

FOREST STEWARDSHIP PLAN

for

JULIE WATTS
2690 Winding Trail Drive
Boulder, CO 80304
(303) 444-7277

Olde Stage Settlement, Lot 91D
NW1/4 SE1/4, Sec 35, T2N, R71W, S.P.M.

(9.0 Acres)

Prepared By:

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Colorado State Forest Service
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November 28, 1994

This management plan has been prepared at my request to guide my Stewardship management activities which I voluntarily apply on my property. I believe that activities recommended in this plan are appropriate to meet my objectives and will benefit the natural resources on my property. I intend to apply the recommended practices and to maintain them for a period of at least ten years, thus helping me to be a good steward of the forest and associated resources entrusted to me on my property.

Julie Watts

Date

STEWARDSHIP INCENTIVES PLAN

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OBJECTIVE

Light cutting activities are planned to control the spread of dwarf-mistletoe. A Defensible Space practice is planned to provide fire resistance for the house, a wildlife thicket is planned to provide food and cover for song birds, and a reforestation planting is planned to establish a tree cover on the east-facing slope and provide a screen along the property line.

DESCRIPTION

The property is located at 2690 Winding Trail; it is the last lot on the road. The lot contains 9.0 acres, of which 0.4 acres is occupied by an access easement; 1.8 acres by a ponderosa pine stand; 1.2 acres by the house and yard; 4.5 acres by an open, savannah-like ponderosa stand; and 1.1 acres by open, rocky hilltop.

There is a small dwarf-mistletoe patch southwest of the house; it overlaps the yard/pine stand boundary. The pine stand is slightly over-stocked and in need of a light thinning.

The house stands on top of the hill, with forest below it. Should fire ever get started along Valley Lane, this lot would probably burn. A Defensible Space practice would help limit damage, as would thinning the pine stand.

The east side of the lot is open and exposed to view from Old Stage Road. A few, scattered ponderosas occur on the site, but mostly, it is occupied by grass.

The ridge-top is open and exposed to wind, but there is no good location for a windbreak. A wildlife thicket at the north end of the property would provide a travel lane for small animals crossing the ridge, but the difficult, rocky site might present problems with planting and survival. An alternate site for a wildlife thicket is just below the road (east side) at the north end of the property.

Annual precipitation is about 18 inches. Plant cover is ponderosa pine on the west end with mountain grasses on the east end.

Bedrock on the ridge-top and east is the Pennsylvanian-age Lyons sandstone, with Ingleside and Fountain Formations occurring below and west of the house.

The soil is Goldvale-Rock outcrop complex west of the ridge-top and Piñata-Rock outcrop complex on top of the ridge and east of it.

INVENTORY

The wooded portion of the lot (1.8 acres) is occupied by a heavily-stocked ponderosa pine stand, containing about 20 cords of wood. A small dwarf-mistletoe patch is located just southwest of the house.

The eastern (grassy) end of the lot is occupied by grass, low shrubs and scattered ponderosa pines.

WILDLIFE

Deer have been seen on the eastern side of the lot. No threatened or endangered species have been seen in the vicinity.

DWARF-MISTLETOE CONTROL

A dwarf-mistletoe reduction project is recommended to halt spread of dwarf-mistletoe and protect existing trees. Heavily-infected trees should be removed and dwarf-mistletoe pruned out of remaining trees. Pruning (cleaning) needs to be thorough and repeated each year for three consecutive years to be sure of removing incipient-stage infections.

This practice is eligible for Stewardship Incentives cost-sharing, but on a project this small, would only pay about \$80 the first year and \$30 each of the next three years. It is questionable whether the \$30 is worth the trip into Longmont to do the paperwork.

DEFENSIBLE SPACE PROJECT

The purpose of Defensible Space is to increase fire resistance around a building. It also opens up the immediate area so a pumper crew or strike team can reach the danger area without undo risk to their lives and equipment. This is accomplished by thinning the forest in the immediate vicinity of the building, removing trees so crowns do not touch and preventing spread of fire through the crowns. Also, low-hanging limbs are pruned to eliminate fire ladders that fire could use to climb into tree

crowns. Accumulations of burnable debris are removed. The above are eligible for 65% of actual cost, up to \$750 in cost-sharing funds (This includes slash chipping.).

Other practices such as enclosing open decks, keeping woodpiles away from buildings and cleaning out gutters and troughs in the roof are required. If, during the ten-year life of the practice, the roof undergoes major overhaul, it must be upgraded to a higher grade of fire-resistant material (Wooden shingles to asphalt shingles, asphalt shingles to metal sheeting, etc.).

PLANTING PROJECTS

Reforestation; SIP-3, Technical Code 04; 4.5 acres.

Purpose: To protect the house site from visual exposure to the east and to restore a forest cover to the site (Note: SIP requires a "wood products" practice as one of the first two practices funded. In your case, forest products harvesting is impractical; this is one way to meet that requirement. You may choose not to do the entire 4.5 acres; the minimum is 0.1 acre and this can be cost-shared as a wildlife thicket, giving a better reimbursement rate.).

Description: This is a reforestation practice with heavy site prep (weed barrier). The planting rate is 390 seedlings per acre; this allows for a 16.7% mortality rate without replanting.

