and natural foods industries. Internet commerce has made these products available to consumers worldwide and expanded interest in medicinal plants, decorative floral products, and edible wild fruits and mushrooms. This guide provides a consolidated information resource that briefly describes biological, ecological attributes of over 60 plants and fungi, and their wild harvest methods, alternatives to wild harvest, and uses. The harvest techniques described in the guide are based on the recommendations of experienced harvesters and experts who have worked with these botanical resources and support sustainable practices. Information for this guide was gathered from various documents and other sources. The technical areas of expertise consulted spanned a wide range of knowledge including plant biological and ecological sciences, ethnobotany, horticulture, mycology, and forest ecology.

Keywords: Special forest products, nontimber forest products, medicinal plants, edible fungi, botanical industry, herbs, wildcraft, Pacific Northwest, sustainable forestry.

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Introduction

Abundant biotic resources of North American forests have provided not only recreational and personal collecting opportunities but also profitability in products that come from various plants, lichens, fungi, algae, and micro-organisms. These special forest products are the basis of many botanical, floral, woodcraft, and decorative industries; they also contribute significantly to the rapidly growing medicinal, herbal, and natural foods industries (Schlosser et al. 1992, Schlosser and Blatner 1994, Vance and Thomas 1997).

Species harvested from forests for other than timber commodities have been referred to variously as special forest products, nontimber forest products, nonwood products, botanical products, and secondary forest products. They refer to the same group of species—plants, lichens, fungi, and other organisms—collected from the forest for various uses including subsistence, education, research, recreation, and commercial enterprise. The process of collecting from the wild is termed **wildcrafting** and is generally a term applied to collecting material from the wild to sell or trade. Native Americans regarded the use and often the maintenance of the many species found in forests and prairies as a fundamental part of their world and life, and would take exception to the concept that they are “special.” It is important therefore to acknowledge that the species we are discovering to be beneficial today were already intimately known by people who lived on this continent and who collected and used these fungi and plants for thousands of years.

Interest in special forest products has increased along with demand for herbal medicines, decorative floral products, and edible wild fruits and mushrooms. This increasing interest in the use of many of the wild botanical resources in the Pacific Northwest accompanies a corresponding increase in questions about how to determine what species are used for which purpose and how are these species properly collected. At the same time, the forested and nonforested habitats where many of these species normally thrive may be altered by land management practices such as clearcutting and wildfire suppression, catastrophic wildfires, and other environmental disturbances. Species such as beargrass, salal, and several medicinal plant species have been so heavily harvested that the quality of the product may have changed. Species growth and reproductive capacity may be affected as well as genetic and population structure. With few exceptions, these species have been harvested without inventories or monitoring, and without addressing sustainability or conservation of the resources or their habitats.

How do all these pieces fit together? As people collect plants and fungi for commercial products, how do they ensure that these species are not overexploited, that their habitats and environments are not being damaged, and that

they are not adversely influencing important ecological functions such as critical interactions with insect and animal pollinators, other mutualisms, and the provision of food and habitat for wildlife. Many of the species being collected in commercial quantities have not been thoroughly studied, yet there is considerable information in the literature and among practitioners that collectively is informative and educational. This guide is a compilation of the information we found to date about selected species in the Pacific Northwest. It is incomplete because new information is continually being generated. We have focused on that information most relevant and useful to sustainable management and conservation of these valuable biological resources growing in the wild.

Based on the information compiled for this publication, we list in table 1 the vascular plants covered in this guide noting species that are exotic, species that can be cultivated, and species deemed vulnerable because the **plant and or its habitat** may be jeopardized by harvest. Of the 76 vascular plant species, 59 species or about 78 percent are available commercially as plant or seed; 10 species or about 13 percent are exotic weeds. About 32 percent are considered vulnerable based direct and indirect effects of harvest. The nonvascular byrobphytes (mosses and liverworts) and the lichen *Usnea* are not cultivated and are also considered vulnerable. Harvest pressure on these byrophytes continues while similar species in other parts of the world are disappearing or threatened by habitat loss, environmental pollution, and overharvest.

Although this guide is a collection of information about economically important plants and fungi species found primarily in the Pacific Northwest, many of these species also are found in Alaska, northern Idaho, and western Montana. The species lists were developed with the input of local harvesters, botanists, land managers, and researchers. This is **not** a comprehensive list of all plants with medicinal, edible, or decorative uses. It is a compilation of species that commonly are harvested for commercial purposes and found on Forest Service lands. Many of these species were and are important to indigenous people, and many tribes today have first rights to collect and use these species. We hope the user of this guide will be sensitive to tribal and treaty rights and the feelings of others who care about these species.

