

PART III

Physical Description

Physical Regions of Washington

On the basis of surface features, Washington may be divided into eight general regions. Agricultural settlement is influenced by factors of topography, climate, soil, forest vegetation, and water resources distinctive to each of the physiographic regions. Each has become a different type of farming area as settlers have learned to adapt crops and livestock to the conditions, or have improved limitations through drainage or irrigation.

Coastal Plains

A narrow, sandy plain with shallow bays, tidal flats, stream deltas, and low headlands lies between the coastline and the Coast Range. It extends from the Columbia River mouth almost to Cape Flattery, being widest and lowest in the Grays Harbor and Willapa Bay districts. The climate is mild and damp with a long growing season, but it is too cool, cloudy, and wet for most crops. Originally this area was covered with heavy forests and much is now covered with woodlands. Lumbering and manufacture of wood products is the main industry. Farming is largely of the livestock and dairying type on low uplands and drained areas in the lower Chehalis River Valley. Cranberry growing is important and well-adapted to numerous, boggy areas in the Grays Harbor and Willapa Bay sections. The shallow bays are also used for oyster culture. Fishing is common in the rivers and coastal banks.

Coast Range

The Coast Range is an uplifted area of sedimentary and metamorphic rocks divided into the Olympic Mountains and the Willapa Hills. The Olympics tower to nearly 8,000 feet in a dome-like structure, carved deeply by rivers. These mountains have the heaviest precipitation in the state. Snowfields and heavy forest cover the mountains. Most of the wilderness area is within the Olympic National Forest and Olympic National Park, being managed for recreation, wildlife, and timber. Farm settlement is limited to some foothill river plains and coastal terraces such as the Dungeness and Port Angeles districts along the Strait of Juan De Fuca. Here in the lee of the mountains, rainfall is moderate and irrigation is practiced by some livestock farmers. The Willapa Hill country is wet, heavily forested, and carved into numerous narrow valleys. Logging is the main industry, combined with livestock farming in the upper Chehalis River Valley and along the banks of the Columbia River. Wet climate, hilly topography, and the difficulty of clearing stump land retards agriculture.

Willamette-Puget Sound Lowland

A broad lowland, described as a trough or valley, lies between the Coast Range and the Cascade Mountains. The northern part is the Puget Sound

Lowland which has been glaciated and occupied by the sea in the lowest sections. The continental glacier reached slightly south of Olympia. Under a warming climate it melted and geologists believe it receded about 25,000 years ago, leaving an infertile plain of moraines and outwash gravels, sands, and clays known today as the Puget Glacial Drift Plain. Its rolling surface has numerous lakes and bogs. Most of the major cities--Seattle, Tacoma, Everett, Bellingham, and Olympia--have been built on moraines bordering the Sound. Rivers such as the Nooksack, Skagit, Snoqualmie, White, and Puyallup built up deltas and flood plains over the older gravelly plains. These narrow valleys are more fertile than the older glacial plains, and support numerous small dairy, vegetable, and berry farms. Most of the gravelly areas are wooded with a second-growth forest and are used for pastures. In the southern part of the Willamette-Puget Sound Lowland, there are two large valleys--the Cowlitz and Chehalis. They drain a low, hilly area with several flat prairies and bottom lands.

Agriculture is handicapped by poor drainage and flooding of the river deltas and plains, by heavy winter rainfall, by cloudy, but dry summers, by coarse, gravelly upland soils, and by densely wooded land which is costly to clear. Advantages are mild climate and a location close to major markets for farm products such as milk, poultry, and vegetables.

Cascade Mountains

The Cascades are a wide and high topographic and climatic barrier which separates western and eastern Washington. The range is made up of sedimentary, igneous, and metamorphic rocks which have been carved by glaciers and streams. High isolated volcanic cones of lava such as Mt. Adams (12,307 feet), Mt. Rainier (14,408 feet), and Mt. Baker (10,791 feet), appear upon the older Cascade rocks. The Cascade crest varies between 10,000 and 3,000 feet and is higher and more rugged in northern Washington. Roads and railroads have been built across its lower passes in central and southern Washington. The Columbia River has cut a deep gorge and the lowest pass through the barrier. The western slope is wet and heavily forested with Douglas fir. The eastern slope is drier with a less-dense pine forest. Nearly all classified as forest land, most of the area is in Federal ownership in five national forests and Mount Rainier National Park. Tree fruit farming in the eastern slope valleys of Wenatchee, Chelan, Methow, Naches, and the Columbia Gorge is most important. Sheep and cattle summer grazing on alpine grasslands is another use. Deep western slope valley bottoms such as the Skagit, Snoqualmie, Misqually, Cowlitz, and Lewis also contain livestock farms. The area is vitally important as a source of water for irrigation and city drinking water and as a source of timber. Steep terrain, wet climate, short growing seasons, and heavy forest vegetation are main handicaps for agriculture.

Columbia Basin

A low plateau of old lava rocks covered with stream and wind-deposited soils extends in a series of plains, ridges, coulees, and hills from the Cascades to the eastern Washington border. The area is basin-like in structure, being higher around its margins and sloping inward to low and level central plains. It has been sharply eroded by the Columbia River and

its interior tributaries, the Snake, Yakima, Palouse, and Spokane Rivers. The basin has sub-areas created by crustal movements and erosion.