1800 Large-pot ponderosa pines @ \$0.91 ea.:	\$ 1638.00
Bulk Rate Discount (10%):	<u>163.80</u>
	\$ 1474.20
16200 Staples @ \$43.40/1000:	703.08
10800' Weed Barrier @ \$100/300':	<u>3600.00</u>
SUB-TOTAL	\$ 5777.28
Sales Tax (3%)	<u>173.32</u>
TOTAL, MATERIALS:	\$ 5950.60
LABOR, PLANTING; 1800 trees @ \$2 ea.:	3600.00
LABOR, WEED BARRIER; 1800 trees @ \$4.50 ea.:	<u>8100.00</u>
GRAND TOTAL	\$17650.60
From Stewardship Incentives Program:	<u>-1845.00</u>
Net Cost Before Tax Benefits:	\$15805.60

Reforestation costs are eligible for several Federal income tax benefits, including the 10% investment tax credit. Unreimbursed costs can be amortized over an 84-month period (Straight-line amortization; half-year convention) and this can be deducted from income. If you

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are in the 28% tax bracket, these two benefits will repay 38% of the cost of the planting:

Net Cost Before Tax Benefits:	\$15805.60
10% Investment Tax Credit:	<u>-1580.56</u>
	\$14225.04

First-Year Amortization (\$1128.97):	<u>-316.11</u>
	\$13908.93

Because Colorado income taxes are based on the Federal system, there is an effect on state income taxes, as well. This amounts to about 10% of the Federal tax:

	\$13908.93
First-year state tax benefit:	<u>-30.00</u>
First-year Net Cost:	\$13878.93

Over the following seven years you may continue to amortize the cost of the planting and deduct that from income. That will return to you another \$4109.43 in Federal income taxes and about \$400.00 in state income taxes that you didn't have to pay.

This brings the final cost of the reforestation planting to about:

\$9399.50.

This amount can be added to the basis in the property for capital gains treatment when the property is finally sold (If you sell the property in less than ten years, these tax benefits are subject to recapture.). Currently, the long-term capital gains rate is 28%. This would give you another \$2631.86 in Federal tax savings and about \$260 in state tax savings, bringing the final cost to \$6507.64.

Cost-sharing and tax savings reimbursed 63% of the cost!

There is talk of changing the capital gains rate; if it goes down, this will reduce the effective tax savings. You should see a professional tax preparer for details.

Wildlife Thicket; SIP-8, Technical Code 645; 0.1 acres.

Purpose: To provide shelter from predators (a travel lane) to small animals crossing the ridge. (Note: A wildlife habitat enhancement practice is the other one of the two practices that must be implemented first. A tenth-acre thicket would fill this requirement.

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Description: This is a wildlife thicket located either on the ridge-top at the north end of the property, or just east of the road at the north end of the property. It occupies 0.1 acres and benefits 3.0 acres.

250 American plums @ \$0.39 ea.:	\$ 97.50
1000 Staples @ \$43.40/1000:	43.40
750' Weed Barrier @ \$100/300':	<u>250.00</u>
SUB-TOTAL	\$ 390.90
Sales Tax (3%)	<u>11.73</u>
TOTAL, MATERIALS:	\$ 402.63
LABOR, PLANTING; 250 trees @ \$2 ea.:	500.00
LABOR, WEED BARRIER; 2.5 rolls @ \$96 ea.:	<u>240.00</u>
GRAND TOTAL	\$1142.63
From Stewardship Incentives Program:	<u>-280.00</u>
Net Cost Before Tax Benefits:	\$ 862.63

If you are a farmer, this is a qualified conservation expense, deductible on Schedule F. If you are not a farmer, this can be added to the basis for capital gains treatment later. It is not reforestation and does not qualify for the reforestation deductions.

A small reforestation planting could be cost-shared as a wildlife habitat practice. It would cost \$741.94 and be eligible for \$280 in SIP cost-sharing, making a net cost of \$461.94. You could qualify for two of these. These would be eligible for the tax credits and deductions.

MAINTENANCE

All practices require maintenance to retain their effectiveness over long periods of time. For example, with Defensible Space, gutters need to be cleaned out once a year and debris needs to be kept cleaned up. With Dwarf-mistletoe Control, annual inspections and pruning of infected trees is needed.

The use of weed barrier just about eliminates the need for maintaining plantings, if it can be placed by mid-June (preferably June 1st). The only thing needed is an occasional inspection tour to re-anchor weed barrier that comes loose. Watering will increase survival and growth, but it is not needed.

You can expect about 15% loss during the first year a planting is in the ground. One year after planting, seedlings usually look terrible. These maintenance plantings may be cost-shared and generally pay the entire 65%. By the third year of a planting, transplant losses should no longer be a problem. A seedling is considered established after surviving five years.

There are a number of things that should be done to enhance seedling survival and growth:

Grass is a vigorous competitor with tree seedlings. It drinks up water and adds compounds to soil to poison competition. Seedlings grow much better if they don't have to compete with it.

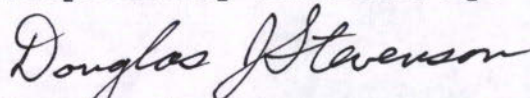
Weed barrier is a woven plastic cloth. It kills grass. Laid around tree seedlings, it provides needed relief from competition. It is expensive (\$2.00 per tree for widely-spaced trees). It is cheaper if seedlings are placed close together (like plums).

