

John Leiberg on forest fires, Indian burning, old-growth forests, logging history, and reforestation of southwest Oregon, ca. 1400 to 1899.

**Edited, with commentary, by Bob Zybach.
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**Part 5. Reforestation & Afforestation Patterns:
ca. 1600 to 1899**

(pp. 280-281) Widespread and intense forest fires powerfully affect the annual ratio of soil humidity on the areas burned over. To this fact is due the often strange and otherwise inexplicable changes in vegetation which occur on such tracts. The supplanting of humid forest types with subhumid ones or the change of forest to brush growth is therefore not always to be sought in climate changes, but is often due to local disturbances in the soil moisture ratio. Such changes may be either evanescent or permanent. When permanent they are probably due to climatic changes involving aridic tendencies. We may in such cases suppose that the balance between forest and brush or between brush and herbaceous vegetation had reached an equilibrium where the slightest push toward arid or semiarid or subhumid types of growth was sufficient to tilt the balance beyond recovery of those conditions. In the region under consideration, as well as many other places on the Pacific slope, it is evident that forest fires have supplied the requisite push.

(p. 233) The tracts on which a condition of temporary semiaridity has been artificially induced consist chiefly of old or recent burns in the forested subhumid areas. They are scattered over the entire slope, but are most numerous and of largest extent in **Ts. 31, 32, 33, 34, and 35 S., R. 4 E.**, where they collectively cover an area of 50,000 acres. It is impossible to say with absolute certainty that the tracts just mentioned are semiarid as a temporary condition only. They are slopes and summits denuded of their forest covering forty or forty-five years ago [1855 to 1860] through the medium of severe fires. They are now covered with brush growths composed of species characteristic of semiarid lands, and their aspect is exactly like that of the semiarid chaparral slopes of California. Areas having similar characters, but not so large, occur in **Ts. 38 and 39 S., Rs. 4 and 5 E.** There is at least an even chance that such tracts will not again reforest, in which event they will constitute evidence proving the northward advance of the arid conditions prevalent in the regions farther south.

(p. 284) In this region under consideration the proposition outlined above holds good in every case where any considerable area has been completely or nearly denuded by fire. Thus, on the summit and on the higher slopes of the Cascades from Diamond Lake southward to the north end of Lake of the Woods are very large reforestations of lodgepole pine, 80 to 95 per cent pure. The lodgepole pine has replaced a former forest of alpine hemlock and noble fir destroyed by fire. But although a great many seed trees of these species escaped destruction they have failed to reproduce themselves on the burned-over areas for no other reason than failure of their seeds to germinate on the dried-out forest floor. On adjacent areas in these same districts, where the natural seepage or soil moisture was not seriously interfered with, there are abundant reforestations of alpine hemlock and noble fir. Reforestations of lodgepole pine are of a transient character at high elevations in the southern Cascades.

(p. 284) The more common species which replace lodgepole pine stands at the higher elevations are alpine hemlock and noble fir, while in the upper canyons of the South Fork of the Rogue River, Englemann spruce is sometimes found replacing old, mature, and decaying growths. On the levels as well as on the mountain areas east of the Cascades, where the normal forest growth is chiefly yellow pine with small admixtures of sugar pine and white fir, reforestations after fires are nearly always pure growths of lodgepole pines. But in the yellow-pine areas of **Ts. 41, 40, and 39 S., Rs. 4 to 6 E.**, inclusive, reforestations after fires are not composed of lodgepole pine. Reforestations here are yellow pine, red and

white fir, sugar pine, and incense cedar; in short, the same species again come in which flourished before the fire.

(p. 284) Reforestations after fires at middle elevations on the western slopes of the Cascades and in the more humid sections on the eastern slope, between 5,000 and 6,000 feet, are extremely varied and complex.