The Yakima Folds are a series of hilly ridges extending from the Cascades eastward into the lower part of the basin. The Yakima and Columbia Rivers have cut gaps through the ridges, and built up plains in the troughs between them. The rich, alluvial plain of the Yakima River is an important irrigated valley.

The Waterville Plateau is a tableland of thin soils overlaying basaltic rock at an elevation of 2,500 to 3,000 feet. It has gorges cut by the Columbia River and ancient glacial outwash streams once flowing in Moses and Grand Coulees. It is too high for irrigation and is used for dryland grain and livestock farming. The high plain is often called the Big Bend country.

The Channelled Scablands is a belt of dry terrain carved by ice-age rivers into a series of coulees. Bare rock is exposed in the coulees. Small plateaus between the old river channels have thin soils used for dryland farming. The Grand Coulee of this region has been developed into a major irrigation reservoir.

The Palouse Hills consist of fertile deposits of wind-blown soil overlaying basaltic lava flows. After being deposited in large dunes, the formation was reshaped by streams into an intricate pattern of low, rounded hills which are tilled for wheat, barley, and legumes. The hills receive 16 to 25 inches of rainfall and have deep, porous and fertile soils. It is one of the richest farming areas of the Pacific Northwest.

The Central Plains are low and relatively level expanses of soil, deposited by old streams crossing the Channelled Scablands and later by the flooding of the Yakima, Columbia, Snake and Walla Walla Rivers. Climate is desert-like (6-12 inches of precipitation per year). The lower lands of the area, the Quincy and Pasco Basins and the Walla Walla valley, are irrigated. Quincy Basin is a new irrigation area watered by Grand Coulee Dam.

Agricultural handicaps in Columbia Basin regions are mainly found in its dry, continental climate. Large irrigation systems built since 1900 have overcome much of the need for water on rich valley and basin soils. Dryland farming in higher areas is practiced widely, although occasional variations in rainfall, lack of snowfall, winter-kill, water and wind erosion inflict damage to field crops and to livestock ranges.

Okanogan Highlands

A portion of the Rocky Mountains, consisting of well-eroded old granites, lavas and sedimentary rocks extends across north central Washington. These are the Okanogan Highlands, the state's richest mineral area. Summit levels reach 4,000 to 5,000 feet with peaks exceeding 7,000 feet. Prominent north-south valleys are occupied by irrigated tree fruit and livestock farms. These are the Okanogan, Sampoil, Kettle, and Colville Valleys. The Columbia River gorge through the Okanogan Highlands is occupied by the large man-made

lake behind Grand Coulee Dam--Roosevelt Lake. High and wetter portions are forested with pine and larch, and are managed for timber and for livestock ranges by the United States Forest Service and the Bureau of Indian Affairs. Cold winter temperatures, short growing seasons, dry valley climates and distance from markets are farming handicaps.

Selkirk Mountains

The Selkirks, a range of the Rocky Mountain system, extend into the northeast corner of Washington. The rocks are old mineralized granites and metamorphics reaching elevations of over 7,000 feet. The Pend Oreille River Valley at the base of the Selkirks is an agricultural area of narrow bottom lands settled by livestock farmers. Nearly all of the uplands are in Kaniksu National Forest. While climate is cool and growing seasons are short, the Pend Oreille Valley has an advantage of being closely located to the Spokane metropolitan market area.