How to Use This Guide

This guide primarily provides information that describes the biological and ecological attributes of each species. The guide is comprehensive but not detailed. It summarizes information while referring the reader to sources that have more specific information. For those interested in harvesting these plants and fungi, this guide includes useful information about low-impact harvest techniques. We also intend for the information to be used to increase awareness of the importance of ethical

Table 1—List of vascular plants indicating those species that are exotic, commercially available (CA) seed or plants (native species), and native plants that are vulnerable or have vulnerable habitats if harvested

Botanical name	Common name	Exotic	Seed or plant	
			CA	Vulnerable
<i>Abies procera</i>	Noble fir		X	
<i>Acer circinatum</i>	Vine maple		X	
<i>Achillea millefolium</i>	Common yarrow		X	
<i>Anaphalis margaritacea</i>	Pearly everlasting		X	
<i>Angelica genuflexa</i>	Kneeling angelica			X
<i>A. arguta</i>	Lyall's angelica			X
<i>Aralia californica</i>	Spikenard		X	X
<i>Arctostaphylos columbiana</i>	Hairy manzanita		X	
<i>A. nevadensis</i>	Pinemat manzanita		X	
<i>A. patula</i>	Greenleaf manzanita		X	
<i>A. viscida</i>	White-leaved manzanita		X	
<i>A. uva-ursi</i>	Kinnikinnick		X	
<i>Arnica cordifolia</i>	Heart-leaved arnica		X	
<i>A. latifolia</i>	Broadleaf arnica		X	
<i>Artemisia douglasiana</i>	Mugwort		X	
<i>Asarum caudatum</i>	Wild ginger		X	X
<i>Berberis aquifolium</i>	Tall Oregon grape		X	
<i>B. nervosa</i>	Dwarf Oregon grape		X	
<i>Calocedrus decurrens</i>	Incense-cedar		X	
<i>Capsella bursa-pastoris</i>	Shepherd's purse	X		
<i>Ceanothus velutinus</i>	Snowbrush ceanothus		X	
<i>C. sanguineus</i>	Redstem ceanothus		X	
<i>Chimaphila umbellata</i>	Pipsissewa		X	X
<i>Coptis laciniata</i>	Oregon goldthread		X	X
<i>C. trifolia</i>	Threeleaf goldthread			X
<i>C. occidentalis</i>	Western goldthread			X
<i>Crataegus douglasii</i>	Black hawthorn		X	
<i>C. monogyna</i>	Oneseed hawthorn	X	X	
<i>C. suksdorfii</i>	Suksdorf's hawthorn		X	
<i>Cupressus lawsoniana</i>	Port-Orford-cedar		X	X
<i>Cytisus scoparius</i>	Scotch broom	X		
<i>Dipsacus fullonum</i>	Common teasel	X		
<i>D. sylvestris</i>	Wild teasel	X		
<i>Equisetum arvense</i>	Common horsetail		X	
<i>E. hyemale</i>	Scouring-rush		X	
<i>Eriodictyon californicum</i>	Yerba santa		X	
<i>Frangula purshiana</i>	Buckthorn		X	
<i>Gaultheria shallon</i>	Salal		X	
<i>Gentiana sceptrum</i>	King's gentian		X	X

Table 1—List of vascular plants indicating those species that are exotic, commercially available (CA) seed or plants (native species), and native plants that are vulnerable or have vulnerable habitats if harvested (continued)

