

“A PLAN OF MANAGEMENT¹
FOR
CLEARWATER WORKING CIRCLE”

ASOTIN DISTRICT
UMATILLA NATIONAL FOREST

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SUMMARY

Location

The Clearwater Working Circle is located in the southern portion of Asotin, Garfield and Columbia Counties in Washington.

Area

| | |
|-----------------------------------|---------------|
| Potentially commercial timbered - | 77,867 Acres |
| Non-timbered - | <u>29,953</u> |
| Total - | 107,820 Acres |

Ownership of Timbered Area

| | | |
|------------------------|------------------------|----------------|
| Public – 67, 657 Acres | Private – 10,210 Acres | Total – 77,867 |
|------------------------|------------------------|----------------|

Accessibility of Timbered Area

| | | |
|------------------------------|-----------------|----------------|
| Accessible – Public – 34,746 | Private – 8,465 | Total – 43,211 |
|------------------------------|-----------------|----------------|

Types

Total Type Acres

| | Ponderosa Pine Type | Larch-fir Type | Lodgepole Pine Type |
|---------|---------------------|----------------|---------------------|
| Public | 32,845 | 15,083 | 2,350 |
| Private | 9,920 | 250 | -- |
| Total | 42,765 | 15,333 | 2,350 |

Accessible Type Acres

| | | | |
|---------|--------|--------|-------|
| Public | 15,832 | 16,964 | 1,960 |
| Private | 8,215 | 250 | -- |
| Total | 24,047 | 17,214 | 1,960 |

Volumes in Mature Age Classes

Total Working circle M ft. BM

| | PP | LP | DF | WL | WF | ES |
|---------|---------|--------|--------|--------|--------|--------|
| Public | 99,934 | 24,060 | 47,518 | 54,275 | 39,453 | 32,968 |
| Private | 15,405 | | 7,580 | 2,930 | 3,595 | |
| Total | 115,339 | 24,060 | 55,098 | 57,205 | 43,048 | 32,968 |

Accessible Portions

| | PP | LP | DF | WL | WF | ES |
|---------|--------|--------|--------|--------|--------|--------|
| Public | 55,834 | 18,642 | 19,301 | 25,220 | 19,273 | 18,229 |
| Private | 11,940 | | 3,550 | 700 | 1,365 | |
| Total | 67,774 | 18,642 | 22,851 | 25,920 | 20,638 | 18,229 |

Rotation

PP. Type – 200 years divided into 50 year cutting cycles. 1% of volume in mature uncut stands to be removed each year during 1st cutting cycle.

Larch-fir Type – 140 year – cutting cycle 140 years.

Lodgepole Pine Type – 80 year – cutting cycle 80 years.

Allowable Annual Cut
M ft. BM

| | Public |
|---|------------------------------------|
| PP. type – 1 st cutting cycle - | PP - 491.86 M ft. BM |
| | LP - 9.90 |
| | DF - 40.80 |
| | WL - 1,303.00 |
| | WF - 124.80 |
| | ES - <u>7.20</u> |
| | Total 1,977.56 M ft. BM |
| Larch-fir Type – 1 st Rotation | 314.34 M ft. BM of PP, LP, DF & WL |
| | 314.00 M ft. BM of WF & ES |
| Lodgepole Pine Type – 1 st Rotation | 364.8 M ft. BM of LP |
| Grand Total possible annual cut – All ownership & Species – 3,090.10 M ft. BM | |
| First cutting cycle. | |

I. Introduction

A. Objectives

The objectives of this plan are to provide for the greatest possible sustained yield of Forest products from the Clearwater Working circle in such a manner and to the end that needed items such as fuel, poles, posts and rough building materials be supplied to the surrounding communities; supplemental employment be furnished for settlers and residents of the area; and that the water shed values and productive capacity of the forest be built up to and maintained at the highest possible level.

This plan proposes to accomplish these ends by setting forth the problems of the area then bringing together all available data concerning the working circle and then developing an ordinary plan for meeting the problems.

B. Description of Working Circle

1. Location.

The Clearwater Working Circle is located at the north end of the Umatilla National Forest in Garfield and Asotin Counties in the extreme southeastern corner of the State of Washington. It comprises some 107,820 acres of mountainous lands of which nearly 30,000 acres or 28% is non-timbered and nearly 78,000 acres or 72% is covered with tree growth.

2. Topography.

The working circle is characterized by rather flat-topped ridges divided by sharp deep canyons whose steep walls are composed of a series of rim rock outcrops from the "breaks" at the ridge levels to the canyon bottoms which are generally too narrow and bolder strewn to permit of road construction at reasonable cost figures. These canyons are from 1,000 to 2,000 feet in depth with elevations ranging from about 3,000 feet at the canyon bottoms at the edge of the area to 6,000 feet at ridge tops near Mt. Misery. Timber growth is mainly on the ridge tops with narrow strips running up canyon bottoms. The rocky canyon walls are for the most part barren bunch grass type or covered with scattered stunted tree growth. Observers have remarked that this was not so much a country of high mountains as a land of deep canyons.

The working circle is divided into two rather distinct drainages, one of which is to the north and northwest in which are found Cummings Creek, Tum-A-Lum Creek, and Pataha Creek; the other to the northeast in which is found Charlie Fork, Lick Fork, North Fork, South Fork of Asotin Creek and the head waters of George Creek. These drainages lead to the Pomeroy area and the Clarkston area respectively. (See Topographic Map – Map #6 in Appendix)

3. Soils.

The soils of the area are mainly of volcanic origin. The entire area appears to be built up of series of extrusive flows of lava. Large deposits of highly colored charred conglomerate indicate sedimentary formations present before and during the period of lava flows. These deposits disintegrating in place give rise to considerable areas of sticky clay-like soils varying from blue to red in color. In other parts of the area, black clay-like soils indicate decompositions in place of the underlying basaltic formations. Other large portions of the area are covered with soils of a volcanic ash type. Numerous, rather large deposits of diatomaceous earth in the deeper canyons indicate that the entire area has been submerged since the period of the lava flows. In general, the soil over the entire working circle is light in character, very susceptible to both wind and water erosion and rather easily depleted of its organic contents.

4. Climate.

Since the circle lies at a rather high elevation, the climate is quite severe, the temperature ranging from 20° to 30° below zero in the winter and up to 90° to 120° above zero in the summer time. The growing season is short and at the higher elevations killing frosts may occur during any month of the year. Annual precipitation ranges from about twenty inches around the forest boundary up to approximately fifty inches at Mt. Misery. Almost all of this is in the form of snow which falls from late October to early March.

II. Management Problems

A. Social and Economic Situations.

Clearwater Working Circle is uniquely situated in reference to social and economic conditions inasmuch as it is surrounded on the north and east by a farming country which has never been dependent on the forest for more than minor products and grazing. Wheat farming is the primary industry, with cattle and sheep ranking a weak second and third, respectively.

The three towns of Pomeroy (in Garfield County), Clarkston, and Asotin and the two communities of Anatone and Cloverland (in Asotin County) make up the centers of population. Approximate populations are: Pomeroy – 1600; Clarkston – 3,000; Asotin – 700; the entire population of Garfield County being about 4,000 and Asotin County being about 8,000.

Both Garfield and Asotin Counties are in excellent financial condition. Garfield, with perhaps the greatest per capita wealth of any County in Washington, has only \$6,000 of delinquent taxes from the 1937 roll of \$127,000, and only \$2300 of 1936 taxes delinquent.

Private forest land makes up such a small part of the taxable area that it has almost no influence on the tax structure. Unemployment is almost entirely a winter problem. This is due to the fact that there are no industries in the area outside of farming. There is an actual shortage of labor most years during harvest time. The depression years have not greatly increased unemployment in Garfield and Asotin Counties.

No forest industries of any consequence have ever been developed in this area although the forest has been the source of supply of items such as fuel, posts, poles, and rough lumber since the days of the early settlers. The rough lumber has for the most part been furnished by small semi-portable mills. Old worn out machinery and inadequate finances has resulted in most of these operators being forced out of business within a year or two.

With the exception of the "Sales at Cost" use for farmers which amounts to about 70% of the sales, the communities are not greatly dependent on the forest for small products, although at the present time some 2500 to 3000 people draw on the circle for fuel. The hauls from forest to town are long, 18 to 30 miles, over rather poor roads. The timber is small, of poor quality and not too easily accessible, hence, the cost the consumer is so near to the cost of imported fuels such as coal, presto-logs and oil that the town dwellers in many cases prefer to purchase the commercial fuels which require less storage space and are easier to handle.

This narrow margin in cost between forest and commercial fuels has prevented commercial woodcutters from operating on the forest to any great extent. The major portion of sales are to people who take the opportunity to cut their own wood during lulls in their farm work or during lay-offs in their employment. They are enabled by so doing, to secure the fuel requirements at less cost and at the same time enjoy a short stay in the mountains.

For this it can be seen that although the demand on the circle, for small products is heavy, it is not a demand that is very attractive to even small commercial operators.

Perhaps of even greater value to the community than the small commodity products is the contribution of the forest along the recreational and watershed lines.

The forest forms about the only avenue of escape from the terrific summer heat in the towns and wheat country and people throughout the area take full advantage of all facilities provided for them in the mountains. Elk and deer are abundant and hunting season brings a heavy flood of hunters to the mountains.

