

THE OLYMIC FOREST AND ITS POTENTIAL POSSIBILITIES.

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The Olympic Peninsula lies west of Puget Sound in the State of Washington. It comprises a wide, somewhat benched coastal strip bordering both the Strait of Juan de Fuca at the north, the Pacific Ocean at the west, and the "Sound" on the east. This coastal strip surrounds a central high area termed the Olympic Mountains. These mountains are wholly isolated. They form an eroded, domed area in the central-northeastern part of the peninsula. From this main mass there extends a western limb in declining altitude to Cape Flattery at the entrance of the Strait of Fuca, Mounts Constance, Meany, and Olympus of the central area approximate 8,150 feet in height, while the immediate region exceeds 6,000 feet in elevation, while the ridge towards the Cape recedes to less than 2,000 feet in altitude. As a result of the practically domed area the drainage is radial in all directions, but the larger streams flow into the Pacific.

This peninsula, with its lofty peaks, stands first in the path of the moisture bearing winds from the Pacific. As a result, the precipitation is very heavy; at the coast it is usually rain, in the mountains snow. The precipitation averages about 40 inches east and north of the mountains, as far up the Strait of Fuca side as Port Angeles. West of the mountains at an elevation of 3,000 feet the precipitation averages 80 inches and in Upper-Strait-Flattery region and along the Pacific front 100 to 120 inches annually. The climate, also, is controlled by the prevailing southwesterly winds from the Pacific. Notwithstanding this, however, the valleys of the upper mountain districts are filled with glaciers. At the coast, however, especially on the Pacific front, snow seldom stays on the ground any length of time.

Growing under this equable climate with such an abundance of rainfall (enough in amount to preserve the forest and shrubbery from general destruction by fire), the peninsula, with few exceptions, is the most densely forested region in North America, and smaller plants do also equally well. Of course, as one approaches the mountains, the forest becomes less dense till the timber line is reached; but in the reverse proportion the flowering herbs at the same time increase in number and beauty. The open country at timber line in summer is one of nature's flower gardens. The region in

the lower levels is a jungle of trees, shrubs, and entangled vines, which must be seen to be appreciated.

The plants identified in the region to date number 687. The trees and plants most noticeable in the peninsula are fir, cedar, spruce, hemlock, red elder, "Shallon," "Rubes," salal, "Vaccinum," "Ribes," Selaginella ("S. oregona"), crab-apple, devil's club, "usnea," bearded lichens, bearberry, dogwood ("Cornus nuttallii"), and oregon grape. Here Douglas fir, tideland spruce, and red cedar reach gigantic proportions. The available timber per township averages 3,000 feet B. M. per acre amid the high mountains up to 59,000 feet B. M. per acre often in the Quillayute region. There is estimated to be 32,890,717 M. feet B. M. lumber in the region according to the estimate of Henry Gannett, Chief of Division of Forestry (1899).¹ This estimate has been more than doubled by Dodwell and Rixon at a later date; they give 69,000,000 M. feet B. M.² And the close measurement now used would likely double that amount. One quarter section in the Quillayute country cruised both by the Lacy Company cruisers and by the Clallam county cruisers for purpose of tax-estimating, aggregated more than 30,000,000 feet B. M. There is enough timber in the region to supply the whole United States' demand for considerable over two years.³

The timber by species is approximately as follows: Spruce, 6 per cent.; cedar, 10 per cent.; Lovely fir, 18 per cent.; Red fir, 24 per cent.; hemlock, 42 per cent.

Geographically, the Olympic Peninsula is parcelled out in the following county divisions: Chehalis county, Mason county, Jefferson county, and Clallam county. For convenience the area of the timber in each and the timber of same will be considered separately.

MASON COUNTY.

This county includes the southeastern part of the Olympic Mountains, from which it extends eastward so as to include much of the Hood Canal country. The portion within the mountains contains but little timber of present merchantable value. the "low country" of the county, however,

¹Twentieth Annual Report, U. S. G. S. (1898-1899), Part V, pp. 12-37.

