

ASSOCIATION OF TREES, SHRUBS, AND OTHER VEGETATION IN THE NORTHERN IDAHO FORESTS

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It is the purpose of this paper to set forth the association of the most common herbs, shrubs, and trees in the forests of northern Idaho, in the hope that the information may afford a better insight into the quality and general characteristics of the habitats.

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The forests of northern Idaho occur in altitudinal belts often spoken of as forest types. At the lowest elevations, bordering on the Columbia River Plateau, the forest is usually of pure western yellow pine. Higher up and on more uneven ground there is western larch and Douglas fir with some western yellow pine in mixture. Still higher and on more broken and rough topography the forest is composed of western white pine, western hemlock, western red cedar, and lowland white fir. Above this again are the sub-alpine forests of mountain hemlock, alpine fir, Engelmann spruce, and lodge-pole pine.

These altitudinal differences in the composition of the forest are, of course, the result of differences in air temperature and precipitation. The annual precipitation in or near the yellow pine forest is from 18 to 20 inches, and that in the forest of western white pine and associates from 27 to 35 inches. The mean growing season, May to September, inclusive, in the yellow pine forest shows a temperature from 60° to 65° F., and from 54 to 60 degrees in the white pine forest. (Data from the U. S. Weather Bureau Cooperative Stations.)

One very marked feature of the climate in this region is the occurrence of abundant precipitation during the colder months, and of a pronounced drought in summer, particularly in July and August. This dry period is further intensified by the warm, dry winds which blow from the Snake River Desert region.

It must not be supposed that the forest belts show a clear-cut demarkation from one type to the other. The transition zones are sometimes as wide as the belts themselves. There is much overlapping according to variations in

the topography, and it is not uncommon to find yellow pine on southerly slopes well within the natural belt of western white pine and associated species.

In presenting the lists of plants usually found in association with forest trees the idea was to give the more frequent and typical kinds rather than complete lists. No effort has been made to determine the frequency of any species. This would be a time-consuming and laborious undertaking, which would serve little purpose, because the distribution is extremely irregular. Under some white pine stands there may be a profusion of *Coptis* and *Tiarella*, while under apparently similar conditions, but in other locations, a wealth of wild ginger, *Pyrola*, and *Clintonia* occurs.

Though a great many plants have been collected in the sub-alpine belt, no effort has yet been made to correlate these with the forest trees.

WESTERN YELLOW PINE FORESTS

The forests of pure western yellow pine occur chiefly on the undulating, sandy, and gravelly flats and lower slopes. The open stand of trees, the clear trunks, and the sparse undergrowth permit a fairly free sweep of the wind, more insolation, and a greater amount of evaporation than in the other forest belts; and the scant humus and litter, as well as the more open spacing on the trees, result in a warmer but poorer soil. The large amount of rock material and dearth of loam lower the water-holding capacity and specific heat so that this site is characterized by greater fluctuations in both heat and moisture.

Since these forests are rather open, there is sufficient light for the associated vegetation to grow among the timber or in small openings.

Species Associated with the Western Yellow Pine Forests

<i>Agropyron spicatum</i> (Pursh) Scribn. & Smith	Wheat grass
<i>Apocynum androsaemifolium</i> L.....	Dogbane
<i>Arctostaphylos uva-ursi</i> Spreng.....	Kinnikinnick
<i>Balsamorhiza sagittata</i> Pursh.....	Balsam-root
<i>Bromus marginatus</i> Nees.....	Brome-grass
<i>Calamagrostis rubescens</i> Buckl.....	Reed grass
<i>Campanula rotundifolia</i> L.....	Bluebell
<i>Ceanothus sanguineus</i> Pursh.....	Mountain balm
<i>Clarkia pulchella</i> Pursh.....	Clarkia
<i>Drymocallis glandulosa</i> (Lindl.) Rydb.....	Cinquefoil; five finger
<i>Erythronium grandiflorum</i> Pursh.....	Dog-tooth violet
<i>Heuchera ovalifolia</i> Nutt.....	Alumroot
<i>Hieracium albiflorum</i> Hook.....	Hawkweed
<i>Lupinus ornatus</i> Dougl.....	Lupine
<i>Nacrea lanata</i> A. Nels.....	Everlasting
<i>Odostemon aquifolium</i> (Pursh) Rydb. (= <i>Berberis aquifolium</i> . Pursh)	Oregon-grape
<i>Opulaster malvaceus</i> Greene	Nine bark
<i>Pentstemon</i> sp.....	Pentstemon
<i>Philadelphus lewisii</i> Pursh	Mock orange