RECOMMENDATIONS





1. Plant the tenth-acre thicket and at least 0.1 acres of re-forestation in the spring of 1995. You should sign up for cost-sharing right away. There is a January 15th deadline for applications for this coming spring. Give me a call so we can set up a time to do this.
2. Complete a Defensible Space practice around your house. This is cost-sharable and you should sign up for cost-sharing at the same time as the wildlife thicket. Plan on doing the work next summer.
3. Control dwarf-mistletoe. Again, the practice can be cost-shared. You can wait until 1996 on this, if you prefer, or you can do that at the same time as the other work.

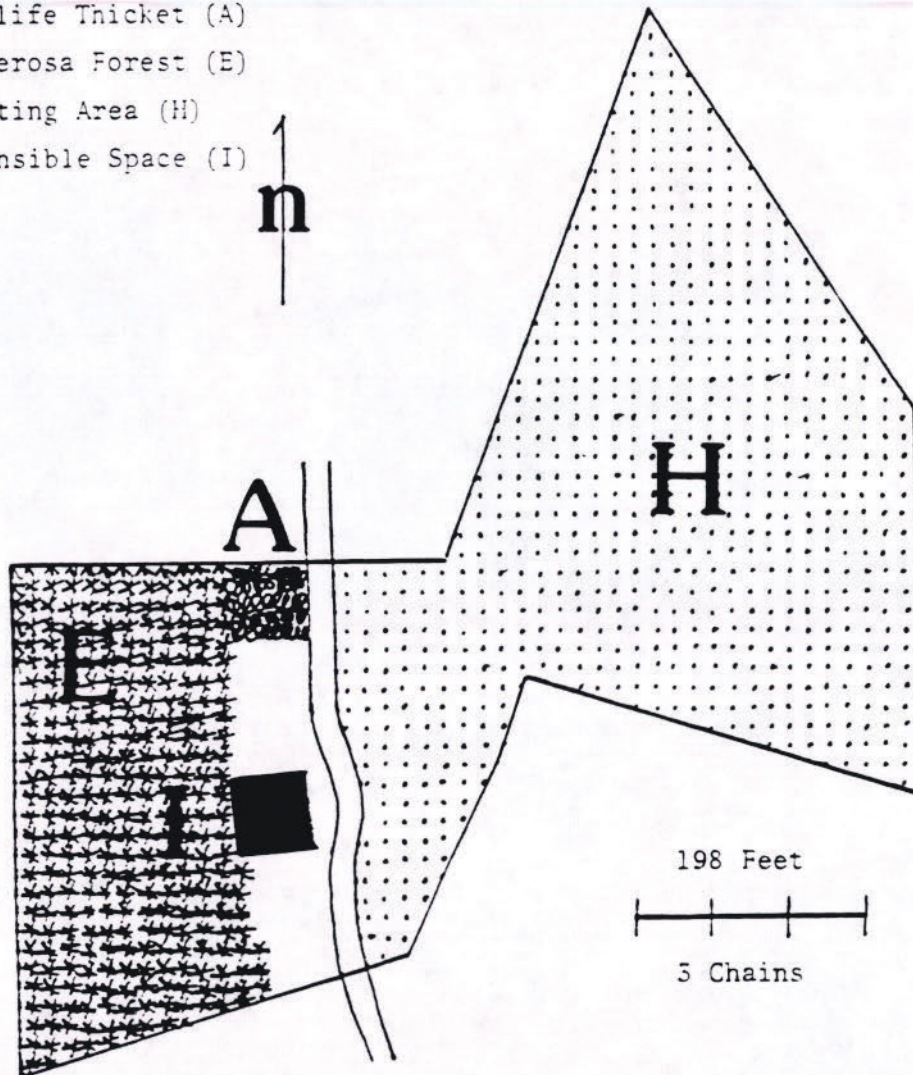
We need to discuss the possibilities in more detail. We can do this when we meet for the sign-up.

Respectfully Submitted By:






Douglas J. Stevenson
Assistant District Forester

-  Wildlife Thicket (A)
-  Ponderosa Forest (E)
-  Planting Area (H)
-  Defensible Space (I)



Julie Watts

NW1/4 SE1/4 Sec 35, T2N, R71W, S.P.M.

-  Property Line
-  Road
-  House

Drawn By:

Douglas Stevenson

November 27, 1994

DWARF-MISTLETOE

C. E. Swift and L. E. Dickens
Colorado State University Extension Service
Service in Action Leaflet No. 2.925

Quick Facts

Dwarf mistletoe causes a serious forest problem in many parts of Colorado.

Hosts for mistletoe include most members of the pine family. The seeds of mistletoe are dispersed in August and early September.

The ultimate effect of dwarf mistletoe is premature death of the affected tree.

Dwarf mistletoes (Arceuthobium spp.) are a major problem in Colorado forests on ponderosa and lodgepole pine. Other members of the pine family, Douglas-fir, pinyon and limber pine are damaged occasionally. Nursery and ornamental plantings seldom are attacked; however, this parasite can be introduced into an area by the planting of collected stock infected with dwarf mistletoe.

Dwarf mistletoes are small, leafless, parasitic flowering plants. The seeds, explosively discharged from the fruit, are very sticky and adhere to any surface they strike. Seeds that adhere to young branches of susceptible trees germinate and the mistletoe plant penetrates the bark. These seeds generally are dispersed in August and September.

