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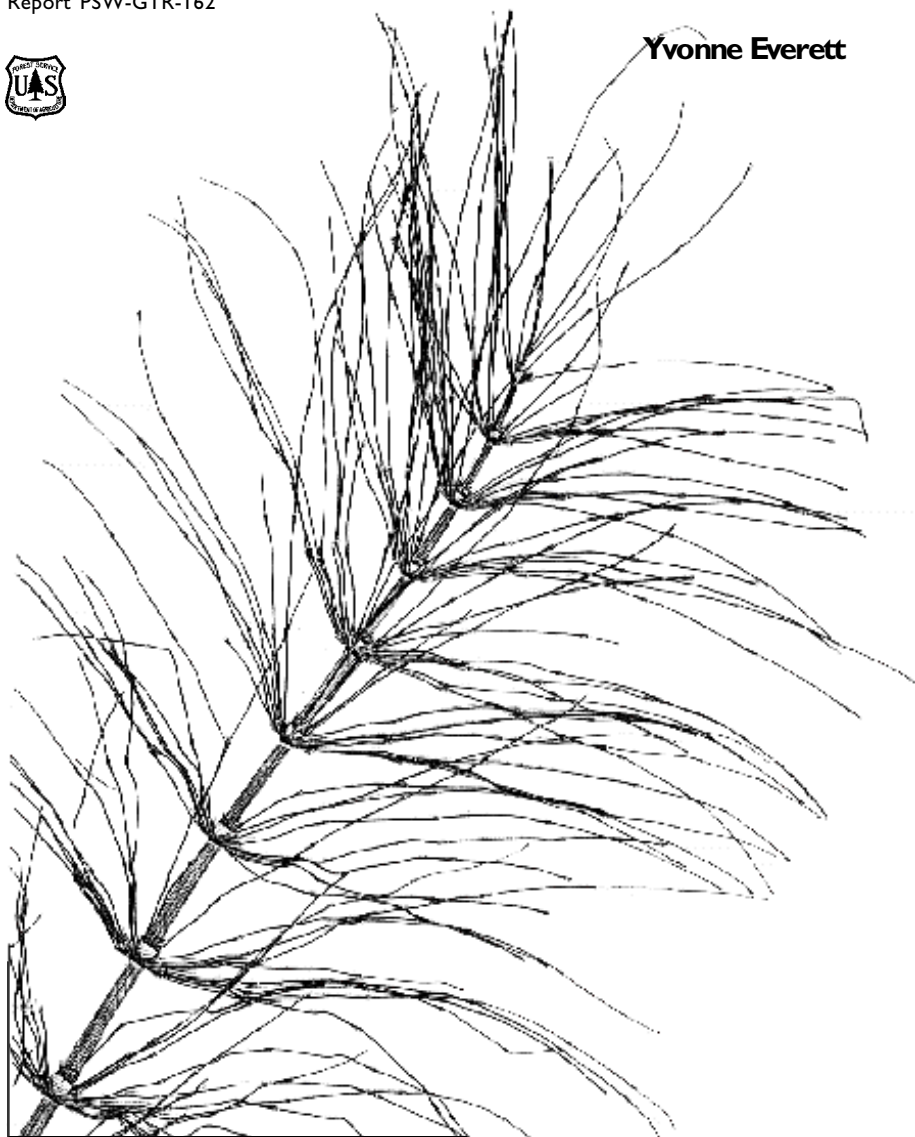
Forest Service

**Pacific Southwest
Research Station**

General Technical
Report PSW-GTR-162

A Guide to Selected Non-Timber Forest Products of the Hayfork Adaptive Management Area, Shasta-Trinity and Six Rivers National Forests, California

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Publisher:

Albany, California
Mailing address:
PO Box 245, Berkeley CA
94701-0245

510 559-6300

<http://www.psw.fs.fed.us>

March 1997

Pacific Southwest Research Station**Forest Service**

U.S. Department of Agriculture

Abstract

Everett, Yvonne. 1997. **A guide to selected non-timber forest products of the Hayfork Adaptive Management Area, Shasta-Trinity and Six Rivers National Forests, California.** Gen. Tech. Rep. PSW-GTR-162. Albany, CA: Pacific Southwest Research Station, Forest Service, U.S. Department of Agriculture; 64 p.

Demand for non-timber forest products (NTFPs) is increasing, and growing numbers of people are enhancing their incomes by harvesting NTFPs from the wild. If forest ecosystems are to continue to produce NTFPs in the long run, harvesters must learn how to gather them in ways that minimize harvest damage to woods and wildlife. This guide, developed in a collaborative, information-sharing effort with harvesters, non-governmental organizations and USDA Forest Service employees, provides guidelines for sustainable harvesting of 24 NTFP plant species found in the Hayfork Adaptive Management Area on the Shasta-Trinity and Six Rivers National Forests of northern California. Illustrations for each species were prepared by Jolie Lonner. Photographs are by Roger Jaegel.

Retrieval Terms: community forestry, ecological sustainability, medicinal herbs, non-timber forest products, wildcrafting

The Author

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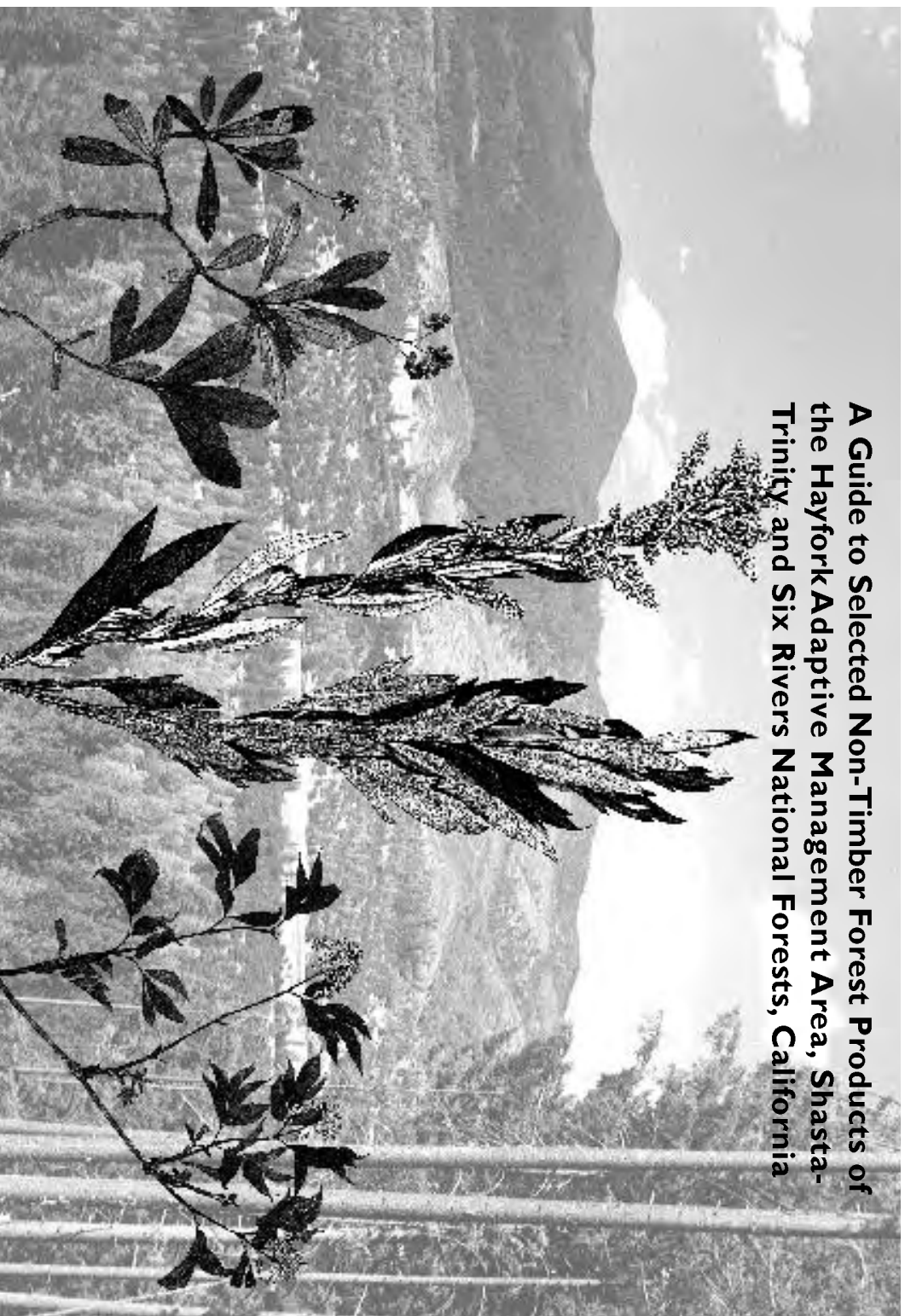
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the Hayfork Adaptive Management Area, Shasta-
Trinity and Six Rivers National Forests, California**



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In Brief

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Demand for non-timber forest products (NTFPs), including floral greens, mushrooms, berries, and medicinal herbs, is increasing globally, and in response, growing numbers of people are enhancing their incomes by harvesting NTFPs from the wild. The interest in NTFPs is particularly strong in the Pacific Northwestern states of Washington and Oregon and in northern California. In these areas, especially where gathering occurs on public lands, concerns are being raised over the impacts of overharvesting on forest ecosystems, and over who should have access rights to NTFP resources. Controlling access to vast areas of public land when valuable and comparatively mobile resources, e.g., mushrooms, are involved is difficult at best; yet, if forest ecosystems are to continue to produce NTFPs in the long run, some mechanisms to manage harvesting are needed. The issue is complex, and an in-depth discussion is beyond the scope of this paper. However, one aspect of the problem is scarcity of information about the plants being gathered among harvesters, or "wildcrafters" as they are known in the NTFP trade, among public land management agency staff and the general public. One can hope that with better understanding of the ecological roles played by NTFPs and information on harvesting, many wildcrafters will exercise self control and learn how to gather NTFPs in ways and in volumes that minimize harvest damage to woods and wildlife, and ensure that there will be NTFPs to gather the next year. Although not everyone will follow such suggestions, and many other issues remain, increasing the number of responsible wildcrafters is a step in the right direction. This guide has been produced as part of an ongoing pilot program to increase communication and cooperation among wildcrafters, and between wildcrafters and public land management agency staff in the Hayfork Adaptive Management Area of the Shasta-Trinity and Six Rivers National Forests, California. Wildcrafters, non-governmental organization staff, herbalists, and USDA Forest Service employees worked with the author to provide basic descriptions and ecological information, as well as develop guidelines for sustainable harvesting of 24 NTFP plant species found in the Hayfork Adaptive Management Area on the Shasta-Trinity and Six Rivers National Forests of northern California. Although much of the information collated here is valid throughout the ranges of the plant species discussed, the harvest guidelines, e.g., regarding suggested harvest quantities, are specific to this region. Because of variation in micro-climate, populations of the same species of plants may be found elsewhere in greater or lesser numbers, and specific guidelines for sustainable harvesting should be developed locally.

Acknowledgments

This publication is a joint effort involving many participants. The project was funded by the Pacific Southwest Research Station, USDA Forest Service, Albany, California, under Research Grant #59-PSW-006G 1995/1996 in cooperation with the Watershed Research and Training Center, Hayfork, California. Funding for developing illustrations and editorial support came from the Shasta-Trinity National Forest, USDA Forest Service, Redding, California.

Jolie Lonner worked closely with me to produce the final manuscript. She designed and produced all of the illustrations beginning with gathering plant specimens from the field. She provided immeasurable good cheer and valuable comments and corrections on the manuscript, especially regarding medicinal uses of our focus species. I am very grateful for all of her help.