(p. 245) The duration of the forest type is indefinite. While undoubtedly subject to evolutionary changes, its modifications or transitions to other types are so slow as to be quite imperceptible to us. Not so with subtypes, They frequently change, sometimes two or three times in a generation. Forest fires are fertile causes for inducing such rapid changes. But even when left undisturbed a subtype rarely persists in any particular locality for more than 250 or 300 years. Such at least is the rule on the eastern and immediate western slope of the Cascades and in the basins between the Cascades and the Rocky Mountains. The only exception to this rule in the region named that is known to me occurs in pure yellow-pine and western-juniper growths.

(p. 286) The tendency of all reforestations after fires in the humid and subhumid forest types is to form pure-growth stands of the species naturally occurring in the region, the condition or ratio of soil humidity, an ever-varying factor, determining the particular species. The abundance or scarcity of seed trees and the degree of tolerance possessed by the various species are factors of trifling importance.

(p. 286-287) Fires in the lower and drier areas of this type of forest are commonly followed by increased growth of various kinds of ceanothus, manzanita, and brush-like or truly arborescent forms of madrona (*Arbutus menziesii*). Sometimes in the upper areas of the subhumid and in the lower portions of the humid tracts fires, instead of being followed by reforestations, give rise to enormously dense brush growths. Tracts of this sort are found in scattered patches everywhere along the middle elevations on the western side of the Cascades, and throughout the Siskiyou Range in the region examined. The most conspicuous examples occur from Mount Pitt northward, **Ts. 36, 35, 34, 33, 32, 31, and 30 S., R 4 E.** The forest, previous to the burns, which are of recent origin [*1855 to 1899*], consisted chiefly of red, white, and noble fir. On a nearly continuous area comprising 58,600 acres the forest has been burned to the extent of 98 per cent, and has been supplanted by brush growth which have every appearance of permanency on the larger proportion of the area. The southern half of the burned district carries the densest stands of brush; in the northern the growths are more scattered. In the former the brush is composed of shrubby chinquapin, service berry, manzanita, scrub oaks, vellum-leaved ceanothus, *Garrya*, and willows. In the latter of huckleberry, blackberry, and various species of ceanothus. The northern areas contain a patch here and there which shows feeble signs of reforestation. The southern tracts present solid masses of brush, comparable to the chaparral slopes in southern California, but even more impassable than they. The brush growths are mostly on slopes facing the west or the south; exactly the situations in which the lowering of soil humidity would be most severely felt.

T. 28 S., R. 5 E. (see: Indian Burning)

(p. 298) The southern and central portions are covered with stands of lodgepole pine, all reforestations after fires and representative of all ages of burns from one hundred fifty years ago [*ca. 1750*] up to the present time [*1899*]. There is no portion of these or the heavier stands of alpine hemlock and noble fir in the northern sections of the township that have not been visited by fire within the past forty-five years [*since 1855*]. Reforestations consist wholly of lodgepole pine as the first growth. In some places on warm southern declivities brush growth comes in after fires. In other localities a grass and sedge sward covers the ground. It is clearly evident that many of the fires have been set for the purpose of promoting these grass growths and enlarging the possible sheep range. It is also noticeable that wherever fires have been kept down for four or five years there is gradual return to forest and a disappearance of the grass.

T. 28 S., R. 6 E. (see: Indian Burning)

(p. 299) The forest consists of stands of alpine-hemlock type. Ninety per cent of it is composed of lodgepole-pine reforestations. Some of these stands date back to Indian occupancy, others are the result of fires set by the white man. All of the forest is fire marked. Reforestations after fires are invariably composed of lodgepole pine. Repeated conflagrations and total destruction of the forest bring grass and sedge growths.

T. 28 S., R. 6 1/2 E. (see: Indian Burning)

(p. 300) The alpine-hemlock type here is composed almost entirely of lodgepole-pine stands, which are reforestations after fires, and occupy the western half of the township.

(p. 300) Reforestations are moderate, but the burned tracts in the yellow pine show a tendency to grow up to lodgepole pine.