Botanical name	Common name	Exotic	Seed or plant	
			CA	Vulnerable
<i>G. calycosa</i>	Mountain bog		X	X
<i>Gypsophila paniculata</i>	Baby's breath	X		
<i>Hypericum perforatum</i>	St. John's wort	X		
<i>Juniperus occidentalis</i>	Western juniper		X	
<i>J. scopulorum</i>	Rocky Mountain juniper		X	
<i>Ligusticum apiifolium</i>	Celeryleaf lovage			X
<i>L. canbyi</i>	Canby's lovage			X
<i>L. grayi</i>	Gray's lovage			X
<i>Lomatium dissectum</i>	Desert parsley		X	X
<i>Oplopanax horridum</i>	Devil's club		X	X
<i>Pachistima myrsinites</i>	False box		X	
<i>Petasites frigidus</i> v. <i>palmatum</i>	Coltsfoot		X	
<i>Polystichum munitum</i>	Western sword fern		X	
<i>Prunella vulgaris</i>	Selfheal		X	
<i>Pteridium aquilinum</i>	Bracken fern		X	
<i>Rosa gymnocarpa</i>	Dwarf rose		X	
<i>R. nutkana</i>	Nootka rose		X	
<i>Rubus idaeus</i>	Red raspberry		X	
<i>Rumex acetosella</i>	Sheep sorrel	X		
<i>R. crispus</i>	Curly dock	X		
<i>Sambucus racemosa</i> ssp. <i>pubens</i>	Red elderberry		X	
<i>S. cerulea</i>	Blue elderberry		X	
<i>Scutellaria lateriflora</i>	Blue skullcap		X	X
<i>S. galericulata</i>	Marsh skullcap			X
<i>S. nana</i>	Dwarf skullcap			X
<i>Taxus brevifolia</i>	Pacific yew		X	
<i>Thuja plicata</i>	Western redcedar		X	
<i>Trillium ovatum</i>	Western trillium		X	X
<i>Urtica dioica</i>	Stinging nettle		X	
<i>Vaccinium membranaceum</i>	Black huckleberry		X	
<i>V. deliciosum</i>	Cascade bilberry		X	
<i>V. ovatum</i>	Evergreen huckleberry		X	
<i>Valeriana sitchensis</i>	Sitka valerian		X	X
<i>V. occidentalis</i>	Western valerian		X	X
<i>V. scouleri</i>	Scouler's valerian		X	X
<i>Verbascum thapsus</i>	Mullein	X	X	
<i>Xerophyllum tenax</i>	Beargrass		X	X

and ecologically sensitive collection and use of these species. For example, it is important to be certain of the exact botanical identity of the plant or fungus being harvested. There are species look-alikes that are federally or state listed as sensitive, threatened, or endangered; other look-alikes are poisonous or toxic. Some species are exotic and invasive. It is important not to spread these invasive or exotic species because of carelessness in harvest and transport. Land managers who make decisions about how to structure permits or management plans, who are responsible for sensitive plants, or who determine harvest impacts also may find this information useful. It is also useful for harvesters who simply want to learn more about the species they are working with. There are also gaps in information revealing where further knowledge may be needed. This guide is intended to increase awareness of the use of many plants and fungi and of their importance to people and the ecosystem. It is also intended to increase knowledge of techniques, whether cultivation or careful harvest, that will promote sustainability and conservation of species, plant and fungal communities, and habitats.

The harvest techniques described in this guide are those recommended by local harvesters who have worked with the plants for years developing techniques that promote sustainable harvest. These techniques have not been, for the most part, field tested, monitored, or scientifically evaluated. Most of these harvest recommendations are locally specific. **Changes in climate or the environment can result in different reactions from species being harvested.** Therefore, always consider the environment when collecting. For example, many species grow in road cuts and fills. Before harvesting a species on a steep slope, consider the consequences of that action to slope stability and erosion. Before collecting along roadsides in particular, the application of herbicides or pesticides should be determined. Consider any potential for adverse impacts on both the species and the land. Note that for species growing on public lands, transplanting is permitted for a limited number of species and not on all forests. Transplanting is total removal of a plant with disturbance of soil and forest floor. It is usually permitted only in areas where destruction of vegetation and soil disturbance have to occur owing to such activity as increasing or maintaining power lines or road rights-of-way.

For many species, it is difficult to locate patches in the wild that are large enough to harvest without impact and still collect enough to be economical. Many are suitable for cultivation, but for some species, successful propagation still eludes growers. Cultivation for commercial markets is not developed for many species, so they tend to be collected only in the wild. In some cases, a price difference exists between wildcrafted and cultivated species, but this is more the exception rather than the rule. In fact, many cultivated species can be

certified organic, which increases their value, although as yet there is not a formal process to certify wildcrafted species. For many species in this guide, cultivation is a recommended alternative to wild harvest. For more detailed information on cultivation of the native plant species listed in this guide, we have referenced, for example, the journal *Hortus West* (1998), the publications “Seeds of Woody Plants in the United States” (USDA Forest Service 1974), “Propagation of Pacific Northwest Plants” (Rose et al. 1998), “Collecting, Processing and Germinating Seeds of Wildland Plants” (Young and Young 1986), and the web site <http://gardenbed.com>. Over the timespan of preparing this guide, web-based information has increased exponentially. We encourage using the Internet to find additional information but caution that reliability of sources should be checked.