I thank all of the people who provided information for this effort: Susan Alexander, Nan Vance, and Jim Weigand, Pacific Northwest Research Station, USDA Forest Service, Corvallis, Oregon; Randi Anderson, Trinity Resource Conservation District, Weaverville, California; Sherlette Colegrove, Hoopa Tribe, Hoopa, California; Bjorn Evenson and Phil Gremaud, Rogue Institute, Ashland, Oregon; Lynn Gunn, Burnt Ranch, California; Paul Harper, Institute for Sustainable Forestry, Redway, California; Lynn and Jim Jungwirth, Watershed Research and Training Center, Hayfork, California; Chris Lewis, Rogue River National Forest, Butte Falls, Oregon; Sheila Logan, Maria Ulloa-Cruz, and John Veevaert, Shasta-Trinity National Forest, Redding, California; John McRae, Six Rivers National Forest, Eureka, California; Ray Patton, Nor-El-Muk Band of the Wintu, Hayfork, California; Flo Rabelais and Julia Riber, Shasta-Trinity National Forest, Hayfork, California; Karen Theiss, Karen Theiss and Associates, McKinleyville, California; Robin Tausch, Intermountain Research Station, USDA Forest Service, Reno, Nevada; University of Nevada at Reno Herbarium, Reno, Nevada.

In addition, a dedicated group provided information and participated in design and editorial reviews of the manuscript: Marcia Andre and Dawn Pedersen, Six Rivers National Forest, Mad River, California; Jan Beyers, Pacific Southwest Research Station, USDA Forest Service, Riverside, California; Jane Bothwell, Herbalist, Kneeland, California; Ann Dennis, Pacific Southwest Research Station, USDA Forest Service, Albany, California; Janet Griffin and Irene Hetrick, Blue Heron Botanicals, Mad River, California; Christina Johnson and Denise and Bede Steenblock-Smith, Trinity Alps Botanicals, Burnt Ranch, California; Julie Nelson, Shasta-Trinity National Forest, Redding, California; and Dan Wood, High Mountain Herb Cooperative, Bridgeville, California. Members from two local wildcrafting and herb-growing cooperatives have been instrumental in this project:

The High Mountain Herb (HMH) Cooperative (Bridgeville, California), formed in the fall of 1993, is governed by five directors elected from its membership. HMH

promotes the development and expansion of agricultural endeavors of both cultivated and non-timber forest products, and is currently developing cooperative-owned processing and marketing facilities. Educational resources and assistance are available from: High Mountain Herb CO-OP, 151 Van Duzen Road, Bridgeville, CA 95526-9401. Tel: (707) 574-6574.

Trinity Alps Botanicals (TAB) (Burnt Ranch, California) is a non-profit agricultural cooperative producing and marketing quality wildcrafted medicinal herbs. Since 1991, the intent has been to provide an opportunity for income for local forest-dependent communities. It provides information and education regarding comprehensive growing and wildcrafting guidelines and techniques.

TAB is also working with an ethnobotanist to establish guidelines for sustainability and certification requirements for the harvest of native species. TAB works to support the harvesting of wild plants in a manner that increases their number and health. TAB currently buys and sells selected fresh and dried herbs, whole or cut and sift.

Introduction

As demand for alternative herbal medicines, floral greens, and forest mushrooms and berries grows in urban North America, Europe, and Japan, harvesting, processing, and marketing these non-timber forest products (NTFPs) is helping to diversify timber-dependent rural economies in the Pacific Northwest.

Many NTFPs are harvested from public lands, especially from the National Forests. More and more people are becoming involved in the NTFP industry, and harvest volumes are increasing. Concerns over the likely impacts on forest ecosystems are growing, as are questions about who should have access to the forests, who will protect the resources, and how long-term sustainability can be ensured.

In these times of economic downsizing of Federal land management agencies such as the United States Department of Agriculture's Forest Service (USDA-FS) and Department of Interior's Bureau of Land Management (BLM), reduced agency staff will not be able to take on the challenge of managing sustainable harvest levels of a plethora of new forest products on extensive acreages of public lands without cooperation from wildcrafters, scientists, and locally experienced citizens and groups. This report represents one step toward such cooperation.

This report provides an introduction to selected non-timber forest products with current market value growing in and around the Hayfork Adaptive Management Area (HAMA) in the Shasta-Trinity and Six Rivers National Forests in northern California. It has been compiled from a year-long process of discussions among local and regional wildcrafters, members of the Hoopa and Nor-El-Muk Wintu tribes, an ethnobotanist, USDA-FS specialists and staff, and the author, an ecologist with the Watershed Research and Training Center, Hayfork, California. It draws together available local knowledge of NTFPs and information taken from the literature on medicinal herbs, wildcrafting, and plant identification.

Adaptive Management Areas are land allocations, under the President's Plan for Ecosystem Management, of public lands in the Pacific Northwest. There are 10 such areas in Washington, Oregon, and California. They have been set aside to scientifically test all aspects of current land management policies and, in particular, the assumptions underlying the concept of Ecosystem Management, through an iterative process of experimentation, monitoring, learning, and adjustment of activities carried out on public lands. Communication and cooperation among land managers, researchers, and the public are seen as key to successful adaptive management.

The Hayfork AMA (*fig.1*) spans roughly 349,000 acres of the Shasta-Trinity and Six Rivers National Forests. The mountainous terrain ranges in elevation from 500 to 6,000 feet, in annual precipitation (rain and snowfall) from below 40 to 80 inches, and includes numerous soil types developed from a highly varied geologic base. Much of the AMA lies in the Trinity River drainage, which lies in the

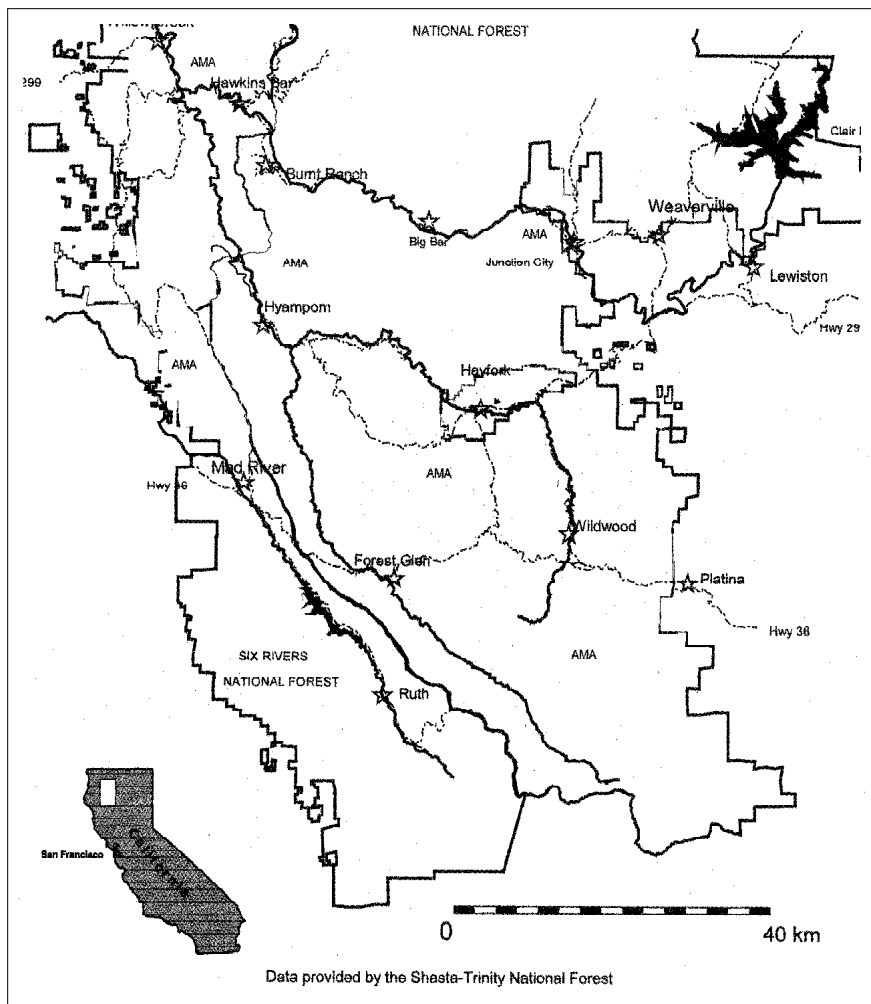


Figure 1 —Hayfork Adaptive Management Area, Six Rivers and Shasta-Trinity National Forests.

southern portion of the Klamath Bioregion, one of the most biologically diverse areas in the continental United States. To maintain this diversity, NTFP harvest guidelines that ensure that plant populations will not be overharvested must be developed with close attention to the local variation in their habitats, population size, vigor, and growth rates.

This paper is part of an effort to document experience with local plant populations, micro-climates, and ecological conditions that will encourage locally sustainable harvest methods and volumes. This effort is only a beginning toward building a locally sophisticated culture of wildcrafting that one day will be fine tuned to include harvest guidelines sensitive to micro-environments, annual variations in temperature and precipitation, and respective plant population and wildlife needs, all supported by well-informed and sensitive human communities.

The paper describes 24 species, tips for their preferred habitats and where to find them, suggested ecologically sensitive harvest methods, economic uses, and local buyers of the NTFPs.

The initial species list was drawn from a group of species of interest to members of Trinity Alps Botanicals, a local wildcrafter marketing cooperative. The list was reviewed by USDA-FS staff to emphasize species that are abundant and least likely to be negatively affected by harvesting. In one discussion session, local wildcrafters, USDA-FS specialists and interested citizens expanded upon a dichotomous key (*table 1*) suggested by Julie Nelson, Botanist of the Shasta-Trinity National Forest, to classify species according to their sensitivity to harvest. The group eliminated most potentially sensitive species and emphasized economically valuable exotic or “weedy” species from the initial list. Harvest guidelines for the more sensitive species included are deliberately conservative until results from research trials on regeneration after harvest have been completed. General guidelines for NTFP harvesting are outlined in *table 2*. Prices paid to wildcrafters for several NTFP species in the Hayfork AMA area in 1996 and contact addresses for contract merchants are listed in *table 3*.

The plant species described in the paper are grouped according to their sensitivity to harvest, with the least sensitive listed first. A key to the information presented for each species precedes the plant descriptions. This effort is a beginning and draws heavily upon the excellent literature on plant identification and economic, especially medicinal, uses of plants. The medicinal uses noted here are intended as indicators of known uses for the plants and are deliberately stated in very general terms. Anyone seeking to use these plants for medicinal purposes should consult with professional herbalists and the relevant literature.

