

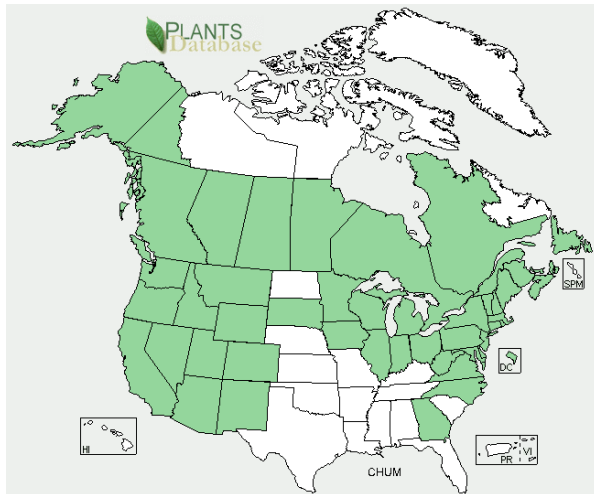
Plant Propagation Protocol for Pipsissewa [*Chimaphila umbellata*]

ESRM 412 – Native Plant Production

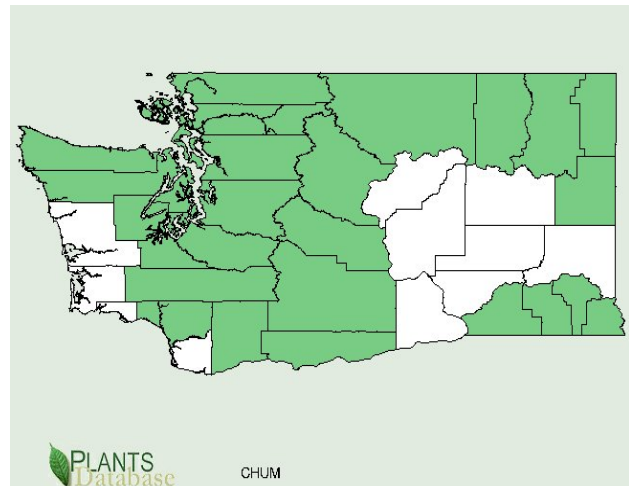


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North American Distribution



Washington State Distribution



USDA-NRCS PLANTS Database

TAXONOMY

Family Names	
Family Scientific Name:	Pyrolaceae
Family Common Name:	Wintergreen or Shinleaf
Scientific Names	
Genus:	<i>Chimaphila</i>
Species:	<i>umbellata</i>

Species Authority:	(L.) W. Bartram
Variety:	n/a
Sub-species:	<i>acuta</i> ; <i>cisatlantica</i> ; <i>occidentalis</i>
Cultivar:	
Authority for Variety/Sub-species:	ssp. <i>acuta</i> (Rydb.) Hultén; ssp. <i>cisatlantica</i> (S.F. Blake) Hultén; ssp. <i>occidentalis</i> (Rydb.) Hultén
Common Name(s):	Pipsissewa, prince's pine, striped wintergreen, waxflower
Species Code:	CHUM
GENERAL INFORMATION	
Geographical range:	See map above.
Ecological distribution:	On humus or rotting wood in well-drained open or dense coniferous forest, ⁹ with medium to coarse textured soils. ¹¹
Climate and elevation range	Low to mid-elevation. ⁹ Occurs in a variety of soil moisture regimes, but decreases as precipitation and elevation increase. ⁷
Local habitat and abundance:	ssp. <i>occidentalis</i> is present in Washington State. ¹¹ Not common in coastal forests, more common in interior under coniferous canopy. Some associated plant species include Douglas-fir (<i>Pseudotsuga menziesii</i>), big leaf maple (<i>Acer glabrum</i>), Pacific yew (<i>Taxus brevifolia</i> and twin flower (<i>Linnaea borealis</i>). ² Commonly associated Kuchler plant communities in Washington include spruce - cedar - hemlock forest, cedar - hemlock - Douglas-fir forest, silver fir - Douglas-fir forest, fir - hemlock forest, mixed conifer forest, western spruce – fir, and grand fir – Douglas-fir. ⁷
Plant strategy type / successional stage:	Somewhat fire resistant, medium drought tolerant, shade tolerant. ¹¹ Does not tolerate physical disturbance well and is not found in disturbed sites. ⁵ Found in all successional stages but more common in mid- to late-succession forest. An indicator of a recovery site or old-growth site in many locations throughout the Northwest. Not a serious competitor with conifer seedlings. ⁷
Plant characteristics:	A small, shrub that is slightly woody, with creeping rhizomes and whorled, evergreen leaves. ⁹ A sub-shrub. ¹¹ Possibly a partial root parasitic plant. ⁶ Has a mycorrhiza relationship that may affect nutrient uptake and help create linkages to host plants. ⁸
PROPAGATION DETAILS – Reproductive	
Propagation Goal:	Plant
Propagation Method:	Seed