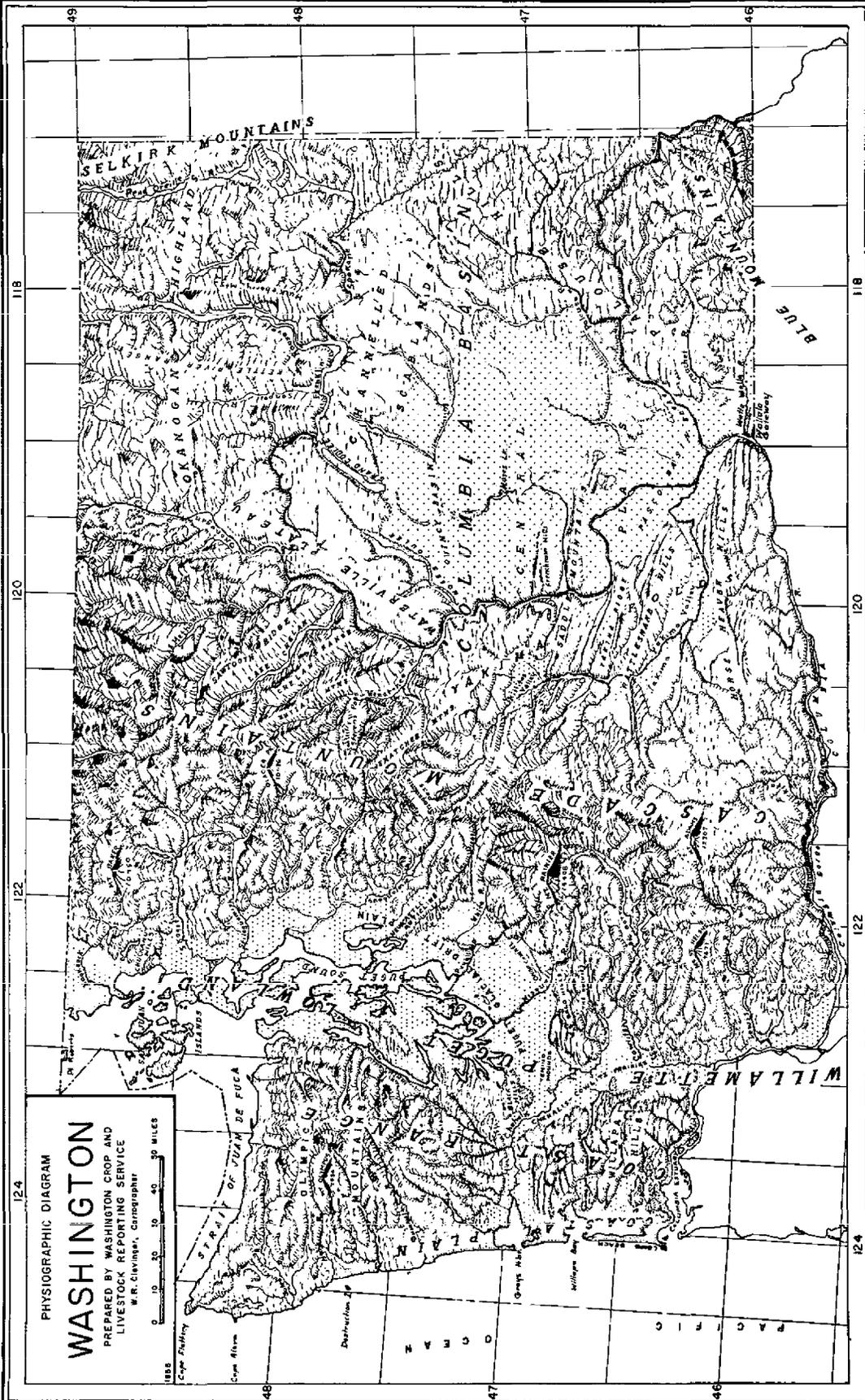
Blue Mountains

The Blue Mountains are an uplifted and eroded plateau extending into the southeastern corner of Washington. The strata are mainly ancient crystalline rocks which contain some minerals. The highest point of the mountains in the Washington section is Diamond Peak (6,401 feet), on the divide between the Grande Ronde, Tucannon, and Touchet Rivers. These rivers, and the Walla Walla River, have cut valleys into the plateau. Extensive pine forest and grassland areas are in the highlands within Umatilla National Forest, where rainfall is 30 to 40 inches. The Snake River has cut a deep valley and gorge across the lower parts of the mountains. The area is well developed agriculturally around its northern foothills where wind-blown soils are deep and irrigation systems are used. The Walla Walla and Tucannon Valleys are rich grain, legume and livestock areas grown under irrigation and by dry farming. Grazing is an important use of the high lands by livestock ranchers in the upper valleys.

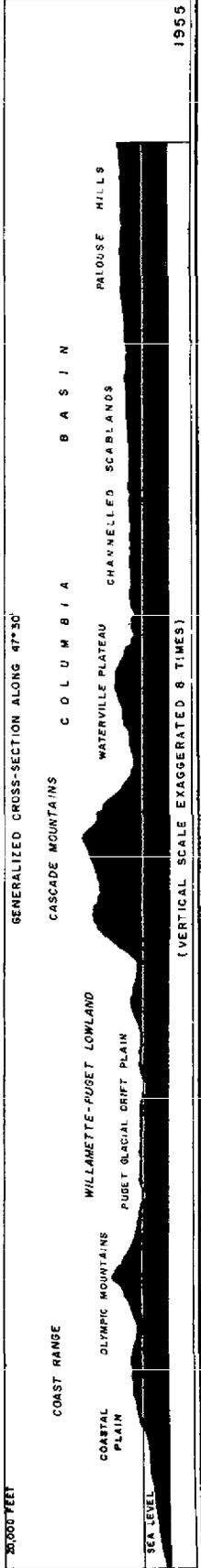
Topography of Pierce County

Sharp contrasts characterize the topography of Pierce County. In no other American county is there such a range of elevation - from sea level on Puget Sound to the top of Mount Rainier, 14,408 feet, within a distance of less than 50 miles.