Among the many references that have informed our learning process in the Hayfork AMA, Michael Moore’s (1987, 1993) books on medicinal plants and the *EcoHerbalist’s Fieldbook* by Gregory Tilford (1993) are particularly recommended. Moore’s books are our most important references, with useful descriptions of medicinal plants of the West, their uses, and preparation. Beside detailed

Table 1— Key to species categories

(1a) Exotic	Category I
If not, go to 1b	
(1b) Native	
(2a) Very common, associated primarily with disturbed ground	Category II
If not, go to 2b	
(2b) More specialized habitat, less dependent upon disturbed sites	
(3a) Can be farmed off site	Category III
If not, go to 3b	
(3b) Difficult to farm with current knowledge	
(4a) Non-Destructive Harvest (tops, leaves, fruits, seeds) ----	Category IV
If not, go to 4b	
(4b) Destructive Harvest (roots, whole plant)	Category V

Examples of Species Representing the Categories from the Hayfork Adaptive Management Area:

Category I	St. John's wort (<i>Hypericum perforatum</i>)
Category II	Yarrow (<i>Achillea millefolium</i>)
Category III	Blue elderberry (<i>Sambucus mexicana</i>)
Category IV	Horsetails (<i>Equisetum spp.</i>)
Category V	Coltsfoot (<i>Petasites frigidus</i> var. <i>palmaris</i>)

Table 2—Some general guidelines for harvesting

- **Walk lightly on the land.** Be aware of your impact on the woods around you. Wear shoes with soft soles. Avoid trampling plants and compacting soils; do not gather when the ground is wet. Use one entry to a harvesting site and work uphill. Avoid unnecessary walking along stream banks. Try not to disturb wildlife.
 - **Use restraint when harvesting.** Be sure of positive plant identification. Harvest from healthy plant populations, and leave plenty of vigorous, mature and seed-producing plants untouched. Harvest at the optimal time of year. When possible, harvest after flowers have had a chance to go to seed so that the next generation can grow (or if harvesting flowers, leave many behind to seed). Limit harvest to 10 percent of the population for species in the “sensitive” category, when the whole plant or roots are harvested. For the more common plants from which flowers and leaves are taken, harvesters should limit harvest to 15–25 percent of the plants present.
 - **Do not harvest plants for food, medicinal, and basketry purposes from roadsides.** Many plants absorb and concentrate toxic compounds from vehicle exhausts as well as from herbicide spraying.
 - **Do not pick unless you plan to use the plants personally or unless you have already found a buyer for your product.** Buyers have individualized specifications for products you will need to follow. Several local contact addresses for purchasers are listed in the Introduction. Don’t waste your time and the limited resources of the forest.
 - **Cooperate fully with the landowner or land manager where you pick.** Get the necessary permission or permits, and report back if asked to do so. Comply with permit conditions.
-

Table 3—Prices offered to wildcrafters for selected non-timber forest products in the Hayfork Adaptive Management Area in 1996 and commissioned merchants

<i>Non-timber forest products</i>	<i>Price¹</i>
Coltsfoot, Western	\$2.00/lb dry leaf
Common Horsetail	\$1.75/lb dry stem
Curly Dock	\$2.50–\$5.00/lb dry root
Dandelion	\$8.00/lb root
Elderberry, Blue Elderberry	\$4.75/lb dry flowers
English Plantain	\$8.00/lb dry leaf
Self Heal	\$5.00/lb dry flowers and leaf
Sheep Sorrel	\$10.00/lb dry leaf
St. John's wort	\$3.75/lb dry flowers, 6-inch stem, leaf
Mugwort	\$2.75/lb dry leaf
Mullein	\$2.50–\$5.00/lb dry leaf
Oregon grape	\$1.25–\$2.50/lb dry root
Yarrow	\$2.10–\$3.25 /lb dry flowers
Yerba Santa	\$3.25/lb dry leaf
<i>Commissioned merchants:</i>	
Janet Griffin:	Blue Heron Botanicals, 154 Van Duzen River Road, Bridgeville, CA 95526. Telephone: (707) 574-6574; e-mail: herbs@telis.org
Christina Johnson:	Trinity Alps Botanicals, P.O. Box 196, Burnt Ranch, CA 95527. Telephone: (916) 629-3514, (916) 224-8602

¹Prices are subject to change and vary with the local purchaser. Wildcrafters should contact purchasers directly for current prices and detailed product specifications.

suggestions for harvesting 50 plant species, Tilford's book includes a chapter on the ethics of harvesting and simple approaches to monitoring harvest impacts. The plant illustrations used in this report are based upon the photocopy format developed by Phyllis Faber and Robert Holland in their book, *Common Riparian Plants of California* (1988). Guides to plant identification are fundamental to those interested in learning about non-timber forest products. *The Jepson Manual: Higher Plants of California* (Hickman 1993) is our definitive reference key to the flora of California. Using the book requires some background knowledge of botany and use of taxonomic keys. Our favorite, less weighty, guides for the field include the *Petersen Field Guide to Pacific States Wildflowers* (Niehaus and Ripper 1976) with its excellent drawings that allow for comparison of similar plant species on one page. Another easy-to-use field guide is the *National Audubon Society Field Guide to North American Wildflowers, Western Region* (Spellenberg 1992). As in Petersen's book, plants are coded by flower color and structure, and in this case, are illustrated with excellent photographs. Although not as easy to use as the preceding guides, Strickler's *Wayside Wildflowers of the Pacific Northwest* (1993) has unrivaled clear and beautiful color photographs. Alice Goen Jones' *Flowers and Trees of the Trinity Alps* is useful for identifying species in this local area. Many important non-timber forest products are derived from plants considered to be weeds that are often not included in wildflower guides. Two guides with excellent photos for identification of these plants are Taylor's (1990) *Northwest Weeds* and Whitson's (1991) *Weeds of the West*. Among the many additional books on herbs in general, we use Lesley Bremness' (1994) introductory guide, *Herbs*, with beautiful illustrations of useful plants from around the world; the comprehensive *Rodale Encyclopedia of Herbs* (Kowalchick and Hylton 1987), which includes tips for cultivation; John Lust's (1974) classic, *The Herb Book*, a compendium of descriptions and uses of herbs; the more recent (1990) *The Way of Herbs* by Michael Tierra; and Miller's (1988) guide to *Native Plants of Commercial Importance*, which includes discussion of wildcrafting and marketing of native plants. There are numerous references that provide information on Native American knowledge and uses of plants, including a pocket guide by Balls (1962), *Early Uses of California Plants*; a book by Alma Hutchens (1991), entitled *Indian Herbalogy of North America*, with useful cross references to indigenous uses of plants in Europe, Russia, and North America; and ethnobotanical works, such as Baker's (1981) *The Ethnobotany of the Yurok, Tolowa and Karok Indians of Northwest California*.

We would be pleased to receive comments and suggestions for additional information to incorporate in future efforts. Please send them to: Dr. Yvonne Everett, Watershed Research and Training Center, P.O. Box 356, Hayfork, CA 96041.

Key to Summary Information for Included Species

COMMON NAMES:	Locally common names; additional names may apply.
BOTANICAL NAME:	Latin name listing genus first with a capital letter, followed by the species name and the name of the person who first formally described the plant (e.g., <i>Achillea millefolium</i> L.). This way of identifying a species (nomenclature) follows the 1993 edition of the <i>Jepson Manual: Higher Plants of California</i> edited by James C. Hickman (referred to hereafter as Jepson).
FAMILY:	Nomenclature follows Jepson, with synonyms in parentheses.
DESCRIPTION:	A brief, non-technical description of each species for identification purposes.
REPRODUCTION:	A description of the way the plant reproduces, which has implications for harvest methods and timing.
DISTRIBUTION:	<i>Global:</i> Describes the geographic range of the species in the world, emphasizing the Pacific Northwest (PNW) of the United States and Canada. <i>Local:</i> Describes the general pattern and relative abundance of distribution for the species in the Hayfork Adaptive Management Area; a species may be common or abundant in its particular habitat but not common in the AMA landscape as a whole.
ELEVATION RANGE:	Lists the elevations in which the species is known to occur; in most cases this is a California or PNW-wide estimate drawn from Jepson.
SLOPE AND ASPECT:	Slope gradient and position relative to the sun preferred by each species where known or important.
SOIL TYPE:	General description of characteristic soils in which each species is found, where known or relevant.
PLANT COMMUNITY:	The vegetation community (e.g., meadow, forest) in which the species is usually found.
ASSOCIATED SPECIES:	A short list of other plants commonly found growing near the species of interest.

SERAL STAGE: Based on ecological theories of succession, Seral Stage identifies the period in vegetation development over time in which the species is typical (e.g., early succession includes areas recently disturbed in which annual grasses and herbs predominate; mid stages include transitions from brush to mature closed-canopy forest, and late Seral Stages include old-growth forests and woodlands).

SPECIAL HABITATS, ECOLOGICAL FEATURES, AND MANAGEMENT CONCERNS: More detailed descriptions of species' growth habits and likely habitats, including our category of the plant's sensitivity to harvest.

PARTS HARVESTED: Plant parts that are gathered by wildcrafters.

HARVEST TIMING: Seasons in which plants are best harvested to minimize ecological impacts and still achieve good quality harvest.

SUGGESTED HARVEST METHODS: Descriptions of approaches to harvesting that should minimize harvest impacts and maintain or enhance wild plant populations.

SUITABILITY FOR CULTIVATION: Known methods for propagating the species.

SPIRITUAL AND CULTURAL SIGNIFICANCE: Lists general categories of traditional uses of plants by indigenous people. Such use can be an indication of long-standing human experience with a plant species and possible additional sources of information about the plant.

ECONOMIC USES: Current uses of plant products from each species which may include, but are not limited to, traditional uses.

Least Sensitive to Harvest

Curly Dock - *Rumex crispus*. 12

Dandelion - *Taraxacum officinale*. 14

Mullein - *Verbascum thapsus* 16

Oxeye Daisy - *Leucanthemum vulgare* (*Chrysanthemum leucanthemum*) . . 18

Plantain - *Plantago lanceolata* 20

Sheep Sorrel - *Rumex acetosella* 22

Shepherd's Purse - *Capsella bursa-pastoris* 24

St. John's Wort - *Hypericum perforatum*. 26

Vervain - *Verbena lasiostachys* 28

Yarrow - *Achillea millefolium* 30



Photo by Roger Jaegel

Least Sensitive to Harvest

- COMMON NAMES:** Curly dock, yellow dock, sour dock (*fig. 2*)
- BOTANICAL NAME:** *Rumex crispus* L.
- FAMILY:** Polygonaceae (Buckwheat family)
- DESCRIPTION:** Robust perennial herb, 1–5 feet tall, stout taproot, narrow strap-like to arrow-shaped leaves to 12 inches long in clusters at base with crisp, curly edges, upper leaves smaller than below, stems unbranched with elongate flower clusters and densely packed three winged seeds that turn reddish in late summer
- REPRODUCTION:** Seed
- DISTRIBUTION:** *Global:* native to Europe; introduced to North America
Local: common
- ELEVATION RANGE:** Below 9,000 ft
- SLOPE AND ASPECT:** All
- SOIL TYPE:** Moist soils
- PLANT COMMUNITY:** Meadow, woodland, forest edge
- ASSOCIATED SPECIES:** Grasses, yarrow, mullein
- SERIAL STAGE:** Early succession
- SPECIAL HABITATS, ECOLOGICAL FEATURES, AND MANAGEMENT CONCERNS:**
Sensitivity Category I; Weedy, thrives on disturbance; found on roadsides, in moist fields, clearcuts and pastures, seasonal sunny drainages in dry interior habitats
- PARTS HARVESTED:** Root, leaves
- HARVEST TIMING:** Fall after first rain for roots; early in year for leaves
- SUGGESTED HARVEST METHODS:**
Dig for roots in fall after plant has gone to seed; dig up roots in relatively dry locations—the more deep yellow color the inside of the root the better; pick leaves when young and tender
- SUITABILITY FOR CULTIVATION:**
Unknown
- SPIRITUAL AND CULTURAL SIGNIFICANCE:**
Native American food and medicinal
- ECONOMIC USES:** Herbalists suggest curly dock root be used in tea or tincture form to aid digestion; or applied topically for treating acne, skin diseases, and parasites; young leaves are an excellent source of iron in salads, whole plant used in dried floral arrangements