Product Type:	
Stock Type:	
Time to Grow:	
Target Specifications:	
Propagule Collection:	Plants produce woody capsules of quantities of fine seeds. ¹
Propagule Processing/Propagule Characteristics:	
Pre-Planting Propagule Treatments:	Plant as soon as seed is harvested. ⁴
Growing Area Preparation / Annual Practices for Perennial Crops:	Sow seeds in moist sphagnum peat and add some soil that was collected around an existing population. This will inoculate the soil with mycorrhizae. Place trays in a shady part of the greenhouse. Prick seedlings and repot and place in a shady part of the greenhouse for the first winter season. ⁴
Establishment Phase:	
Length of Establishment Phase:	
Active Growth Phase:	
Length of Active Growth Phase:	~6 months ⁴
Hardening Phase:	
Length of Hardening Phase:	
Harvesting, Storage and Shipping:	
Length of Storage:	
Guidelines for Outplanting / Performance on Typical Site:	Transplanted in spring and top-dressed lightly with granular fertilizer may enhance thick growth and flowering. ¹ This plant is very difficult to propagation. ⁶
Other Comments:	Seem to have mycorrhiza relationship to uptake water and nutrients; this may make propagation difficult. Best naturalized in dry, acid woodlands. ¹ In 1986, it was said that nothing is known about propagation. ¹²
PROPAGATION DETAILS - Vegetative	
Propagation Goal:	Plants
Propagation Method:	Cuttings
Product Type:	Container
Stock Type:	
Time to Grow:	
Target Specifications:	
Propagule Collection:	Cutting of new whorled growth with a section of stem and fully developed leaves in mid-summer. ¹ Taking cuttings is very difficult because plant is sensitive to disturbance; take cutting of softwood in June. ⁴
Propagule Processing/Propagule Characteristics:	
Pre-Planting Propagule Treatments:	
Growing Area Preparation / Annual	Cuttings are grown in a flat. ¹ Along of with planting

Practices for Perennial Crops:	medium, use some soil from around an existing wild population to inoculate mycorrhizas. ⁴
Establishment Phase:	
Length of Establishment Phase:	
Active Growth Phase:	
Length of Active Growth Phase:	
Hardening Phase:	
Length of Hardening Phase:	
Harvesting, Storage and Shipping:	
Length of Storage:	
Guidelines for Outplanting / Performance on Typical Sites:	In the following spring after taking cuttings. ¹ Plant in the following spring or early summer after last frost. ³
Other Comments:	Overharvesting due to flavoring for root beer and for wild crafting and difficultly propagating this plant has negatively affected populations. It is highly recommended to reduce harvesting to taking only the top 1/3 when necessary. ¹⁰ It is possible that collection of plant with roots and host plant may increase survival of plant. ⁶