This parasite is easily identified by the yellow to green or brownish-green segmented shoots that protrude from the infected part of the tree. These perennial shoots are 2 to 6 inches (5-15 centimeters) long and $\frac{1}{8}$ - to $\frac{1}{4}$ -inch (.3-.6-cm) in diameter.

The "roots" of the dwarf mistletoe are imbedded in the bark and phloem of the tree. The parasite produces secondary root-like structures called "sinkers" that become imbedded deeper in the wood as the twig adds its annual growth rings. These "roots" provide the parasite with nutrients obtained from the living tissues of its host.

Symptoms

The first symptom of dwarf mistletoe infection is a slight swelling of the bark at the site of infection. As the "roots" of the parasite become more extensive in the host, a distorted branching habit or witches' broom may form. The witches' broom diverts food from uninfected parts of the tree, subsequently

reducing vigor and causing premature death of the tree. Infected trees that do not develop witches' brooms usually have visible mistletoe shoots protruding from the infected area; however, shoots are not formed until two to three years after infection.

Control

Pruning is the best control measure available for reducing or eliminating dwarf mistletoe infections in ornamental trees or urban forests. Trees severely infected in the upper branches or those with only a few live branches should be cut. Trees with high, unreachable mistletoe infections will continue to rain seeds on nearby trees if not cut down.

Lightly infected trees can be freed from the parasite by pruning off all infected branches. All branches to be pruned should be cut off flush with the trunk. The entire branch should be removed. The trees should be examined every two or three years and any infected branches pruned off. The mistletoe shoots die as soon as the branch is cut, consequently burning pruned-off branches is not necessary.

If the mistletoe on a branch is close to the trunk the infection may have already entered the trunk. Shoots will form on the trunk even if the branch is removed. When pruning infected limbs, the following guidelines should be used to insure the trunk is free from infection. Trees with infections closer than indicated should be cut down to remove a future source of infection.

Branch diameter (outside bark)	Distance of infection on branch from trunk
Under 1.0 inch (2.5 centimeters)	6 inches (15.2 cm)
1.1 - 2.0 inches (2.8 - 5.1 cm)	8 inches (20.3 cm)
2.1 - 3.0 inches (5.3 - 7.6 cm)	10 inches (25.4 cm)
3.1 - 4.0 inches (7.9 - 10.2 cm)	12 inches (30.5 cm)

In some cases a highly desirable tree with a trunk infection cannot be removed for aesthetic or other reasons. In these instances, the mistletoe shoots must be knocked off periodically as they appear to prevent further spread.

In heavily infested areas, nonsusceptible trees can be planted to replace cut trees. Ponderosa pine areas can be planted to:

Douglas-fir	Pinyon pine	White fir
Limber pine (sic)	Blue spruce	Rocky Mountain juniper

In lodgepole pine areas, the following trees can be substituted:

Engelmann spruce	Subalpine fir	Douglas-fir
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Hardwoods such as ash, birch and aspen, also can be planted in affected areas because dwarf mistletoes do not attack hardwood trees.

DWARF-MISTLETOE ADDENDUM

Douglas J. Stevenson
Colorado State Forest Service

Three species of dwarf-mistletoe occur in Boulder County. They are ponderosa pine dwarf-mistletoe (Arceuthobium vaginatum), lodgepole pine dwarf-mistletoe (Arceuthobium americanum) and limber pine dwarf-mistletoe (Arceuthobium cyanocarpum), each named for its primary host.

Besides its primary host, each dwarf-mistletoe species attacks the other two pine species as a secondary host (Limber pine is attacked by ponderosa pine dwarf-mistletoe as a secondary host and should not have been listed on the Service in Action leaflet as suitable for planting on ponderosa pine sites.). Only in rare circumstances are other species of trees affected.

Dwarf-mistletoe infects and eventually kills its primary host. Secondary hosts are much more resistant to attack. There are numerous examples of secondary host trees standing in the middle of heavy dwarf-mistletoe infections without becoming infected.

Dwarf-mistletoe control is achieved in forest situations by clear-cutting the infected patch, allowing the stand to regenerate from natural seeds from adjacent stands. If the patch is a large one, the clearcut may have to be completed in several stages so that a seed source remain nearby until the stand regenerates.

In urban settings, or with ponderosa pine dwarf-mistletoe, which is large enough to see easily, it is often feasible to prune dwarf-mistletoe out of infected trees. Due to dwarf-mistletoe's incipient stage, this process must be repeated for at least three consecutive years.

Planting with susceptible tree species before the overstory stand is free of dwarf-mistletoe will result in reinfection. Seedlings are small and not usually infected during the first few years, so if control efforts are continued until all dwarf-mistletoe is gone, an extra two or three years' growth can be obtained by planting after the first year's cleaning.

William M. Harlow, Ph.D., SUNY College of Forestry
Ellwood S. Harrar, Ph.D., Duke University School of Forestry

Textbook of Dendrology

DOUGLAS-FIR (Pseudotsuga menziesii (Mirb.) Franco

BOTANICAL FEATURES

Leaves $\frac{3}{4}$ " to $1\frac{1}{4}$ " long, yellow-green or blue-green, more or less flattened, standing out from all sides of the twig or with a tendency to be somewhat 2-ranked; apex rounded-obtuse or rarely acute, stomatiferous below, persistent for 8 or more years. Cones 3" to 4" long, pendent, ovoid-cylindric, with exserted, 3-lobed, forklike, appressed or strongly reflexed bracts; seeds triangular, terminally winged; about 42,000 seeds to the pound, dewinged.