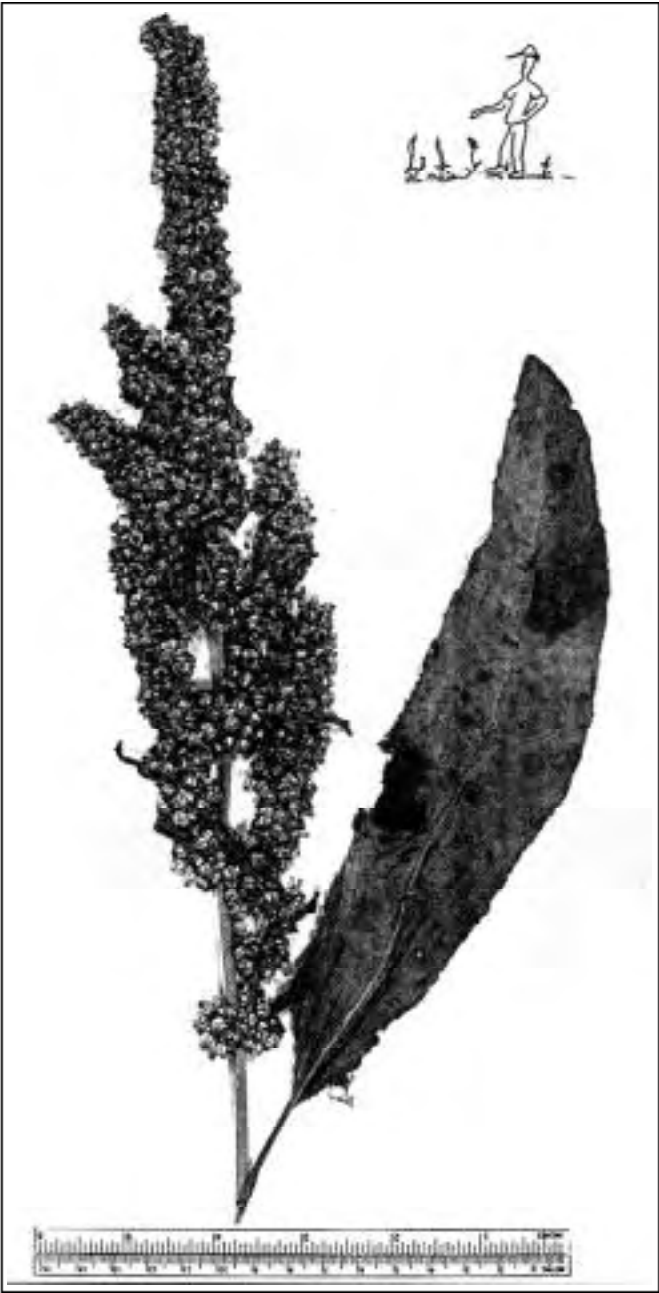


Illustration by Jolie Lonner

Figure 2 —CURLY DOCK *Rumex crispus* buckwheat family Polygonaceae

- COMMON NAMES:** Dandelion (*fig. 3*)
- BOTANICAL NAME:** *Taraxacum officinale* Wigg.
- FAMILY:** Asteraceae (Sunflower family)
- DESCRIPTION:** Leaves variously toothed or lobed in rosettes, shiny green, no hair; flower head 1–1.5 inches wide, yellow, golden color on single long stem; stem hollow, milky; long thick taproot
- REPRODUCTION:** Root, seed
- DISTRIBUTION:** *Global:* native to Europe, common weed throughout N. America
Local: common
- ELEVATION RANGE:** Below 10,000 ft
- SLOPE AND ASPECT:** Flat ground preferred
- SOIL TYPE:** Moist
- PLANT COMMUNITY:** Meadows
- ASSOCIATED SPECIES:** Grasses, plantain
- SERIAL STAGE:** Early succession
- SPECIAL HABITATS, ECOLOGICAL FUNCTIONS AND MANAGEMENT CONCERNS:**
Sensitivity Category I; Weedy, thrives on disturbance; common along roadsides, in meadows, vacant lots, lawns
- PARTS HARVESTED:** Leaves, root
- HARVEST TIMING:** Spring for leaves; fall for root
- SUGGESTED HARVEST METHODS:**
Pluck leaves when young and tender, older leaves are bitter
- SUITABILITY FOR CULTIVATION:**
Can be cultivated
- SPIRITUAL AND CULTURAL SIGNIFICANCE:**
Native American and European medicinal and food plant
- ECONOMIC USES:** Herbalists suggest that the medicinal uses of dandelion leaf and root differ: dandelion leaf is an effective herbal diuretic. The tea can help to reduce high blood pressure and be used to treat urinary disorders. Dandelion root is a bitter and mild laxative as well as a mild diuretic; it can be used to treat jaundice and support kidney and liver function. The root is also used to reduce inflammation from allergies and in rheumatic joints; fresh leaves are nutritious in salads; roots yield a magenta dye.



Illustration by Jolie Lonner

Figure 3 —DANDELION *Taraxacum officinale* sunflower family Asteraceae

COMMON NAMES: Mullein, Woolly mullein (*fig. 4*)

BOTANICAL NAME: *Verbascum thapsus* L.

FAMILY: Scrophulariaceae (Figwort family)

DESCRIPTION: Biennial herb, 3–6 feet tall; during the first year, a basal rosette of thick, woolly entire leaves, during the second year a 2- to 6-ft tall stalk shoots up, leaves decrease in size from the base to the top of the stalk that ends in a head of densely packed lemon yellow flowers, which are tubular with five lobes

REPRODUCTION: Seed

DISTRIBUTION: *Global:* native to Eurasia, now widespread in the United States
Local: common

ELEVATION RANGE: Below 7,500 ft

SLOPE AND ASPECT: Prefers gentle slopes to flat ground

SOIL TYPE: Well-drained, rocky, gravelly

PLANT COMMUNITY: Meadow, open woodland, forest edge

ASSOCIATED SPECIES: Grasses, yarrow

SERIAL STAGE: Early succession

SPECIAL HABITATS, ECOLOGICAL FUNCTIONS, AND MANAGEMENT CONCERNS:

Sensitivity Category I; One of the first plants to come in after major disturbance, especially fire; found along roadsides, in burns, clearcuts, young plantations, mine tailings, draw-down zones of reservoirs.

PARTS HARVESTED: Leaves, flowers

HARVEST TIMING: Leaves best before flowering; harvest flowers at peak bloom

SUGGESTED HARVEST METHODS:

Harvest from plant in field; do not take whole plant for later leaf, flower removal, as the plant will draw in its sap to the stem, decreasing active compounds in leaves; leave portion of leaves and flowers on each plant to allow for reseeding

SUITABILITY FOR CULTIVATION:

Can be cultivated

SPIRITUAL AND CULTURAL SIGNIFICANCE:

Medicinal use by Native Americans and Russians

ECONOMIC USES: Herbalists recommend a medicinal tea from dried leaves, dried flowers to treat coughs, congestion of lungs and throat, especially in initial stages of infection; oil from flowers for earaches; roots to treat bladder weakness and to be taken as a urinary tract diuretic and astringent



Illustration by Jolie Lonner

Figure 4 —MULLEIN *Verbascum thapsus* figwort family Scrophulariaceae

- COMMON NAMES:** Oxeye daisy, field daisy (*fig. 5*)
- BOTANICAL NAME:** *Leucanthemum vulgare* Lam. (*Chrysanthemum leucanthemum* L.)
- FAMILY:** Asteraceae (Sunflower family)
- DESCRIPTION:** Perennial branched herb with 1–10 stems per plant, 2–3 ft tall; irregularly ridged stems; alternate, widely spaced, long, narrow, toothed leaves; daisy flowers, 22 or more white ray flowers, flower head center yellow, 1- to 2.5-inch diameter; emits a yarrow, or chamomile-like odor when crushed
- REPRODUCTION:** Primarily vegetative, creeping rootstock
- DISTRIBUTION:** *Global:* native to Europe, cultivated in pastures, escaped to North America
Local: abundant
- ELEVATION RANGE:** Below 6,000 ft
- SLOPE AND ASPECT:** All
- SOIL TYPE:** Well-drained
- PLANT COMMUNITY:** Meadow, open woodland
- ASSOCIATED SPECIES:** Grasses, yarrow, mullein, St. John's wort
- SERIAL STAGE:** Early succession
- SPECIAL HABITATS, ECOLOGICAL FEATURES, AND MANAGEMENT CONCERNS:**
Sensitivity Category I; Found in disturbed areas along roadsides, in vacant lots, fields
- PARTS HARVESTED:** Flowers
- HARVEST TIMING:** Best early in season; flowers early to mid June
- SUGGESTED HARVEST METHODS:**
Clip flower heads; always leave ample flowers behind for seed
- SUITABILITY FOR CULTIVATION:**
Easy to cultivate
- SPIRITUAL AND CULTURAL SIGNIFICANCE:**
Common floral
- ECONOMIC USES:** Herbalists suggest that daisy tea helps to dry secretions (asthma, bronchitis), acts as an anti-fungal, antibacterial; can be used as a disinfecting wash in external applications; flowers are an active insecticide and flea repellent; cut flowers are marketed



Illustration by Jolie Lonner

Figure 5 —OX-EYE DAISY *Leucanthemum vulgare* sunflower family Asteraceae

- COMMON NAMES:** Plantain, English plantain, ribwort, white man's foot (*fig. 6*)
- BOTANICAL NAME:** *Plantago lanceolata* L.
- FAMILY:** Plantaginaceae (Plantain family)
- DESCRIPTION:** Perennial herb 5–15 inches tall in flower; clustered fibrous roots with long taproot; leaves entire or shallow lobed, lance shaped, parallel veined, often finely toothed, 2–6 inches long in a rosette around base of plant; flowers on wiry stems densely clustered in 0.5- to 2-inch spikes at end of stem
- REPRODUCTION:** From seed and at least partially vegetative
- DISTRIBUTION:** *Global:* native to Europe, introduced to North America, now widespread in United States
Local: very common
- ELEVATION RANGE:** Below 4,200 ft
- SLOPE AND ASPECT:** Most common on flat ground
- SOIL TYPE:** Well-drained
- PLANT COMMUNITY:** Meadow
- ASSOCIATED SPECIES:** Grasses, herbs
- SERIAL STAGE:** Early succession
- SPECIAL HABITATS, ECOLOGICAL FEATURES, AND MANAGEMENT CONCERNS:**
Sensitivity Category I; Weedy, thrives on disturbance, enhanced by mowing; common in lawns, fields, pastures, along sunny stream banks, in sidewalk cracks; stays green even in dry conditions, may be important secondary food for wildlife during drought
- PARTS HARVESTED:** Leaves and seed heads
- HARVEST TIMING:** Whenever plants are green and healthy looking
- SUGGESTED HARVEST METHODS:**
Pick by hand or clip; best to pick when flower stalk is visible to avoid mix-ups with potentially harmful lilies; pick seed heads when dry
- SUITABILITY FOR CULTIVATION:**
Can be cultivated
- SPIRITUAL AND CULTURAL SIGNIFICANCE:**
Native American medicinal
- ECONOMIC USES:** Herbalists use the plant as a medicinal oil, salve, wash; leaves anti-inflammatory and anti-microbial in poultices for burns, insect bites and stings; seeds used as laxative



Illustration by Jolie Lonner

Figure 6 —PLANTAIN *Plantago lanceolata* plantain family *Plantaginaceae*

- COMMON NAMES:** Sheep sorrel (*fig. 7*)
- BOTANICAL NAME:** *Rumex acetosella* L.
- FAMILY:** Polygonaceae (Buckwheat family)
- DESCRIPTION:** Perennial herb grows 1–2 feet tall; leaves shaped like arrowheads 1–3 inches long; small flowers grow in dense clusters on several branches, reddish
- REPRODUCTION:** Rootstock
- DISTRIBUTION:** *Global:* native to Europe; now found throughout California
Local: common
- ELEVATION RANGE:** Below 9,000 ft
- SLOPE AND ASPECT:** All
- SOIL TYPE:** Moist
- PLANT COMMUNITY:** Meadow
- ASSOCIATED SPECIES:** Grasses, herbs
- SERAL STAGE:** Early succession
- SPECIAL HABITATS, ECOLOGICAL FEATURES, AND MANAGEMENT CONCERNS:**
Sensitivity Category I; Found in moist disturbed areas, on roadsides, vacant lots, clearcuts, lawns, pastures, fields; weedy, rhizomes break easily, broken pieces remaining behind sprout anew
- PARTS HARVESTED:** Whole aboveground plant
- HARVEST TIMING:** Spring
- SUGGESTED HARVEST METHODS:**
Cut plants when leaves are young and tender and seeds are present for positive identification. Sheep sorrel browns very easily, is fragile and difficult to dry
- SUITABILITY FOR CULTIVATION:**
Grows well from transplanted roots
- SPIRITUAL AND CULTURAL SIGNIFICANCE:**
Native American food plant
- ECONOMIC USES:** Medicinal—a common ingredient in the ESSIA¹ herbal formula used to treat some cancers; also a salad green, adds tart flavor.

