FOREST AND HERBACEOUS RESOURCE INVENTORY AND SUPPLEMENTAL FOREST MANAGEMENT PLAN, DWORSHAK PROJECT

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Final Report

for

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INTRODUCTION

This report is submitted in fulfillment of contract No. DACW 68-73-C-0245 entered into by the Corps of Engineers and the College of Forestry, Wildlife and Range Sciences, University of Idaho.

This report serves the purpose of fulfilling three major objectives:

1) To provide data on the forest and herbaceous vegetation currently existing on Dworshak project lands. These data form a basis upon which the management program for the Dworshak project lands can proceed with reasonable confidence that the forested setting around the reservoir will be maintained.

2) To present recommended vegetation management alternatives for the community types located on Dworshak project lands. These recommended management alternatives will attempt to provide an environmental balance between the social demands of the using public and the requirements of wildlife for winter forage. The management alternative will be considered in light of their affect on:

   a) visual beauty - actions should preserve or improve the naturalistic atmosphere generally experienced on the reservoir.

   b) forest sanitation and thrift - actions should maintain young, thrifty forest stands which are relatively free of and resistant to insect and disease agents.

   c) wildlife habitat and forage development - actions should develop and maintain the deciduous brush browse areas to support wildlife and create a floristic variety through the manipulation of the forest and brush canopy.

d) recreation access - actions should manipulate the forest canopy to improve or preserve resource values adjacent to the roads and trails within the forested areas.

e) safety - actions should eliminate hazards from snags and trees with exposed roots in public use areas. Manipulation of vegetative communities with a high potential for mass wasting or wildfire should be minimized in public use areas.

f) timber production - actions should be for purposes of maintaining or improving topics a) thru e) . This topic is not considered a management goal but rather a by-product of forest stand manipulation.

3) To present recommendations for a computerized land resource information system. It should be a flexible, working system that allows quick display and retreivable of resource data needed for the ongoing management of Dworshak project lands.

With the establishment of Dworshak Reservoir and the ensuing changes in recreational access, land use patterns around the reservoir and unification of ownership by the Corps on lands adjacent to the reservoir, it is imperative that a formalized management plan be developed. This plan should not be static but reflective of changing resource conditions and varying public demand.

AREA DESCRIPTION

Dworshak Dam is located in north-central Idaho on the Northfork of the Clearwater River 1.9 miles above its confluence with the main Clearwater river (Figure 1). The 717 ft. tall structure forms a reservoir extending approximately 55 miles up the Northfork of the Clearwater drainage, creating

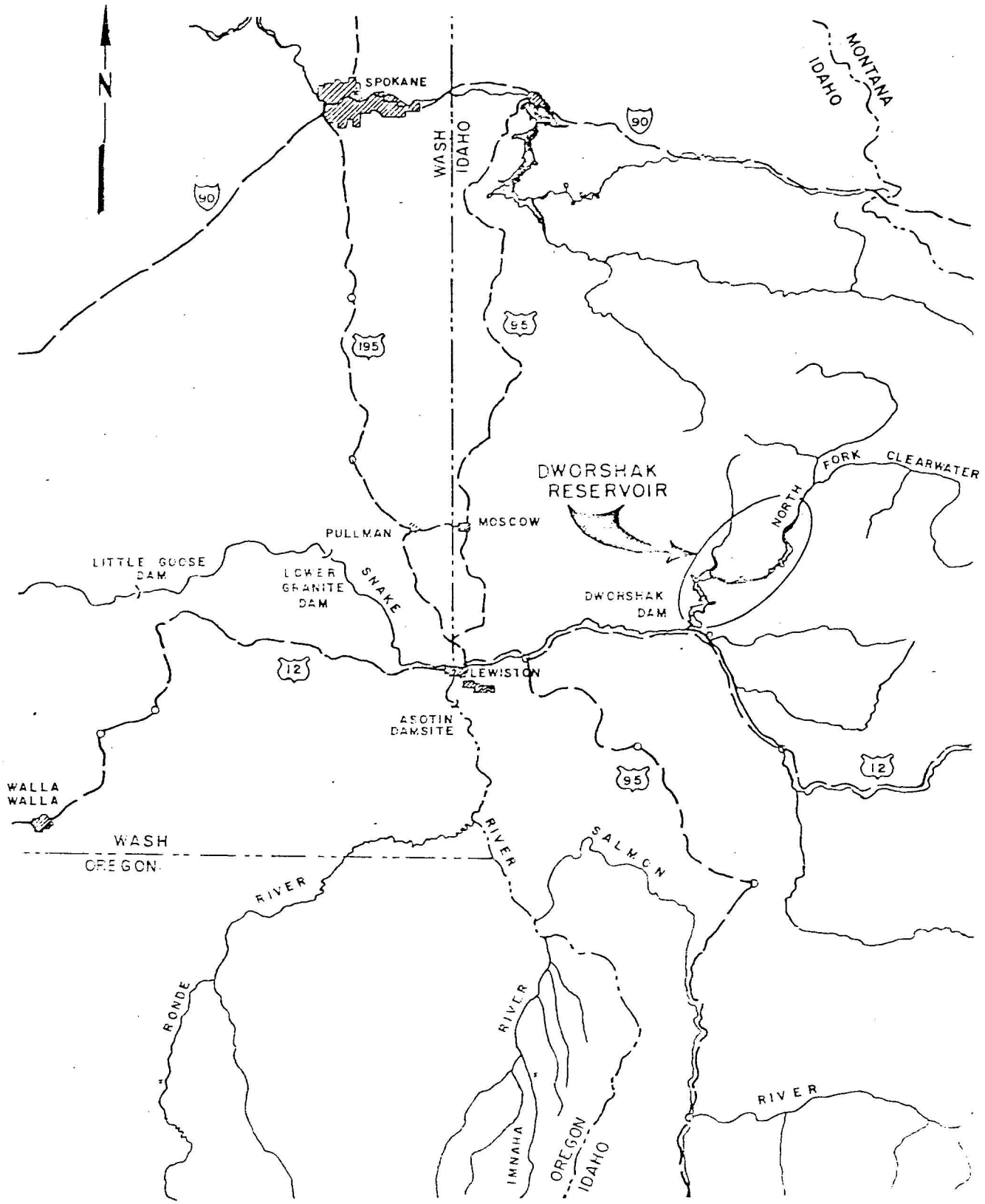

Figure 1. Geographic location of Dworshak Dam and Reservoir.

approximately 175 miles of shoreline at maximum pool. The Corps has responsibility for approximately 25,000 acres of land surrounding the reservoir. The forest types of land vary from ponderosa pine (Pinus ponderosa) at the lower end of the pool to western hemlock (Tsuga heterophylla) at the upper end of the pool with numerous different forest types in-between. This variability is predictable since such a large geographic distance is transected.