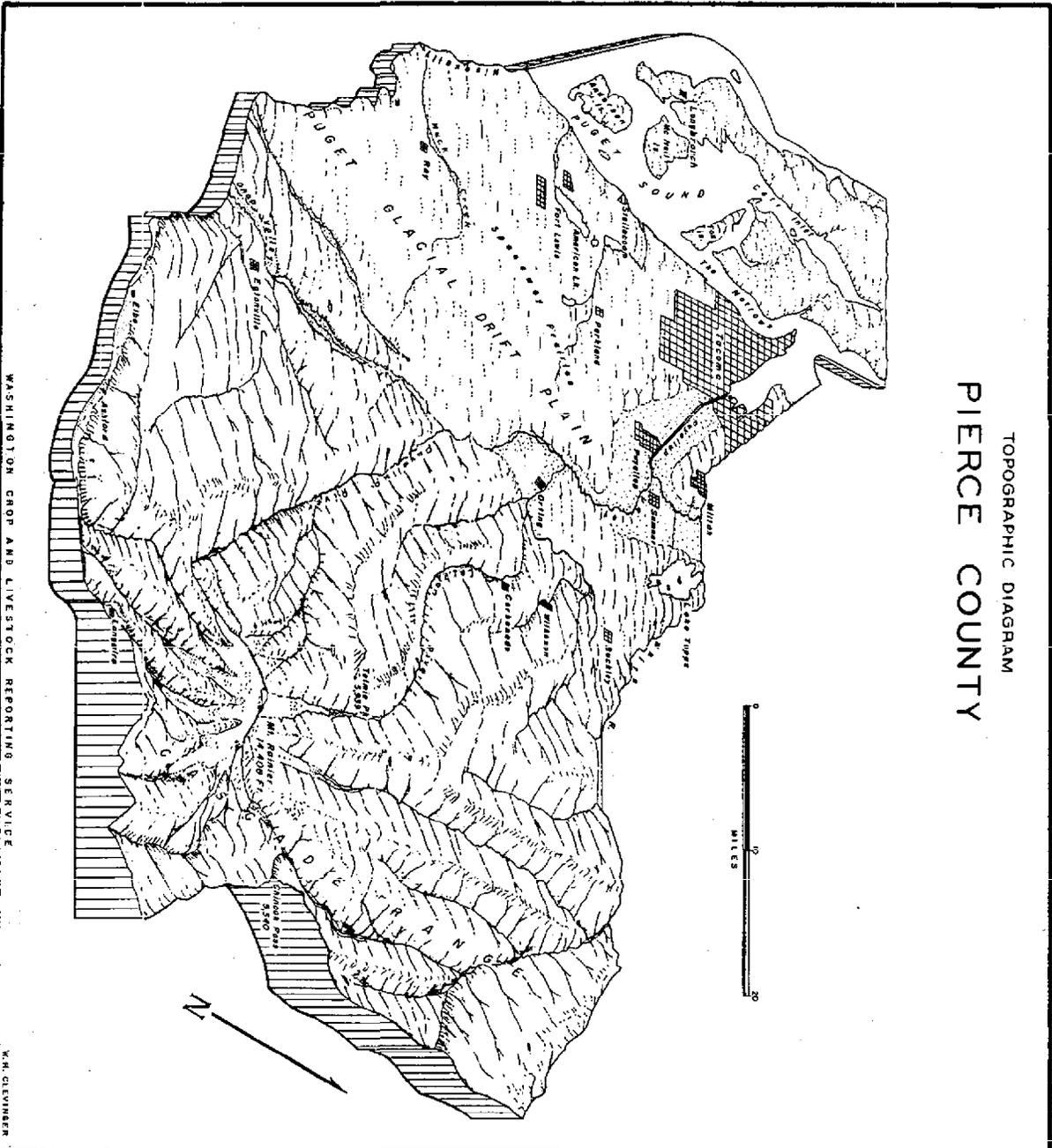
The county area is about equally divided between Cascade Mountain terrain and low, rolling glacial drift plains of the Willamette-Puget Sound lowland. Inland from Puget Sound about 25 miles, the Cascade foothills of sandstone, shales, basalt and andesite rocks rise abruptly. The Cascade Range crest forms the eastern border, ranging from 3,500 to over 7,000 feet. The high, massive volcanic cone of Mount Rainier was extruded in more recent geological time on top of older Cascade rocks to the west of the Cascade crest. A cone of about 8,000 feet elevation was deposited on an older plateau surface already about 7,000 feet. In the process of volcanic activity, the top of the cone was destroyed. Spectacular, snow-covered Mount Rainier, called "Tahoma" by the Indians, forms a scenic eastern back-drop to the farm landscapes of Pierce County. During its dormancy of the last several thousand years an extensive glacier system, the nation's largest, has accumulated on the mountain. Glacial melt



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 PHYSIOGRAPHIC DIAGRAM
WASHINGTON
 PREPARED BY WASHINGTON CROP AND
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 W. R. CLAYTON, Cartographer



TOPOGRAPHIC DIAGRAM
PIERCE COUNTY



WASHINGTON CROP AND LIVESTOCK REPORTING SERVICE

W. M. GUYMER

water and the heavy rain and snow of the Mount Rainier area feed the four major rivers of the county - the Nisqually, Puyallup, Carbon and White. The former two have been developed for hydro-electric power.

The western half of Pierce County lies in the Puget Glacial Drift Plain, a wide, low terrain formed by the continental ice-age period of comparatively recent geological time. During advances and recessions of the ice sheet covering Puget Sound lowlands, a deep mantle of gravel, sand and clay was deposited in plains and gently sloping moraines of 100 to 500 feet elevation above sea level. Numerous lakes and ponds were left in the uneven surface as the ice sheet melted. The depressions became American, Spanaway, Steilacoom, Ohop and Kapowsin Lakes. Numerous small, level plains of clay and peat were formed as many shallow lakes and marshes were filled by soil and vegetation. An ice melt river, the diverted course of the ancient Puyallup River, scoured out the Ohop Valley channel. Gravelly plains with thin top soils such as the Yelm, Spanaway and Fort Lewis prairies were created by outwash from the ancient ice sheet. Moraines were deposited in large heaps on the Puget Sound bottom and became Fox, Anderson and McNeil Islands.

From an agricultural standpoint the most important topographic feature is the valley flood plain more recently formed by the erosion of the Puyallup River and the Stuck River, a branch. The Puyallup cut a wide trench across the glacial plains in its course from the Cascades to Puget Sound. Periodic river flooding and meandering deposited a winding plain of fine silty and sandy soils. The bottomlands contrast with the less fertile, coarse, unassorted gravels on the low uplands and moraines flanking the river valley floor. Drainage ditching and river diking have brought most of the river bottom under cultivation. Called the lower Puyallup Valley, this rich soil area extends from Orting to Commencement Bay at Tacoma, a valley bottom two to three miles wide and nearly twenty miles long. The silty, marshy delta of the Puyallup at Commencement Bay has been reclaimed largely by the Port of Tacoma as a commercial and industrial area.