Buds fusiform, sharp-pointed, lustrous brown.

Bark on young stems smooth except for resin blisters; at length becoming 6" to 24" thick on old trees, and then divided into thick reddish-brown ridges separated by deep irregular fissures. In a few instances the bark is "tight" (fine-textured) on old trees and corky on others, particularly those of the mountain form.

GENERAL DESCRIPTION

Douglas-fir, monarch of Pacific Northwest forests, was first observed by Menzies on Vancouver Island when he accompanied the British naval captain Vancouver on an expedition to the Pacific Coast in the early 1790s. For more than a quarter of a century this tree was variously classified as a spruce, hemlock, true fir, and even as a pine; in fact logs exported by the Hudson's Bay outpost near the mouth of the Columbia River were listed in European ports as "Oregon pine," a name which has persisted in the trade to this day, especially in Australia. It remained for David Douglas, a Scottish botanist sent out by the Royal Horticultural Society in 1825, to study this tree, to show that it was sufficiently different to be considered as separate from other previously described conifers; later Carrière coined the new generic name Pseudotsuga. This name was a rather unfortunate choice, since it literally means "false hemlock." The common name, Douglas-fir (The names red fir and yellow fir have been used by loggers and lumbermen to differentiate locally certain specimens on the basis of ring width, color and softness.), commemorates Douglas, and in addition serves to distinguish this species from the true fir (Abies).

Douglas-fir is a dimorphic species with two more or less distinct forms (Several European workers have claimed that there are three

species of Douglas-fir; this is based largely upon needle structure. Studies by W. E. Kilgore at the New York State College of Forestry have failed to substantiate this viewpoint.). One of these is restricted to the forests of the Pacific slope, and the other to those of the Rocky Mountain region.

The Rocky Mountain form of Douglas-fir is considered distinct from the coast form by some taxonomists, who accordingly classify it as Pseudotsuga glauca Mayr. or Pseudotsuga menziesii var. glauca (Beissn.) Franco. However, in certain sections, the two types intergrade. Usually the foliage of the Rocky Mountain tree is blue-green, but sometimes trees with blue-green foliage and others with yellow-green leaves are found standing together. Similarly, although yellow-green crowns are typical of the coast form, some trees show a blue-green coloration. The principal botanical difference between these two forms lies in the structure of their cones. Rocky Mountain trees have small cones rarely 3 inches in length, with much-exserted and strongly reflexed bracts. By contrast, the cones of the coast form are often 4 in. long and have straight, more or less appressed bracts.

Douglas-fir comprises about 50 percent of the standing timber of our western forests. It produces more timber than any other American species and at the present time furnishes about one-fifth of the total annual cut.

ROCKY MOUNTAIN FORM

The Rocky Mountain form of Douglas-fir rarely exceeds a height of more than 130 ft or a diameter of 3 ft. It occurs in both pure and mixed stands with ponderosa pine, western larch, and grand fir. Other associates include western hemlock, western white and lodgepole pines, Engelmann spruce, white fir and aspen. Douglas-fir is more tolerant than these except the hemlock and spruce.

Although most abundant on moist sites, Rocky Mountain Douglas-fir is quite drought resistant and is often found on arid areas with ponderosa pine. It is frost-resistant and hardy in the East and is a common ornamental of that region. The trees are grown for timber in Europe and have been planted successfully in many parts of the world.

RANGE

Western United States and British Columbia. Altitudinal distribution: sea level to 5,000 ft along the coast; 4,000 to 6,000 ft inland; 10,000 ft in the southern Rocky Mountains.

PONDEROSA PINE (Pinus ponderosa Laws.)

BOTANICAL FEATURES

Needles in 3's, or 2's on the same tree, 5" to 11" long, dark gray-green to yellow-green, flexible, persistent until the 3rd season. Crushed needles have a turpentine odor similar to that of most other pines.

Cones 3" to 6" long, ovoid to ellipsoidal, sessile, solitary or clustered; usually leaving a few basal scales attached to the twig, when shed; apophysis dark reddish brown to dull brownish yellow, transversely ridges and more or less diamond-shaped; umbo dorsal, with a slender, often deciduous prickle; seeds $\frac{1}{4}$ " long, ovoid, slightly compressed toward the apex, brownish purple; wings moderately wide, about 1" long; about 12,000 (6,900-23,000) seeds to the pound.

Twigs stout, exhaling a turpentine odor when bruised; buds usually covered with droplets of resin.

Bark brown to black and deeply furrowed on vigorous or young trees (bull pines); yellowish brown to cinnamon-red and broken into large flat, superficially scaly plates separated by deep irregular fissures on slow-growing and old trunks.

GENERAL DESCRIPTION

This is the most important pine in western North America, and in the United States is found in commercial quantities in every state west of the Great Plains. At present it furnishes more timber than any other American pine and in terms of total annual production of lumber by species is second only to Douglas-fir.