The publication is just a guide. The collector should make personal observations about the effects of any harvest and note any significant changes in populations or habitats across the landscape.

General Harvest Guidelines

Know the species that is to be collected.

Be sure of its identification before harvesting a plant or mushroom. Many plants look similar but do not necessarily have the same properties. There are species in the same genus that look similar to the more common species but may be rare, at risk, or federally or state listed as threatened or endangered. Another reason for careful identification is that certain plants and fungi have poisonous look-alikes! If you are uncertain, take a small sample and consult a qualified botanist. You may find one at most colleges and universities, or you can call your forest or agriculture extension agent who will know where to refer you. Native plant societies have local chapters and provide excellent opportunities to identify plants and fungi, and discover and learn the local flora as well.

Know the end use.

If collecting plants to sell, you should first contact the buyer and discuss what criteria and quality standards are to be met. Many buyers will only take products that have been collected, dried, or processed in a certain way. Many plants are sensitive enough that just a few days or even hours of improper handling can result in unusable products. Know how to handle collected material properly and use proper storage facilities or materials.

Pay attention to the environmental conditions.

Avoid harvesting during extreme conditions. After heavy rain, the soil will be more prone to compaction or slippage. When harvesting plants that grow in riparian areas, avoid taking plants that are critical to maintaining the integrity of the streambanks. When it is particularly dry, some plants may become stressed. Harvesting parts of a plant at this time may add to stress and negatively impact regeneration. In addition, be aware of plants or plant parts that are diseased or infested with insects so as not to spread contamination.

Learn about the life cycle of the plant you are harvesting.

Plants need to be able to reproduce or regenerate to continue to exist. For example, if you are collecting roots and the plant reproduces by seed, is it possible to collect in fall after the seeds have dropped? This type of awareness will help assure there are plants in the area to harvest again next year.

Harvesting Responsibilities

Wildcrafter training and responsibilities:

- Have in-field instruction on how to identify, harvest, and handle plant material properly including quality control, sustainable harvest guidelines, bagging, bundling, tagging, storing, and transporting.
- Know land and landowner regulations including use permit requirements with location, harvest dates, full name of harvester, and owner's signature; land use ethics.

Collector responsibilities:

- Train and supervise wildcrafters.
- Weigh, tag, and document harvested plant material including location.
- Transport plant material to processor.
- Communicate regularly with landowner and assure permit compliance.

Processor responsibilities:

- Train and supervise collector.
- Receive plant material and harvest documentation from collector.
- Inspect and process product. Bag tags identify each wildcrafter's product.
- Communicate with landowner and be involved in use permit process.

Monitor and observe a patch over time.

Notice what impact your harvest is having. Take notes with map locations so you know how to return to the same area. Evaluate harvest recommendations for your area. Surprisingly, some plants may actually increase if harvested in the right quantities and if the right techniques are used.

Always secure permission to harvest on anyone's land.

This applies to public land as well as private. In Oregon, a permit is required to carry commercial quantities of product in your vehicle. This can be a handwritten permit from a private landowner. Other states in the Pacific Northwest have or are now enacting similar laws. Know the requirements set forth in these laws. Public lands also require permits for harvesting. Some public lands are off-limits to harvesting (such as national parks and many special management areas on national forest lands). Presently, public land managers will sell permits for many of the species listed in this guide. They often want to know generally where harvesting is occurring so that they can track areas of heavy use in order to balance impact across the landscape. Personal-use permits are available for noncommercial harvest. Even if you do not like the current permit systems, getting involved with them is the best way to have input into future changes.

Use harvest techniques that minimize disturbance.

This means using the right tools and using them correctly. If you are collecting leaves and stems, gently clip them off of the plant. Do not simply break them off or pull them out of the ground, as you tend to get more of the plant than you can use. Also, breaking stems may produce more extensive injury and create sites for pathogens. With roots, dig gently with a small shovel, trowel, or your hands (depending on the conditions). Avoid disturbing surrounding vegetation. Fill in any holes you make after you finish collecting. Take out litter and trash with you.

Sustainable harvest does not come with a formula.