<i>Prunus demissa</i> (Nutt.) Walp.....	Chokecherry
<i>Pteridium aquilinum</i> (L.) Kuhn.....	Brake fern
<i>Rosa nutkana</i> Pres.....	Wild rose
<i>Salix scouleriana</i> Barr.....	Willow
<i>Scritothea dumosa</i> (Nutt.) Rydb. (= <i>Holodiscus dumosus</i> (Nutt.) Heller).....	Ocean spray
<i>Sedum douglasii</i> Hook.....	Stone crop
<i>Senecio</i> sp.....	Groundsel
<i>Spiraea lucida</i> Doug.....	Spiraea
<i>Zygadenus venenosus</i> S. Wats.....	Death camas

WESTERN LARCH-DOUGLAS FIR FORESTS

The larch and Douglas fir forests grow under somewhat better moisture conditions and a little lower temperature than the forests of yellow pine, and the trees stand closer together, so that the associated vegetation is found in the natural openings.

Associated Species

<i>Amelanchier alnifolia</i> Nutt. (= <i>A. florida</i> Lindl.).....	June berry
<i>Antennaria racemosa</i> Hook.....	Everlasting
<i>Antennaria rosea</i> (D. C. Eat.) Greene.....	Everlasting
<i>Arctostaphylos uva-ursi</i> (L.) Spreng.....	Kinnikinnick
<i>Castilleja miniata</i> Dougl.....	Indian paint-brush
<i>Ceanothus velutinus</i> Dougl.....	Mountain balm
<i>Chimaphila umbellata</i> (L.) Nutt.....	Princess pine
<i>Cytherea bulbosa</i> (L.) House (= <i>Calypso borealis</i> Salisb.).....	Calypso
<i>Drymocallis glandulosa</i> (Lindl.) Rydb.....	Drymocallis
<i>Fragaria</i> sp.....	Wild strawberry
<i>Lepargyrea argentea</i> (Nutt.) Greene.....	Silver brush
<i>Lepargyrea canadensis</i> (L.) Greene.....	Buffalo berry
<i>Linnaea borealis</i> L.....	Twin flower
<i>Lonicera utahensis</i> S. Wats.....	Honeysuckle
<i>Odoestemon repens</i> (Lindl.) Cockerell (= <i>Berberis repens</i> Lindl.)	Oregon grape
<i>Pachystima myrsinites</i> Raf.....	Goat brush
<i>Smyphoricarpos racemosus</i> Michx.....	Snowberry
<i>Sorbus angustifolia</i> Rydb.....	Mountain ash.

WHITE PINE, CEDAR, HEMLOCK, AND LOWLAND WHITE FIR FORESTS

The trees which make up the white pine, cedar, hemlock, and lowland white fir belt are found on deeper soils with greater moisture-holding capacity than either of the two aforementioned, and their characteristic sites are the steeper north slopes, fertile lower slopes, benches, and bottoms within the more mountainous regions. Here the extremes of the climate are much reduced by the greater precipitation, cloudiness, the denser stand of trees, and the consequent shade. There is, therefore, much more material produced per unit area, and an accumulation of humus and litter whereby the texture and moisture-holding capacity of the soil is improved.

There is in this forest belt not only a greater variety of trees than in the

other lower belts, but also richness in the variety of shrubs, evergreens, and annuals. The following is a list of the most prominent and most indicative. Because the forests are very dense little light is admitted to the forest floor. Practically all of the species, therefore, occupy the soil temporarily after fire or in small openings. Some of the most shade enduring are *Coptis*, wild ginger, *Tiarella*, wintergreen, and *Pachystigma*.