T. 29 S., R. 5 E. (see: Indian Burning)

(p. 305) After a fire one of three things happens: either lodgepole pine comes in as the first forest growth, or grasses and sedges form a thin, interrupted sward, or the ground remains bare of all vegetation. It is impossible to predict beforehand which one of the three phases will appear.

T. 30 S., R. 2 E. (see: Old-Growth)

(p. 311) The burned-over areas in the township do not reforest rapidly or well. The tendency is toward grassy glades rather than to forest at all the higher elevations, and to dense brush growths at the lower and middle altitudes. Some of the slopes covered with pumice, or with small lapili, are being denuded of their soil down to the lava bed rock as a result of the fires and the consequent loosening of the forest floor.

T. 30 S., R. 4 E. (pp. 286, 314-315)

(p. 314) The yellow pine is of poor quality and occurs as small, scattered groups in the western area of the township. The red fir is composed largely of standards and veterans, generally of the same class and dimensions as those in the preceding township [*T. 30 S., R. 3 E.*]. Much of the alpine-hemlock type is of small dimensions, being reforestations after fires which burned 90 to 100 years ago [*ca. 1800 to 1810*]. The heaviest stands of forest occur in the northwest sections of the township, on terraces belonging to the valley of the North Fork of Rogue River.

(p. 314) Practically all of the forest is fire marked. One-sixth of the entire area has been burned clean of timber, save for the occasional tree, and the remainder has lost 40 per cent of its mill timber through the same cause. The southern areas have suffered the most, but no tract has been entirely exempt. Brush growths of the vellum-leaved ceanothus follow the fires. In a few localities lodgepole-pine reforestations are beginning to supplant the brush.

T. 30 S., R. 6 1/2 E. (see: Indian Burning)

(p. 319) Reforestations are nearly always lodgepole pine at all elevations. Brush growths are not common.

T. 30 S., R. 7 E. (see: Indian Burning)

T. 30 S., R. 8 E. (see: Indian Burning)

T. 30 S., R. 9 E. (pp. 278, 321)

T. 31 S., R. 1 E. (see: Forest Fires)

T. 31 S., R. 1 E. (pp. 326-328)

(p. 326) The central portions contain a few hundred acres of grazing lands. They consist of open, park like ridges, covered with yellow pine, where the scattered timber permits a thin growth of grass to exist. Cattle range on these tracts, but no sheep.

(p. 327) The young [*red-fir*] growth represents reforestations after fires which burned the forest one hundred years ago [*c. 1800*].

(p. 327) Most of the burned-over areas are reforesting, principally with red fir. A few of the southern slopes are becoming brush covered, dense thickets of rhododendron and of vellum-leaved ceanothus occupying the ground.

T. 31 S., R. 3 E. (see: Old-Growth)

(p. 285-286) The solidity of this old growth is broken in many places by old burns more or less completely reforested. The reforestations are mostly, and sometimes wholly, composed of yellow pine, although this species forms under normal conditions the smallest percentage of any of the trees in the surrounding old-growth forest. Where the yellow-pine reforestations have reached an age of 200 years and upward, the yellow pine is giving way to the encroaching red-fir growth. Where fires of modern date [*1855-1899*] have burned away the reforestations in these places, lodgepole pine or brush growths have taken possession.

(p. 330) Reforestation is scanty everywhere; it is practically lacking up Huckleberry Mountain, where heavy brush growths flourish on all the fire-swept areas.

T. 31 S., R. 4 E. (see: Indian Burning)

T. 31 S., R. 5 E. (pp. 333-334)

T. 31 S., R. 6 E. (see: Indian Burning)

T. 31 S., R. 7 E. (see: Indian Burning)

T. 31 S., R. 8 E. (pp. 250, 338)

T. 32 S., R. 1 W. (see: Indian Burning)

(p. 252) It is a reforestation after an extensive fire which burned about one hundred and twenty years ago, and the red-fir component is as yet below standard with reference to its average height and diameter.