Land Classification and Soils

In general, the land forming processes of mountain building and the wide deposition of rocky material by the continental glacier have not resulted in a favorable surface or soil for agriculture in a greater part of Pierce County. Productive land of high economic classification for crop growing or cultivation is limited to the Puyallup and some other smaller valley lowlands and older lake beds scattered over the lower-elevation sections. The land is divided into eight general classes ranging from excellent for farming to rocky, mountainous areas unsuited for any plant growth. Soil scientists have mapped a large variety of soils, consisting of 89 types. ^{1/}

Class I and II lands, the best for farming, are confined to the lower Puyallup Valley and its tributaries, the Stuck River Valley and lower parts of the Carbon Valley. These lands are alluvial soils deposited by the rivers.

^{1/} U.S. Department of Agric., Soil Conservation Service. Soil Survey, Pierce County, Washington, July 1955. 88 pages and 4 sectional soil maps.

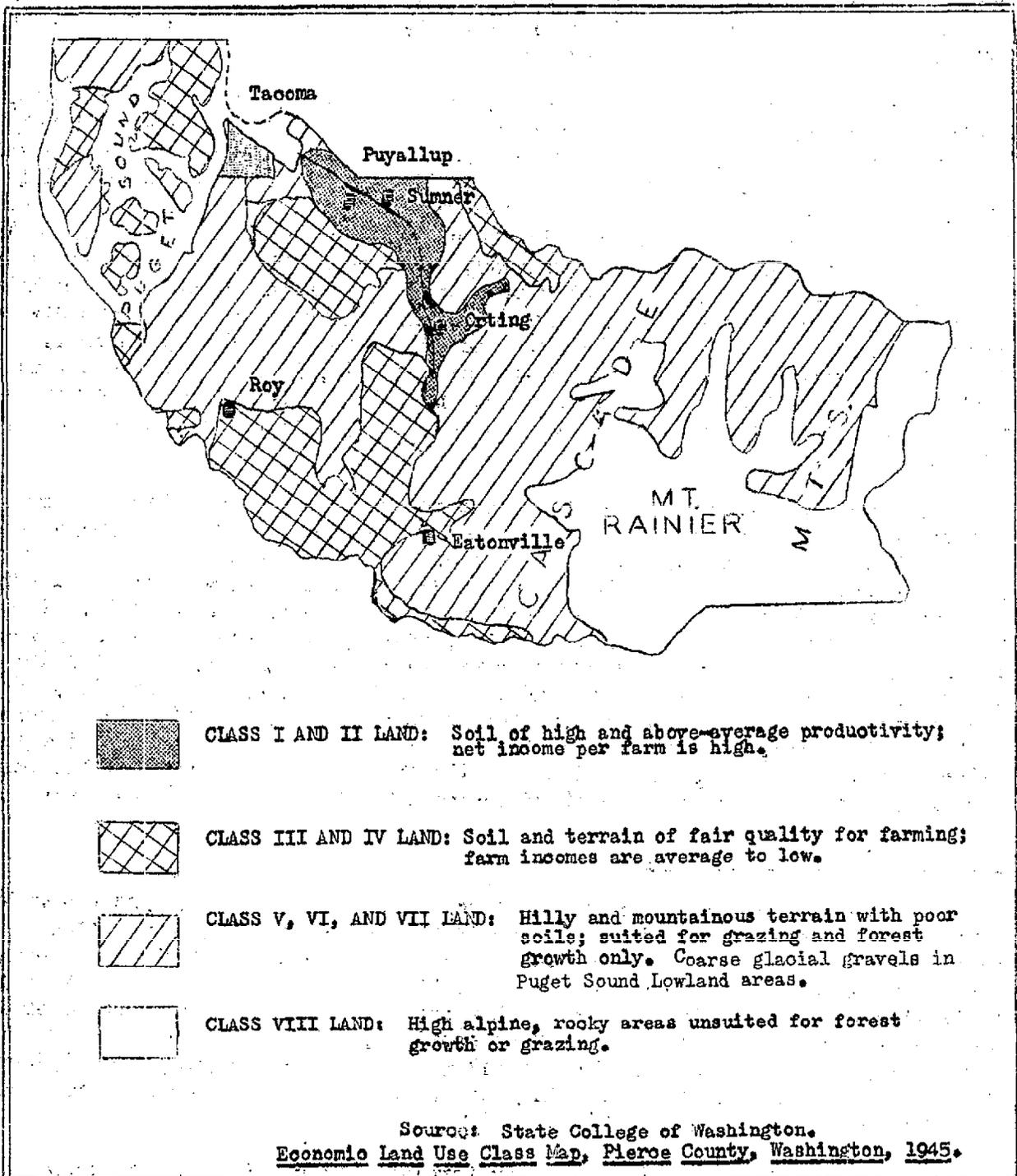


Figure 5.- General Quality of Land For Farming in Pierce County

While wet in many places, acid in chemical nature, and slightly deficient in calcium, phosphorus and other soluble minerals, they are deep, fine-textured and rich in organic matter. When drained and improved with lime and other fertilizers they are highly productive. The major, most easily cultivated soils of this Puyallup bottom land belt include the following: Puget silt and silty-clay loams, Puyallup loams, Sultan loams, Orting loams, Pilchuk loams and Snohomish loams. These fertile, deep loams comprise a total area of about 27,000 acres.