INFORMATION SOURCES

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	⁵ Ingersoll, Cheryl A., and Mark V. Wilson. 1990. "Buried propagules in an old-growth forest and their response to experimental disturbances". <i>Canadian Journal of Botany. Journal Canadien De Botanique</i> . 68 (5): 1156.
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	⁷ Matthews, Robin F. 1994. <i>Chimaphila umbellata</i> . In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: http://www.fs.fed.us/database/feis/ [2012, May 16].
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	⁹ Pojar, Jim, A. MacKinnon, and Paul B. Alaback. 1994. <i>Plants of</i>

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	¹¹ USDA, NRCS. 2012. The PLANTS Database (http://plants.usda.gov , 15 May 2012). National Plant Data Team, Greensboro, NC 27401-4901 USA.
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Protocol Author:	Lindsey Hamilton
Date Protocol Updated:	05/14/12

Appendix A – Kachel, S. 2006. ESRM 412 Protocol for *Chimaphila umbellata*

Pipsissewa (*Chimaphila umbellata*)

Small, evergreen understory herb and groundcover; has specific mycorrhizal associations that must be retained for plant to thrive.



Range: Circumboreal, throughout North America, Northern Eurasia

Climate, Elevation: Temperate; Low to middle elevations

Local Occurrence: Uncommon in Coastal forests of Pacific Northwest, though locally abundant at some sites, more common in interior.

Habitat Preference: Well-drained sites in coniferous forests.

Plant Strategy: Facultative seral species; shade tolerant; reproduction by seeds and rhizomes.

Associated Species: Found under nearly all western conifer species; some associate species include Rocky Mountain maple (*Acer glabrum*), Pacific yew (*Taxus brevifolia*), Saskatoon serviceberry (*Amelanchier alnifolia*), honeysuckle (*Lonicera spp.*), currant (*Ribes spp.*), baldhip rose (*Rosa gymnocarpa*), huckleberry (*Vaccinium spp.*), salal (*Gaultheria shallon*), twinflower (*Linnaea borealis*), queencup beadlily (*Clintonia uniflora*), sweet-scented bedstraw (*Galium trifolium*), threeleaf foamflower (*Tiarella trifoliata*), oneleaf foamflower (*T. unifoliata*), starry Solomon-seal (*Smilacina stellata*), Pacific trillium (*Trillium ovatum*), violet (*Viola spp.*)

May be Collected As: Seed; Cuttings, Rhizomes

Collection Guidelines/Restrictions: Due to overharvest by softdrink industry to produce rootbeer, as well as extensive wildcrafting, this plant is struggling in many locales. Collect only from relatively healthy populations and avoid excessive root disturbance. Collect small amount of (inoculated) soil from around established plants. Collect seeds by tapping dehisced fruits to dislodge seeds into a jar or bag. However, it may be easier to collect closed capsules before they dehisce, then dry and macerate to recover the seeds. With this technique however, seed maturity is not assured. Collect rhizomes and cuttings in spring.

Seed Germination: Sow as soon as ripe on moist peat with small amount of inoculated soil from parent site. It is very possible however that seeds that have germinated in trials are actually seeds already within the soil seed bank rather than those collected and sown. This suggests that extensive stratification may be required. Efforts to germinate *Chimaphila* have met almost entirely with failure, therefore it may be easier to propagate from cuttings and rhizomes

Seed Life and Storage: Unknown

Propagation Recommendations: Rhizome divisions and cuttings. Soil seedbank from existing patches.

Soil/Medium Requirements: Grows in a wide range of soil types.

Installation Form: As whole plant, with soil from parent site or nursery pot. It is important to note that based on this plants high sensitivity to disturbance, it is unlikely to make a good restoration site candidate.

Planting Density: Unknown

Care Requirements: At all costs, avoid trampling or excessive site disturbance.

Normal Rate of Growth/Lifespan: Spread by rhizomes is reported to be very rapid, with individual rhizomes stretching several meters and supporting many offshoots. Plants live for many years, with individual leaves persisting for seven-eight years before falling away.

Sources:

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Data compiled by S. Kachel Spring 2006