(p. 342) Result of fires is brush growths on the southern slopes; reforestations of red fir on the summits and north slopes of the ridges.

T. 32 S., R. 3 E. (see: Old-Growth)

T. 32 S., R. 4 E. (see: Forest Fires)

T. 32 S., R. 5 E. (see: Indian Burning)

T. 32 S., R. 6 E. (see: Logging)

(p. 292) Its [*“white fir’s”*] reproduction is generally good, but in some locations on the eastern side of the range, as **T. 32 S., R. 6 E.**, brush growths are replacing burned or partially burned stands of the white fir.

(p. 350) Most of the old and standard growth of alpine-hemlock type has long since been burned, and reforestations, made up of lodgepole pine, white pine, and alpine hemlock, of small size and in dense,

thick stands, have taken the place of the former forest. The stands of yellow-pine type have been grievously thinned by the fires, and dense masses of underbrush, composed almost exclusively of the vellum-leaved ceanothus, have occupied the place of the burned forest.

T. 33 S., R. 3 E. (see: Old-Growth)

(p. 285) In the south-central areas of **T. 33 S., R. 3 E.**, occur similar reforestations of white pine following burned stands of red and white firs. Here as elsewhere the white-pine seed trees were in the minority, white and red firs predominating.

(p. 287) The madrona in this locality is composed of old trees. Several were observed 75 feet in height and 2 feet in diameter. The reproduction of it here has practically ceased.

T. 33 S., R. 4 E. (see: Forest Fires)

T. 34 S., R. 2 E. (see: Logging)

T. 34 S., R. 3 E. (p. 253, 376)

T. 34 S., R. 4 E. (see: Forest Fires)

T. 34 S., R. 5 E. (see: Old-Growth)

(p. 379-380) Most of the standing timber is of small size, being chiefly reforestations after fires which denuded the region a decade or two anterior to the advent of the white man.

(p. 380) More than 75 per cent of the stands are composed of trees with basal diameters below 18 inches.

T. 34 S., R. 6 E. (see: Old-Growth)

(p. 382) Reforestations of the burned-over areas are few and thin. Most of the young forest outside the yellow-pine areas consists of lodgepole pine. Where the yellow-pine stands have been destroyed heavy brush growths of the vellum-leaved ceanothus have followed. On a few of the higher elevations facing east and south the forest has been replaced with a thin sward of grass. In the burns which have occurred in the alpine-hemlock type large tracts are entirely bare of vegetation.

T. 35 S., R. 4 E. (see: Forest Fires)

T. 35 S., R. 5 E. (see: Indian Burning)

(p. 288) On the lava plateaus flanking the crest of the range in **Ts. 34 and 35 S., R. 5 E.**, grassy places created by fires before the advent of the white man have, in course of time, become covered with thick stands of lodgepole pine, now mature and giving way to stands of noble fir and alpine hemlock.

(p. 395) The lodgepole pine has had time to mature, die, and fall down, and a new forest 150 years old has taken its place since that time.

T. 36 S., R. 3 E. (see Old-Growth)

(p. 406) Fires have run through most of the township, burning 10 per cent of the timber. Brush growths with scanty reforestations are the results of the fires.

T. 36 S., R. 4 E. (see: Forest Fires)

T. 36 S., R. 5 E. (see: Forest Fires)

T. 36 S., R. 6 E. (see: Logging)

T. 37 S., R. 5 E. (pp. 257, 278, 285, 423-424)

(p. 257) The white pine rarely occurs in sufficient numbers to form stands distinguishable as subtypes. It is mostly found scattered throughout the mixtures of red and white fir in the middle and upper areas of the red-fir type. Exceptions occur, however. In **T. 37 S., R. 5 E.**, in the space between Mount Pitt and Mount Brown, is a tract of about 2,000 acres on which white pine [*“6 million feet”*] forms 70 per cent of the forest. It is a growth 70 or 80 years old [1820 to 1830 origin] – a reforestation after forest fires.