²Arthur Dodwell and Theodore F. Rickson: Forest Conditions in the Olympic Forest Reserve, Washington. Professional paper, U. S. Geol. Surv., No. 7, 110 pages, 20 plates, 1 map, 1902.

³See Reagan: Transactions of the Kansas Academy of Science, p. 136, in article, "Some Notes on the Olympic Peninsula, Washington."

with the exception of a few small prairie tracts, was originally heavily timbered, but the timber is now more than half logged.

Area of timbered and other lands in Mason county, Washington.

Total area.....	996 square miles
Present merchantable timber area.....	395 square miles
Logged area.....	493 square miles
Naturally barren area.....	6 square miles
Burned area.....	112 square miles

Estimate of timber in Mason county, Washington.⁴

Fir.....	2,055,648 M. feet B. M.
Spruce.....	492 M. feet B. M.
Cedar.....	25,970 M. feet B. M.
Hemlock.....	8,955 M. feet B. M.

Total.....2,091,065 M. feet B. M.

Average per acre of timbered land, 5,600 feet B. M.

CHEHALIS COUNTY.

This county borders upon the Pacific Ocean, and on the north extends far up into the Olympic Mountains. The mountainous part is high and rugged and contains but little merchantable timber, and in other parts there are numerous prairie tracts. Barring these areas, the county was originally heavily forested, mainly with fir in the interior and with spruce and cedar upon the coast. There have been but few fires in this county and the burned area is trifling. The county, however, lies in the Grays Harbor lumber district and an approximate third of it has been denuded of its forests.

Area of timbered and other lands in Chehalis county, Washington.

Total area.....	2,104 square miles
Present merchantable timber area.....	1,000 square miles
Logged area.....	831 square miles
Naturally bare area.....	47 square miles
Burned area.....	236 square miles

⁴After Gannett. Loc. cit., p. 28. It is well to add that under the present close cruising of timber, however, Mr. Gannett's figures should be multiplied by 3.

*Estimate of timber in Chehalis county, Washington.*⁵

Fir.....	9,799,418 M. feet B. M.
Spruce.....	3,068,307 M. feet B. M.
Cedar.....	3,474,350 M. feet B. M.
Hemlock.....	<u>2,236,983 M. feet B. M.</u>
Total.....	18,579,058 M. feet B. M.
Average per acre of timbered land, 21,300 feet B. M.	

JEFFERSON COUNTY.

This county stretches from Hood's Canal upon the east to the Pacific Ocean. Its central portion, comprising three-fourths of it, lies within the Olympic Mountains. Scattered here and there in this area there are considerable timber in the below-timber-line districts, but on account of the inaccessibility of the district it is of no value at present for milling purposes. Barring the mountain area, the county was formerly heavily forested, on the west with cedar and spruce, on the east with fir. The timber in the eastern part of the county has been largely destroyed either by ax or fire, mainly the latter. The timber in the western part of the county is yet virgin, being untouched by fire or ax. The most abundant species represented in this county is the cedar.

Area of timbered and other lands in Jefferson county, Washington.

Total area.....	1,688 square miles
Present merchantable timber area.....	430 square miles
Logged area.....	296 square miles
Naturally bare area.....	100 square miles
Burned area.....	215 square miles
Non-merchantable timber area.....	647 square miles

*Estimate of timber in Jefferson county, Washington.*⁶

Fir.....	794,232 M. feet B. M.
Spruce.....	267,427 M. feet B. M.
Cedar.....	2,124,725 M. feet B. M.
Hemlock.....	<u>1,043,776 M. feet B. M.</u>
Total.....	4,230,160 M. feet B. M.
Average per acre of timbered land, 15,300 feet B. M.	

⁵Loc. cit., p. 19. Remarks above apply.⁶Loc. cit., p. 24. Remarks above apply.

CLALLAM COUNTY.