Ponderosa pine is a large tree 150 to 180 feet high and 3 to 4 ft in diameter (On the best sites, 300-year-old dominant trees average about 175 ft high and 48 in. d.b.h.) (max. 262 by 8.6 ft). Even though this species commonly forms open parklike forests, the boles are ordinarily symmetrical and clear for one-half or more of their length; short conical or flat-topped crowns are characteristic of old trees. Four-year-old trees may have tap-roots four to five feet long. Moderately deep wide-spreading laterals develop as the trees get older. Ponderosa pine is not exacting in its soil requirements, but trees on thin, dry soils are usually dwarfed. Its occurrence on dry sites with the nut pines and certain of the junipers is indicative of its great resistance to drought. This species attains its greatest development, however, on the relatively moist but well-drained western slopes of the Siskiyou and Sierra Nevada Mountains of southern Oregon and California, respectively.

Ponderosa pine occurs in pure and mixed coniferous stands. Excellent pure forests are found in the Black Hills of South

Dakota, the Blue Mountains of Oregon, the Columbian Plateau northeast of the Sierra Nevada, and in northern Arizona and New Mexico. It is also commonly the most abundant tree in mixed coniferous stands; east of the summit of the Cascade Range in Washington and Oregon it occurs with western larch, Douglas-fir, and occasionally lodgepole pine; in the central Rocky Mountains with Douglas-fir; and in California with Jeffrey and sugar pines, incense-cedar, Douglas-fir, and white fir. On the Fort Lewis plains in western Washington, near Puget Sound, ponderosa pine is occasionally found in association with Douglas-fir and Oregon white oak.

Small quantities of seed are produced annually, but large crops are released only at intervals of three to five years. Under forest conditions germination as high as 50 percent may be anticipated, but in the nursery this figure can be increased to 80 percent. Seedlings can exist under the canopy of the parent trees, even though they grow quite slowly, and in such conditions often attain a height of only 3 to 4 ft during the first 15 to 20 years. Reproduction is best in clearings made by fire or logging. The seedlings will grow on sterile sites and have been planted extensively in the Nebraska sand hills and elsewhere. Ponderosa pine is classed as intolerant.

The rapidity of growth has a marked effect on the general appearance of the trees of this species. Young, vigorous specimens commonly develop dense crowns of dark foliage, and bark which is dark brown to nearly black, more or less corky, and deeply furrowed. In contrast, the foliage of old-growth or slow-growing trees is yellow-green, and the bark yellow-brown to cinnamon-red and plated. Those of the first type are generally called "bull" or "blackjack pines," and to some woodsmen ponderosa pine and bull pine are different trees. Fast-growth bull pines 150 years of age found near Cle Elum, Washington, measured 30 to 40 in. in diameter, while more typical ponderosa pines occurring in the same vicinity were only 10 to 14 inches in diameter at the same age. The growth of this species varies considerably with locality. In California, trees 120 years of age averaged 23 in. d.b.h., while in Arizona trees of the same age were only 16 in., and in the black hills 10½ in. Trees over 500 years of age are seldom encountered (Keen considers that this pine may reach an age of 800 years, while Mills reported a tree in southwestern Colorado with 1047 rings.). Severe damage is caused by bark beetles, and ponderosa pine is also attacked by more than 100 other kinds of insects. Fires kill seedlings and cause considerable damage even to large trees. Severe fires in the past have completely destroyed hundreds of thousands of acres of ponderosa pine forest. Other destructive agents include mistletoe and fungi.

The common name ponderosa pine is identical with the species name. Previously called western yellow pine, logs of this tree

were also sold under such names as Arizona white pine, California white pine, and western soft pine, since the wood resembles that of the white pines rather than that of the hard, moderately heavy wood of the southern yellow pines. Finally, the name ponderosa pine was adopted by the U. S. Forest Service, and it is now accepted by the industry.

RANGE

Western North America. Altitudinal distribution: 5,000 to 8,000 ft in Arizona, 3,300 to 6,000 ft in Montana and South Dakota, 2,000 to 7,000 ft in northern Idaho, sea level to 6,200 ft in British Columbia and Washington, sea level (Columbia River Valley) to 7,000 ft in Oregon, 300 to 7,000 ft in northern California, 4,000 to 9,000 ft in southern California; for the most part a tree of relatively low elevations.

Donald C. Moreland, Soil Conservation Service
Ronald E. Moreland, Soil Conservation Service

Soil Survey of Boulder County Area, Colorado

Goldvale Soil Series

The Goldvale series is made up of deep, well-drained soils that formed on mountainsides in loamy alluvium. Slopes are 9 to 55 percent. Elevations are 5,900 to 6,700 feet. The native vegetation is mainly ponderosa pine and Douglas-fir. Annual precipitation is 18 to 22 inches. Mean annual air temperature is 43° to 47° F., and the frost-free season is about 100 to 120 days.

In a representative profile the surface layer, about 2 inches thick, is grayish-brown stony coarse sandy loam mantles with forest litter and stones. The subsurface layer is pink coarse sandy loam about 17 inches thick. Below this is about 6 inches of pink or reddish-brown sandy clay loam or stony sandy clay loam that extends to a depth of 65 inches or more and that has many stones. Soil reaction is slightly acid.

These soils are used for grazing, woodcutting, recreational purposes, and homesites.