The watershed value of the circle is inestimable both from the standpoint of flood prevention and water supply. The towns of Clarkston and Asotin take their water supply, both for domestic use and

irrigation purposes, from Asotin Creek. The watershed of this creek is entirely within the National Forest. Full advantage is also taken of the grazing opportunities provided in the forest.

B. Forest Resources and Conditions.

1. Ownership.

Privately owned timberland is not of great importance in the working circle as out of a total timbered area of 77,867 acres only 8,465 acres are privately owned. However, management on these private lands is somewhat complicated by the absence of large controlling ownerships, the largest ownership being about 1200 acres and the average running from 200 to 300 acres.

Most of the timberland is held in connection with large ranch properties, the owner placing value on it for grazing rather than timber raising purposes. In many cases the owners would prefer to see the timber removed and the area devoted to grass and in some cases to grain. Practically all private land ownership is outside the National Forest boundaries and the major portion is located in T. 8N. R. 44E. in the vicinity of Big Butte and Anatone.

2. Forest Types.

The entire working circle, outside of grass lands, is a strong white fir climax especially at the higher elevations. Although pure white fir type is not extensive, deviations from it are obviously the direct result of large fires. Unmolested, revision to climax type is rapid.

At present there are three principle forest types on the area; Ponderosa Pine, Larch-fir and Lodgepole. The demarcation between the Ponderosa Pine and the Larch-fir types is quite distinct, but between the larch-fir and lodgepole types there is a more gradual transition. Numerous areas of pure lodgepole, too small to have been shown by the Forest Survey, are to be found within the larch-fir type. All types are badly broken up with age classes and varying compositions. Immature age classes amount to over half of the area. In this plan the three principle types will be considered separately. (See type map in Appendix)

PP. Type.

The Ponderosa pine type is to be found almost entirely at the lower elevations, almost none being found above 5,000 feet. No pure stands occur. Although the volume is predominantly ponderosa pine, a considerable amount of douglas fir, noble fir, and larch are always found in the stands.

The best growth occurs on the flat topped ridges where the trees attain fair form and size. Growth is stunted and extremely scattered or absent altogether on the precipitous thin-soiled canyon slopes and the narrow streamers up canyon bottoms are of but little better form and stocking.

The site quality is low for the entire type, running from medium site V to low site IV, and so trees of large size or high commercial value are not found. According to the forest survey, 16,706 acres of the PP. type is PP. Site IV and 26,059 acres are Site V.^{2*} Volumes in the pine types run from 5 to 8 M ft. BM per acre over most of the area.

The working circle contains a total of 42,765 acres of PP type, which is nearly 54% of the total timber type of the working circle, of this amount, 30,643 acres are classed as mature and overmature and 24,047 acres are economically available at the present time. (for summary of PP type areas by maturity and accessibility see Table II in Appendix)

Approximately 2,630 acres of the mature PP types have been cut over on a light selection basis up to the present time. The remaining timber is for the most part rather inaccessible to the present systems of cutting, being on the steeper slopes or in areas without roads.

Much of the mature PP type is becoming decadent and annual growth is more than offset by decay. Insect damage has not been heavy although in some places mild outbreaks of bark beetle can be noted. The most serious enemy of pine in the working circle is the porcupine, whose depredations are of serious proportions in the Ables Ridge, Stevens Ridge and Charlie Fork Areas.

Larch-fir Type.

This type covers some 32,752 acres or about 44% of the total timber area. Occurrence of this type is mainly at higher elevations above the upper limits of the PP, although it occurs along stream bottoms clear into the bunch grass country. The larch-fir type offers a wide variety of compositions and age classes. Species making up the stand include douglas fir, western larch, Engelmann spruce, lodgepole pine, noble fir and alpine fir with a very little PP at the lower limits.

The larch-fir type is the direct result of large fires in past years. At present, 17,419 acres or 54% is classed as mature, the remainder (15,333 acres) varies in age from 20 to 40 years. A large part of the area occupied by the larch-fir type is extremely rough and but 17,214 acres (51%) can be classed as reasonably accessible.

Due to the strong tendency for progression toward the true fir climax, this type presents a rather difficult management problem. The true firs have little or no value at the present time and it is not possible to definitely foresee a future value. The principle demand on the forest is for fuel, poles, posts, and rough lumber.

² See Site map and tables of accessible type acres by Site, Table III in Appendix.

The true firs are not too well suited for any of these uses while the larch, douglas fir and lodgepole are in great demand. The demand for white fir for rough building lumber and for shakes is growing locally. White fir throughout the working circle is commonly affected by stringy heart rot and over large areas rot has usually set in by the time the tree reaches 4 to 6 inches d.b.h. Untreated fence posts of larch and douglas fir are very durable in this area, hence, it is not likely that a demand will arise for white fir for this use as it must be treated with preservatives. There is some possibility that a small outfit could find a market for white fir and spruce lumber for use in butter boxes, etc. and there is a possibility that a market for white fir could be found in the small paper mill located at Spokane, Washington.

Growth of larch, douglas fir and lodgepole pine are quite satisfactory. It is obvious that these species should be favored over the true firs. However, most forms of cutting do the opposite, due to the extreme tolerance of the white firs. Without artificial stimulus the progression toward the white fir climax is very rapid. None of the larch-fir type is in private ownership. (For summary of large-fir type areas by maturity and accessibility by blocks see table II in Appendix)

The larch-fir type is classed as douglas fir Site IV and IV and runs from high Site V to medium Site IV. The Forest Survey classes 12,353 acres of the larch-fir type as DF Site IV and 20,399 acres as Site V. In following growth computations, the median index for each site is used.*³

Lodgepole Pine type.

This type, totaling 2,350 acres, has the smallest area in the working circle. It, like the larch-fir type is a direct result of past fires or cutting. It occurs in relatively small spots scattered amongst the larch-fir type. There is a very strong demand for lodgepole in the form of fuel wood and fence poles, hence, this type, though small in area, is very important and quite possibly its areas should be increased by careful management. In the younger age classes, the type is made up of pure lodgepole but as the stand grows older the percentage of white fir increases. As lodgepole is not a long lived tree, it is but a comparatively short time until the type changes from lodgepole to white fir. 1155 acres or approximately 50% of the stand is now mature or overmature. The remainder or 1195 acres ranges from seedling size to near maturity.

Lodgepole has a very rapid growth and attains very satisfactory form and size in the area. Trees 100 feet high and 14 to 18 inches d.b.h. are common especially at lower elevations in the larch-fir types.

³ See type map and tables of type acres by sites, Table III, in Appendix.

As in the case of the larch-fir there has never been any systematic cutting in the lodgepole. Each permittee cutting wherever and whatever he wishes without thought to the value of the rest of the stand. 1,960 acres or 84% of the type can be classed as reasonably accessible at the present time.

There has been almost no windfall or insect damage in lodgepole areas on this working circle.

The lodgepole type is entirely in National Forest ownership. The Forest Survey has not classified the lodgepole types according to lodgepole site classes.

3. Timber Volumes.

Volume figures for the Clearwater Working Circle are based entirely upon data from the Economic Forest Survey carried on by the Pacific Northwest Experiment Station. Field work in this area was completed in 1934.

Since the forest survey figures are given on a township basis, it was necessary to revise them to show totals by maturity classes and types. To do this, it was necessary to secure copies of the original field sheets and work from the stand per acre, figures given thereon. The forest survey gives the following volumes in M ft. BM for the working circle:

| | <u>DB</u> | <u>ES</u> | <u>Y</u> | <u>WL</u> | <u>AF-WF</u> | <u>LP</u> | <u>Total</u> |
|-------------|-----------|-----------|----------|-----------|--------------|-----------|--------------|
| Private | 5,810 | 30 | 18,736 | 2,038 | 3,406 | | 30,020 |
| State | 1,002 | 20 | 2,685 | 210 | 1,359 | | 5,276 |
| Other Fed. | 120 | | 485 | | | | 605 |
| Nat. Forest | 55,579 | 32,100 | 101,594 | 57,717 | 38,452 | 6,246 | 291,688 |
| Total | 62,511 | 32,150 | 123,500 | 59,965 | 43,217 | 6,246 | 327,589 |

These figures, it must be remembered, include inaccessible timber and also the volume in immature age classes.

PP. Type.

The ponderosa pine type covering 42,765 acres carries the following volumes by species in accessible portions of the mature age classes: (Including area lightly cut over)

| | <u>M ft. BM (Scribner rule)</u> | | | | | |
|---------|---------------------------------|-----------|--------------------|-----------|--------------------|-----------|
| | <u>PP</u> | <u>LP</u> | <u>PB & DC</u> | <u>WL</u> | <u>WF & AF</u> | <u>ES</u> |
| Federal | 54,773 | 496 | 9,294 | 6,785 | 6,014 | 360 |
| Private | 11,940 | | 3,550 | 700 | 1,365 | |
| Total | 66,713 | 496 | 12,844 | 7,485 | 7,379 | 360 |

As the oldest age class of any appreciable area in the immature groups is 40 years and since the rotation is 200 years, these volumes represent the available volumes in the PP type for the coming 160 years.