This county extends from the top of the Olympic Mountains north to the Strait of Fuca and from near Dungeness on that strait to a little to the south of LaPush on the Pacific coast, occupying a large area both to the north and to the west of the Olympics. The mountainous part of the county is not regarded as containing any timber of present merchantable value. The remainder of the county is heavily forested; but the ax has made inroads in these forests along the shores of the Strait of Fuca as far west as Crescent Bay, and millions of feet of logs have been cut at Clallam Bay and in the Hoko district on the same side of the peninsula. In addition, fires have extended inland from these cuttings to the mountain districts, destroying large areas of timber. The western part of the county is still in the virgin state. In this county hemlock and fir vie with each other in amount of merchantable log-lumber.

Area of timbered and other lands in Clallam county, Washington.

Total area.....	1,824 square miles
Present merchantable timber area.....	1,000 square miles
Logged area.....	217 square miles
Burned area.....	181 square miles
Bare and unmerchantable timber area.....	426 square miles

*Estimate of timber in Clallam county, Washington.*⁷

Fir.....	3,045,297 M. feet B. M.
Spruce.....	1,758,845 M. feet B. M.
Cedar.....	547,617 M. feet B. M.
Hemlock.....	3,719,840 M. feet B. M.

Total.....9,071,599 M. feet B. M.
Average per acre of timbered land, 15,700 feet B. M.

Below is a description of the merchantable timber species as they occur in the peninsula.

⁷Loc. cit., p. 20. Remarks above apply.

FAMILY PINACEAE: PINE FAMILY.

Genus *Chamaecyparis*.

C. nootkatensis (Lamb) Spach: Alaska Cedar. This tree is found on all the mountain ridges below 3,500 feet elevation. It is a conspicuous tree on the ridges at the headwaters of the Soleduck and Bogachiel rivers and in the vicinity of the Soleduck Hot Springs. It is often called Yellow Cedar. It is also more abundant in the swamp regions near the Pacific coast, bordering the rivers near their mouths. It is a medium tree in height for this region, but exceeds the Red Fir in girth. Its greatest development is usually where it stands the heaviest. It averages about 140 feet in height and 50 inches in diameter. This tree is subject to rot; half of the stand is injured by this disease.⁸

Genus *Thuja*.

T. plicata Donn: Red Cedar; Giant Cedar. This cedar is found in all parts of the peninsula, except in the high mountain districts. It is of larger growth near the coast, where it often measures from 40 to 50 feet in circumference; some trees in the Elwa valley are said to measure even 80 feet in circumference.

This tree differs from *C. nootkatensis* above in its wood being reddish in color, in its larger size in circumference-measurements, and in the scales of its cones being oblong, not plicate.⁹

⁸The juice of the bark of this tree and that of the Giant Cedar is used by the natives in dyeing basket straw. The other coloring matter used by these Indians is burned yellow clay, black earth, blood, soot and charcoal.

⁹Of this giant cedar the Indians make their dug-out canoes, canoes ranging from the size of a little river canoe to an ocean-whaling canoe that will hold ten whale hunters, or three tons of freight. These canoes are in each case made from a single piece (section) of log and the canoe is in each case one continuous piece when finished, except just the front totem (river-deer) part. In making these canoes in the old time it was a slow process of burning and scraping with clam shells, and a possible ebiseling with some wedge-shaped stone. Today they are hewed out with ax and Indian adz. A canoe for ocean use is now worth about \$100.

The cedars are used for many purposes by the Indians of the coast. The juice of the green bark is used as medicine after being boiled. The outer bark is used in making wigwams. In the old times they also shredded the inner bark of these species and wove it into a sort of cloth. Of this cloth they then made skirts for the women, and other wearing apparel both for the men and the women. They also lined their cradles with this bark and wrapped their babies up in it before tying them in the cradles. A peculiar raincoat was made from this bark to be worn by the men while fishing in stormy weather.

Genus *Pinus*.

P. monticola Dougl.: Western White Pine. This tree is found on the western slopes of the Olympics, above 500 feet elevation, usually in swamps and wet places.

Description: Cones oblong-cylindrical; scales of cones unarmed; leaves five in each fascicle.