Project lands lie in the western slopes of the Bitterroot Mountain Range generally in steep and rugged terrain. Shoreline slopes vary from ten percent to overhanging bluff formations. Soils are decomposed granitic base of widely diverse particle sizing and are highly erodable. Soil classification maps do not exist for the area.

Prior to acquisition by the Corps, the project land was used primarily for commercial timber production. A variety of harvesting practices were used. Many of these harvested areas are currently being reforested through the process of natural regeneration. Minor amounts of land were cleared for homesteads and were used for grazing domestic livestock. These areas continue to remain as grasslands.

RESOURCE INVENTORY METHODOLOGY

PREINVENTORY STUDY

During the summer of 1973, plots were located on Dworshak project lands between Reeds Creek and Evans Creek. The purpose of this intensive sample was to:

1. test field techniques
2. verify aerial photographic interpretation of forest types
3. estimate the degree of variability within forest types
4. determine optimum plot size, and
5. analyze the time required to complete the desired field measurements with varying sized crews.

The resource information was summarized and presented to the contracting officer during the fall of 1973.

PHOTO INTERPRETATION

Following the preinventory, all Dworshak project lands were stratified into forest types using aerial photographs. The major criteria used to distinguish forest types on the photographs were differences in texture and density. When possible, an attempt was made to identify forest types by size class and species. Field inventory data provided information as to the major species composition within a given forest type.

Information obtained from aerial photographic interpretation and field inventory data were used to develop a base map of the forest types around the reservoir.

SAMPLE POINT LOCATION

A total of 240 sample points were located on the aerial photographs. These points were established such that every major forest type delineated during the photo interpretation phase contained at least one sample point. The location of sample points within a given forest type was random. This

assured the distribution of sample points over the entire length of the reservoir while still maintaining some degree of randomization.

FOREST INVENTORY INFORMATION

Forest Tree Information

At each sample point, a one-tenth acre circular plot (37.2 ft. radius) was established. All trees 3.0 inches and larger in diameter at breast height on the one-tenth acre plot were recorded by 2-inch interval diameter classes and total tree height. The 4-inch diameter class is defined as the interval containing trees with diameters in the range 3.0 to 4.9 inches. This information was tallied separately for the following forest tree species:

Grand fir	*Abies grandis*
Western larch	*Larix occidentalis*
Engelman spruce	*Picea engelmannii*
Lodgepole pine	*Pinus contorta*
Western white pine	*Pinus monticola*
Ponderosa pine	*Pinus ponderosa*
Douglas-fir	*Pseudotsuga mensiesii*
Pacific yew	*Taxus brevifolia*
Western redcedar	*Thuja plicata*
Western Hemlock	*Tusga heterophylla*
White alder	*Alnus rhombifolia*
Red alder	*Alnus rubra*
Birch	*Betula spp.*
Aspen	*Populus spp.*

Site Quality Information

Site quality was estimated using site index. Site index is an indirect measure of site quality obtained by expressing the total height of a tree at a given age. Total age and total height of individual sample trees were ascertained on approximately 16 percent of the sample points. Site index sample trees were not restricted to trees located on the one-tenth acre sample plot.

Forest Tree Seedling Information

Four milacre quadrats were located in a straight line and centered about each sample point. Seedling density was tabulated for each of the previously mentioned forest tree species on each of the quadrats. On the basis of these four quadrats, seedlings frequency was determined. Frequency is defined as a percent of the quadrats occupied by one or more individuals of the same species. Density is defined as an estimate of the number of seedlings per acre. Forest trees less than 3.0 inches in diameter at breast height are defined as seedlings in this inventory.

Forest Insect Information

At each sample point, the extent of forest insect infestation was estimated. The insect infestation categories were: 0%, 1-25%, 26-50%, 51-75%, 76-99% and 100%. Percent infestation is defined as the proportion of forest trees existing on the one-tenth acre sample plot that show signs of insect damage. When possible, the insect agents causing the damage were categorized as:

1. Bark beetles
2. Defoliators

Forest Disease Information

At each sample point, the extent of forest disease infestation was estimated. Disease infestation categories were: 0%, 1-25%, 26-50%, 51-75%, 76-99% and 100%. Percent infestation is defined as the proportion of forest trees on the one-tenth acre sample plot that show signs of disease. When possible, the type of disease agents existing on the plot were categorized as:

1. Internal defect
2. Blister rust
3. Mistletoe

Forest Insect and Disease Information

In addition to the forest insect and disease information recorded at each sample plot, areas containing major visible insect and/or disease infestation centers were mapped for the Dworshak project lands. These data were obtained through visual detection from a boat on the reservoir. No attempt was made to categorize groups of dead or dying trees separately by suspected insect or disease agents.

HERBACEOUS AND BROWSE INVENTORY INFORMATION

Herbaceous Vegetation Information

Presence of grass, forb and shrub vegetation by species was recorded on each of four milacre quadrats located in a straight line and centered about each sample point. Table 1 is a complete list of the species observed. Frequency is defined as the percent of the quadrats occupied by one or more individuals of the same species.

Browse Information

Major browse species were tabulated separately on each of six milacre quadrats located in a straight line and centered about each sample point. Major browse species were defined as:

Mountain maple	*Acer glabrum*
Serviceberry	*Amelanchies sp.*
Redstem ceanothus	*Ceanothus sanguineus*
Snowbrush	*Ceanothus velutinus*
Ninebark [1/]	*Physocarpus malvaceous*
Willow	*Salix spp.*

1/ Ninebark was inadvertently included on the list of major browse species. Therefore, field crews collected all the browse measurement on it. Rather than discard this information it has been included with the major browse species.

Table 1. Grass, Forb and Shrub Species Observed on Dworshak Project Lands during the Collection of Herbaceous Inventory Data.

Crested Wheatgrass	Agropyron cristatum
Bentgrass	Agrostis spp.
Brome	Bromus spp
Cheatgrass	Bromus tectorum
Pinegrass	Calamagrostia rubescens
Sedge	Carex spp
Orchardgrass	Dactylis spp
Idaho Fescue	Festuca idahoensis
Timothy	Phleum spp
Bluegrass	Poa spp
Needlegrass	Stipa spp
Yarrow	Achillea millefolium
American Trail Plant	Adenocaulon bicolor
Maidenhair Fern	Adiantum pedatum
Wild Onion	Allium spp
Piper Anemone	Anemone piperi
Pussytoes	Antennaria spp
Rockcress	Arabis spp
Sandwort	Arenaria spp
Heartleaf Arnica	Arnica cordifolia
Ladyfern	Athyrium felix-femina
Balsamroot	Balsamorhiza spp
Mariposa	Calochortus spp
Bellflower	Campanula spp
Indian Paintbrush	Castilleja spp
Thistle	Cirsium spp
Clarkia	Clarkia spp
Queencup Beadlily	Clintonia uniflora
Collinsia	Collinsia spp
Collomia	Collomia spp
Goldthread	Coptis occidentalis
Larkspur	Delphinium spp
Willowweed	Epilobium spp
Horsetail	Equisetum spp
Strawberry	Fragaria spp
Woods Strawberry	Fragaria vesca
Virginia Strawberry	Fragaria virginiana
Cleavers Bedstraw	Galium Aparine
Sweetscented Bedstraw	Galium Triflorum
Geranium	Geranium spp
Western Rattlesnake Plantain	Goodyera oblongifolia
Sunflower	Helianthus spp
Western Hawkweed	Hieracium albertinum
St. Johnswort	Hypericum spp
Peavine	Lathyrus spp
Longtube Twinflower	Linnaea borealis longiflora
Biscuitroot	Lomatium spp
Lupine	Lupinus spp
Tarweed	Madia spp
Indianlettuce	Montia spp