Associated Species

<i>Acer glabrum</i> Torr.....	Rocky Mountain maple
<i>Actaea rubra</i> Ait.....	Bane berry
<i>Adenocaulon bicolor</i> Hook.....	Silver green
<i>Adiantum pedatum</i> L.....	Maidenhair fern
<i>Alnus tenuifolia</i> Nutt.....	Alder
<i>Alsine laeta</i> (Rich.) Rydb. (= <i>Stellaria longipes laeta</i> Wats.)..	Chickweed
<i>Aralia nudicaulis</i> L.....	Sarsaparilla
<i>Asarum caudatum</i> Lindl.....	Wild ginger
<i>Aspidium</i> sp.....	Wood fern
<i>Atragene occidentalis</i> Hornem.....	Virgin's bower
<i>Betula fontinalis</i> Sarg. (= <i>B. microphylla</i> Bunge.).....	Birch
<i>Circaea pacifica</i> Asch. & Magn.....	Circaea
<i>Claytonia perfoliata</i> Donn.....	Spring beauty
<i>Clintonia uniflora</i> (Schult.) Kunth.....	Clintonia
<i>Coptis occidentalis</i> (Nutt.) T. & G.....	Gold thread
<i>Cornus canadensis</i> L.....	Trailing dogwood
<i>Cornus stolonifera</i> Michx.....	Dogwood
<i>Distegia involucrata</i> (Richards.) Cockerell.....	Honeysuckle
<i>Dryopteris filix-mas</i> (L.) Schott.....	Shield fern; <i>Male fern</i>
<i>Epilobium palmeri</i> Rydb.....	Willow herb.
<i>Fatsia horrida</i> (J. E. Smith) Benth. & Hook.....	Devil's club
<i>Galium boreale</i> L.....	Northern bedstraw
<i>Galium triflorum</i> Michx.....	Three-flowered bed- straw
<i>Geranium carolinianum</i> L.....	Geranium
<i>Geum oregonense</i> (Scheutz.) (Rydb.).....	Large-leaved avens
<i>Linnaea borealis</i> L.....	Twin flower.
<i>Lonicera ciliosa</i> (Pursh.) Poir.....	Honeysuckle
<i>Lycopodium</i> sp.....	Clubmoss
<i>Mentha canadensis</i> L.....	Wild mint
<i>Mertensia ciliata</i> (Torr.) Don.....	Mertensia; Bluebell
<i>Mitella trifida</i> Graham.....	Bishop's cap
<i>Montia spatulata</i> (Dougl.) Howell.....	Miner's lettuce
<i>Osmorhiza</i> sp. (= <i>Washingtonia</i> sp.).....	Sweet cicely
<i>Polygonum spargulariaeforme</i> Meis.....	Knot weed
<i>Polystichum lonchitis</i> L.....	Holly fern
<i>Pyrola rotundifolia</i> L.....	Round shinleaf
<i>Ribes reniforme</i> Nutt. (= <i>R. cereum</i> Dougl.).....	Currant
<i>Ribes viscosissimum</i> Pursh.....	Currant
<i>Rubus melanolasius</i> Focke (= <i>R. strigosus</i>) west American. author, not Michx.....	Red raspberry
<i>Rubus parviflorus</i> Nutt.....	Thimble berry

<i>Rubus</i> sp.....	Blackcap raspberry
<i>Sambucus glauca</i> Nutt.....	Elderberry
<i>Sambucus melanocarpa</i> A. Gray.....	Elderberry
<i>Spiraea densiflora</i> Nutt.....	Spiraea
<i>Spiraea lucida</i> Dougl.....	Spiraea
<i>Thalictrum occidentale</i> A. Gray.....	Meadow rue
<i>Tiarella unifoliata</i> Hook.....	Coolwort
<i>Trautvetteria grandis</i> Nutt.....	False Bugbane
<i>Trillium petiolatum</i> Pursh.....	Trillium
<i>Vaccinium membranaceum</i> (Doug.) Hook.....	Huckleberry
<i>Vaccinium occidentale</i> A. Gray.....	Huckleberry
<i>Vagnera liliacea</i> (Greene) Rydb.....	False Solomon seal
<i>Vagnera sessilifolia</i> (Baker) Greene.....	False Solomon seal
<i>Valeriana septentrionalis</i> Rydb.....	Valerian
<i>Viola blanda</i> Willd.....	Violet (yellow)
<i>Viola glabella</i> Nutt.....	Violet
<i>Xylosteon</i> sp.....	Bush honeysuckle

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