There are no bottom line numbers that work for each species. Think of the species in context, as part of the ecosystem. For some species, ecological function or importance has already been documented and is described in this guide. Many species, however, have not been thoroughly researched. Draw conclusions about the sensitivity of a patch by using observation and the information contained here. Harvest conservatively. Then watch the results. Over the next few seasons, observe what impact harvesting had on the species collected as well its surroundings.

Transplanting Tips

The following transplanting tips have been adapted from the brochure “*Collecting Native Plants Permit Conditions and Transplanting Tips*” (Johnson and Warner 1997).

- Be sure you have written permission first from the landowner or land manager.
- Important! Know where your transplants will be located in your yard **before** finding them. Select plants growing in conditions that match where they will be planted; e.g., sun exposure, moisture, soil drainage, frost, etc.
- Reduce transplant shock by collecting plants between October and May, when soils are moist and plants are not actively growing. The best days for transplanting are cool-overcast days.
- Avoid collecting on steep slopes to prevent soil erosion.
- Dig plants carefully, retaining as much soil around the roots as possible. Keep roots moist at all times. Wrap wet newspapers or burlap around the outside of the root ball.
- Completely cover your plants when carried in the back of an open truck. The air movement will rapidly dry the foliage and roots, which severely stresses the plants, possibly causing them to die. Roots must be kept covered and moist at all times as they die rapidly when exposed to air.
- Replant your newly collected plants as soon as possible. Until then, keep them cool, shaded, and slightly moist.
- Trees take 1 to 2 years to reestablish themselves in your landscape. Supplemental watering is advised during this period. Keep shrubs, grasses, and herbs watered until they are actively growing. During dry summer months, water every 1 to 3 weeks (depending on species).
- Even with the greatest care, the establishment rate of transplanted herbs can be low. We encourage you to propagate herbs with seeds or cuttings, or obtain from a nursery.

The commercial value of the special forest products industry to the Pacific Northwest has been reported in excess of \$190 million (Schlosser and Blatner 1992). It is estimated that the value of the personal-use sector exceeds the commercial value by 3 to 1. Today, as in the past, a major value of special forest products from native plants and fungi of the Pacific Northwest is their use by the ordinary person. Over 85,000 people enter the public forest each year to collect plant material and mushrooms for their own personal use. Also 65 percent of 90,000 nonindustrial private forest land owners stated that a primary reason for owning forest property was for other products besides timber. These products represent the full range of commercial, educational, environmental, and aesthetic uses for the owners, their families, friends, and others. Protecting plants and fungi helps maintain forest complexity and is an inclusive activity not only for ecosystem and species diversity but also for engaging people who represent all of the values for which public forest lands are managed.

Harvesting Mushrooms

The following harvest guidelines are adapted from the brochure “Mushroom Picking—What Makes a Good Harvest?” (USDA Forest Service 1995).

Know where mushrooms grow.

Forest ecosystems provide diverse plant, animal, and fungal species. Unlike green plants, fungi cannot use sunlight to make food but use other living organisms or dead organic matter for food and moisture. Mushrooms can be found in different forest and nonforest environments. They commonly are found in leaf litter or other plant organic material, and near trees in deciduous and coniferous woodlands as well as in nonforest lands. When locating mushrooms for harvest, disturb the ground as little as possible as many grow during the rainy season when the ground is soft.

Know the mushroom.

Know the mushroom **before** picking it! Remember, not all mushrooms are edible, and some are poisonous. There are many guidebooks available at bookstores, local libraries, and county extension offices to assist with mushroom identification. Picking mushrooms and identifying them later may result in contamination and throwing out mushrooms that could do more good left on site.

Take care of mushroom habitat.

Improper techniques, such as raking, can damage mushrooms by breaking caps and stems. It also can damage mushroom habitat. Remember areas that are disturbed because of picking should be carefully restored. This protects the underground portions of the fungi, which produce the mushrooms. Mushrooms will return almost every year if they are harvested carefully—and the weather cooperates.

Know good harvesting techniques.

Depending on the type of mushroom, there are three methods a picker should use to minimize resource damage during harvest:

- Grasp the mushroom at its base and gently rock and twist until it comes loose.
- Use a sharp knife to cut the mushroom off at ground level.
- Insert a narrow object like a stick or knife under the base while prying straight up and out of the ground. This method “pops” the mushroom out without disturbing the surrounding area or damaging the mushroom.

Mushrooms damaged by improper harvesting or storage have little or no commercial value.