Sweetanise	Osmorhiza occidentalis
Beardtongue	Penstemon spp
Phacelia	Phacelia spp
Swordfern	Polystichum munitum
Gland Cinquefoil	Potentilla glandulosa
Brackenfern	Pteridium aquilinum
Wintergreen	Pyrola spp
Teavine	Satureja spp
Skullcap	Scutellaria spp
Wormleaf Stonecrop	Sedum stenopetalum
Butterweed	Senecio spp
Solomonplume	Smilacina spp
Goldenrod	Solidago spp
Claspleaf Twistedstalk	Streptopus amplexifolius
Dandelion	Taraxacum spp
Meadowrue	Thalictrum spp
Mountain Thermopsis	Thermopsis montana
Goatsbeard	Tragopogon spp
Western Starflower	Trientalis latifolia
White clover	Trifolium repens
White trillium	Trillium ovatum
Violet	Viola spp
Darkwoods Violet	Viola orbiculata
Thinleaf Alder	Alnus incana
Mountain Alder	Alnus sinuata
Oregongrape	Berberis spp
Pipsissewa	Chimaphila umbellata
Clematis	Clematis spp
Dogwood	Cornus spp
Hawthorn	Crataegus spp
Oceanspray	Holodiscus discolor
Honeysuckle	Lonicera spp
Utah Honeysuckle	Lonicera utahensis
Rustyleaf	Menziesia ferruginea
Devilsclub	Oplopanax horridus
Mockorange	Philadelphus lewisii
Ninebark	Physocarpus malvaceus
Bitter Cherry	Prunus emarginata
Chokecherry	Prunus Virginiana
Buckthorn	Rhamus spp
Gooseberry	Ribes spp
Baldhip Rose	Rosa gymnocarpa
Bristly Nootka Rose	Rosa nutkana
Thimbleberry	Rubus parviflorus
Trailing Blackberry	Rubus ursinus
Elderberry	Sambucus spp
Spirea	Spiraea spp
Snowberry	Symphoricarpos albus
Snowberry	Symphoricarpos mollis
Huckleberry	Vaccinium membranaceum

Browse availability is defined as the proportion of current years growth between 2 and 8 feet above the ground and was recorded to the nearest 10 percent. Browse decadence is defined as the ratio of stems not containing current years growth to total available stems. The following percentage categories were used to express decadence: 0%, 1-25%, 26-50%, 51-75%, 76-99%, and 100%. It should be noted that the browse decadence category incorporates measures of both utilization and decadence. Utilization reflects the proportion of stems which have had the current years growth removed while decadence reflects the proportion of dead or dying stems. Both of these conditions where considered when the browse was assessed.

AESTHETIC, UNIQUE SPECIES AND SAFETY INVENTORY INFORMATION

Aesthetic Information

If the area at or adjacent to any sample point was perceived to have substantial aesthetic quality or unique recreational potential the characteristics and their locations were specifically recorded. Special care was taken to note these occurrences in areas of potentially high public use.

Unique Plant and Animal Species Information

Herbaceous vegetation recorded at each sample point was used to identify sites containing rare, endangered or noxious plant species. In addition to sample point information, observations of rare, endangered or noxious plant species adjacent to sample point locations were recorded.

Areas at or adjacent to the sample points were observed for indications of the presence of unique, rare or endangered animal species. This would include items such as eagle nests, osprey nests, bear dens and bee trees. If observed, the items characteristics and locations were specifically recorded. In addition to this information, osprey nest locations were mapped for the Dworshak project lands. These data were obtained through visual detection from a boat on the reservoir.

Safety Hazard Information

Areas at or adjacent to the sample points were observed for the presence of snags or trees with exposed roots and, if noted, their location was specifically recorded. Special care was taken to record these occurrences in areas of potentially high public use.

Herbaceous vegetation recorded at each sample point was used to identify potential mass wasting areas. In addition to the sample point information, areas containing visibly unstable land masses adjacent to the edge of the reservoir were mapped for the Dworshak project lands. These data were obtained through visual detection from a boat on the reservoir. These unstable land mass areas were classified as small, medium or large.

COMPUTERIZED INFORMATION RETRIEVAL AND INFORMATION UP-DATING SYSTEM

INFORMATION RETRIEVAL SYSTEM

The forest and herbaceous vegetation information collected to satisfy the first major objective of this report has been transferred to computer punch cards. It is now in a form readily available for computer data analysis and retrieval. The most efficient and effective use of this resource information can be obtained if it is linked to a computerized management-planning system. A management-planning system provides analytical techniques for evaluating complex resource management problems, it is capable of incorporating and updating the resource information base, and it is capable of rapidly displaying resource information.

The last factor can best be handled through the combined use of computer mapping and data summerization programs. A prototype of a resource mapping system has been developed. It is intended that the maps generated from this system be used as overlays on the forest type maps.

A complete resource mapping and information retrieval should be developed for the Dworshak project lands. The system should lend itself to and encourage resource information up-dating. With such a system, new resource information becomes part of a larger information base rather than a new resource information base.

INFORMATION UP-DATING SYSTEM

The initial resource information is considered adequate for scheduling management activities on the Dworshak project lands. As specific vegetation types are scheduled for management treatment, an intensive inventory should be undertaken. This is necessary because of the low sampling intensity associated with the initial resource inventory. The precision of the

estimates for the total inventory were quite adequate but estimates associated with any specific vegetative type may be inaccurate. Therefore, an intensive inventory within a specific vegetative type is necessary to insure precise estimates of current resource conditions in this area.

Sample point locations in these vegetative types should be established in a manner similar to that described by Stage and Alley. 2/ The type of plots and resource characteristics measured will be dictated by the management activities under consideration. If the forest and herbaceous resource information is collected in the manner prescribed in Appendix I it will be compatible with the existing resource information. This new resource information could and should be incorporated with the old resource information base creating a new, enlarged and more complete resource information base.

As an individual vegetative type undergoes management treatment, the residual condition of that vegetative type should be incorporated in the resource information base. This does not mean the initial condition should be deleted from the resource information base. If that were done, the historical record of the management treatment might be lost. Instead, both the initial and residual conditions should be retained but the historical record should not be used to ascertain the current status of the resource information base.