¹Trade names and commercial products or enterprises are mentioned solely for information. No endorsement by the U.S. Department of Agriculture is implied.



Illustration by Jolie Lonner

Figure 7 —SHEEP SORREL *Rumex acetosella* buckwheat family
Polygonaceae

- COMMON NAMES:** Shepherd's purse (*fig. 8*)
- BOTANICAL NAME:** *Capsella bursa-pastoris* L. (Medikcus)
- FAMILY:** Brassicaceae (Mustard family)
- DESCRIPTION:** Branched annual grows 12–20 inches tall. Leaves at base are lobed and toothed, hairy below; leaves on stem clasp stalk and have pointed ear-like lobes; flowers are white, about 0.25 inch in size and clustered along stem; fruits are a flat triangular to heart-shaped “purse” divided into two parts with several seeds contained in each
- REPRODUCTION:** Seed
- DISTRIBUTION:** *Global:* Native to Europe, introduced to North America
Local: common
- ELEVATION RANGE:** Below 7,000 ft
- SLOPE AND ASPECT:** Most likely in flat places
- SOIL TYPE:** Prefers rich, well drained soil
- PLANT COMMUNITY:** Meadows
- ASSOCIATED SPECIES:** Grasses, herbs
- SERIAL STAGE:** Early succession
- SPECIAL HABITATS, ECOLOGICAL FEATURES, AND MANAGEMENT CONCERNS:**
Sensitivity Category I; Common in disturbed areas such as meadows, fields, pastures, gardens, roadsides, burns, clearcuts, empty lots
- PARTS HARVESTED:** Whole plant
- HARVEST TIMING:** Spring, summer
- SUGGESTED HARVEST METHODS:**
Best time to gather is when seed capsules have formed (yet flowers are still present) to ensure potency and positive identification
- SUITABILITY FOR CULTIVATION:**
Can be cultivated, very invasive
- SPIRITUAL AND CULTURAL SIGNIFICANCE:**
Native American food plant
- ECONOMIC USES:** Herbalists use a tincture of fresh plants to stop hemorrhaging such as post-partum bleeding and for treatment of urinary inflammations; edible fresh in salads



Figure 8 —SHEPHERD'S PURSE *Capsella bursa-pastoris* mustard family Brassicaceae

Illustration by Jolie Lonner

- COMMON NAMES:** St. John's wort, Klamath weed (*fig. 9*)
- BOTANICAL NAME:** *Hypericum perforatum* L.
- FAMILY:** Hypericaceae (St. John's wort family)
- DESCRIPTION:** Upright, branched perennial herb 2–3 feet tall; two edged stems, opposite pale green narrowly oblong leaves less than 1 inch long with translucent oil glands like dots embedded on leaf surface (hold leaf up to light to see glands); flowers yellow, with five sepals, five petals, many yellow stamens; flowers bruise red, stain purple; fruit three-celled capsule; distinctive "curry like" odor
- REPRODUCTION:** Seed, sprouts from tap root and short runners (one creeping root mass may have numerous aboveground "plants")
- DISTRIBUTION:** *Global:* native to Europe; introduced to eastern North America, now found in Pacific Northwest to British Columbia, Idaho, W. Montana, NW. California, High Cascade Range, northern and central Sierra Nevada, Sacramento Valley, Central Coast, San Francisco Bay Area, Peninsular Ranges
Local: common
- ELEVATION RANGE:** Below 4,500 ft
- SLOPE AND ASPECT:** All
- SOIL TYPE:** Well-drained
- PLANT COMMUNITY:** Meadow, open woodland, mixed conifer forest edge, open cover riparian
- ASSOCIATED SPECIES:** Grasses, herbs
- SERIAL STAGE:** Early succession
- SPECIAL HABITATS, ECOLOGICAL FEATURES AND MANAGEMENT CONCERNS:**
Sensitivity Category I; St. John's wort is sun loving and found singly or in small clumps everywhere along roadsides, in burned-over areas, clearcuts and young plantations, grasslands, fields, pastures and along streams. Classified as a weedy, exotic species, St. John's wort is invasive. In feed, it causes livestock to become sensitive to sunlight and suffer damage to their eyes and skin. A beetle (*Chrysolina quadrigemina*) and a Cinnabar moth have been introduced as biological controls to contain the plants' spread; St. John's wort attracts pollinators, especially bees.
- PARTS HARVESTED:** Flowers, leaves, flowering tops
- HARVEST TIMING:** June–August
- SUGGESTED HARVEST METHODS:**
Cut top of stems with flowers with clippers at beginning of blooming; active ingredients are strongest in the bud stage well before flowers go to seed.



Illustration by Jolie Lonner

Figure 9 —ST. JOHN'S WORT *Hypericum perforatum* St. John's Wort
family Hypericaceae

SUITABILITY FOR CULTIVATION:

Easy to cultivate but as St. John's wort is classified as a noxious weed; cultivation is not advised due to danger of further spreading.

SPIRITUAL AND CULTURAL SIGNIFICANCE:

Widely used in European medicine

ECONOMIC USES:

Medicinal tea, oil, and tincture are antidepressant, antibacterial, antiviral, and astringent; used to lessen nerve overstimulation and take edge off of pain; to treat gastritis and stomach ulcers, oil used externally for abrasions, burns, skin ulceration, muscle, nerve pain; produces a yellow or red dye.

- COMMON NAMES:** Vervain (*fig. 10*)
- BOTANICAL NAME:** *Verbena lasiostachys* Link.
- FAMILY:** Verbenaceae (Vervain family)
- DESCRIPTION:** Upright, square stemmed, mint-like plants; 1–2 feet tall, branched; leaves simple, opposite up to 4 inches long, sword-shaped to oval, lobed, serrated; tiny blue flowers in long spikes, flowering successively toward tips; not aromatic
- REPRODUCTION:** Seed
- DISTRIBUTION:** *Global:* common in tropical, subtropical, and temperate America, Europe
Local: common
- ELEVATION:** Below 4,000 ft
- SLOPE AND ASPECT:** Prefers flat ground
- SOIL TYPE:** Well-drained to moist
- PLANT COMMUNITY:** Meadows, fields, pastures, roadsides
- ASSOCIATED SPECIES:** Grasses, yarrow, St. John's wort
- SERAL STAGE:** Early succession
- SPECIAL HABITATS, ECOLOGICAL FEATURES, AND MANAGEMENT CONCERNS:**
Sensitivity Category II; Thrives in disturbed areas; along roadsides, in burns, clearcuts, asphalt cracks, streamsides
- PARTS HARVESTED:** Leaves, flowers
- HARVEST TIMING:** Spring, summer
- SUGGESTED HARVEST METHODS:**
Clip plants above ground when in flower. Discard woody stems.
- SUITABILITY FOR CULTIVATION:**
Can be cultivated via root division in spring; seed in fall
- ECONOMIC USES:** Herbalists suggest vervain tea as a sedative, diaphoretic, diuretic, bitter tonic, antispasmodic; especially used at the onset of headaches, colds and flu



Figure 10 —VERVAIN *Verbena lasiostachys* Vervain family Verbenaceae

Illustration by Jolie Lonner

- COMMON NAMES:** Yarrow, Milfoil (*fig. 11*)
- BOTANICAL NAME:** *Achillea millefolium* L.
- FAMILY:** Asteraceae (Sunflower family)
- DESCRIPTION:** Perennial herb, often branched, up to 3 feet tall, covered with silky hairs; fine, feathery, fern-like leaves; numerous tiny white flower heads gathered in flat topped clusters
- REPRODUCTION:** From seed or via vegetative growth from short rootstock
- DISTRIBUTION:** *Global:* broad distribution; native to Europe and North America. *A. millefolium* var. *lanulosa* native to North America, common in California and Pacific Northwest
Local: common throughout HAMA, especially in drier areas, e.g. Hayfork.
- ELEVATION RANGE:** Below 11,000 ft
- SLOPE AND ASPECT:** Prefers flat ground and moderate slopes
- SOIL TYPE:** Though widespread, yarrow prefers neutral (pH 6.1), well-drained soil
- PLANT COMMUNITY:** Meadow, open woodland
- ASSOCIATED SPECIES:** Grasses, herbs, mullein, *Ceanothus* spp.
- SERAL STAGE:** Early grass/herb/shrub
- SPECIAL HABITATS, ECOLOGICAL FEATURES, AND MANAGEMENT CONCERNS:**
Sensitivity Category II; Yarrow thrives on frequently disturbed sites especially after fire. It is found in sunny fields, pastures, young forest plantations, and along roadsides.
- PARTS HARVESTED:** Flower heads
- HARVEST TIMING:** In most of the HAMA, harvest from June through September from lower to higher elevations
- SUGGESTED HARVEST METHODS:**
Cut flower heads with clippers when in full bloom, leave plenty of heads behind for reseeding. Dry loose in shade.
- SUITABILITY FOR CULTIVATION:**
Easily cultivated from root cuttings or seed. Yarrow attracts beneficial insects, e.g., ladybugs and predatory wasps; may enhance other plants' essential oil production when companion planted; can be used as a ground cover and mowed once per year
- SPIRITUAL AND CULTURAL SIGNIFICANCE:**
Native American medicinal
- ECONOMIC USES:** Fresh leaves and essential oil used as a topical first aid to reduce bleeding; medicinal tea of flower heads good for colds and used as a stomach tonic, to stimulate sweating in acute fevers and to



Illustration by Jolie Lonner

Figure 11 —YARROW *Achillea millefolium* sunflower family Asteraceae

regulate menstruation; used in cleansing lotions for skin (astringent); as a moth repellent; flowers for yellow dye; whole plant for olive dye for wool; fresh and dried cut flowers marketed.

Moderately Sensitive to Harvest

Elderberry - <i>Sambucus melanocarpa</i>	34
Elderberry, Blue - <i>Sambucus mexicana</i>	36
Horsetail, Common - <i>Equisetum arvense</i>	38
Horsetail, Common Scouring Rush - <i>Equisetum hyemale</i> ssp. <i>affine</i>	40
Horsetail, Smooth Scouring Rush - <i>Equisetum laevigatum</i>	42
Manzanita, Greenleaf - <i>Arctostaphylos patula</i>	44
Manzanita, Pinemat - <i>Arctostaphylos nevadensis</i>	46
Manzanita, Whiteleaf - <i>Arctostaphylos viscida</i>	48
Mugwort - <i>Artemisia douglasiana</i>	50
Self-Heal - <i>Prunella vulgaris</i> var. <i>lanceolata</i>	52
Yerba Santa - <i>Eriodictyon californicum</i>	54

Moderately Sensitive to Harvest



Photo by Roger Jaegel

- COMMON NAME:** Elderberry, "Country Medicine Chest" (fig. 12)
- BOTANICAL NAME:** *Sambucus melanocarpa* A. Gray
- FAMILY:** Caprifoliaceae (Honeysuckle family)
- DESCRIPTION:** Deciduous, many branched 3- to 6-foot small tree, compound leaves with 5–7 leaflets and saw-toothed margins; creamy white early summer flowers in fragrant, dense dome-shaped clusters, blue to black berries
- REPRODUCTION:** Seed
- DISTRIBUTION:** *Global:* High Sierra to W. Canada, Utah, New Mexico, Cascade Ranges
Local: found sporadically all over HAMA, more common around Willow Creek
- ELEVATION RANGE:** 5,400–11,500 ft
- SLOPE AND ASPECT:** Moderate slopes
- SOIL TYPE:** Prefers potassium-rich soils (e.g., after burns)
- PLANT COMMUNITY:** Mixed conifer, montane brush, sunny riparian
- ASSOCIATED SPECIES:** *Ceanothus* spp. madrone, manzanita, conifers
- SERIAL STAGE:** Early to mid succession
- SPECIAL HABITATS, ECOLOGICAL FEATURES, AND MANAGEMENT CONCERNS:**
Sensitivity Category III; found along streamsides, meadow or forest edge, in young plantations, brushfields, burns, roadsides several years after disturbance
- PARTS HARVESTED:** Flowers, berries
- HARVEST TIMING:** Flowers in summer, berries in fall
- SUGGESTED HARVEST METHODS:**
When harvesting, do not strip bushes, leave a significant amount of flowers behind to bear fruit or leave berries for wildlife
- SUITABILITY FOR CULTIVATION:**
Can be cultivated
- SPIRITUAL AND CULTURAL SIGNIFICANCE:**
Native American food plant
- ECONOMIC USE:** Herbalists suggest that a tea of the flowers is medicinal for hay fever, coughs, sore throat, cold, flu, high in Vitamin A and C; expectorant, diaphoretic (causes sweating to break a fever), mild laxative; flowers can be eaten, made into beverages, used for eye and skin lotions; leaves for bruises and sprains, bark for epilepsy, roots for lymphatic and kidney ailments; berries



Illustration by Jolie Lerner

Figure 12 —ELDERBERRY *Sambucus melanocarpa* honeysuckle family *Caprifoliaceae*

eaten (caution: raw berries can cause gastric upset), for jams, elderberry wine high in protein and iron; fruits produce green, violet and black dyes; brew of leaves makes an insecticide.