Methods

This information guide was developed in multiple stages. First, a selection process was developed for including species in the document. Second, information categories were defined and refined. Third, information was collected and carefully documented for each of the species. Finally, the document was reviewed for completeness and content accuracy.

The species list for this guide was compiled first from permit lists obtained from the U.S. Department of Agriculture (USDA), Forest Service and U.S. Department of the Interior (USDI), Bureau of Land Management. These lists provided the names of species for which permits were obtained in the USDA Forest Service, Pacific Northwest Region. Additional species were added based on recommendations from harvesters and business owners who knew that other products were being collected. As other species were suggested, researchers determined what quantities were being removed and if the species were commercially important enough to be included on the list.

A draft category list was completed in 1996. The original categories included description, ecology, uses, and harvest suggestions. Throughout the data-collection process, these categories were reworked. For example, as more information became available on the cultivation of medicinal plants, a section on

propagation of the species was included. The section addressing markets was reduced in detail; it became clear that information would be difficult to keep current with market and price information proliferating and becoming more fluid.

Drafts of a prototype were presented at workshops and conferences, which allowed an opportunity to refine the format. Feedback was solicited that provided key areas on which to focus the work. Suggestions were made about how a category could be made more useful. As the document was tailored to fit the needs of the users, additional categories were added and modified when necessary. For example, land managers repeatedly mentioned that the literature would say that nothing was known about many species. Thus, as data were collected, references were listed, thereby allowing end users to followup with their own research as needed. Our goal here was to summarize what information exists while providing extensive references for accessing details on each species.

This feedback also helped streamline the categories that were included in the document. The result was an emphasis on the resource rather than products. People wanted to know about the species, its ecological attributes and harvest concerns rather than just focusing on its economic attributes. We have accompanied each species or taxon with a botanical illustration, most of which for plant species are from Hitchcock et al. (1969).

Information for this guide was gathered from documents that cover various sciences including ecology, ethnobotany, horticulture, and mycology. Other sources were found on the Internet, a growing source of information. Because information on the Internet often is updated more frequently than publications, web-based information was consulted as recently as possible before this document went to press. Important sources of unpublished information were provided by people with experience or knowledge in harvesting these species or in processing their products. They have been added as personal contacts and their credentials confirmed by peers in their field. Information also was referenced against several lists including threatened and endangered species lists, regional sensitive plant species lists, United Plant Savers, and lists of seeds available in cultivation. All citations, including the web sites, were cross checked for accuracy.

As information was collected, decisions had to be made about how to treat special cases. We acknowledge that “moss” harvest includes many liverwort and moss genera. We grouped them under the name “Bryophyta” and provided general information as applicable. Harvesters are not selective about which species of moss they bring in because the market is concerned about the look of the moss, not the species. For genera such as *Rosa* and *Juniperus*, several species within the genus are collected for the same purposes. We identified the most prominent, but other species within the genus also may be used. Where information was identical among species, we did not provide species-specific information. Wherever possible when we found species-specific information, we included it.

Explanation of Information Categories in This Guide

This guide was reviewed by scientists, managers, and special forest products business people at various stages. Several reviewers were asked to review those species with which they work most closely or have the most familiarity.

Identification

Botanical name: Binomial nomenclature is used (genus and species name in Latin) followed by the accepted abbreviation of the person recognized as first naming the species. The nomenclature used is primarily from the National Plants Data Center (NPDC). Note exception with “mosses,” which are harvested bryophytes. Bryophyta is a taxonomic division.

Name: Most common name for the species, or for coverage of multiple species under a single genus, the genus name, additional common names used in the region for the species.

Family: The family name for each species. Nomenclature follows NPDC.

Plants code: Code established by the NPDC. Composed of the first two letters of the genus and first two letters of the species. A number is added if there is more than one species with the same first two letters.

Species names: Botanical, common names, and plants code where only genus is listed. For those species covered together under the generic name, differences relating to an individual species are identified; otherwise a generic description is used.

Ecology

This section covers ecology that is most relevant to sustainable management and conservation of the species.

Description: First, nativity to the United States is identified followed by a botanical description of the species including size, shape, and color of leaves, flowers, and fruits. Most species identified as exotics were introduced in the United States for garden plants or for some other purpose.

Range and distribution: A generalized description of the range of the species is given. Distribution includes geographic information and in general how the species occurs; e.g., widely distributed but infrequent.