Representative profile of Goldvale stony coarse sandy loam in Goldvale-Rock outcrop complex, 9 to 55 percent slopes, located 1,500 feet west and 2,340 feet north of the southeast corner of sec. 26, T. 2 N., R. 71 W.:

- O1 - 4 to 2 inches, undecomposed organic material, chiefly needles, bark and twigs.
- O2 - 2 inches to 0, partially decomposed organic matter, chiefly needles, bark and twigs.
- A1 - 0 to 2 inches, grayish-brown (10YR 5/2) stony coarse sandy loam, very dark grayish brown (10YR 6/3) when moist; strong, fine, crumb structure; soft, very friable; 20 percent flagstone; slightly acid; clear, smooth boundary.
- A2 - 2 to 19 inches, pink (5YR 8/3) stony coarse sandy loam, light reddish brown (5YR 6/3) when moist; moderate, thick, platy structure that parts to moderate fine granular; slightly hard, very friable; 20 percent flagstone; slightly acid; gradual, wavy boundary.
- A&B - 19 to 25 inches, pink (5YR 8/3) stony light coarse sandy clay loam, light reddish brown (5YR 6/3) when moist; contains thin, discontinuous reddish brown (2.5YR 5/4) coarse sandy clay lamellae and nodules; lamellae are reddish brown (2.5YR 4/4) when moist; lamellae have thin, continuous clay films on ped faces; horizon has weak, medium, subangular blocky structure;

- very hard, very friable; 20 percent flagstone; slightly acid; clear, wavy boundary.
- B2t - 25 to 57 inches, reddish-brown (2.5YR 5/4) stony sandy clay, reddish-brown (2.5YR 4/4) when moist; moderate, medium, subangular blocky structure; extremely hard, friable; thick, continuous clay films on faces of peds and inside root channels and pores; 20 percent flagstone; slightly acid; gradual, wavy boundary.
- B3t - 57 to 65 inches, reddish-brown (2.5YR 5/4) stony sandy clay loam, reddish brown (2.5YR 4/4) when moist; weak, coarse, subangular blocky structure; extremely hard, friable; patchy clay films on faces of peds and inside root channels; 25 percent flagstone; slightly acid; gradual, wavy boundary.
- C - 65 to 75 inches, light reddish-brown (2.5YR 6/4) stony coarse sandy loam, reddish brown (2.5YR 5/4) when moist; massive; very hard, very friable; 25 percent flagstone; slightly acid.

The A1 horizon ranges from 0 to 3 inches in thickness. The A2 horizon ranges from 8 to 20 inches in thickness and from loamy sand to sandy loam in texture. Structure of the B2 horizon ranges from moderate to strong subangular blocky or blocky.

Goldvale-Rock outcrop complex, 9 to 55 percent slopes (GrF). - This complex is made up of about 55 percent Goldvale stony coarse sandy loam and about 30 percent Rock outcrop. This complex is on long mountain spurs and ridges.... Goldvale soils are on the smoother west-facing slopes where there are trees. Rock outcrop is throughout the complex, but particularly on the ridgetops.

Included with this complex in mapping are minor amounts of shallow soils on ridgetops and alluvial soils along the edges of streams and drainageways. These included soils make up about 15 percent of each mapped area.

Runoff is rapid on areas of this complex. The erosion hazard is high.

All of the acreage of this complex is used for grazing livestock and for woodcutting. An increasing number of areas are being used for homesites, recreational purposes and wildlife habitat. (Capability unit VIIe-1, nonirrigated; tree suitability group 2)

Piñata Soil Series

The Piñata series is made up of moderately deep, well-drained soils that formed on upland ridges and side slopes. These soils developed in stony sandy to clayey residuum and colluvium

weathered from sandstone and shale. Slopes are 5 to 55 percent. Elevations are 6,000 to 7,000 feet. The native vegetation is mainly ponderosa pine with a sparse understory of grass. Annual precipitation is 14 to 18 inches. Mean annual air temperature is 47° to 51° F., and the frost-free season is about 100 to 130 days.

In a representative profile...the surface layer is brown very stony loamy fine sand about 3 inches thick. The subsurface layer, about 9 inches thick, is pink very stony loamy fine sand. The subsoil is a red very stony clay, about 20 inches thick, that overlies sandstone. Soil reaction is slightly acid.

Piñata soils have slow permeability. Available water capacity for the profile is moderate. Roots can penetrate to a depth between 20 and 40 inches.

These soils are used mainly for pasture and as a source of quarried sandstone. Some areas have a limited use for forestry.

Representative profile of Piñata very stony loamy fine sand in an area of Piñata-Rock outcrop complex, 5 to 55 percent slopes, located 1,200 feet east and 400 feet south of the northwest corner of sec. 6, T. 3 N., R. 70 W.:

- O1 - 2 inches to 0, partially decayed pine needles and forest litter.
- A1 - 0 to 3 inches, brown (7.5YR 5/2) very stony loamy fine sand, dark brown (7.5YR 3/2) when moist; weak, fine, granular structure; soft, very friable; slightly acid; clear, smooth boundary.
- A2 - 3 to 12 inches, pink (5YR 7/3) very stony loamy fine sand, reddish brown (5YR 5/3) when moist; weak, coarse, subangular blocky structure; soft, very friable; slightly acid; abrupt, wavy boundary.
- B2t - 12 to 32 inches, red (2.5YR 5/6) very stony clay, dark red (2.5YR 3/6) when moist; weak, medium, prismatic structure that parts to moderate, coarse and medium, subangular blocky structure; very hard, firm; thick, continuous clay films on ped faces; slightly acid; clear, smooth boundary.
- R - 32 to 60 inches, reddish-brown (2.5YR 5/4) noncalcareous Lyons sandstone with flagstone cleavage.