- COMMON NAME:** Blue elderberry, "Country Medicine Chest" (*fig. 13*)
- BOTANICAL NAME:** *Sambucus mexicana* C. Presl.
- FAMILY:** Caprifoliaceae (Honeysuckle family)
- DESCRIPTION:** Deciduous shrubby tree lacking a mainstem; creamy white, flat topped, early summer flowers with central cluster shorter than surrounding flowers; blue to purple berries
- REPRODUCTION:** Seed
- DISTRIBUTION:** *Global* High Sierra to W. Canada, Utah, New Mexico, Cascade Ranges
Local found all over HAMA; common around the Hayfork area
- ELEVATION RANGE:** Below 9,000 ft
- SLOPE AND ASPECT:** Moderate slopes
- SOIL TYPE:** Well-drained
- PLANT COMMUNITY:** Forest edge, streamside, brush
- ASSOCIATED SPECIES:** *Ceanothus* spp. madrone, manzanita, conifers
- SERIAL STAGE:** Early to mid succession, brush
- SPECIAL HABITATS, ECOLOGICAL FEATURES, AND MANAGEMENT CONCERNS:**
Sensitivity Category III; Found along streamside, meadow or forest edge, disturbed areas, young plantations, brushfields, burns, roadsides
- PARTS HARVESTED:** Flowers, leaves, berries
- HARVEST TIMING:** Early summer for flowers; late summer and fall for berries
- SUGGESTED HARVEST METHODS:**
Use knife or clippers to cut flowers and berries from stem; avoid damaging the bush; leave plenty of flowers or berries behind.
- SUITABILITY FOR CULTIVATION:**
Can be cultivated
- SPIRITUAL AND CULTURAL SIGNIFICANCE:**
Native American food plant
- ECONOMIC USE:** Herbalists suggest a medicinal tea of flowers to treat hayfever, coughs, sore throat, colds, fever; elderberry is a blood purifier and mild laxative; flowers can be eaten, made into beverages, used for eye and skin lotions; leaves for bruises and sprains, bark for epilepsy, roots for lymphatic and kidney ailments; berries eaten (caution: berries can cause gastric upset), used in jams, elderberry wine; green, violet and black dyes; brew of leaves makes an insecticide.



Illustration by Jolie Lonner

Figure 13 —BLUE ELDER *Sambucus mexicana* honeysuckle family *Caprifoliaceae*

COMMON NAMES: Horsetail, Common horsetail (*fig. 14*)

BOTANICAL NAME: *Equisetum arvense* L.

FAMILY: Equisetaceae (Horsetail family)

DESCRIPTION: Perennial, non-flowering herb, 1–3 feet tall; above-ground shoots branched in whorls, jointed sections with black-tipped teeth; scale like leaves; fertile shoots unbranched, 4–10 inches with cone-shaped tip from which spores are released; deep creeping roots

REPRODUCTION: By spores held in cones on fertile shoots; rootstock

DISTRIBUTION: *Global:* Asia, Europe, North America
Local: abundant in key habitats

ELEVATION RANGE: Below 9,000 ft

SLOPE AND ASPECT: Flat ground, north aspect more likely

SOIL TYPE: Moist soils

PLANT COMMUNITY: Riparian forest

ASSOCIATED SPECIES: Spikenard, coltsfoot

SERAL STAGE: All

SPECIAL HABITATS, ECOLOGICAL FEATURES AND MANAGEMENT CONCERNS:

Sensitivity Category IV; Found in moist disturbed areas along streams, shady springs, seeps, moist banks on roadsides; one of the most evolutionarily ancient plants; can be toxic to livestock if more than 20 percent of their feed; plants accumulate minerals from soil (silicates, gold, silver, selenium); Riparian Reserve standards must be met for harvest from public lands.

PARTS HARVESTED: Sterile shoots, fertile shoots

HARVEST TIMING: Fertile shoots for salads in spring; sterile shoots all year; however, for medicinal purposes always harvest early as silica in plants hardens and makes older shoots less soluble. They can become irritants.

SUGGESTED HARVEST METHODS:

Cut with clippers above ground; gather from edge of healthy stands during dry weather, avoid trampling and compaction. Horsetails concentrate toxic chemicals and soil compounds, avoid gathering from soils rich in toxic minerals such as selenium and along roadsides and where herbicides have been applied; gather near non-polluted, clear creeks.

SUITABILITY FOR CULTIVATION:

Spreads by rootstock; encouraged by pruning but difficult to transplant

SPIRITUAL AND CULTURAL SIGNIFICANCE:

Native American food and fiber



Illustration by Jolie Lonner

Figure 14 —COMMON HORSETAIL *Equisetum arvense* horsetail family Equisetaceae

ECONOMIC USES: Herbalists suggest that the tea is astringent and diuretic, helps lung recovery from asthma, pneumonia or infections; dried plant topically applied slows external bleeding, heals wounds, strengthens hair and nails; shoots and roots edible; fiber used for scouring

- COMMON NAME:** Horsetail, Common scouring rush (*fig. 15*)
- BOTANICAL NAME:** *Equisetum hyemale* L. ssp. *affine* (Engelm.) Calder and R.H. Taylor
- FAMILY:** Equisetaceae (Horsetail family)
- DESCRIPTION:** Perennial; unbranched shoots 2–5 feet tall; 10–50 sheath teeth at stem joints; two dark bands on stems; cone pointed
- REGENERATION:** By rootstock, spores
- DISTRIBUTION:** *Global:* North America, California Floristic Province (not in Central Valley)
Local common in key habitat
- ELEVATION:** Below 8,500 ft
- SLOPE AND ASPECT:** North aspect most likely, moderate to flat slopes
- SOIL TYPE:** Moist, sandy, gravelly
- PLANT COMMUNITY:** Riparian forest, wet meadow
- ASSOCIATED SPECIES:** Umbrella plant; grasses, rushes, alder, big leaf maple
- SERAL STAGE:** All
- SPECIAL HABITATS, ECOLOGICAL FEATURES, AND MANAGEMENT CONCERNS:**
Sensitivity Category IV; Comparatively indifferent to disturbance; found along streams, springs, road banks, culverts; Riparian Reserve standards must be met for harvest from public lands
- PARTS HARVESTED :** Shoots
- HARVEST TIMING:** All year except early spring
- SUGGESTED HARVEST METHODS:**
Clip shoots with clippers close to ground; select plants at the edge of a patch to avoid trampling
- SUITABILITY FOR CULTIVATION:**
Can be propagated with rootstock
- SPIRITUAL AND CULTURAL SIGNIFICANCE:**
Native American food and fiber plant
- ECONOMIC USE:** Herbalists suggest that the medicinal tea is astringent and diuretic, helps lung recovery from asthma, pneumonia, or infections; applied topically, plant slows external bleeding, heals wounds; shoots and roots edible; fiber used for scouring.



Illustration by Jolie Lonner

Figure 15 —COMMON SCOURING RUSH *Equisetum hyemale* ssp. *affine* horsetail family *Equisetaceae*

- COMMON NAME:** Horsetail, Smooth scouring rush (*fig. 16*)
- BOTANICAL NAME:** *Equisetum laevigatum* A. Braun
- FAMILY:** Equisetaceae (Horsetail family)
- DESCRIPTION:** Unbranched 1–5 feet tall; 10–50 sheath teeth at stem joints; shoots with one dark band at tip; cone rounded
- REPRODUCTION:** Rootstock
- DISTRIBUTION:** *Global:* California Floristic Province, Modoc Plateau, desert mountains to British Columbia, Canada; Eastern United States
Local: in key habitat areas
- ELEVATION:** Below 9,000 ft
- SLOPE AND ASPECT:** Moderate to flat ground, north aspect
- SOIL TYPE:** Wet to moist
- PLANT COMMUNITY:** Riparian forest, wet meadow
- ASSOCIATED SPECIES:** Umbrella plant; rush, alder, big leaf maple
- SERAL STAGE :** All
- SPECIAL HABITATS, ECOLOGICAL FEATURES, AND MANAGEMENT CONCERNS:**
Sensitivity Category IV; Found in moist sandy, gravelly areas; Riparian Reserve guidelines must be followed when harvesting on public land.
- PARTS HARVESTED:** Sterile shoots for medicine, florals; fertile shoots for food
- HARVEST TIMING:** All year
- SUGGESTED HARVEST METHODS:**
Clip shoots with clippers close to ground; select plants at the edge of a patch to avoid trampling
- SUITABILITY FOR CULTIVATION:**
Can be propagated by rootstock
- SPIRITUAL AND CULTURAL SIGNIFICANCE:**
Native American fiber used for sand paper
- ECONOMIC USE:** Herbalists suggest that the medicinal tea is astringent and diuretic, helps lung recovery after damage by asthma, pneumonia, or infections; topically applied, plant slows external bleeding, heals wounds; shoots and roots edible; fiber used for scouring