Since the major demand is for cordwood these figures based on board feet measure, Scribner rule, do not reflect a true picture of the situation. Due to allowances for saw kerf, slab, and utilization standards, the Scribner rule falls short of the actual cordwood volume. However, a considerable portion of the volume may in the future be cut as rough building material and it is felt that the differences in board feet and cordwood volume had best remain buried as a safety factor. The site quality of the PP type is rather low and as a result the timber is all of rather poor quality from a lumber standpoint⁴. The trunks are rather short and limby and very little clear lumber can be recovered. Knots are large and in many cases loose, and compression wood is common. Windshake is also common in the larger pine and larch trees. Considerable decay is present in the overmature pine. Most of the rot has gained entrance through large fire scars at the base. The first log is usually of no value whatsoever.

Volumes in immature age classes are not of great significance as the measure of future volume is degree of stocking, hence no figures are given here for volumes in accessible immature stands which cover 7,748 acres. In this acreage the following age classes and degrees of stocking are found.

| Age Class | 0 to 5 Yrs. | 30 Years | | | 40 Years | | | 50 Years |
|--------------------|----------------|----------|--------|------|----------|--------|-------|----------|
| Degree of Stocking | | Light | Medium | Well | Light | Medium | Well | Well |
| Area | 730 | 140 | 955 | 70 | 425 | 1,450 | 3,814 | 164 |

See table V & Va in appendix for summaries of volumes in mature accessible stands by blocks, townships and types. See Table II in appendix for summaries of areas of immature types.

Larch-fir Type.

Volumes by species in the accessible portions of the larch-fir type of mature age class are as follows:

⁴ See Table IV in appendix for summary of type acres by sites.

M ft. BM Scribner Rule

| | <u>PP</u> | <u>LP</u> | <u>DB & DC</u> | <u>WL</u> | <u>WF</u> | <u>ES</u> |
|-----------------|-----------|-----------|--------------------|-----------|-----------|-----------|
| National Forest | 1,061 | 2,801 | 10,007 | 17,585 | 12,389 | 17,869 |

The best rotation age for douglas fir and larch in this area appears to be 140 years and since the oldest immature types are 40 years of age, the above volumes represent the available volumes during the next 100 years.*⁵

These figures do not, of course, include the volumes now present in immature stands all of which carry some volume in over-mature larch which survived the fires that created the younger age classes. These over-mature trees are dying rapidly and will be eventually utilized under free use permits as dead timber. It would be entirely impractical to endeavor to secure their utilization at the present time.

The douglas fir and larch in the larch-fir type is of fair size and quality. It is suitable for such uses as small dimension and bridge timbers as well as for poles and in some cases short piling, however, it is quite certain that the bulk of this timber will be used for cordwood and posts. The volume figures above are given in board feet Scribner rule which falls far short of actual cordwood volume. The cordwood volume will amount to from 205% of the Scribner board feet volume in 100 year old timber 12" in diameter to 157% of the Scribner volume in 160 year old trees 14" in diameter. This over run of cordwood over board feet volume becomes less as the size of the tree increases. A considerable portion of the volume in the larch-fir type is in diameter classes of 24" or less. It is estimated that the cordwood volume will amount to at least 125% of the board feet volumes given for larch and fir. For lodgepole pine it will amount to more nearly 200% of the board feet volume.

On a cordwood basis using a converting factor of 500 board feet = 1 cord and the above percentage of overrun, the volumes will appear as follows:

Cords in larch-fir type

| <u>PP</u> | <u>LP</u> | <u>DB</u> | <u>WL</u> | <u>WF</u> | <u>ES</u> |
|-----------|-----------|-----------|-----------|-----------|-----------|
| 2,652 | 7,002 | 25,018 | 43,912 | 30,972 | 44,672 |

⁵ Calculations of Rotations based upon data contained in Tech. Bull. #201.

The 17,869 M ft. BM of Engelmann spruce in this type presents a serious problem. This spruce is of excellent quality being of fair size and good form. D.b.h. averages from 20 to 36 inches and the boles are sound, well formed and free of limbs for from 30 to 50 feet in much of the stand. This spruce was inspected by the army during the World War was declared of airplane quality.

At present, this spruce is considered a weed-tree as it has no value for posts or poles without preservative treatment and makes very poor quality cordwood. Areas predominating in spruce volume should be reserved from cutting until such time as a demand arises for this species.

Unless a small mill can be encouraged to find a market for and to cut true firs, the 12,389 M ft. BM of white and alpine firs will undoubtedly find very little or no use as there is but little demand for it in this area. A large part of the white fir is of poor quality, heart rot being present in much of the stand and nearly all trees are limby and of poor form.

As in the PP type, the volume on immature areas at the present time is of little or no significance. Areas, composition, and degree of stocking or immature age classes indicate the future volumes. For the accessible portion of the larch-fir type, these are as follows:

| Age | 0 | | 20 | | 30 | | 40 | | | |
|--------------------|--------|------|--------|------|------|--------|-------|------|--------|-------|
| Degree of Stocking | Medium | Poor | Medium | Well | Poor | Medium | Well | Poor | Medium | Well |
| Area | 960 | 110 | 0 | 0 | 20 | 130 | 2,151 | 0 | 593 | 5,150 |

Composition of the immature stands is approximately 40% douglas fir, 45% larch, 5% lodgepole, 10% true fir and spruce.

Lodgepole Pine Type.

This is the smallest type in acres found in the Clearwater working circle. However, it is of considerable importance. The mature, accessible portion of this type covers only 870 acres, yet this carries a volume (computed on a basis of cubic foot for lodgepole and Scribner rule for larch and white fir) of 15,345 M ft. BM lodgepole, 870 M ft. BM white fir. In terms of cordwood this would be 30,690 cord LP, 1,740 cord white fir.

The lodgepole in this area is satisfactory for use as cordwood and poles. The growth over most of the area is quite satisfactory and trees are clear of limbs with tall well-formed boles. The site index for the type is about 50 at 80 years at the higher elevations. The indicated rotation age is also 80 years. This age will produce trees 50 feet high with a d.b.h. of about 8 inches which is a very desirable size for both poles and cordwood.

Aside from the 30,690 cords of lodgepole in mature age classes, the area contains some 1,090 acres of immature accessible lodgepole type, varying in age from seedlings up to 50 years old. Accurate data on age of lodgepole stands is not available, however, the greater portion of the immature stands average about 45 years of age. Hence, the 30,690 cords of mature timber represent the volume available in the lodgepole type during the next 35 years.

4. Depletion.

The figures given in the foregoing discussion of volumes have been adjusted in so far as possible to take care of cutting which has taken place. No cutover record has been maintained on the working circle and cutting has not been localized or systematized. In past years each permittee has cut wherever he wished—usually selecting the handiest place that he could find where the timber as thickest and easiest to cut.

The best estimates available place the cutover area at a little over 4600 acres. This past cutting greatly complicates placing the area under management as the working circle has been pretty completely culled over and the most accessible and the most desirable patches of timber have been cut.

Within recent years there has been almost no depletion from fire or insect causes. See map of cutover areas in appendix.

5. Growth.

Due to the rather poor site quality throughout the working circle, the mean annual growth is not high. The following table shows the potential mean annual growth for the entire working circle on the basis of individual types:

| Type | Rotation Age | Site Class | Area | Mean Annual bd. Ft. Increment | Potential Mean Annual Growth |
|--------------------------------|--------------|---------------------------------|--------|-------------------------------|------------------------------|
| PP | 200 | IV | 16,706 | 215 (a) | 3,592 M ft. BM |
| | | V | 26,059 | 129 (a) | 3,362 M ft. BM |
| Total for PP Type | | | | | 6,954 M ft. BM |
| Larch-fir | 140 | IV | 12,353 | 349 (b) | 4,311 M ft. BM |
| | | V | 20,399 | 137 (b) | 2,794 M ft. BM |
| Total for Larch-fir Type | | | | | 7,105 M ft. BM |
| Lodgepole | 80 | Site Index 50 to 80 years | 2,350 | 175 © | 411 M ft. BM |
| Grand total for Working Circle | | | | | 14,470 M ft. BM |

- (a) Taken from Tech. Bull. 630, table 25 “Mean annual board-foot increment Scribner Rule per acre of trees 11.6 inches and more in diameter.
- (b) Taken from Tech. bull. 201, table 9 – Bd. Ft. Scribner rule trees 12” and more in diameter.
- (c) Computed from table 39, B.C.F.S. “Volume, yield and stand tables for some principle timber species of British Columbia” 1936.

This potential mean annual growth is, however, far greater than the realizable mean annual growth. As the potential growth does not take into account areas of partial stocking, losses through decay, windfall, fire, etc., and it presupposes that all portions of the area are under intensive management and in a growing condition. The realizable mean annual growth which takes these factors into account is a difficult figure to derive. The following factors indicate that it will be far less than the potential factor:

Accessibility – Only 55% of the entire area is considered accessible to present methods.*⁶

Maturity – 59% of the accessible area is covered with mature timber on which no growth is now taking place.

Stocking - Of the accessible immature types, 685 acres or 4% are poorly stocked; 4,838 acres or 27% are medium stocked and 12,439 acres or 69% are well stocked.

It can be seen from this that the present mean annual growth will be only about 20% of the potential or about 2,900 M ft. BM. This figure would increase annually as the mature timber is removed and the land placed in a growing condition. Due to abnormal distribution of age classes, this present mean annual growth does not indicate allowable annual cut.

6. Sustained Yield Capacity

The sustained yield capacity for the working circle is based upon the independent management of the three major types.

Ponderosa Pine Type.