Class III and IV land makes up large sections of the low glacial drift plains and moraines of central and western Pierce County. These upland soils are of glacial origin and are generally of unassorted gravels, sands and clays. They are hard to till and do not retain moisture well because of their coarse, porous texture. Rainfall and surface water seeps through the top layers of the soil and the ground water table is generally deep. Top soil is thin, and organic matter or humus is deficient. These soils have to be sprinkler-irrigated and deeply top-dressed with manures or compost to get fair productivity of grasses or crops. Moisture and nitrogen are their main deficiencies. In their natural state these soils once supported a dense forest cover of Douglas fir and thickets of brush and bracken ferns. The soils formed from glacial action are numerous in type. The most common types farmed are the following: Alderwood gravelly and sandy loams south of Puyallup and in and about Tacoma, Barneston and Kapowsin gravelly and sandy loams in the Eatonville and Kapowsin area, and Buckley-Enumclaw loams in the White River Valley area at Buckley. Some higher valley silty soils mixed with the glacial gravels are of better fertility. These include the Chehalis silt loam of South Prairie Creek and Chop Lake valleys. Muck and peat soils are in numerous pockets and are productive for grasses and crops when drained. Tacoma muck, Carbondale muck and Mukilteo, Tanwax, Greenwood and Rifle peat make up farmlands in the prairies between Tacoma and the Misqually river and in lowest parts of the Puyallup Valley.

Over two-thirds of Pierce County is in Classes V, VI, VII and VIII. They include the very gravelly prairies south of Tacoma in the Fort Lewis and Spanaway districts, some of the island and peninsular sections in the Sound, and the Cascade Mountain region in the east. The Spanaway gravelly sandy loams are a relatively infertile and dry soil covering over 80,000 acres. The materials are the outwash deposits of the ancient ice sheet. This soil supports grasslands and a cover of small Douglas fir and Scotch Broom. Rough, mountainous, and stony land covers over 113,000 acres, nearly all in forest. Rough, broken land such as steep bluffs along the Puget Sound shore and the valley banks make up about 69,000 acres. Most of these lands are unsuited for farming and are forest country in Mount Rainier National Park and Snoqualmie National Forest. Large private holdings in the mountains are also managed as tree farms to produce sawmill logs and pulpwood. A large part of the poor-yielding Spanaway soils are within the large Fort Lewis Military Reservation, also partially covered with forest growth and unused for farming.

Climate

Pierce County is located in the West Coast Marine climate region of North America. This coastal climatic zone extends from southeastern Alaska to northern California. Climatologists describe this region as one which is influenced

by the mild, moist air flowing inland from the oceans. Because of mountain barriers and the prevailing inland movement of oceanic air, the climate is cool, cloudy and wet for most of the year. Cold or hot and dry air of the continental interior seldom invades the county because of the high barrier formed by the Cascade Mountains. The Puget Sound lowlands have a climate similar to other parts of the world located on the west coasts of continents between the latitudes of 40 to 55 degrees. This includes the British Isles, Northwest Europe, southern Chile of South America and New Zealand. Regions in this climate are noted for dairy and forest products and crops adapted to cool, moist climatic conditions with long wet seasons and short summer dry seasons.

Because of great variations in Pierce County elevations, its temperatures, frost conditions, growing seasons and precipitation vary considerably by localities. There are two general climatic belts. Western Pierce County lowlands are warmer and drier than the mountainous portion. The Mount Rainier area is somewhat of a climatic island of alpine Arctic nature with extremely heavy rain and snowfall. Temperature zones on the mountain range from temperate to Arctic at different elevations. Snowfall of over 200 inches often isolates the higher portion of Mount Rainier National Park.