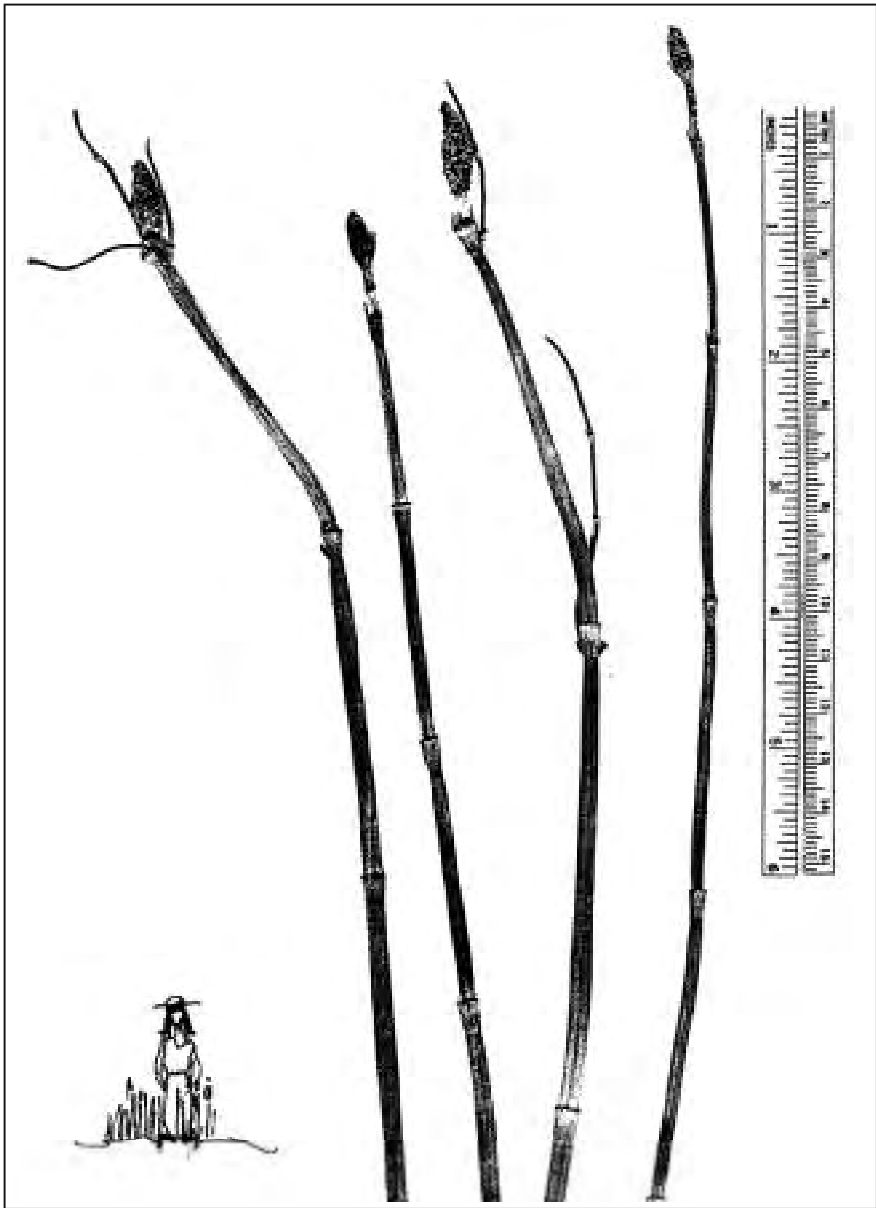


Figure 16 —SMOOTH SCOURING RUSH *Equisetum laevigatum* ssp. *affine* horsetail family

Illustration by Jolie Lommer

- COMMON NAME:** Manzanita, Greenleaf manzanita (*fig. 17*)
- BOTANICAL NAME:** *Arctostaphylos patula* E. Greene
- FAMILY:** Ericaceae (Heath family)
- DESCRIPTION:** Woody shrub, growing in circles 3–9 feet tall; reddish bark; bright green leaves erect, alternately arranged on stem, oval, with smooth edges; flowers pink or white, urn-shaped, numerous; fruit a berry, looks like a miniature apple
- REPRODUCTION:** Root sprouts, seed
- DISTRIBUTION:** *Global:* California to Washington, Montana, Colorado, Baja Calif.: High North Coast Range, Cascade Range, Sierra Nevada, San Gabriel, San Bernadino, San Jacinto Mts.
Local: common throughout HAMA
- ELEVATION RANGE:** 2,000–10,000 ft
- SLOPE AND ASPECT:** More common on south and southwest aspect
- SOIL TYPE:** Rocky, dry soils
- PLANT COMMUNITY:** Chaparral; open mixed conifer forest
- ASSOCIATED SPECIES:** *Ceanothus* spp., conifers, oaks, tan oak, chinquapin
- SERIAL STAGE:** Early succession, shrub stage; immature forest
- SPECIAL HABITATS, ECOLOGICAL FEATURES, AND MANAGEMENT CONCERNS:**
Sensitivity Category III; Common in sunny disturbed areas, e.g., recovering from a burn or clearcut logging
- PARTS HARVESTED:** Leaves, berries
- HARVEST TIMING:** Leaves spring to fall; berries in late summer
- SUGGESTED HARVEST METHODS:**
Clip or pluck 15 percent or less of a plant's leaves from all sides of a bush, avoid stripping individual plants; when harvesting berries, leave plenty behind for wildlife.
- SPIRITUAL AND CULTURAL SIGNIFICANCE:**
Native American food and medicinal plant
- ECONOMIC USES:** Herbalists say that the medicinal tea is astringent and antimicrobial. It is used to acidify urine and combat urinary tract infections. Avoid use during pregnancy; dried leaves used in herbal smoking mixtures.



Figure 17 —GREENLEAF MANZANITA *Arctostaphylos patula* heath family *Ericaceae*

Illustration by Jolie Lonner

- COMMON NAME:** Manzanita, Pinemat manzanita (fig. 18)
- BOTANICAL NAME:** *Arctostaphylos nevadensis* A. Gray
- FAMILY:** Ericaceae (Heath family)
- DESCRIPTION:** Low-growing (less than 1 foot) woody shrub, forming mats or mounds several yards broad; leaves alternately arranged on stem, evergreen, almond-shaped, margins smooth without lobes; flowers small, pink or white, urn-shaped; berry brownish-red
- REPRODUCTION:** Seed; root sprouts
- DISTRIBUTION:** *Global:* California to Washington: Klamath Range, High North Coast Range, Cascade Range, Sierra Nevada
Local: common at higher elevations in HAMA area.
- ELEVATION RANGE:** 2,700–9,000 feet
- SLOPE AND ASPECT:** Prefers sunny south/southwest aspect
- SOIL TYPE:** Well-drained to rocky soils
- PLANT COMMUNITY:** Mixed conifer forest
- ASSOCIATED SPECIES:** Conifers, *Ceanothus* spp., other manzanitas
- SERIAL STAGE:** Early succession, shrub stage; immature forest, montane chaparral
- SPECIAL HABITATS, ECOLOGICAL FEATURES AND MANAGEMENT CONCERNS:**
Sensitivity Category III; This species thrives with disturbance, especially after fire; is commonly found in burned or clear-cut logged areas and young plantations. Positive identification (for example, by asking a botanist at the Ranger District) is important as some other manzanitas are rare and sensitive to disturbance.
- PARTS HARVESTED:** Leaves
- HARVEST TIMING:** Spring to late fall
- SUGGESTED HARVEST METHODS:**
Clip or pluck 15 percent or less of a plant's leaves from all sides of a bush; avoid stripping individual plants
- SPIRITUAL AND CULTURAL SIGNIFICANCE:**
Native American food and medicinal plant
- ECONOMIC USES:** Herbalists suggest that the medicinal tea is astringent, antimicrobial; mostly used to acidify urine and combat urinary tract infections; avoid use during pregnancy; dried leaves used in herbal smoking mixtures.



Illustration by Jolie Lonner

Figure 18 —PINEMAT MANZANITA *Arctostaphylos nevadensis* heath family *Ericaceae*

- COMMON NAME:** Manzanita, Whiteleaf manzanita (*fig. 19*)
- BOTANICAL NAME:** *Arctostaphylos viscida* C. Parry
- FAMILY:** Ericaceae (Heath family)
- DESCRIPTION:** Woody shrub to small tree 3–15 ft tall; reddish bark; leaves alternately arranged on stem, leaves erect, oval, white to grayish, smooth edged; flowers pink or white, urn-shaped, numerous; fruit, flower stem sticky; fruit a berry resembling a tiny apple
- REGENERATION:** Seed
- DISTRIBUTION:** *Global:* Pacific Northwest, Cascade Range Foothills, Sierra Nevada, southwestern Oregon
Local: common, especially in blue oak, gray pine woodland
- ELEVATION:** 500–5,000 ft
- SLOPE AND ASPECT:** Most likely found on south- and southwest-facing slopes
- SOIL TYPE:** Rocky, dry soils
- PLANT COMMUNITY:** Chaparral, woodland, open mixed conifer
- SERIAL STAGE:** Early succession, shrub stage
- ASSOCIATED SPECIES:** Pine, oak, *Ceanothus* spp.
- SPECIAL HABITATS, ECOLOGICAL FEATURES, AND MANAGEMENT CONCERNS:**
Sensitivity Category III; Common in sunny disturbed areas, e.g., recovering from a burn or clear-cut logging
- PARTS HARVESTED:** Berries, leaves
- HARVEST TIMING:** Berries in later summer; leaves spring to fall
- SUGGESTED HARVEST METHODS:**
Clip or pluck 15 percent or less of a plant's leaves from all sides of a bush, avoid stripping individual plants
- SPIRITUAL AND CULTURAL SIGNIFICANCE:**
Native American food and medicinal plant
- ECONOMIC USE:** Herbalists suggest that the medicinal tea is astringent and antimicrobial; used to acidify urine and to combat urinary tract infections; avoid use during pregnancy; dried leaves used in herbal smoking mixtures.



Figure 19 —WHITELEAF MANZANITA *Arctostaphylos viscida* heath family *Ericaceae*

- COMMON NAME:** Mugwort, Western mugwort (*fig. 20*)
- BOTANICAL NAME:** *Artemisia douglasiana* Besser
- FAMILY:** Asteraceae (Compositae, Sunflower family)
- DESCRIPTION:** Perennial herb, sometimes with woody base 2–5 feet tall, grows in colonies of unbranched leafy stems from same rootstock; leaves lance-shaped, several times longer than wide at top of stems, often toothed at tips; sometimes leaves at base of plant are lobed, smooth green gray above; densely fuzzy, whitish, silvery below; sage-scented; small inconspicuous flowers on spikes
- REPRODUCTION:** By rootstock and seed
- DISTRIBUTION:** *Global:* California to Washington, Idaho, Baja California
Local: common
- ELEVATION RANGE:** Below 6,600 ft
- SLOPE AND ASPECT:** More likely found on flat or moderately sloped ground
- SOIL TYPE:** Prefers moist soil, will grow in dry, sandy, gravelly soil
- PLANT COMMUNITY:** Forest edge; riparian zone
- ASSOCIATED SPECIES:** St. John's wort, grasses, sweet clover
- SERAL STAGE:** Early succession
- SPECIAL HABITATS, ECOLOGICAL FEATURES, AND MANAGEMENT CONCERNS:**
Sensitivity Category III; Thrives in disturbed areas with some moisture (stream banks, roadsides) and partial shade
- PARTS HARVESTED:** Leaves, small stems, tops, flowers
- HARVEST WINDOW:** Summer and fall
- SUGGESTED HARVEST METHODS:**
Clip stems near ground level; avoid trampling and compacting surrounding plants and soil; leave plenty of stems behind
- SUITABILITY FOR CULTIVATION:**
Easy to grow
- SPIRITUAL AND CULTURAL SIGNIFICANCE:**
Native American medicinal plant
- ECONOMIC USE:** Herbalists suggest use of medicinal tea for digestion, gastrointestinal problems; depression, nervous tension and as a wash to relieve rash from poison oak; dried plant used in dream pillows; insect repellent, used as a biological control in gardens



Figure 20 —MUGWORT *Artemisia douglasiana* sunflower family Asteraceae

Illustration by Jolie Lanier

- COMMON NAMES:** Self heal, all heal (*fig. 21*)
- BOTANICAL NAME:** *Prunella vulgaris* L. var. *lanceolata* (Barton) Fern.
- FAMILY:** Lamiaceae (Mint family)
- DESCRIPTION:** Perennial herb up to 10 inches tall, erect square stems, opposite, paired leaves, 1–2 inches long, oval, to sword-shaped tip, wedge-shaped base, long leaf stems; flowers in whorled clusters, flower center dark green to purplish, petals bluish violet or pink, white; no odor
- REPRODUCTION:** Rootstock, seed
- DISTRIBUTION:** *Global:* Eurasia, East Asia, N. America, California Floristic Province
Local: common
- ELEVATION RANGE:** Below 7,500 ft
- SLOPE AND ASPECT:** More likely in flat areas
- SOIL TYPE:** Rich soils
- PLANT COMMUNITY:** Moist areas in coniferous forest, woodlands, riparian areas
- ASSOCIATED SPECIES:** Other mints, clovers, grasses, plantain
- SERAL STAGE:** Early succession
- SPECIAL HABITATS, ECOLOGICAL FEATURES, AND MANAGEMENT CONCERNS:**
Sensitivity Category III; Prefers 50 percent or more shade, moist areas; concentrates lead compounds and other pollutants, avoid gathering from roadsides; can be invasive. Likely to be in Riparian Reserve areas, follow land manager guidelines regarding streamside gathering.
- PARTS HARVESTED:** Leaves, flower heads, stems
- HARVEST TIMING:** During flowering, late spring, summer
- SUGGESTED HARVEST METHODS:**
Cut plants at ground level; avoid pulling which can damage roots; gather at edge of large stands, avoid trampling and compacting soil.
- SUITABILITY FOR CULTIVATION:**
Can be cultivated by root cuttings
- SPIRITUAL AND CULTURAL SIGNIFICANCE:**
Native American medicinal
- ECONOMIC USES:** Medicinal tea is gentle for fevers, sore throats; a poultice is said to sooth bleeding gums and act as anti-inflammatory first aid on fresh wounds.