For the ponderosa pine type it will amount to 491.86 M ft. BM of PP per year from public lands plus 119.4 M ft. BM from private lands making a total of 611.26 M ft. BM of PP from the working circle. To this cut of PP can be added 9.9 M ft. BM of LP; 40.8 M ft. BM of DF; 1303 M ft. BM of WL; 124.8 M ft. BM of WF; and 7.2 M ft. BM of ES per year for the first cutting cycle.

⁶ See Accessibility Map in Appendix.

The above cuts are based upon instructions on pages 6, 7, 8, and 9 of Part VII of TM Handbook. The cut figures are computed at 1% of the mature stand per year for PP as it is believed that this figure will largely eliminate a hiatus at the end of the second cutting cycle. It is also believed that 50% of the stand should be removed at the first cut. This is because of the light volume per acre in which a lighter cut would make logging and administrative costs mount unduly

The cut of associate species is designed to remove them from the stand in the first cutting cycle.

See Part A, Table VI in appendix for figures by blocks.

Larch-fir Type.

Because of the great divergence from normal distribution of age classes, the usual methods of arriving at an allowable cut do not apply to the larch-fir type in the Clearwater working circle during the first rotation.

There are no age classes between 40 years and maturity and the immature age classes are over 50% of the area. Because of this, the mature timber must be spread over 100 years of cutting in order that the immature stands may reach rotation age before the supply of mature timber is exhausted. The present stands of mature timber are not heavily stocked and over 50% of the material is not of saleable species at the present time.

The volume of merchantable mature timber in the accessible portion of the stand is placed at 31,434 M ft. BM. Spread over 10 years, this volume would allow an annual cut of 314.34 M ft. BM. This is considerably less than the mean annual growth on the immature stands, which at the rotation age will amount to about 140 bd. Ft. per acre on the average for the saleable species or about 1,222 M ft. BM for the entire immature area. The entire immature stands will reach cutting age within the 1st rotation but in order to bring the area to a normal condition as rapidly as possible and in order to avoid a great increase of cut at 100 years and then a decrease at 140 years, it would be desirable to reserve a major portion of the immature stand until the second rotation. If this is done the cut for the second rotation can be made very nearly uniform throughout, and the entire type placed in nearly a normal condition at its end.

In order to accomplish this the allowable cut for the last 40 years should be computed upon an area regulation basis – the areas weighted by site factors. This would call for cutting 1,837.36 M ft. MB annually.

(For calculations of allowable annual cut in larch-fir type see table VI, part b in appendix.)

The allowable annual cut of 314.34 M ft. BM for the first 100 years and 1,837.36 M ft. BM for the last 40 years, are both based upon the volumes of DF, WL, LP, and PP only. If demand should arise for white fir and spruce, it would be possible to double the allowable cut since nearly 50% of the mature volume and at least 50% of the stocking in immature stands is white fir and Engelmann spruce. Thus, should demand arise for white fir and spruce, the total allowable cut of all specie in the larch-fir type would be about 628 M ft. BM for the first 100 years and 3,674 M ft. BM for the last 40 years.

Lodgepole Pine Type.

This type is composed of 870 acres of mature timber with a volume of 15,345 M ft. BM of LP and 1090 acres of immature timber ranging from 0 to 45 years of age. The major portion of the immature stands are nearly 45 years old, hence, the mature timber volume should be spread over about 35 years of cutting. If this is done, all of the type will have reached the cutting age of 80 years within the rotation. As definite data on age classes is not available, it will be assumed for the purpose of this plan that the immature stands will be cut at the age of 80 years. Thus the allowable annual cut for the type will be 364.8 M ft. BM of LP.

(See computations in Table VI, part c in appendix.)

Total All Types.

The allowable annual cut of all species from public ownership for the entire working circle during the first 100 years of management would be 2,656.7 M ft. BM if ES and WF do not become commercially valuable and 2,970.7 M ft. BM if they should become valuable. After the first 100 years, the allowable cut for the remainder of the first rotation in larch-fir types would be 4,179.72 M ft. BM without WF and ES and 6,016.72 M ft. BM with WF and ES. These figures would be increased by 119.4 M ft. BM by addition of private owned lands to the sustained yield plan.

This allowable annual cut of 2,656.7 M ft. BM for the first 100 years of management without including WF and ES amounts to 1,769.22 M ft. BM more than the entire cut of green timber during 1938 which was 887,480 bd. ft. of Class-A and S-22 sales, the allowable cut of 119.4 M ft. BM from private lands is in addition to this figure. The dead wood removed from the working circle should not be counted against the sustained yield capacity as there seem to be a sufficient supply of this type of material to last for a number of years in the future. Should the dead wood supply become completely exhausted, it is likely that only a small part of its demand would be transferred to green wood.

7. Transportation Facilities.

As can be seen on the road map (Map No. V in the appendix) the Clearwater working circle has been supplied with a maize of utilization or "wood roads". However, these roads are all on ridge tops

and do not open up any of the timber on the slopes or in the draws. In the future, it would be desirable to construct roads which would open up the timber in the draws, but this, in many cases, presents quite a problem. The majority of the drainages are deep with narrow, steep, right bottoms which are of such character that road construction would be entirely too expensive along the creeks. It is believed that in a good many cases the solution would be to start from the lower elevations on the ridge roads and run contour roads into the gulches at varying elevations. In the more gentle drainages of the Pataha Creek and Charley Fork of Asotin Creek such roads could be made to open up considerable stands of timber and would not be difficult to construct. It does not appear, however, that funds may become available in the near future for such construction and the margin of profit obtained by the wood cutters is so small that it is not possible for them to do any extensive construction themselves. Transportation from the forest to the markets must, in the future as well as now, be largely over the four main roads leading into the ranger district. The hauling will undoubtedly always be done with trucks.

8. Fire, Insect, and Disease Protection

The problem of protecting the Clearwater working circle from fire, insects and disease has never been troublesome nor is it expected that it ever will be so. Due to the generally open character of the country, the absence of heavy undergrowth and numerous sharp rim rock "breaks", fire control is not difficult. The main cause of fires in this area is lightning and in a majority of cases, rains accompany or follow the electrical storms.

No diseases have ever made their appearance in epidemic form in this area, and although the pine bark beetle (*Dendroctonus Brevicomis*) is present in the area, it has never been epidemic and due to the way the stands are broken up by types, it is doubted that its attack will ever be serious.

9. Forestry Silvicultural Practices.

In the past years, cutting in the ponderosa pine type has been done under a light selection basis with removal of from 40% to 50% of the stand. Only mature and over-mature trees have been cut. In some areas, however, the stands are so completely over-mature that much of the material left should have been removed from a silvicultural standpoint. This system has worked out very well in this area and should be continued in the ponderosa pine type. In the larch-fir type and the lodgepole pine types cutting has not been done under any special silvicultural system. It has been very loosely supervised and has resulted in a very inferior type of reproduction stand. Cutting has been carried on by the permittees when and where they desired, no effort being made to centralize the cutting. Consequently, the better stands of timber have been "hi-graded" and undesirable species or undesirable trees from the wood cutter's standpoint have been left to reseed the area in haphazard fashion.

The lodgepole pine types have been a little better managed than the larch-fir types inasmuch as they were more uniform in character and the wood cutter of his own volition, made a rather careful clear cut of the area. Also a study has been undertaken to determine the desirability of clearcutting in the lodgepole pine areas. Of all the cutover areas outside of the ponderosa pine type the lodgepole pine areas are in much the better condition.

It is believed that in future cuttings in both the larch-fir and lodgepole pine types, a form of the "clear cutting by groups" system should be used. This recommendation is based upon the fact that the entire area is a strong white fir climax type and throughout the working circle, lodgepole pine, douglas fir and larch can in no way compete with white fir in a mixed stand.

As white fir at the present time, and very likely through the future years, is an inferior species for the uses to which timber is put by the adjoining communities, it seems that management should be such as to favor the douglas fir, western larch, and lodgepole pine which are the most desirable species on the entire working circle being perhaps even more desirable than ponderosa pine. In order to secure larch, lodgepole pine, or douglas fir, reproduction, clear cutting with a slash burn which covers a fair per cent of the area is absolutely necessary. Areas which have been clear cut in the past and have been broadcast burned have come back to very satisfactory stands of larch, lodgepole pine, or douglas fir, while areas which have been cut selectively have come back 100% to white fir with occasionally some Engelmann spruce intermingled. As the areas cut over each year are relatively small, clear cutting does not have the disadvantages which are inherent in its application in regions where large areas are logged each year with heavy machinery. In almost no case in the Clearwater working circle would an area be clear cut in one year which would be over 80 to 100 acres in extent as the distribution of types, age classes, and topography limit the cutting to such small areas.

Slash disposal has always been cared for under cooperative agreement with the permittees. The permittee has been required to make a small deposit and also to pile the slash ready for burning, the Forest Service has then supplied the burning crews. This system is satisfactory in the ponderosa pine type and should undoubtedly be followed in the future. In the larch-fir and lodgepole pine types, this system results in either rather high expenditures or careless disposal. Throughout these types the slash is quite heavy and as the cutting is necessarily more or less scattered, the brush burning crew does not make rapid progress in cleaning up. It is believed that the most desirable system in many cases would be to require the permittee to make the customary deposit for slash disposal and instead of piling his slash, to lop the limbs so that they lie closer to the ground and then lop and throw back all material lying around the edge of his cuttings so as to form a sort of fire break around his slashings. This strip in which the permittee should be required to clean up the material, in no case need to be over

8' to 10' wide. He should also be required to slash all white fir which has been left standing inside of his cutting area. The Forest Service burning crews then could, with a minimum of effort, clear a trench around the entire cutting area and burn broadcast. The time of burning, of course, would have to be very carefully controlled in order to avoid escape of fire and yet to allow a clean burn. It is proposed to inaugurate this system on at least part of the cutting areas in the coming season.