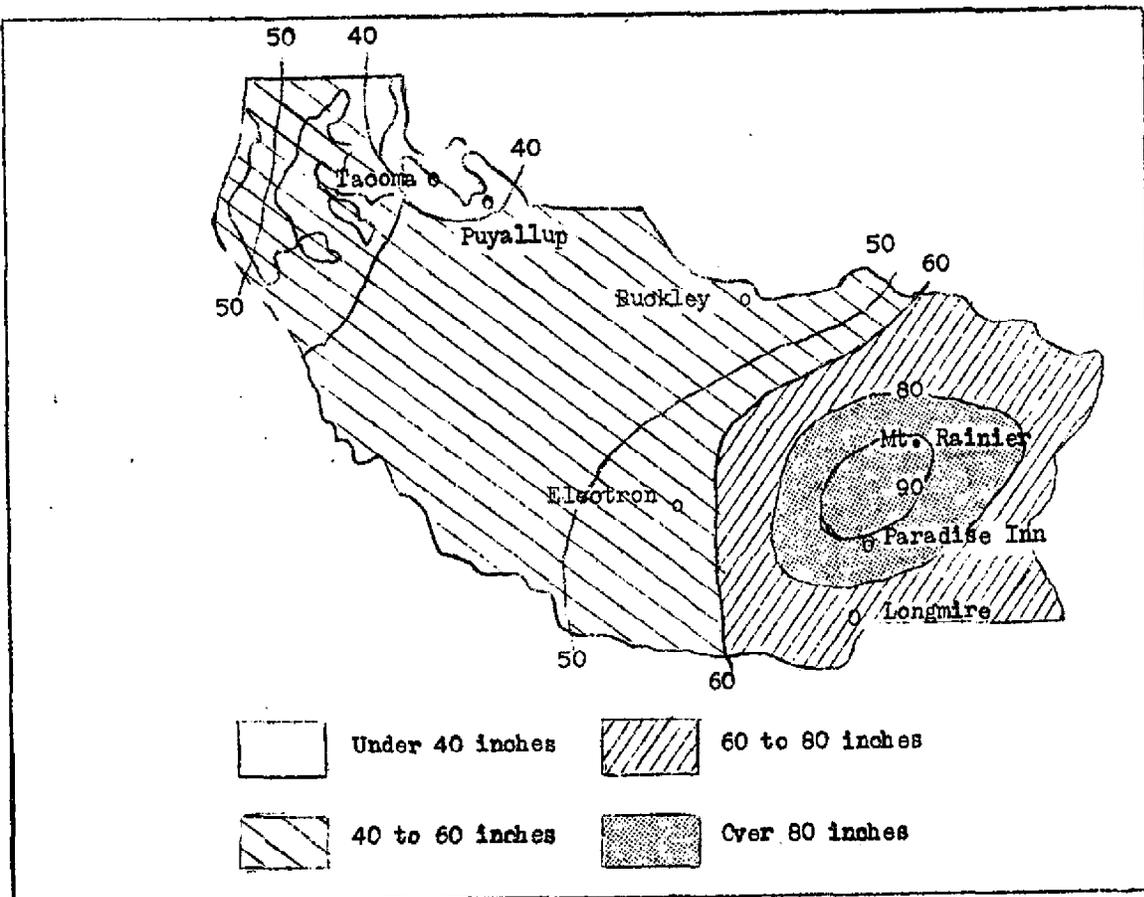
Temperature records for over 20 years show that the Puget Sound and Puyallup Valley lowlands have a daily temperature average ranging from 38 degrees in mid-winter to 65 in mid-summer. In the interior uplands and foothills the range is from 32 to 64. Moderate summer averages are caused by the cool nights and some air drainage from the mountains. Sea breezes off Puget Sound also temper the hot periods.

Growing season and freeze conditions vary according to elevation and patterns of air drainage. Killing frosts and severe freezes are not common and occur only occasionally in the Puyallup Valley and Puget Sound shoreline districts. Heat given off by Puget Sound waters to the lower atmosphere is generally sufficient to prevent local frosts. Ground fogs, or valley fogs, accumulate over the Sound in early spring and autumn and often prevent frosts. Inland valley bottoms, lake depressions, and bog areas have frosts earlier and more frequently as heavy, cold air from uplands and mountains drains into them

Table 6.-- Temperature Extremes, Dates of Killing Frost
Pierce County

Station and Elevation	Temperature Extremes Recorded (degrees Fahrenheit)		Killing Frost Average Dates	
	Coldest	Hottest	Last in Spring	First in Fall
Buckley (685)	5	100	April 11	October 25
Electron (1,730)	-8	99	May 19	October 8
Puyallup (50)	-2	99	April 23	October 17
Sumner (53)	-7	94	May 12	October 17
Tacoma (203)	7	98	March 13	November 18
Longmire (2,762)	-9	105	May 26	October 7

Source: U.S. Dept. of Agric., Climate and Man,
1941 Yearbook of Agriculture.



Source: U.S. Department of Agriculture, Climate and Man
1941 Yearbook of Agriculture

Figure 6.- Distribution of Precipitation
Pierce County

Table 7.- Precipitation, Pierce County

Station and Elevation in Feet	Average Monthly Precipitation (in inches)												Annual Total (inches)
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	
Buckley (685)	5.70	4.12	4.75	3.77	3.06	2.88	1.19	1.28	2.62	4.67	5.58	6.72	46.34
Electron (1,730)	11.81	7.13	4.67	6.35	3.21	6.93	2.16	3.73	3.62	5.06	8.44	9.51	72.62
Puyallup (50)	5.49	4.00	3.94	2.74	2.21	1.61	.79	.81	1.84	3.50	4.92	6.40	38.25
Tacoma (203)	5.00	4.08	3.70	2.22	1.66	1.29	.61	.89	1.73	3.51	4.64	5.90	35.23

on calm, clear, spring or autumn nights. Tacoma and the Puyallup Valley generally enjoy a growing season or frost-free period of about 240 days. Puyallup farmers usually plan on mid-April as a safe planting date and mid-October as the time of the first killing frost.

Table 8.- Temperatures For Selected Stations, By Months,
Pierce County
(Source: United States Weather Bureau)

Station and Elevation in Feet	Average Temperatures (in degrees Fahrenheit)												Annual Average
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	
Buckley (685)	37.7	40.4	44.5	49.2	54.0	59.3	63.6	63.8	58.4	51.2	43.6	39.3	50.4
Puyallup (50)	38.6	40.9	45.1	49.8	54.4	59.6	63.6	63.0	58.1	51.7	44.1	40.1	50.8
Tacoma (203)	39.5	42.1	45.8	50.5	56.0	60.4	64.3	64.0	59.3	52.9	45.7	41.8	51.8
Electron (1,730)	32.5	48.7	36.5	41.2	49.9	51.3	55.9	55.6	53.3	46.3	43.7	35.7	45.1

Three precipitation zones are apparent from Weather Bureau data. A small area about Puyallup and Tacoma is only moderately wet with 40 inches or less of rainfall per year. This area is slightly within the rain shadow of the Olympic Mountains when westerly and northwesterly winds blow off the Pacific. Winter rains are heavy with some snowfall at Tacoma, but the summer season is quite dry being under an inch monthly in July and August.