2/ Stage, A. R. and J. R. Alley. 1972. An Inventory Design using Stand Examinations for Planning and Programming Timber Management. U.S.F.S. Research Paper INT-126, 17 p.

MANAGEMENT OBJECTIVES AND THEIR IMPLEMENTATION

Management of Dworshak project lands is intended to be a continuing, long-term process. The basic approach to the management of any extensive land resource necessarily requires knowledge of the following factors:

a) the present condition of the resource.

b) the desired condition of the resource.

c) acceptable management practices which will obtain the desired conditions.

MANAGEMENT UNITS

In this report the extensive land resource is divided into 11 management units. A management unit is a 5-mile reservoir segment. A management action, implemented on a specific unit of area, should be evaluated in the context of its relation to a larger resource base. The management units encourage this perspective on areas no smaller than 5-mile reservoir segments.

FORMAT

The present condition of the resource is described in detail both verbally and with descriptive tables for each management unit. The desired condition of the resource is developed from the management objectives. Acceptable management practices which will accomplish the desired resource condition are verbally discussed for each management unit under a heading titled Management Alternatives.

SCOPE

The scope of this management plan does not allow for a detailed management design for each management unit. It does lay down a basic structure on which the project forester can schedule and plan his resource management alternatives. Detailed stand evaluations are necessary in those individual stands chosen for a management treatment.

OBJECTIVES

The basic objective of this management plan is to increase and preserve the social value of Dworshak project land for the present and future generations of people using them. This entails establishing and maintaining a productive wildlife habitat, an accessible recreational area, a visually pleasing landscape and a healthy and diverse forest community. None of the land should be managed solely for timber production.

CONSIDERATIONS

In the development and implementation of this plan, numerous factors were considered. Each factor was evaluated in terms of its strengths, weaknesses and conformity to management objectives. Appendix II contains a list of references used during this evaluation process.

A number of important biological and physical consideration had to be discussed and resolved before the management alternatives could be developed. Each of these considerations is discussed on the following pages in the context of the stated management objectives.

Management-No Management

It is imperative that Dworshak project lands be intensively managed. This implies an active silvicultural and habitat management program. Without such a program productive wildlife habitat, aesthetic landscapes and thrifty forest stands can not be maintained or developed.

The vegetative manipulation programs should be conducted in a manner that mimics nature as closely as possible. Every effort should be taken to blend these management activities with the surrounding environment.

Silviculture and Timber Harvesting

Timber harvesting on Dworshak project lands will be used to maintain safe and thrifty forest stands, to enhance wildlife habitat and browse production and to improve recreation access. Since maintenance of visual quality is most important, the logging and silvicultural systems used should be those which are least conspicious or those which best adapt to the surrounding terrain.

A silvicultural system is a comprehensive program of intermediate and reproduction cuttings planned for the life of a forest stand. When at all possible, methods insuring the establishment of new stands through natural regeneration should be encouraged on Dworshak project lands. In areas where browse and shrub vegetation is favored over tree seedlings, artifical regeneration may be necessary if forest stands are to be developed after the browse and shrub community loses its forage productivity. Artifical regeneration may also be necessary on south facing slopes if adequately stocked forest stands are to be maintained.

Five types of intermediate cuttings are suggested for forest stands on Dworshak project lands. They are listed and described below:

1) Low thinning

The crown is used as the basis for selection. Trees in the lower crown classes are removed. The purpose is to salvage trees that would otherwise die. Competition is improved only to the degree that root competition is reduced. This type of thinning may encourage the development of a shrub and herbaceous understory.

2) Crown Thinning

The crown is used as the basis for selection. Trees in the middle and upper crown classes are removed. The purpose is to open the canopy and favor the development of the most promising trees of the same crown class. This type of thinning would be used to maintain a thrifty stand and may encourage the development of a shrub and herbaceous understory.

3) Selection Thinning

The crown is used as the basis for selection. Trees in the upper crown class are removed. The purpose is to stimulate growth of the trees in the lower crown classes. This type of thinning would be used to maintain a thrifty stand.

4) Mechanical Thinning

Predetermined spacing or pattern is used as the basis of selection. Little consideration is given to a tree's position in the crown canopy. This type of thinning is used in young, previously unthinned, dense stands. It would be used to maintain a thrifty stand.

5) Cleaning

This is a type of release cutting made in stands which are not past the sapling stage. It is used to free the best trees from undesirable individuals of the same age. It would be used to create a thrifty stand.

Several reproduction cutting methods are available for stands on Dworshak project lands. Figure 2 depicts factors critical to natural regeneration and how they are influenced by the various types of reproduction cuttings. Following is a listing and brief description of each method:

1) Clearcutting Method

This is an even-aged management system which requires the removal of all trees, large or small, in the forest stand. It is only applicable with species that are capable of establishment in conditions of full exposure. Because of the importance of visual quality, patch clearcuts are most applicable. They would create a series of distinct stands of various age classes.

2) Seed-tree Method

This is an even-aged management system which requires the removal of all trees except for those left standing singly or in groups for the purpose of providing seed necessary to regenerate the site. The residual trees do not protect the site. Stands treated with this method would not differ visually from those treated using a clearcut procedure, therefore, on project lands this method has no advantages over clearcutting.

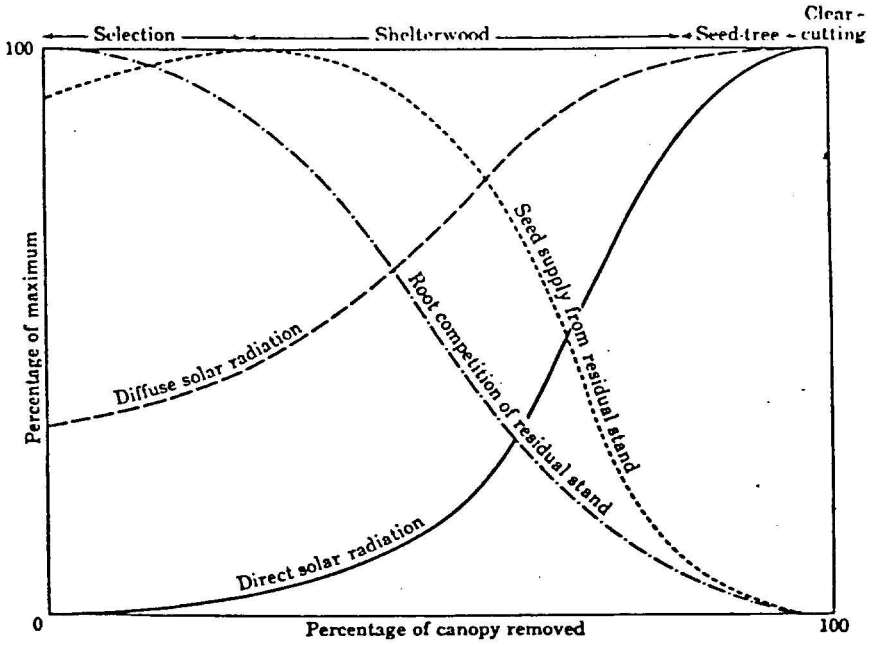

Figure 2.