10. Marketing.

As has been stated previously, the class of timber, type of topography and distance from market all combine to increase the cost of production to such a point that the operator has a very narrow margin of profit left. It seems quite certain that timber sale prices could not be advanced in the near future and leave the operator any margin at all.

11. Acquisition Possibilities.

No large acquisition program is indicated in connection with the Clearwater working circle. Areas in private ownership adjacent to the Pomeroy block are undoubtedly not available for acquisition as apparently most of the owners desire to hold their own land. In the private area adjacent to the Asotin block, there might be opportunity for some acquisition in T. 8N., R. 44E. However, the situation in regard to private ownerships is not such as to make acquisition by the government a necessity from the standpoint of community welfare. It is believed that priorities over the region would preclude any acquisition program on the Clearwater working circle.

12. Planting.

Natural reproduction throughout the working circle has been very satisfactory and there are no areas at present where planting is needed. Under any careful form of management, planting should not be needed in the future.

13. Research Problems.

Some research in connection with brush disposal as outlined in a previous paragraph, and in connection with growth of thinned stands of lodgepole pine in the area would be very desirable. One thinning plot was established some years back but subsequent fires, road construction and unregulated cutting has largely destroyed its value. It is believed that pole cutting in the young lodgepole pine stands should be done on a thinning basis leaving a portion of the stand to develop for larger products. However, it has not been demonstrated that this system would produce a greater volume of material in a shorter time than would clear cutting. It is quite possible that the growth during the earlier years of the stand is sufficiently rapid to make it more desirable to clear cut pole areas and so bring on a new

pole stand within a relatively short period. The one thinning plot which has been established was thinned about some six years ago and as yet no increase of growth can be detected.

III. SOLUTIONS AND PLANS

A. Management of National Forest Timber

Administrative policy.

It seems desirable that the timber in this working circle be dedicated to supply the local demand for fuel wood, posts, poles and rough building lumber. Any attempt to develop a market for white fir or spruce lumber should be encouraged. It is not believed that the area could support more than one or two small mills. These mills should be of the portable type and should preferably not have a capacity of more than 10,000 to 12,000 board feet per day.

Silvacultural Policies.

The ponderosa pine type should be managed under a light selection system and brush disposal should be done by piling and burning. There is some possibility that in this area it would be advantageous to lop and scatter ponderosa pine slash instead of burning. In the larch-fir and lodgepole pine types, it is believed that a clear cutting by groups system should be followed. This should be managed so that clear cut areas are never so extensive as to preclude rapid seeding in from the sides or to allow erosion to become started. If areas are kept small and regeneration gained immediately, there should be no danger of erosion or water shed destruction by this system.

Sales Policies.

It is believed that the policy of supplying local farmers under regulation S-22 should be continued. These users should be favored over commercial users in case of a shortage of material. Commercial sales should be made as needed up to the indicated sustained yield capacity. Inasmuch as stumpage prices must be kept low in order to make the timber operable, the revenue derived therefrom is small and an effort should be made to keep administrative costs as low as possible. In line with this it is deemed advisable to encourage one or two operators to do as much of the commercial cutting as possible. It is believed that if one or two commercial wood cutters could take over most of the cord wood market in Pomeroy and Clarkston, that administrative costs could be greatly reduced.

It is believed that there may be opportunity to tie up the major portion of the privately owned timber adjacent to the Pomeroy block under sustained yield agreements by careful control of the sales policy to small mills. It is believed that the policy of requiring private owners to place their timber under

sustained yield management in return for the privilege of cutting Forest Service timber should be continued.

Stand Improvement.

The major problem of stand improvement exists in the larch-fir and lodgepole pine types where it consists of reducing the percentage of white fir in the stands. It is believed that this objective can be attained through clear cutting systems of management.

Rotations and Cutting Cycles.

Due to the relatively low sites throughout the working circle, it is believed necessary to place the ponderosa pine type on a rotation of 200 years. Any period short of this will not produce timber of desirable size. The cutting cycle, it is believed, should be approximately 50 years. In the larch-fir type in order to secure material of desirable size for cordwood, a 140-year rotation has been chosen. Inasmuch as it is recommended that the clear cutting system be used in this type, the cutting cycle will coincide with the rotation. In the lodgepole pine type, it is believed that an 80-year rotation will produce timber of desirable size, here again clear cutting is recommended and the cutting cycle coincides with the rotation.

Cutting Budget.

As stated previously, the cutting budget for the coming 100-year period should be as follows:

| | |
|------------------|---|
| Ponderosa Pine - | 491.86 M ft. BM from public owned lands 119.40 M ft. BM from private lands per year 1486.00 M ft. BM Other species being removed from the stand in 1 st cutting cycle. |
| Larch-fir Type - | 314.34 M ft. BM (Unless white fir and Engelmann spruce become saleable in which case it could be 628.68 M ft. BM per year.) |
| Lodgepole pine - | 364.8 M ft. BM per year. |
| Total - | 2776.4 M ft. BM per year plus a possible 314 M ft. BM of WF and ES. |

Sufficient detailed information concerning topography, age classes and types to allow preparation of a detailed cutting budget map is not available at the present time. This information should be secured as soon as possible and an orderly plan of cutting evolved.

Correlation of Other Uses and Other Ownerships.

The Clearwater area is extensively used for grazing and recreational purposes as well as for timber production. Timber cutting as practiced on the district is not apt to conflict with grazing uses,

however, it should be carefully managed in order not to conflict with recreation. It is believed that cutting should be avoided around the several small summer home areas and also in the area between Clearwater Ranger Station and Mt. Misery along the breaks of the Tucannon River. Over the rest of the working circle, it is believed that there will be no conflict between these uses.

B. Cooperation and Coordination with other Owners.

Inasmuch as the private ownerships are not extensive and there are no major forest industries on private lands, this does not present a serious problem. However, it is believed that there may be opportunity of cooperation with some of the private owners and so secure a sustained yield management on their lands. All of the private owned lands are in the ponderosa pine type and the sustained yield for the private ownerships of 119.4 M ft. BM is indicated for the 1st cutting cycle.

C. Plan for Social Stability.

Inasmuch as there are no large forest industries concerned and as the products are mainly used on neighboring farms or in neighboring towns, the forest influence on community stability is not important more than to the extent of furnishing a continuous supply of the type of products which the community needs. At least for the coming 100 years while the area is being placed under management, the forest does not present any great source of employment to the local communities nor does it represent any large source of income for the communities. However, the S-22 business does represent a big item of savings to the farming communities.

D. Miscellaneous

In carrying out any plan of management on the Clearwater working circle, it is vitally important that a survey of the cutover areas be inaugurated in the very near future and a cutting budget record maintained. Due to the small size of the individual sales in the past, this has not been done. Hence, the information concerning the condition, size and location of cutover areas is very meager. It is not believed that any extensive timber surveys would be justified. The figures given by the forest survey appear to be adequate for immediate needs. It would be extremely desirable however, to obtain topographic maps of the entire working circle. Due to the extremely rough topography, preparation of well-founded plans is almost impossible without reliable topographic maps. In this area, the most desirable method of securing such maps would be by the airplane mapping system. Only a very small portion of the working circle has been covered by U.S.G.S. topographic maps up to the present time.

It is recognized that this management plan is more or less preliminary in character and will have to be revised as management proceeds on the working circle.

R 43 E

R 44 E

R 45 E

Site Map Clearwater W.C.