In the central area precipitation increases gradually toward the east from 40 to 60 inches, as elevation increases toward the Cascade foothills.

The third climatic section in the east, the Cascade Mountains including Mount Rainier, is cloudy and wet for about nine months of the year. Precipitation is heavy and mainly in the form of snow above 2,000 feet elevation. It ranges from 60 to over 90 inches per year. Both the lowland and mountain regions have a distinct summer dry season which favors the harvesting of hay. Summer dryness creates fire hazards in the interior forests and farm woodlands. Land clearing, burning, logging and general forest entry are often curtailed during the fire season.

Forests and Wildlife

The natural vegetation has been modified greatly by forest cutting and agriculture. Only the mountainous section contains large areas of primeval forest and native animal life. Mount Rainier National Park is a large, protected wilderness area little disturbed by man. The lowlands adjacent to Puget Sound were grazed as early as 1835, and have been partially cleared for numerous farms. Scotch Broom, an ornamental shrub, introduced from the British Isles about a century ago, has thrived and spread over much of the western and central glaciated plains.

Dense woodlands of Douglas fir regrowth and red alder cover much of the gravelly uplands and the steeper slopes of the Cascade foothills. Abundant timber resources have permitted a continuous source of off-farm and part-time employment for many farmers. Nearly everywhere the logging operations preceded settlement on farms; they aided in clearing away forest cover and lowering the

costs of bringing land under cultivation. For many years Pierce County was one of the major lumber-producing areas of the Pacific Coast. In 1925 there were 44 mills which cut 1,033,481,000 board feet of lumber, third among Washington counties. In 1949 sawmilling had decreased to a volume of 279,68,000 board feet produced by 30 mills. ^{1/} Depletion of privately owned commercial timber in the accessible areas was the primary reason for this reduction. This has also occurred in neighboring Puget Sound counties.

According to the most recent Forest Service survey in 1939, Pierce County contained a large timber resource in federal and private holdings located in the mountainous lands. ^{2/} Over 80 percent of Pierce County (869,525 acres) was classified as forest land. Douglas fir of sawlog size amounted to 5,750,000,000 board feet; western hemlock 5,010,000,000 feet; balsam firs 2,040,000,000; western red cedar 750,000,000; and other species 40,000,000 feet. These are 1939 figures which have now been decreased by further logging. Second-growth timber which has grown in the last 30 to 50 years has become important to farmers and other woodland owners. The Forest Service estimates that the potential annual growth of young timber could add 217,000,000 board feet to Pierce County forests per year under intensive management. Regrowth stands have become valuable as sources of pulpwood, small logs, posts, poles and Christmas trees.

The ownership of the commercial-sized timber of Pierce County, totalling 14 billion feet, is about evenly divided between private and public ownership. Private owners such as lumber, paper, railroad and land companies, together with farmers, own 495,600 acres with an estimated stand of 7,307,000,000 feet. Federal Government ownership in Mount Rainier National Park, Snoqualmie National Forest, Fort Lewis Military Reservation, together with some Indian lands amounted to 313,020 acres supporting 6,164,465,000 board feet. About one-third of the Federal timber is within Mount Rainier National Park reserved from any commercial cutting.

Some ripe timber in Snoqualmie National Forest, however, is being sold at public auction, and 25 percent of the revenues from the timber sales are returned to the county government. The Federal forest and park lands are carefully managed to serve multiple uses as watersheds, wildlife ranges and recreational areas. Over a million visitors and campers enjoy wilderness and mountain recreation in Rainier National Park each year. Many private owners are practicing tree farming on a long-term basis. The St. Paul Lumber Company has a large tree farm under intensive management in the Carbon River watershed.

The wildlife, fish and game resources are valuable in the county economy. The mountainous and sea-shore environment supports a varied list of animal species. A trip from Tacoma to the top of Mount Rainier is somewhat comparable to a journey from the same city to Point Barrow, Alaska. There are changes in climate from temperate to Arctic which result in differences in plants and

^{1/} West Coast Lumbermen's Association, Portland, Oregon. 1949-1950 Statistical Year Book.

^{2/} U.S. Dept. of Agric., Forest Service, Pacific Northwest Forest and Range Experiment Station, Portland, Oregon. Forest Statistics, for Pierce County, Washington. May 15, 1959.

animals adapted to each zone. Fish, game and fur animal resources are important to numerous farm families and to rural communities as a source of supplemental income. According to the Washington State Game Department, Pierce County-Puget Sound waters, rivers, lakes and mountain lands yield an important return to sportsmen. ^{1/} The Puyallup and Nisqually are among the state's top steelhead fishing streams, yielding 14,190 and 3,146, respectively, in the 1952-53 season. In the woodlands, 3,843 deer were killed, and thirty elk were bagged in the mountains during the 1955 season. Trappers (many of them farm boys) harvested a fur catch in 1955-56 of 1,595 muskrat, 108 mink, 4 marten and 40 raccoon.

^{1/} Washington State Game Department, Game Bulletin, January, 1954-April 1956, and "Report of Trappers Catch of Fur-Bearing Animals, 1955-56" (mimeographed).