A generalized representation of the effects of the initial cuttings of various methods of reproduction, when applied uniformly over an area in a humid, temperate climate, on several factors usually critical in the establishment of natural reproduction. 3/

3/ Smith, D. M. 1962. The practice of silviculture Seventh Edition 578 p. John Wiley and Sons, Inc.

3) Shelterwood Method

This is an even-aged management system which requires the gradual removal of the entire stand in a series of partial cuttings which extend over a fraction of the rotation. These cuttings usually resemble heavy thinnings. Natural reproduction is established under the protective canopy of the older stand. This method can provide a wide variation in relative degrees of shelter and exposure in both time and space. Three types of cuts are required: preparatory - prepare the seedbed, seed - provide growing space for seedling establishment and removal - elimination of the overstory residual. This method should be favored on project lands since it is an attempt to duplicate the natural process of old stand disintegration and their subsequent replacement by new growth arising from the understory.

4) Selection Method

This is a management system which creates or maintains an uneven-aged stand. Mature timber is removed either as single scattered trees or in small groups at short intervals. Generally the oldest trees are cut first. A modification of this method is the group selection method where two or more mature trees are removed in close proximity to each other. This method should also be favored on project lands since it benefits many wildlife species. They profit from the combination of environmental conditions existing along the boundaries between young and old groups of trees. The microsite conditions produced by this system foster a variety

of browse which is in close proximity to a range of protective covers.

5) Coppice Method

This is a management system which relies on the vegetative reproduction. Thus, stump sprouts and root suckers are relied upon as the main source of regeneration. This method would only be appropriate for the hardwood component of the forest stand. This method is most successful when trees are young and thrifty. The stands should be clearcut so nothing is left to reduce the vigor of sprouting.

Forest Tree Seedling and Browse Regeneration

The prediction of regeneration potential by forest tree species on any given piece of land is an important factor in determining resource land management policy. Currently U. S. F.S. Forest Science Lab, Moscow has a project underway to develop a predictive model for forest tree regeneration potential given certain physiographic, climatic, vegetation and edaphic conditions. Presently there are some general statements that can be made about a forest types tree regeneration potential. These are summarized as:

1) forest tree regeneration potential for all species on directly facing south slopes is normally low.
2) forest tree regeneration potential for all species on directly facing north slopes is normally high.

Microsites can be modified in either of these cases through the use of silvicultural stand treatments. Thus, regeneration can to a degee be encouraged or discouraged.

In addition the habitat type classification can be used to evaluate the regeneration potential of a forest site. These general guidelines are outlined by habitat type in Table 2.

Artifical regeneration should be considered on areas where the potential for regeneration by natural means is low or where the site must be reforested immediately. Under these situations planting of forest seedlings or containerized forest seedlings is a desirable management option.

Table 2. Management Implications by habitat type[1/]

	Pinus ponderosa/Festuca idahoensis Ponderosa Pine/ Fescue	Pinus ponderosa/Physocarpus malvaceous Ponderosa Pine/ Ninebark	Pseudotsuga menziesii/Symphoricarpos albus Douglas-fir/ Snowberry	Pseudotsuga menziesii/Physocarpus malvaceous Douglas-fir/ Ninebark	Abies grandis/Pachistima myrsinites Pachistima Grand fir/	Thuja plicata/Pachistima myrsinites Western Redcedar/Pachistima	Tsuga heterophylla/Pachistima myrsinites Western hemlock/ Pachistima	Thuja plicata/Athyrium felix-foemina Western Redcedar/ Ladyfern	Abies lasiocarpa/Pachistima myrsinites Alpine fir/ Pachistima
1	PP	PP	PP,DF (L)	PP,DF (L)	PP,GF, L,DF, WP(ES)	WP,C, L,DF, GF(PP)	WP,GF. ES,C,H, L,DF[3/]	C,ES	L,ES, DF,LP[2/] WP
2	--	--	(LP)	(LP)	LP[2/]	LP[2/]ES	LP[2/]	DF,GF, WP	AF,GF
3	S,SW	S,SW	SW,CC	SW,CC	SW,CC	SW,CC	SW,CC	S	SW,CC
4a	--	--	3	3	3	2	2	--	3
4b	--	--	2	2	2	2	2	--	3
5a	Low	Low	Low	Low	Med	High	High	Med	High
5b	Low-Med	Med	Med	Med	Med-High	High	High	High	High
5c	Low	Med	Low-Med	Med	Med-High	High	High	Med	High
6	1	1	2-(4)	2-(4)	6-(7)	6-(8)	7-(10)	4-(5)	5-(9)
7	3	6	6	8	9	9	10	7	7
8a	3	7	5	8	10	10	10	6	10
8b	3	6	5	6	5	4	3	2	2
8c	9	10	8	10	7	7	5	1	2
8d	1	7	7	9	10	10	10	5	9
9	10	7	7	4	3	2	2	1	2
10a	2	4	5	5	6	6	7	6	8
10b	10	8	8	6	5	4	3	6	2
10c	1	3	3	4	5	6	7	3	8
11a	8	5	4	4	3	2	1	1	2
11b	3	5	5	10	9	8	8	1	8
11c	3	7	6	8	10	10	10	9	9

[1/] From Pfister, R., J. Schmantz, D. On and C. Brown. 1971. "Management Implications by Habitat Types" R-1 Habitat Type Training Session. p. 30.