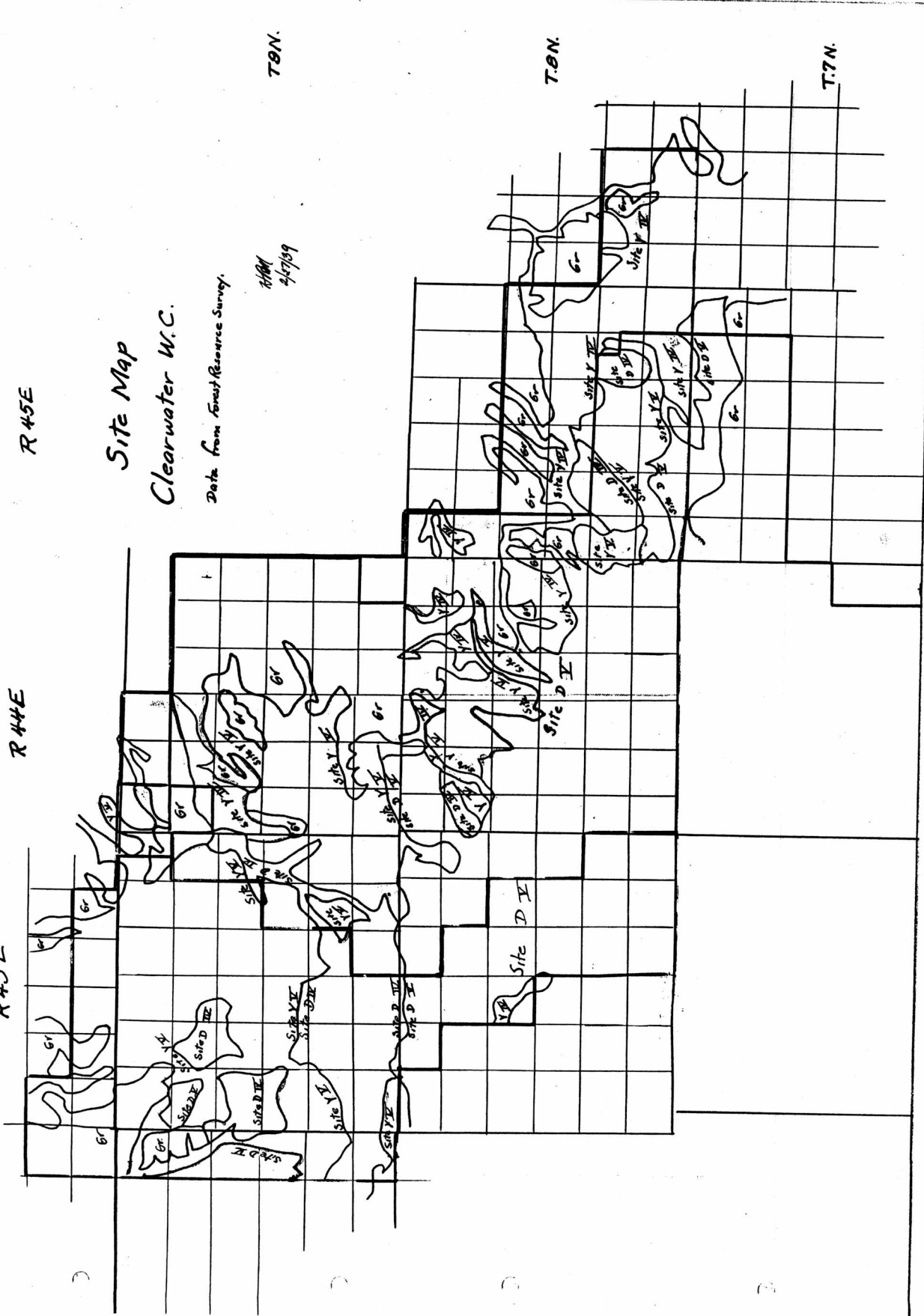
Data from Forest Resource Survey.

11/81
2/4/79

T 6 N.

T 6 N.

T 7 N.



R 42 E

R 43 E

R 44 E

T 9 N

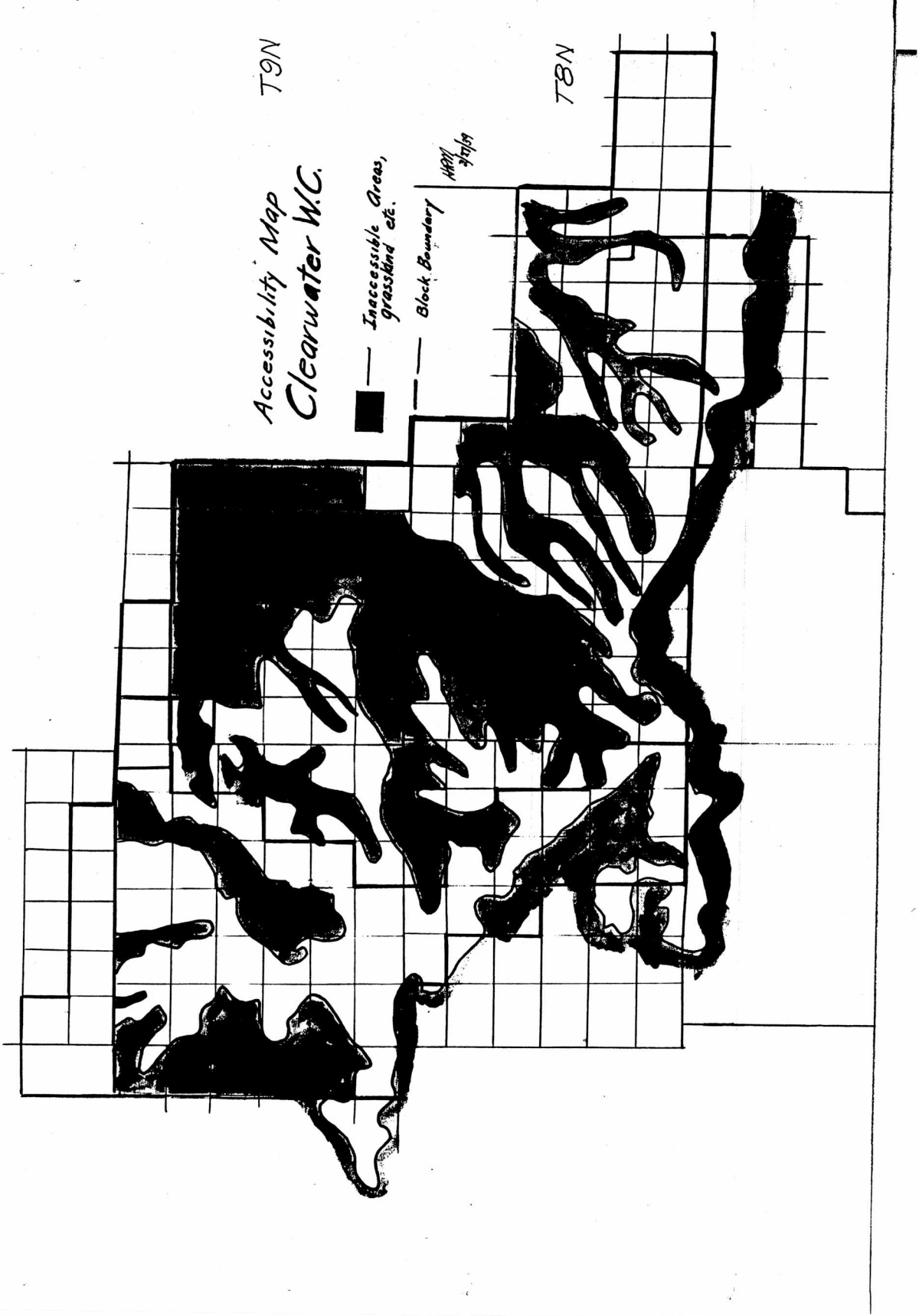
T 8 N

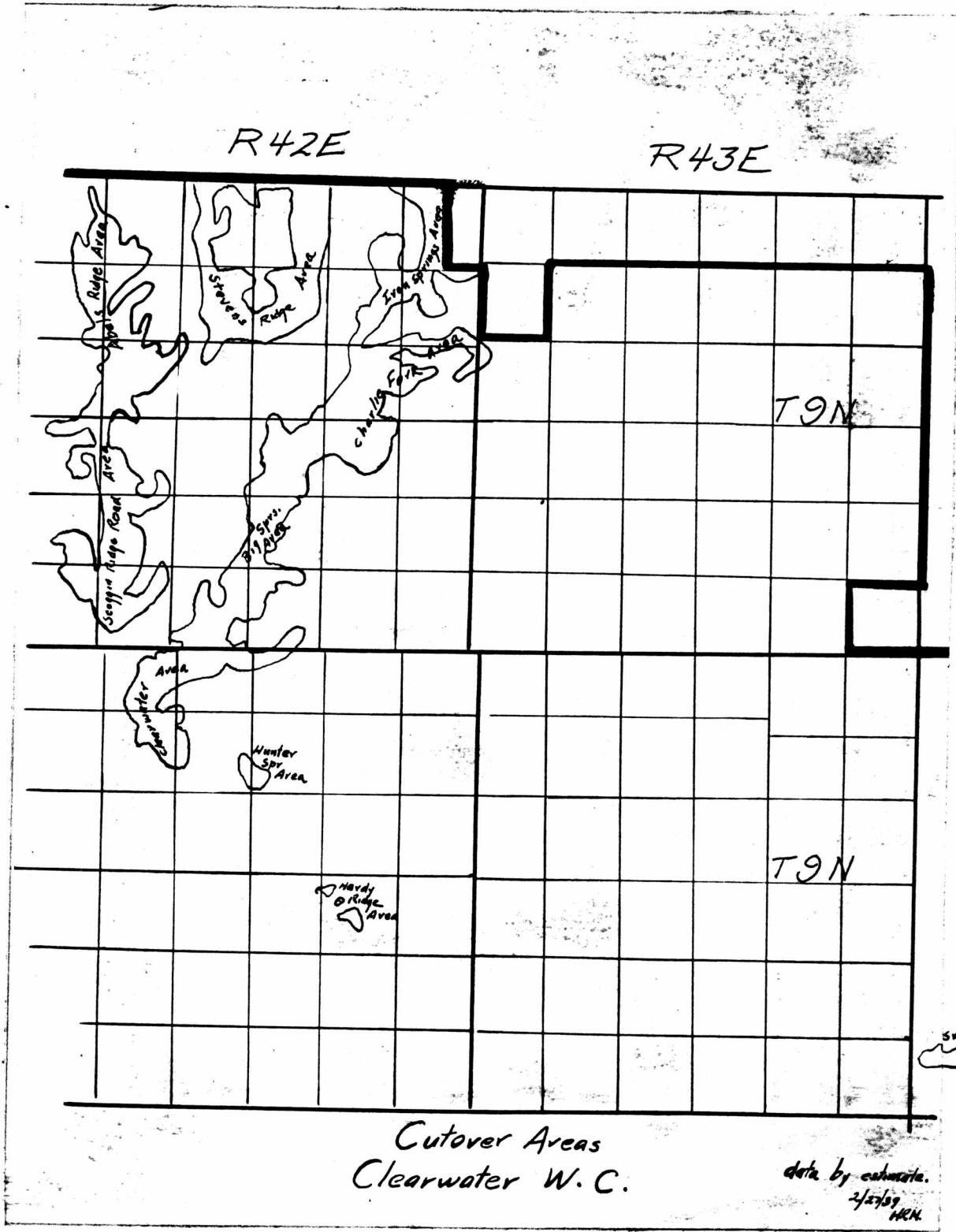
*Accessibility Map
Clearwater W.C.*

■ — Inaccessible Areas,
grassland etc.