Associations: In most cases, we have included primary and dominant tree associates, representative for the region. For any particular area, tree series and plant associations can be found in national forest plant association guides within

the Pacific Northwest in addition to material we have referenced. We did not include most zones, series, or associations but tried to include representative associated plants from most common habitats. For nonforest, weedy, or roadside species, we suggest several types of plants that commonly would be associated with these species.

Habitat: General descriptions of the types of environmental conditions in which the species grow. If possible, this included general physiographic information, moisture, and temperature.

Successional stage: An indicator of the vegetative structure type where the species is typically found, based on ecological theories of succession. For example, early-successional stage refers to recently disturbed areas and open conditions, whereas later successional stage refers to stages of development where the overstory tree structure has developed relatively disturbance free, and in nonforest communities, where the plant community structure is stable over time. It also refers to the response of a species to disturbance and its shade tolerance.

Ecological relations: Interactions between the species and other plants, animals, the soil, or other components of the ecosystem are listed including pollinator-related information, if found. Also included are fire ecological relations, if known. In some cases where information was not found for a specific species, inferences are made based on associated plants. Far more ecological information exists than we have found or included. The wide body of literature precludes our providing an exhaustive list.

Biology

This section includes information on reproductive biology, applied seed biology, and information related to propagation and cultivation of the species.

Flowering and fruiting: Includes the months or seasons that the species typically flowers and descriptions of plant or fruit when fruit and seed are mature.

Seed: Includes seed dispersal and natural germination requirements where found, as well as general germination requirements for artificial seed propagation. Most seeds are stored dried, and noted if stored otherwise. For many species, there is much literature on seed management; therefore, we provided key references rather than details.

Vegetative reproduction: Regeneration in the wild vegetatively by layering, coppicing, or by rhizomes; or in cultivation, species that can be vegetatively propagated, for example, by rooted cuttings.

Cultivation: Species that have been cultivated, or evidence that they can be cultivated. In addition we denote as “commercially available” those species for which seed and plants can be obtained from commercial nurseries based on plants listed in the “Plant and Seed Directory” (Hortus West 1998.)

Transplant viability: Suitability for transplanting based on using good transplant techniques (see “Transplanting Tips”).

Collection

Information and recommendations were compiled from local harvesters who emphasize long-term use of the resource, as well as from publications.

Part harvested: The part of plant or fungus that is harvested depending on use.

Harvest techniques: Generally accepted ways to collect fungi, plant, or plant parts.

Harvest season: Season in which fungi, plant, and plant parts typically are harvested.

Regeneration after harvest: Describes how the species reacts to harvest. Harvest of branch tips may stimulate secondary branch growth and increased sprouting. Rhizomatous plants generally have better regenerative potential to limited harvest of belowground tissue. Fungi may regenerate sporocarps after harvest but take a full reproductive cycle.

Uses and Products

Lists of most common uses, products, and markets for which species are collected.

Common uses: The primary uses for which the species are collected. This includes personal medicinal, craft, and other uses as well as various commercial uses. In this category, there often are more individual uses than we have listed.

Indigenous uses: A general list of various uses by native peoples of the Pacific Northwest. Most likely, there are more specific uses of these species by Native Americans than we have documented here.

Common products: Most common products and representative types of the products distributed and sold in wholesale and retail markets. Many botanical plant products are sold wholesale as bulk dried and cut or sifted. We usually

describe the common retail product; however, the diversification of products has increased so rapidly that there are often many more types of products than we list.

Types of markets: Categories of general markets. Extent of the market for the commercial products where known; i.e., local, regional, national, or international. If local, regional, and national, we indicate those collectively as “domestic.” From its inception to when this guide was published, the markets have expanded. Because of Internet commerce, many products find international buyers; small local companies are able to reach consumers worldwide, so the distinction between domestic and international has blurred. Some terms are overlapping such as medicinal, herbal, nutraceutical, or dietary supplement. In addition, the commercial enterprises we list, e.g., nursery, landscape, and horticultural, overlap.

Comments and Areas of Concern

Comments that may be important to the user or harvester, and additional information of interest or importance to conservation, sustainable harvest, or management have been placed in this section. We note other species in the same genus as the harvested plants that are federally and state listed. We have included web sites where information on state listing can be obtained (see “References”).

Referenced Material

All referenced material used for each species is listed alphabetically by name and date. The full citation can be found under “References.” This section also includes several publications and web sites of general interest or value to the reader but not cited with any particular species.

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