[2/] Should be managed on a shorter rotation because of mountain pine beetle

[3/] Should be managed on a shorter rotation because of Poria Weirir

[4/] Should be managed on a shorter rotation because of Fomes Pihi

KEY TO MANAGEMENT ITEMS, TABLE

1. Desirable Species
2. Acceptable Species
3. Harvest Cutting - Recommended possible cutting methods based on silvicultural considerations where timber production is a major objective. S= Selection, SW = Shelterwood, CC = Clearcut (Group selection and seed tree can be considered as variants of these 3 methods)
4. Site Preparation (years)
   a. Scarification - Refers to preparation of a strip or large scalp deep enough to remove most resprouting organs of competing vegetation and is expressed as average years longevity of site preparation benefits.
   b. Burning - Refers generally to broadcast burning of normal, medium to light intensity, and is expressed as average years longevity of site preparation benefits.
5. Probability of Natural Regeneration Success - Because of climatic and seed crop variability from year to year, probabilities are very general and simply relative ratings.
   a. Without slash disposal on site preparation
   b. With scarification
   c. With burning
6. Tree Species Alternatives - See Dawbenmire and Dawbenmire, 1968 (p. 104), U.S.F.S., Referance Material, 1970. (p. 11), and U.S.F.S. - R1 Western Larch Management Guides.
7. Estimated Relative Potential Productivity Rating on a Scale of 1-10 from 1 (lowest) to 10(highest). This scale is based on estimated maximum potential cubic feet/acre/year.
8. Big Game Forage
   a. Summer Supply - Based on estimated amount (biomass) of desirable forage produced in early successional stages (10 highest)
   b. Winter Supply - Based on estimated amount (biomass) of desirable forage produced in early successional stages adjusted downward for accessibility limitations. (10 highest)
   c. Winter Demand - Based on observations of actual use by big game on these habitat types (10 - greatest use)
   d. Improvement by Fire - Estimated potential for improving winter game range by use of fire (10 - greatest increase)
9. Livestock forage production - Estimated potential for producing summer forage for cattle and sheep in later successional stages.
10. Water
    a. Total precipitation, 10 highest (40-60 "/yr.) To 1 lowest (10-20 "/yr.)
    b. Evapotranspiration loss, 10 greatest (drought prolonged) to 1 least (short drought period)
    c. Total yield of water off site to provide stream flow, 10 greatest, 1 least.
11. Recreation
    a. General Suitability - Spring and fall - General campground suitability rating based on climate vegetation cover and normal soil and slope relationships.
    b. Summer
    c. Esthetic recovery - Rate of vegetative succession (and height of under growth) following major disturbance.

Brush and shrub communities may be increased by stimulating sprouting of the vegetative cover through the use of mechanical or prescribed burning treatments. Seed of desirable browse species, germinated in containers and then outplanted provides an acceptable method of increasing vegetative cover or providing desired vegetative cover in areas where the treatment alternatives can not be implemented.

Logging Systems

A variety of logging systems could be used on Dworshak project lands to implement the silvicultural system. On areas of moderate terrain, small crawler tractors or rubber tired skidders should be favored. The use of horses might be explored in stands where public use is heavy and visual impact must be kept to a bare minimum. On steeper terrain small cable systems should be encouraged. The use of balloon or helicopter systems should also be explored for the steeper sites.

Slash Removal

Slash buildups following harvest operations can be held to a minimum by requiring full-tree harvesting systems and stressing high utilization standards. Remaining debris can be lobbed, piled, scattered, burned and/or chipped

In areas of heavy recreational use and visibility, chipping of slash is recommended. The chips can be used to surface areas of potentially heavy compaction, i. e. around tables and on trails.

In areas not immediately adjacent to the reservoir slash can be lobbed and scattered. If utilization standards are met and if it is properly done the increased fire and insect buildup hazard and visual impact would be minimal.

Aesthetics

The identification of the landscape as a scenic resource implies that it has an aesthetic value. Given a landscape, it then follows that the discipline of design can provide a particular point of view as to what affects visual perception of that landscape and how it may

be categorized.

Litton defines six factors which affect the landscape as it is seen or affects the observer as he looks at the landscape [4/] . They are light, spatial definition, form, observer position, distance and sequence. The first three are concerned with the landscape and man can do little to alter them. The last three are concerned with the observer in relation to the landscape and these relationships can be manipulated.

As the forest canopy is altered, as recreational access is developed and as trails and observation points are established the discipline of design should be relied upon to insure that these management disturbances will blend into or enhance the landscape to the greatest possible degree.

Management Within Recreation Areas

Vegetation manipulation in areas of heavy recreational access should rely on individual tree selection procedures. Management actions should be undertaken during periods of low or non-use and material should be removed in a manner which minimizes site disturbances. Winter operations on top of a snowpack should be considered.

Noxious plant species, poison ivy and devil's club for example, may constrain the location of recreational access and development areas. In extreme situations, these plant species may have to be eradicated.

4/ Litton, R. B. Jr. 1968. Forest Landscape Description and Inventory a Basis for Land Planning and Design. U.S.F.S. Research Paper PSW-49, 64 p.

Safety Hazards

In areas of heavy public use forest stands should be silviculturally treated to eliminate the dangers of windthrow and falling branch debris. This required the removal of dead or dying trees and the management of those stands on a shorter rotation. Nearly all snags should be eliminated. A few might be retained for wildlife and bird habitat but their condition should be closely monitored and they should not be located adjacent to heavy public use corridors.

The movement of large masses of earth material quickly or slowly from one place to another is described by the general term mass wasting. Numerous potential mass wasting areas exist in the Northfork of the Clearwater drainage. These potential areas should be recognized so management activity can be restricted on these areas if necessary.

Local features which can be used to identify potential mass wasting areas include:

1) steep slopes
2) sag ponds and hummocky ground in the toe slope
3) tilted or jack-strawed trees or the presence of "pistol-butted" trees
4) soggy soil in areas adjacent to seeps and springs
5) the following plant species

alder	Alnus spp.
lady fern	Athyrium felix-femina
sweet-scented bedstraw	Galium triflorum
devils' club	Oplopanax horridus
sword fern	Polystichun munitum
false solomon seal	Smilacina spp.
false hellebore	Veratrum spp.

Fire Management

Prescribed burning should be considered an acceptable method of treating slash following harvest operations, preparing a seedbed for forest stand establishment and rehabilitating big game winter range.

The use of fire requires that weather conditions be closely monitored. Because of this dependence on climatic conditions, treatment can be expected only on limited areas annually.

Major concern is that of fire's potential detrimental effect on soil. This danger can be minimized through spring burning programs. These burns will be of relatively low intensity but they have been shown to produce desired results. 5/ Repeated high intensity burns may degrade site productivity because of detrimental effects to the soil. This practice should not be undertaken until more information is known about this potential management action.

Fire Lanes

Except for major access roads, fire lanes should not be considered as management alternatives. They are not warranted because their visual impact greatly exceeds the potential protection they provide.

To be effective they could not support vegetation and would have to be several feet wide. Even under these conditions they would aid in fire suppression only during the very initial period.

More effective fire prevention measures would include the restriction of personel on shore during periods of severe fire danger, information and education campaigns and well designed campsites and fireplaces.

5/ Hooker, L. L. and E. W. Tisdale. 1974. Effects of prescribed burning on a seral brush community in northern Idaho. College of Forestry, Wildlife and Range Sciences, Experiment Station Paper No. 14, 11 p.

Wildlife Habitat and Browse

Management recommendations will be based on maintaining, as closely as possible the current vegetation types existing on Dworshak project lands. Manipulation of the forest and brush canopies should insure adequate habitat for current levels of wildlife populations and more likely provide for a modest increase in population levels. Portions of the forest canopy can be removed creating small openings in the stands. These openings will create wildlife feeding areas while preserving areas of cover and escape corridors.

As the reservoir stabilizes, the riparian vegetation around it will develop. This land-water ecotone should create a habitat for a variety of wildlife species.

The maintenance and establishment of browse production areas should be in conjunction with silvicultural prescriptions and/or natural occurrences. Browse production areas may be established and their productivity maintained through the use of periodic burning programs. It is critical that adequate browse be maintained for big game animals, specifically elk and white tailed deer. However, browse production areas do not necessarily have to occur on the same acre of land year after year.