Figure 21 —SELF HEAL *Prunella vulgaris* var. *lanceolata* mint family *Lamiaceae*

Illustration by Jolie Lonner

- COMMON NAMES:** Yerba santa, mountain balm (*fig. 22*)
- BOTANICAL NAME:** *Eriodictyon californicum* (Hook. & Arn.) Torrey
- FAMILY:** Hydrophyllaceae (Waterleaf family)
- DESCRIPTION:** Perennial woody shrub with shredding bark, 2–9 ft tall; simple, alternate, leathery leaves lance-shaped to oblong, smooth to toothed edges, 1.5–5 inches long and less than 1 inch wide; twigs and leaves sticky, especially in late summer; white to blue or purple flowers at top end of stems in small clusters, tubular or bell-shaped; small black seeds
- REPRODUCTION:** Seed
- DISTRIBUTION:** *Global:* Northwest California, Cascade Range, Sierra Nevada, Great Central Valley, Central Western California and Oregon
Local: common in key habitat
- ELEVATION RANGE:** 150–6,000 ft
- SLOPE AND ASPECT:** South to southwest aspect; moderate to steep slopes
- SOIL TYPE:** Moderately deep, well-drained, heavy to gravelly sandy loam, slightly acid, especially Parrish and Neuns family soils
- PLANT COMMUNITY:** Montane chaparral and woodland
- ASSOCIATED SPECIES:** Buck brush, manzanita, chamise, gray pine
- SERAL STAGE:** Early, brush
- SPECIAL HABITATS, ECOLOGICAL FEATURES, AND MANAGEMENT CONCERNS:**
Sensitivity Category III; Thrives on disturbed ground; grows best along roadside slopes and on edges of hillsides covered with chamise or buck brush; sprouts from rootstock after disturbance
- PARTS HARVESTED:** Leaves
- HARVEST TIMING:** After flowering, summer into fall, when leaves begin to be tacky but are still green
- SUGGESTED HARVEST METHODS:**
Locate healthy stand; pluck individual leaves or clip tops from vigorous stems; take no more than 25 percent of the leaves from no more than 25 percent of the plants in a patch
- SUITABILITY FOR CULTIVATION:**
Sow seed in early spring or fall in sandy soil under dry sunny conditions
- SPIRITUAL AND CULTURAL SIGNIFICANCE:**
Native American medicinal plant
- ECONOMIC USES:** Medicinal tea and tincture are decongestant (slows secretions from lungs and nasal passages) and expectorant (relieves coughing); herbal smoking mixture.



Illustration by Jolie Lomer

Figure 22 —YERBA SANTA *Eriodictyon californicum* waterleaf family *Hydrophyllaceae*

Sensitive to Harvest

Coltsfoot, Western - <i>Petasites frigidus</i> var. <i>palmaris</i>	58
Oregon Grape - <i>Berberis nervosa</i>	60
Prince's Pine - <i>Chimaphila umbellata</i>	62

Sensitive to Harve



Photo by Roger Jaegel

- COMMON NAMES:** Coltsfoot, butterbur, coughwort (*fig. 23*)
- BOTANICAL NAME:** *Petasites frigidus* L. Fries var. *palmatus* (Aiton) Cronq.
- FAMILY:** Asteraceae (Sunflower family, Compositae)
- DESCRIPTION:** Perennial herb; large leaves 3–15 inches wide on 1- to 2.5-ft stalks; leaves simple, palm-shaped with lobes, dark green on top, whitish and hairy below; flowers emerge long before leaves in flat-topped clusters, purplish white on 3- to 18-inch stalks emerging from partially exposed roots; flowers with strong vanilla scent; coltsfoot may be mistaken for a very common similar-looking plant, Indian rhubarb/umbrella plant (*Darmera peltata*) which has large round to funnel-shaped leaves attached at the base from the center of the leaf
- REPRODUCTION:** Rootstock
- DISTRIBUTION:** *Global:* Northwestern and northwest central California, Arkansas, northeastern United States
Local: restricted to specified habitats; common in low-elevation drainages on South Fork Mountain and Willow Creek Area
- ELEVATION RANGE:** To 2,500 ft
- SLOPE AND ASPECT:** Most likely in north, northeast aspect
- SOIL TYPE:** Wet
- PLANT COMMUNITY:** Riparian forest
- ASSOCIATED SPECIES:** California spikenard, ferns, Douglas-fir, big leaf maple
- SERIAL STAGE:** Late seral
- SPECIAL HABITATS, ECOLOGICAL FEATURES AND MANAGEMENT CONCERNS:**
Sensitivity Category V; Coltsfoot is found along moist, shaded streamsides and in canyons in late seral mixed conifer and Douglas-fir-dominated forest at low elevations. Riparian Reserve regulations must be followed when harvesting coltsfoot. It is not abundant in the higher and/or drier areas of the AMA (Hayfork, Platina, Weaverville) and should not be harvested in commercial quantities there.
- PARTS HARVESTED:** Leaves
- HARVEST TIMING:** Leaves in summer; roots in spring
- SUGGESTED HARVEST METHODS:**
Cut leaves at the base of stalk; cut from edges of stands, avoid trampling roots. To harvest roots, dig carefully around root and cut with a knife to minimize disturbance to adjacent rootstock.
- SUITABILITY FOR CULTIVATION:**
Unknown



Illustration by Jolie Lonner

Figure 23 —WESTERN COLTSFOOT *Petasites frigidus* var. *palmatus* sunflower family Asteraceae

SPIRITUAL AND CULTURAL SIGNIFICANCE:

Native American medicinal

ECONOMIC USES:

Medicinal tea and tincture from leaves are said to slow spasms that cause coughing, and soothe sore throats, chest colds, and stomach cramps; poultices of roots and leaves applied topically reduce inflammation and pain from sprains, bumps.

- COMMON NAMES:** Oregon grape (*fig. 24*)
- BOTANICAL NAME:** *Berberis nervosa* Pursh.
- FAMILY:** Berberidaceae (Barberry family)
- DESCRIPTION:** Native evergreen low-growing shrub; leaves divided into 9–19 paired, shiny, holly-like leaflets with spiny margins; leaves often growing in pairs or as triplets from rootstock; yellow flowers in clusters; dark blue berries
- REPRODUCTION:** From rootstock
- DISTRIBUTION:** *Global:* Calif. South Coast Region to San Francisco Bay Area, north to British Columbia, Canada, Idaho
Local: fairly abundant in key habitat areas in HAMA
- ELEVATION RANGE:** Below 6,000 ft
- SLOPE AND ASPECT:** More likely on moderate north-facing slopes
- SOIL TYPE:** Deep, well-drained
- PLANT COMMUNITY:** Coniferous forest
- SERIAL STAGE:** Mid-mature to mature closed canopy forest understory, shady north slopes, canyons
- ASSOCIATED SPECIES:** Douglas-fir, ponderosa pine, prince's pine, white-veined shinleaf
- SPECIAL HABITATS, ECOLOGICAL FEATURES, AND MANAGEMENT CONCERNS:**
Sensitivity Category V; found primarily in late seral forest on South Fork Mountain or in Willow Creek area; slow-growing plant, larger stands not very common in drier Eastern areas of HAMA, should not be gathered in commercial quantities there because overharvesting is possible.
- PARTS HARVESTED:** Foliage, roots (the lower stem from the lowest leaves down considered "aboveground root" for medicinal purposes)
- HARVEST TIMING:** Roots: fall, winter, spring; foliage: summer, fall
- SUGGESTED HARVEST METHODS:**
Harvest from moister areas of HAMA (e.g. South Fork Mountain; Willow Creek areas). Harvest from edges of stands to avoid compacting and trampling soil. Leave berries for wildlife (one of the last berries available before winter). Hold main stem and pull slowly upward. Rootstock will begin to emerge. Pull to about 1-ft length and clip off (this leaves secondary roots behind to grow into new plants). Washed roots should be chopped while still fresh; dry roots become very hard to process.
- SUITABILITY FOR CULTIVATION:**
Difficult but possible from seed; rhizome can be transplanted, cuttings work well.



Illustration by Jolie Lonner

Figure 24 —OREGON GRAPE *Berberis nervosa* barberry family Berberidaceae***SPIRITUAL AND CULTURAL SIGNIFICANCE:***

Native American medicinal

ECONOMIC USE:

Medicinal tea, tincture used for liver ailments and as a digestive tonic. Leaves are used topically in salves, oils and dusting powders as an antibacterial, antimicrobial; edible berries; yellow dye; floral green

- COMMON NAME:** Prince's pine, pipsissewa (*fig. 25*)
- BOTANICAL NAME:** *Chimaphila umbellata* L. (Bartram) var. *occidentalis* (Rydb.) S.F. Blake
- FAMILY:** Ericaceae (Heath family)
- DESCRIPTION:** Native evergreen, understory perennial, 4–12 inches tall; long, partially buried woody stems, leathery whorled 2- to 5-inch dark green leaves, several times longer than wide, toothed; 5–15 waxy pink flowers in a cluster on a 2- to 4-inch stalk at the end of stem or as a side branch; fruit is a small round capsule with many tiny seeds.
- REPRODUCTION:** Seed, rootstock
- DISTRIBUTION:** *Global:* Central America, Southern Calif. north to British Columbia, east to Michigan, Montana; Klamath Ranges, North Coast Ranges, High Cascade Range, High Sierra Nevada, South Coast Ranges, San Bernardino, San Gabriel Mts., Peninsular Ranges
Local: not common in HAMA; but frequently found in patches in specified habitat types.
- ELEVATION RANGE:** 900–8,500 ft.
- SLOPE AND ASPECT:** North-facing slopes most likely
- SOIL TYPE:** Well-drained to sandy, acid, spongy soil
- PLANT COMMUNITY:** Medium moist to dry coniferous forest understory, often in drainages
- ASSOCIATED SPECIES:** Conifers, Oregon grape, white veined shinleaf
- SERIAL STAGE:** Mature closed canopy forest, old growth
- SPECIAL HABITATS, ECOLOGICAL FEATURES, AND MANAGEMENT CONCERNS:**
Sensitivity Category V; occurs in forest with at least 50 percent shade, on undisturbed ground, with considerable duff, twigs, and leaf litter; grows slowly, especially in dry years; potential for overharvesting
- PARTS HARVESTED:** New growth on above-ground plant
- HARVEST WINDOW:** Early fall, after seeds have been produced
- SUGGESTED HARVEST METHOD:**
Clip new shoots off above-ground with clippers; avoid lifting rhizomes out of soil. Harvest in dry weather from edge of healthy stands. Avoid trampling and compaction. Harvest conservatively and rotate harvest areas. Leave seeds to regenerate.
- SUITABILITY FOR CULTIVATION:**
Difficult. Seeds are tiny; research trials underway



Illustration by Jolie Lorner

Figure 25 —PRINCE'S PINE *Chimaphila umbellata* wintergreen family Pyrolaceae

SPIRITUAL AND CULTURAL SIGNIFICANCE:

Native American medicinal

ECONOMIC USES:

Medicinal tea and tincture are astringent, disinfectant, diuretic especially used for kidney ailments, arthritis and rheumatic pains; flavoring for root beer

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