(p. 285) Fires in the mixed growth or in timber stands where the red fir predominates are frequently followed by great masses of white fir seedlings, which develop into heavy and dense forest stands, and occupy the ground for a century or more. An example of this kind occurs in **T. 37 S., R. 5 E.** We here have a [*“4,000 or 5,000 acre”*] forest composed almost wholly of white fir [*“10 million feet”*], in the midst of which rise here and there huge veterans of red fir [*“20 million feet”*] 400 to 500 years old. The white fir is a reforestation, a hundred years old, following a burn which destroyed a mixed growth in which red fir largely predominated. Notwithstanding the fact that large numbers of seed trees of red fir escaped destruction, this species was quite unable again to occupy the ground as the first forest growth after the fire.

(p. 423) Most of the central depression in the township is covered with the waters of Lake of the Woods.

(p. 424) The northern and the southern ends of Lake of the Woods terminate in marshes containing in aggregate about 1,200 acres. They produce heavy growths of coarse marsh sedges and species of rush, and are covered with water to a depth of 2 to 4 feet during portions of the year.

(p. 424) The forest is chiefly of the red-fir type. It contains a small percentage of yellow pine [*“2 million feet”*], which species here crosses the Cascades, one line coming north from the yellow-pine areas in the Klamath Gap, another coming from the southwest through low gaps in the crest line of the range from the headwaters of Jenny and Dead Indian creeks. The red and white firs also cross the range in this township.

(p. 424) Fires have ravaged the entire township. With the exception of the thinly forested lava flows on the slopes of Mount Brown, I did not see a patch of forest as large as 20 acres which did not show the marks of fire within the past forty years. In many localities the fires have made a clean sweep of the timber, and the areas have grown up to brush; in other places they have been of low intensity, burning 40 per cent of a stand here, 5 per cent there, or merely destroying individual trees, but consuming the humus and killing the undergrowth. The areas to the west and at the south end of Lake of the Woods have been exceptionally badly damaged by recent fires, The entire township seems to have been peculiarly exposed to destructive forest fires for ages. Most of its forest consists of reforestations less than 120 years of age, which in some places contain scattered trees of veteran red fir 400 or more years old. One of the noteworthy features of the reforestations is the very large quantity of white fir in their composition.

T. 37 S., R. 6 E. (see: Logging)

T. 37 S., R. 7 E. (see: Forest Fires)

T. 38 S., R. 3 E. (pp. 433-434)

T. 38 S., R. 4 E. (see: Old-Growth)

T. 38 S., R. 5 E. (see: Forest Fires)

T. 39 S., R. 4 E. (see: Forest Fires)

T. 39 S., R. 5 E. (see: Old-Growth)

T. 39 S., R. 6 E. (pp. 284, 447-448)

T. 40 S., R. 2 W. (pp. 451-452)

T. 40 S., R. 1 W. (see: Old-Growth)

T. 40 S., R. 1 E. (pp. 453-454)

T. 40 S., R. 2 E. (pp. 454-455)

T. 40 S., R. 3 E. (pp. 287, 455-456)

(p. 287) In **T. 40 S., R. 3 E.**, are large brush-covered tracts following the destruction of a nearly pure growth of red fir. The brush is largely composed of *Ceanothus sanguineus*.

T. 40 S., R. 4 E. (pp. 280, 284, 456)

T. 40 S., R. 5 E. (see: Logging)

T. 40 S., R. 6 E. (pp. 284, 458)

T. 41 S., R. 2 W. (see: Old-Growth)

T. 41 S., R. 1 W. (see: Indian Burning)

T. 41 S., R. 1 E. (pp. 292, 464-465)

T. 41 S., R. 3 E. (see: Forest Fires)

T. 41 S., R. 4 E. (see: Indian Burning)

T. 41 S., R. 5 E. (see: Logging)

T. 41 S., R. 6 E. (see: Forest Fires)