The natural cycle is for brush fields to be established following natural disturbances of the forest community; for example wildfire, blowdown and insect epidemics. Natural openings in the forest canopy caused by these distrubances allow more light to reach the forest floor which stimulates the growth of desired browse species. A planned harvesting program coupled with the wise use of naturally disturbed

(wildfire and insect outbreak) areas could replicate the natural cycle and will insure adequate browse production.

Maintenance of browse through the periodic burning of established browse areas may be desirable in some locations. This should be done with caution because of the possibility for irrepairable soil damage resulting from extreme ground temperatures. When possible the maintenance of browse production areas should be accomplished through the encouragement of the natural successional cycle; forest cover, shrub communities and return to forest cover.

Insects and Diseases

Insects that infest timber species can be broken down into two major groups: bark beetles and defoliators.

Bark Beetles

In the bark beetle class probably the major insect that causes damage is the Douglas-fir bark beetle (Dendroctonus pseuotsugae). This beetle infests Douglas-fir and has in the past caused extensive damage in the Clearwater drainage. Other bark beetles that exist in the Clearwater drainage are: Mountain pine beetle (Dendroctonus ponderosae) which infests western white pine; pine engraver (Ips pini) which infests pines but is more important in ponderosa pine; Fir engraver (Scolytus ventralis) which infests grand fir and alpine fir; western balsam bark beetle (Dryocoetes confusus) which infests true firs; and spruce beetle (Dendroctonus rufipennis) which infests Engelmann spruce. General information on these species is contained in a publication by Keen [6/] which

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6/ Keen, F. P. 1952. Insect Enemies of Western Forests. U. S. D. A. Misc. Publ. No. 273, 280 p.

is currently being revised by R. L. Furnis and V. M. Caroly, but is not expected to be published for a year or more.

Defoliators

The major economic species of defoliators which attack tree species found on Dworshak project lands are: the Larch casebearer (Coleophora laricella), an introduced species that infest western larch; Spruce budworm (Choristoneura occidentalis), which infests true firs, Douglas-fir, and Spruce in that order of preference; the Douglas-fir Tussock moth (Hererocampa pseudotsugata) which infests true firs and Douglas-fir; and the Hemlock luper (Lambdina fiscellaria) which infests Western hemlock.

Chemicals can be used to control these insects. Biological control in the form of virus, bacteria and predators are currently being explored as a means of control. The latter method provides possible management alternatives for project lands. However, the most acceptable method of long term control is the proper use of silvicultural practices to maintain the forest community in a healthy and thrifty state, thus establishing a highly insect resistant stand. This management technique is the one which is followed by the majority of agencies and companies involved in forest management and is currently considered the best method for prevention of epidemic insect infestations.

Listed in Appendix III are the currently acceptable chemical controls that could be used on insects. The presentation of this list does not constitute an endorsement of their use of Dworshak project lands.

There are several insects which infest shrub species occurring on project lands. These insects primarily attack shrubs of the Amalanchier, Ceanothus, Cercocarpus, Purshia and Salix genera. The insects and the shrubs which they attack are listed in Appendix IV. Dr. Furnis, of the Forestry Sicence Lab, U.S. Forest Service, Moscow currently is involved with a research project studying insects that infest browse plants. Results of this study should aid in the identification and possible control of browse infesting insects.

Disease

In the forests of Idaho, one of the major pests is disease. It is beyond the scope of this report to give the description of or the defect caused by all the diseases that may exist in the Clearwater drainage. Some of the major diseases will be mentioned here by their common name, their scientific name and the major tree species they affect.

Diseases can most easily be broken into three categories: Interior defects, Rusts and Mistletoes. Interior defects can further be divided into 1) trunk rots, 2) root and butt rots and 3) sap rots or stains.

Interior defects

1. Trunk Rots

Red ring rot (Fomes pini) is of particular importance in western white pine, ponderosa pine, lodgepole pine, western larch, Douglas-fir and Engelmann spruce; Red ray rot (Polyporus anceps), a heart rot in ponderosa pine, Douglas-fir, grand fir, Engelmann spruce, western white pine, western redcedar and lodgepole pine; Brown top rot. (Fomes roseus), affecting all conifers of Idaho;

Brown trunk rot (Fomes officinalis), most commonly occurring in western larch, Douglas-fir and ponderosa pine; Yellow pitted trunk rot (Hydnum abietis), found in western hemlock, grand fir, subalpine fir and Engelmann spruce; White trunk rot (Fomes igniarius), affecting quaking aspen, paper birch, alders and other hardwoods (this rot is not found in conifers); Stringy brown rot (Enchinodontium tinctorium), also called Indian paint and most commonly found in both grand fir and hemlock in Idaho are the major trunk rots observed in this region of Idaho.

2. Root and Butt Rots

Red-brown butt rot (Polyporus schweinitzii) and red-brown root and butt rot (Polyporus tomentosus), found in nearly all Idaho conifers; feather rot (Poria subacida), found in grand fir, Engelmann spruce, western white pine, ponderosa pine, Douglas-fir, western hemlock, western redcedar, (this rot is also found in hardwoods); Yellow ring rot (Poria Weirii), most commonly observed in western redcedar and found in western hemlock, Douglas-fir and grand fir; Fomes root and butt rot (Fomes annosus), affecting western larch, Engelmann spruce, western white pine, white bark pine, lodgepole pine, ponderosa pine, Douglas-fir, western hemlock and western redcedar; Shoestring root rot (Armillaria mellea), affecting most conifers and hardwoods in Idaho and particularly common in western white pine, ponderosa pine, Douglas-fir and grand fir; white pocket rot (Fomes nigrolimitatus), affecting Douglas-fir and western larch; and Brown pocket rot of cedar (Polyporus Sericeomollis), common in living western redcedar are the major root and butt rots observed in this region of Idaho.

3. Sap rots and stains

Pitted sap rot (Polyporus abietinus), affecting virtually all conifers in Idaho; Gray sap rot (Polyporus volvatus), found on grand fir, Englemann spruce, ponderosa pine, Douglas-fir western larch, western hemlock; Brown sap rot (Lenzites saepiaria), found on all commercial conifers in Idaho; Brown crumbly rot (Fomes pinicola), found on all conifers and occassionally decays birch, aspen, and cottonwood; Sap stain or blue stain (species of Ceratocystis Graphium, Leptographium), most commonly found in sap wood of western white pine, ponderosa pine, lodgepole pine and Engelmann spruce are the major sap rots and stains observed in this region of Idaho.

Control measures for these fungal diseases have not been well established at his time. Major efforts to manage these diseases has been through silvicultural practices. Stands that are over-mature become prime targets for these rots.

Blister Rust

White pine blister rust (Cronartium ribocola) has occurred in Northern Idaho since its discovery in 1921. There has been extensive research done on the control and elimination of this fungus. Development of genetically resistant white pine have been shown to provide a means of biological control. White pine should be retained during stocking reduction in mixed species stands if resistant trees are identified. If white pine seedlings are planted, every effort should be made to obtain genetically resistant planting stock.