Genus *Abies*.

A. nobilis Lindl.: Lovely Fir; Noble Fir. This tree is found at considerable elevations; but rarely at elevations less than 1,500 feet.

Description: This is a tall, silvery-barked, noble-looking tree. It differs from the other firs principally in the color of its bark and in its having cones with conspicuous reflexed bracts.

A. lasiocarpa (Hook) Nutt.: Alpine Fir; Subalpine Fir. This tree is found only on the higher parts of the mountains, rarely below 5,000 feet.

Description: A tree of 60 to 80 feet in height; bark pale, thin, smooth, ash-gray in color; leaves dark-green above, with two resin-ducts about equi-distant between the upper and lower face; cones oblong-cylindrical, puberulent, with bracts concealed.

A. amabilis (Dougl.) Forbs.: Lovely Fir; Amabilis Fir. This tree is found only on the high ridges adjacent to the mountains, rarely below 1,200 feet elevation. It is one of the large lumber-producing trees of the region, producing more than 11,000,000 M. feet B. M.

Description: This tree is distinguishable from *A. lasiocarpa* above by its cones not being puberulent and by the greater length of the cones.

A. grandis Lindl.: White Fir. This tree is occasionally met with in the Soleduck Hot Spring region.

Genus *Pseudotsuga*.

P. mucronata (Raf.) Sudw.: Douglas Fir; Red Fir. This tree grows in abundance. It reaches its greatest development in the Quillayute-middle-upland region. In its growth, however, it extends up the mountain slopes to the altitude of 3,500 feet. In the high mountains and in the neighborhood of the Pacific coast, this species is practically entirely wanting. It grows to its greatest dimensions where the stand is heaviest. Throughout the region it averages 240 feet in height; 77 feet clear of limbs, with a diameter

of 55 inches. This tree is everywhere free from disease. The stand of timber of this species is estimated to be more than 15,000,000 M. feet B. M.

Description: Tree large; in youth, spruce-like and pyramidal, more spreading in old age; leaves somewhat two-ranked by a twist at base.

Genus *Tsuga*.

T. heterophylla (Raf.) Sarg.: Western Hemlock. This tree is found throughout the region.

Description: This is a lowland tree, with cones 1 to 2 cm. long.

T. mertensiana (Bong.) Carr: Black Hemlock; Merten's Hemlock. This tree is found almost everywhere in the forest from the shore line up to 4,500 feet elevation. With the Western Hemlock above, it is by far the most abundant tree in the region, being found in every part of it to timber line. It is not so large a tree as the other merchantable trees, either in height or diameter, the amount of clear trunk is also less. In the high mountain regions the tree is greatly affected by disease, but as the shore line is approached the percentage of diseased trees diminish to the minimum. This tree with the Western Hemlock estimate 26,000,000 M. feet B. M.

Description: Characteristically, this tree differs from the Western Hemlock above in its having appreciably longer cones.¹⁰

Genus *Picea*.

Picea sitchensis (Bong.) Traut: Sitka Spruce. This species is found only in the neighborhood of the coast, seldom ever found thirty miles inland. It is densest a little way back from the coast, the immediate coast seeming to be too damp for its best development. The tree averages 225 feet in height, 81 feet of which is often clear of limbs. Its diameter exceeds 5 feet on the average. This tree seems to be less affected by disease than any other merchantable tree in the region. It aggregates over 4,000,000 M. feet B. M. in merchantable timber.

Description: Trees tall, pyramidal, with soft, white, tough timber; leaves flattened, somewhat two-ranked, and spirally arranged around the branchlets.

P. engelmanni Parry: Engelmann Spruce. This spruce is only scattered

¹⁰The Indians use the bark of this tree in tanning hides. Hemlock bark tea is also used as an emetic.

here and there and in too small quantities, usually, to be of much value in a merchantable way.

Description: Tree subalpine, with height averaging about 90 feet; branches horizontal; bark thin, scaly, reddish to purplish brown; branches pubescent; leaves quadrangular.