— Block Boundary

APR 27/59



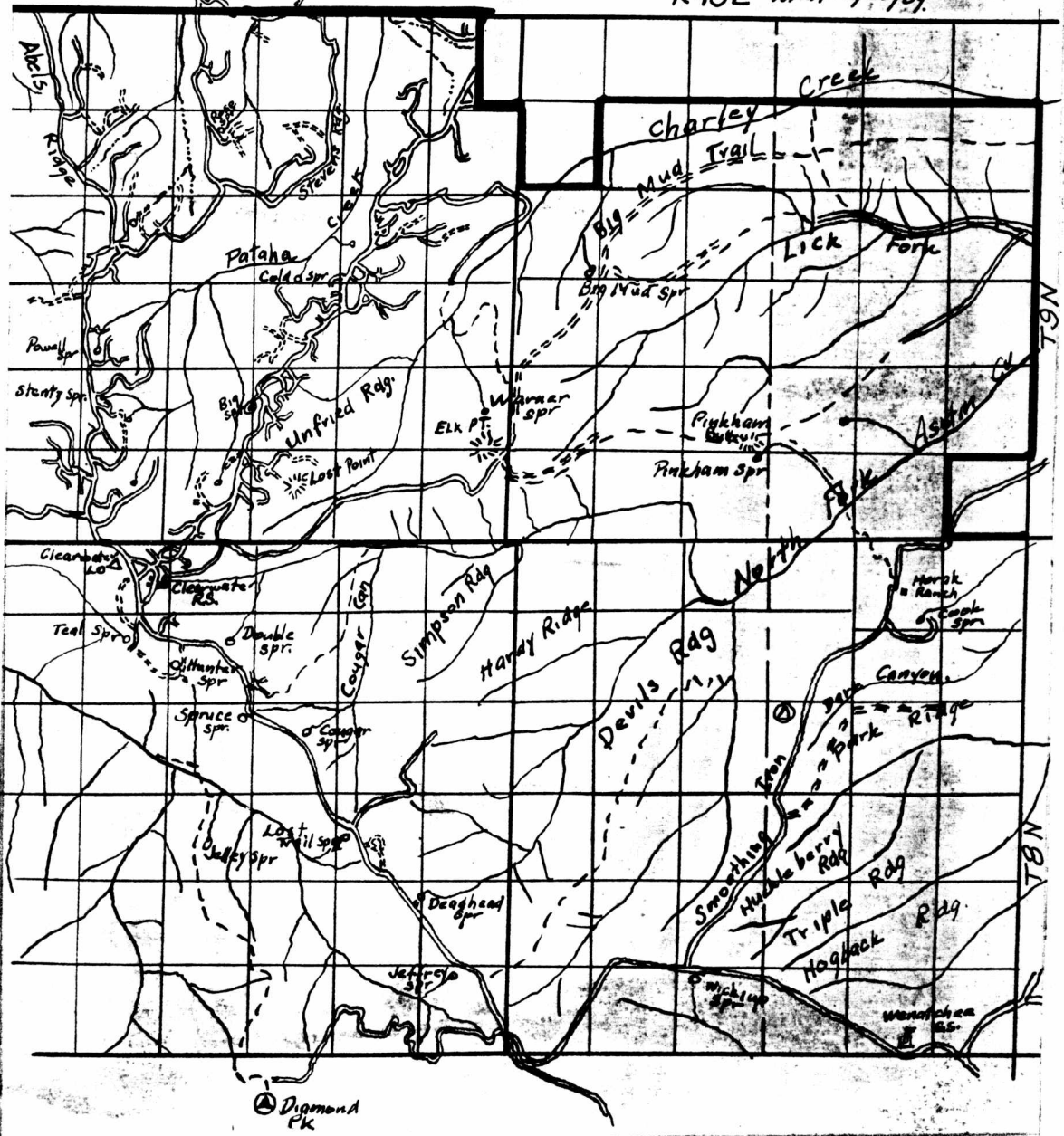


Road Map. Clearwater W.C.

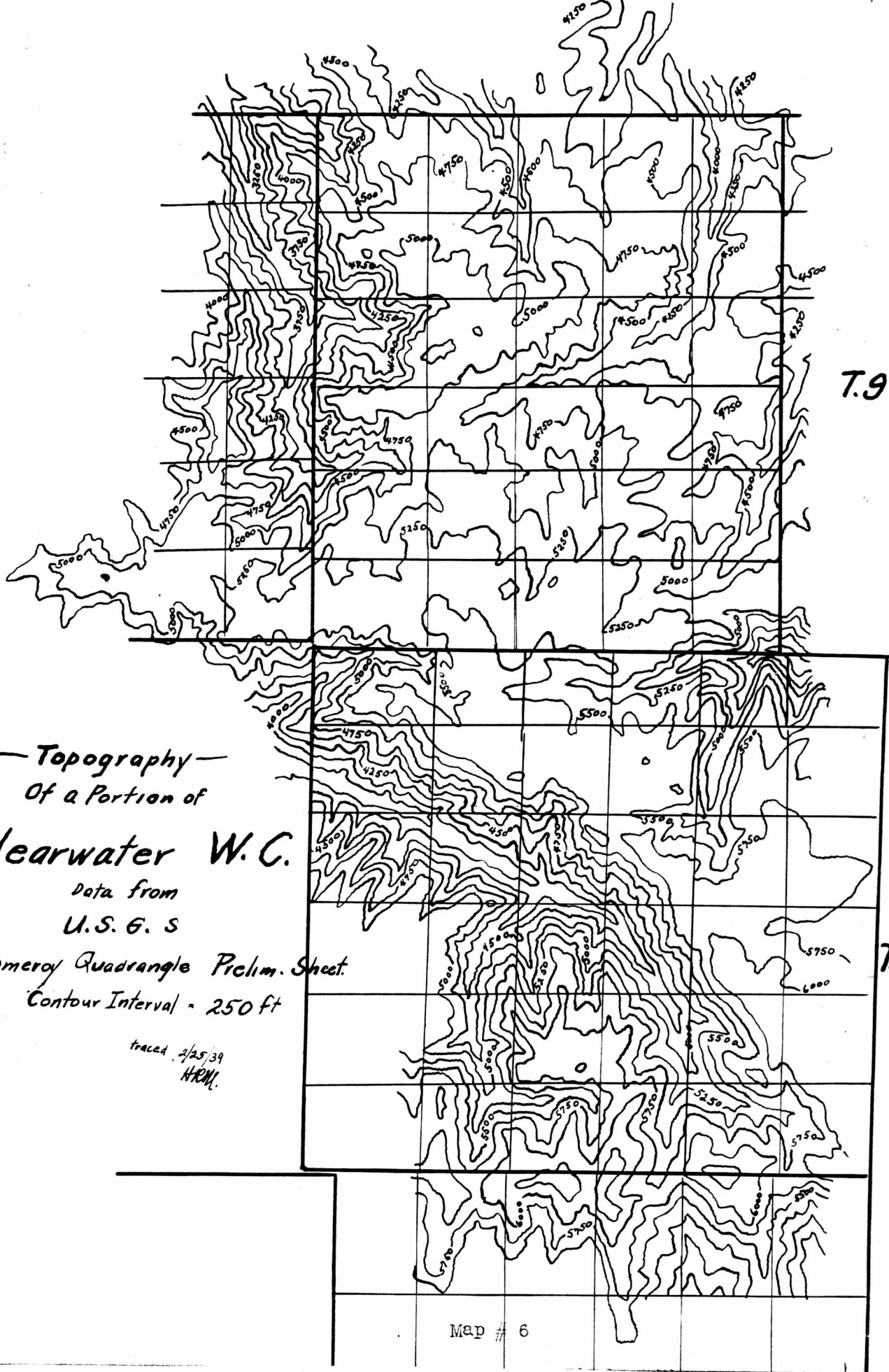
Data by Compass & Chain
Survey by O.E.T. 1936

R42E

R43E ~~1939~~ 4/25/39



R. 42 E.



T. 9 N.

T. 8 N.

— Topography —
Of a Portion of

Clearwater W.C.

Data from
U. S. G. S

Pomeroy Quadrangle Prelim. Sheet.
Contour Interval - 250 ft

traced 2/25/39
H.M.M.