The A1 horizon ranges from 0 to 4 inches in thickness, and the A2 horizon ranges from 7 to 18 inches in thickness. The A horizon ranges from loamy fine sand to heavy loamy sand in texture. Amount of stones ranges from 35 to 80 percent throughout the profile.

Piñata-Rock outcrop complex, 5 to 55 percent slopes (PrF), - This complex is on upland ridges.... It is about 45 percent Piñata

very stony loamy fine sand and about 35 percent Rock outcrop. The Piñata soil is throughout the area but mainly has the smoother slopes. Rock outcrop is scattered throughout the area, but mainly has the steeper slopes.

Mapped with this complex along drainageways are small areas of a Piñata-like soil that overlies sandstone at a depth of more than 40 inches. Near ridgetops are some soils that overlie sandstone at a depth of less than 20 inches. A few areas of Colluvial land are also included. These included soils and Colluvial land make up about 20 percent of each mapped area.

Runoff is medium to rapid on areas of this complex. The erosion hazard is high.

Most of the acreage of this complex is used for forestry and limited grazing of livestock. A major use in recent years is quarrying of building stone. (Capability unit VIIe-1, nonirrigated; tree suitability group 6)

Capability Unit VIIe-1 (Nonirrigated)

This unit consists of deep and moderately deep, well-drained soils of the Allens Park, Fern Cliff, Goldvale, and Piñata series. These soils have a stony coarse loamy sand, loamy sand, or gravelly sandy loam surface layer. The subsoil or underlying layer is gravelly sandy loam, sandy loam, gravelly sandy clay loam, sandy clay loam, or sandy clay. Slopes are 5 to 60 percent. Permeability is slow to moderately rapid, and the erosion hazard is high. Available water capacity is low to high. The effective rooting depth is 20 to 60 inches or more.

These soils are used mainly as woodland. They are also used as a habitat for wildlife. Proper management of both the timber and understory helps reduce possible erosion. Wooded areas should be protected from fire and insects and from plant diseases. Thinning of timber improves the quality and quantity of trees.

A few areas of the woodland are used for grazing of the understory vegetation. No more than half of the current year's growth of vegetation should be grazed. Where grazing is properly managed, such grasses as Arizona fescue, mountain muhly, and pine dropseed increase. Seeding of grasses is not practical because of the slope, rock outcrop, and the amount of trees and stones.

COLORADO STATE FOREST SERVICE

JULIE WATTS

THIS AGREEMENT, made this 15th day of October, 1994, by and between the Colorado State Board of Agriculture on behalf of the Colorado State Forest Service, 936 Lefthand Canyon, Boulder, CO 80302, hereinafter referred to as CSFS, and Julie Watts, whose address is 2690 Winding Trail, Boulder, CO 80304, hereinafter referred to as the LANDOWNER; and

WHEREAS, CSFS has the expertise to provide the services described below; and

WHEREAS, LANDOWNER desires to implement the practices described below;

NOW, THEREFORE, it is hereby agreed that:

1. LANDOWNER warrants that he is the owner of the property described below, or has obtained permission from the owner of said property to grant all rights and provisions provided in this Agreement. The property is described as follows:

about 9.0 acres lying in the
SE1/4 NE1/4, Sec 35, T2N, R71W, S.P.M.

2. LANDOWNER grants to CSFS the right of access to the above described property for purposes of:

Preparing a forest management plan consistent with the requirements of the Stewardship Incentives Program.

3. CSFS agrees to provide the above services in consideration for an estimated:

\$25.00 per parcel (1):	\$ 25.00
\$8.00 per acre (9.0 acres):	72.00
\$4.00 per uncalled property line (0):	0.00
\$1.50 per called property line (9)	<u>13.50</u>
Total:	\$ 110.50

4. This Agreement shall begin on the date first above written and shall remain in force until January 15, 1995.
5. This Agreement may be terminated by either party ten (10) days following written notice to the other party.

6. CSFS may designate a subcontractor to do all, or part of the work, fees due such subcontractor to be paid directly by LANDOWNER and deducted from amount due CSFS.
7. CSFS and its subcontractors shall maintain during the life of this Agreement, such liability insurance as is required by Colorado law.
8. This Agreement shall be extended due to inability of CSFS to perform work due to circumstances beyond its control, or as mutually agreed by LANDOWNER and CSFS. All extensions will be in writing and become part of this Agreement.
9. Financial obligations of CSFS payable after the current fiscal year are contingent on funds for that purpose being appropriated, budgeted and otherwise made available.
10. CSFS agrees that it will comply with all applicable laws regarding discrimination on the basis of race, creed, color, sex, or handicap including, but not limited to Executive Order 11246 as amended or as may be further amended hereafter.
11. The laws of the State of Colorado and rules and regulations issued pursuant thereto shall be applied in the interpretation, execution and enforcement of this Agreement.
12. The signatories hereto aver that to their knowledge no CSFS employee has any personal or beneficial interest whatsoever in the property described herein.

IN WITNESS WHEREOF the parties hereto have executed this Agreement on the date first above written.

Mike Watts
LANDOWNER

11/6/94
DATE

Douglas Stevenson
COLORADO STATE FOREST SERVICE

10/15/94
DATE