Table VI Part A

SUSTAINED YIELD CALCULATIONS - PP TYPE

1st cutting cycle - 50 years
Rotation - 200 years

| Pomeroy Block | | M ft. BM | | | | | |
|--|---|-----------------------------|----------|-------------------------------------|------------|------------|----------|
| | | Annual Cut to Sustain Yield | | Annual Cut to Eliminate from Stand. | | | |
| | | PP | LP | DF | WL | WF | ES |
| Vol. in Public | (Vol. from Table V less Mature Uncut Vol. on light cut areas) | 8769 | | 2393.5 | 1297.5 | 1474.5 | |
| | | x .01 | | ÷ 50 yrs. | ÷ 50 yrs. | ÷ 50 yrs. | |
| Annual Cut | | | | | | | |
| 1st Cutting cycle | | 87.69 Mft. | | 47.8 Mft. | 25.9 Mft. | 29.5 Mft. | |
| Vol. Private | | 6340 | | 1800 | | 665 | |
| Mature Uncut | | x .01 | | ÷ 50 yrs. | | ÷ 50 yrs. | |
| Annual Cut | | | | | | | |
| 1st Cutting cycle | | 63.4 Mft. | | 36 Mft. | | 13.3 Mft. | |
| Total annual cut 1st cutting cycle for Pomeroy Block | | 151.09 | | 83.8 Mft. | 25.9 Mft. | 42.8 Mft. | |
| <u>Asotin Block</u> | | | | | | | |
| Vol. in Public | | 40417 | 496 | 4602 | 4523 | 3402 | 360 |
| Mature Uncut | | x .01 | ÷ 50 | ÷ 50 | ÷ 50 | ÷ 50 | ÷ 50 |
| Annual Cut | | | | | | | |
| 1st cutting cycle | | 404.17 | 9.9 Mft. | 92 Mft. | 90.4 Mft. | 68 Mft. | 7.2 Mft. |
| Vol. in Private | | 5600 | | 1750 | 700 | 700 | |
| Mature Uncut | | x .01 | | ÷ 50 | ÷ 50 | ÷ 50 | |
| Annual Cut | | 56.00 | | 35 Mft. | 14 Mft. | 14 Mft. | |
| Total Annual Cut for Asotin Block | | 460.17 | 9.9 Mft. | 127 Mft. | 104.4 Mft. | 82 Mft. | 7.2 Mft. |
| Total for Working Circle | | 611.26 | 9.9 Mft. | 210.8 Mft. | 130.3 Mft. | 124.8 Mft. | 7.2 Mft. |

Table VI, Part B

SUSTAINED YIELD CALCULATIONS - LARCH-FIR TYPE

(All LF Type in Public Ownership)

Basic Data

| Volume of Mature timber - M ft. EM - on 8100 acres | | | | | | Total of Merchantable Species - PP - LP - DF - WL. |
|--|------|--------|--------|--------|--------|--|
| PP | LP | DF | WL | WF | ES | |
| 1061 | 2801 | 10,007 | 17,565 | 12,389 | 17,869 | 31,434 M ft. EM 30,258 M ft. EM Non-saleable species WF & ES. |

Immature Types

| | Acres | Age | Stocking | Composition |
|---------|-------|---------|----------|-----------------------------------|
| Site IV | 635 | 0 to 10 | = | 50% LP, DF, & WL; 50% WF & ES. |
| | 1,056 | 30 | = | " |
| | 448 | 40 | = | " |
| | 3,662 | 40 | = | " |
| Site V | 325 | 0 to 10 | = | " |
| | 110 | 20 | = | " |
| | 20 | 30 | = | " |
| | 130 | 30 | = | " |
| | 1,085 | 30 | = | " |
| | 1,238 | 40 | = | " |

8,864 Acres

Stocking 50% desirable &
Averages about 50% undesirable
70% of normal
after deduc-
tions for
losses, etc.

Total operable stocking
35% of normal.

Table IV Part A

SUSTAINED YIELD CALCULATIONS – PP TYPE

1st cutting cycle – 50 years
Rotation – 50 years

| Pomeroy Block | M ft. BM | | | | | |
|--|-----------------------------|-----------|------------------------------------|---------------------|---------------------------------|-------------|
| | Annual Cut to Sustain Yield | | Annual Cut to Eliminate from Stand | | | |
| | PP | LP | DF | WL | WF | ES |
| Vol. in Public Mature Uncut (Vol. from Table V less Vol. on light cut areas) | 8769 x .01 | | 2393.5 ÷ 50 yrs. | 1297.5 ÷ 50 yrs. | 1474.5 ÷ 50 years. | |
| Annual Cut. 1 st Cutting cycle | 87.69 M ft. | | 47.8 M ft. 1800 ÷ 50 yrs. | 25.9 M ft. | 29.95 M ft. 665 ÷ 50 yrs. | |
| Vol. Private Mature Uncut | 6340 x .01 | | | | | |
| Annual cut. 1 st Cutting cycle | 63.4 M ft. | | 36 M ft. | | 13.3 M ft. | |
| Total annual cut 1 st cutting cycle for Pomeroy Block | 151.09 | | 83.8 M ft. | 25.9 M ft. | 42.8 M ft. | |
| <u>Asotin Block</u> Vol. in Public Mature Uncut | 40417 x .01 | 496 ÷ 50 | 4602 ÷ 50 | 4523 ÷ 50 | 3402 ÷ 50 | 360 ÷ 50 |
| <u>Annual cut</u> 1 st cutting cycle | 404.17 | 9.9 Mft. | 92 Mft. | 90.4 M ft. | 68 M ft. | 7.2 M ft. |
| Vol. in Private Mature Uncut | 5600 x .01 | | 1750 ÷ 50 | 700 ÷ 50 | 700 ÷ 50 | |
| | 56.00 | | 35 M ft. | 14 M ft. | 14 M ft. | |
| Total Annual Cut For Asotin Block | 460.17 | 9.9 M ft. | 127 M ft. | 104.4 M ft. | 82 M ft. | 7.2 M ft. |
| Total for Working Circle | 611.26 | 9.9 M ft. | 210.8 M ft. | 130.3 M ft. | 124.8 M ft. | 7.2 M ft. |

Table VI, Part B

SUSTAINED YIELD CALCULATIONS – LARCH-FIR TYPE

(All LF Type in Public Ownership)

Basic Data

Volume of Mature timber – M ft. BM – on 8100 acres

| PP | LP | DF | WL | WF | ES | Total of Merchantable Species – PP – LP – DF – WL |
|------|------|--------|--------|--------|--------|--|
| 1061 | 2801 | 10,007 | 17,565 | 12,389 | 17,869 | 31,434 M ft. BM 30,258 M ft. BM Non-saleable species WF & ES |

Immature Types

| | Acres | Age | Stocking | Composition |
|---------|-------------|----------|---|--|
| Site IV | 635 -- 0 | to 10 -- | = | 50% LP, DF, & WL; 50% WF & ES. |
| | 1,056 --- | 30 --- | = | " |
| | 448 --- | 40 --- | = | " |
| | 3,662 --- | 40 --- | = | " |
| Site V | 325 -- 0 | to 10 | = | " |
| | 110 --- | 20 --- | = | " |
| | 20 --- | 30 --- | = | " |
| | 130 --- | 30 --- | = | " |
| | 1,095 --- | 30 --- | = | " |
| | 145 --- | 40 --- | = | " |
| | 1,238 --- | 40 --- | = | " |
| | 8,864 Acres | | Stocking Averages about 70% of normal after deductions for losses, etc. | 50% desirable & 50% undesirable |
| | | | | Total operable stocking 35% of normal |

Larch-Fir Type Contd.

Calculation of Allowable cut first 100 years of first rotation:

31,434 M ft. BM of mature timber ÷ 100 years = 314.34 M ft. BM per year.

Calculation of Allowable cut last 40 years of first rotation:

Giving Site IV acres a weight of 2.5 compared to Site V (based on mean annual increment at 140 years, table 9 – Scribner Rule – Tech. bull. 201) the type contains – 6,846 (Site IV acres) x 2.5 = 17,115 + 10,118 (Site V acres) = 27,233 weighted Site V acres. This divided by the rotation of 140 years would give an annual cut of 193 weighted Site V acres. This in terms of volume cut would be the volume of 193 Site V acres at rotation age (140 years) reduced by the degree of stocking.

27.2 M ft. BM per A. x 193 A. = 5,249.6 M ft. BM. This reduced for stocking is 5,249.6 x 35% = 1,837.36 M ft. BM allowable cut during last 40 years of first rotation.

Table IV, Part C

SUSTAINED YIELD CALCULATIONS – LODGEPOLE PINE TYPE

| Present Age | Area | Age when cut | Normal Vol. per A. at cutting age | Vol. per A. reduced for stocking & losses 90% of normal | Total Vol. Available | Years to cut |
|-------------|-------|--------------|-----------------------------------|---|----------------------|--------------|
| Mature | 870 | | | | 15,345 | 42 yrs. |
| Immature | 1,090 | 80 | 14.1 M ft. BM | 12.69 M ft. BM | 13,843 | 38 |
| | | | | | 29,188 M | 80 |

$$29,188 \div 80 = 364.8 \text{ M ft. BM per Yr.}$$

Yield figures taken from table 39 – “Site Index 50 at 80 years – Site Index yield tables for entire stand of all trees 1” and over” - from B.C.F.S.” Volume, yield and stand tables for some of the principal timber species of British Columbia” 1936. Stocking considered 90% of normal.

There are 5 hand-written tables that were too large to transcribe. These are available to view at the Umatilla NF's Supervisor's Office.