Mistletoe

Dwarf mistletoe (Acenthobium americanum) infects all conifers existing in the Clearwater drainage but is of particular importance to lodgepole pine, ponderosa pine and western larch. Mistletoe reduces growth and increases mortality as well as reducing seed production in infected trees. It is most damaging in stands that have been partially opened up by cutting, epidemic insect attack or blowdown. Partial cutting or thinning can increase mistletoe damage if the level of infection in the stand is moderate to heavy. Mistletoe can be controlled through silvicultural treatments. Specific areas of moderate to heavy infestation should be identified and these areas should be carefully monitored.

Chemical-Natural Controls

The use of chemicals, both insecticides and herbicides, immediately adjacent to streams or the reservoir should be severely restricted. Because of the physical arrangement of project lands, this greatly constrains their usefulness.

Application of chemicals on local areas under close control should be considered as a possible management action. Application of herbicides can be considered in this context.

Biological control in the form of virus, bacteria and predators should be considered when dealing with insect agents. The use, effectiveness and development of insect attractants should be monitered and considered as a possible control method in areas of heavy public use.

The maintanence of thrifty forest stands is the best guard against insect and disease problems. Participation in the Northern Rocky Mountain Forest Pest Action Council is encouraged.

Unique Plants and Animals

Plant Species

Red alder (Alnus rubra) is fairly abundant on the upper portion of the reservoir. This species is a coastal disjunct and is found in few places in Idaho. This means it is commonly found along the west coast but does not extend continuously into Idaho. Locally it is found in isolated pockets. It is considered a rare species in the state and should be conserved. Red alder is a seral species and will not reach a climax community in this area. Therefore, in the region in which it currently exists, openings or disturbance must occur for its continued existance. Since red alder lives to be approximately 100 years old the period between disturbances can be quite long and a healthy population of alder can be maintained.

Based on the work of Steele [7/] there are several other rare, endangered of disjunct plant species that exist in the Northfork drainage. However, none of these species were encountered during the sampling process. It is suggested that a specific search be made to identify the location and abundance of these species.

Devil's club (Oplopanax horridus) and poison ivy (Rhus radicous) are present on Dworshak project lands. These species can create hazardous health situations when located in areas of heavy public use. When present, their occurrance should be noted and they should be physically identified.

7/ Steele, Robert W. 1971. Red Alder Habitats in Clearwater County, Idaho. M.S. Thesis, University of Idaho.

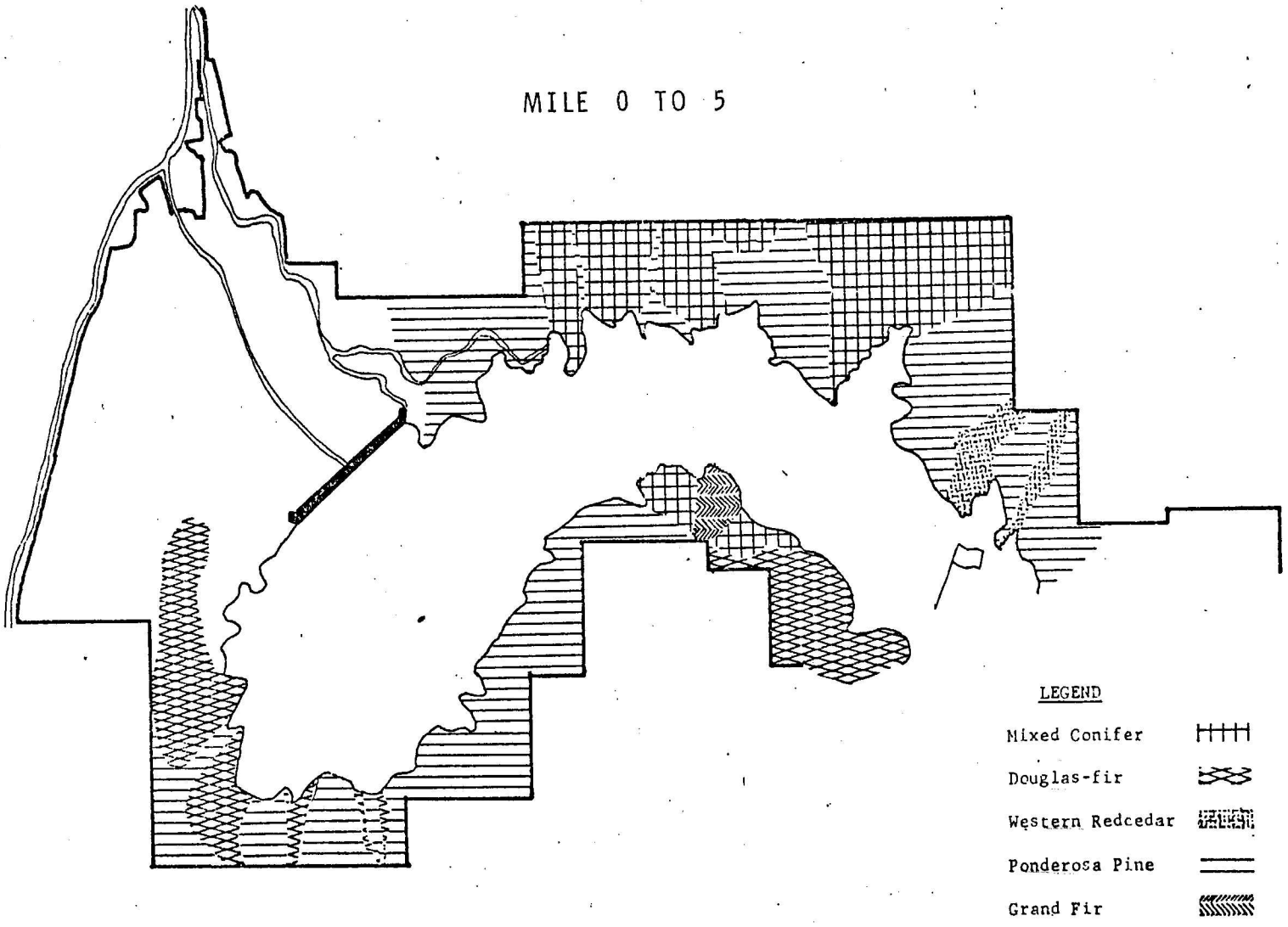
Larkspur (Delphinium spp.) and Lupine (Lupinus spp.) both occur on project lands and can be harmful or deadly to cattle or sheep. Lupine is most hazardous to sheep but must be in relatively dense patches. Presently there are no known areas that would create hazardous conditions. The area should be monitored for these plants where domestic animals are grazing.

Larkspur is deadly to cattle. It was only observed on sample plots in the area between mile 1 and mile 5. It may occur in other areas along the reservoir. Areas should be closely monitered for this plant where cattle are grazing.

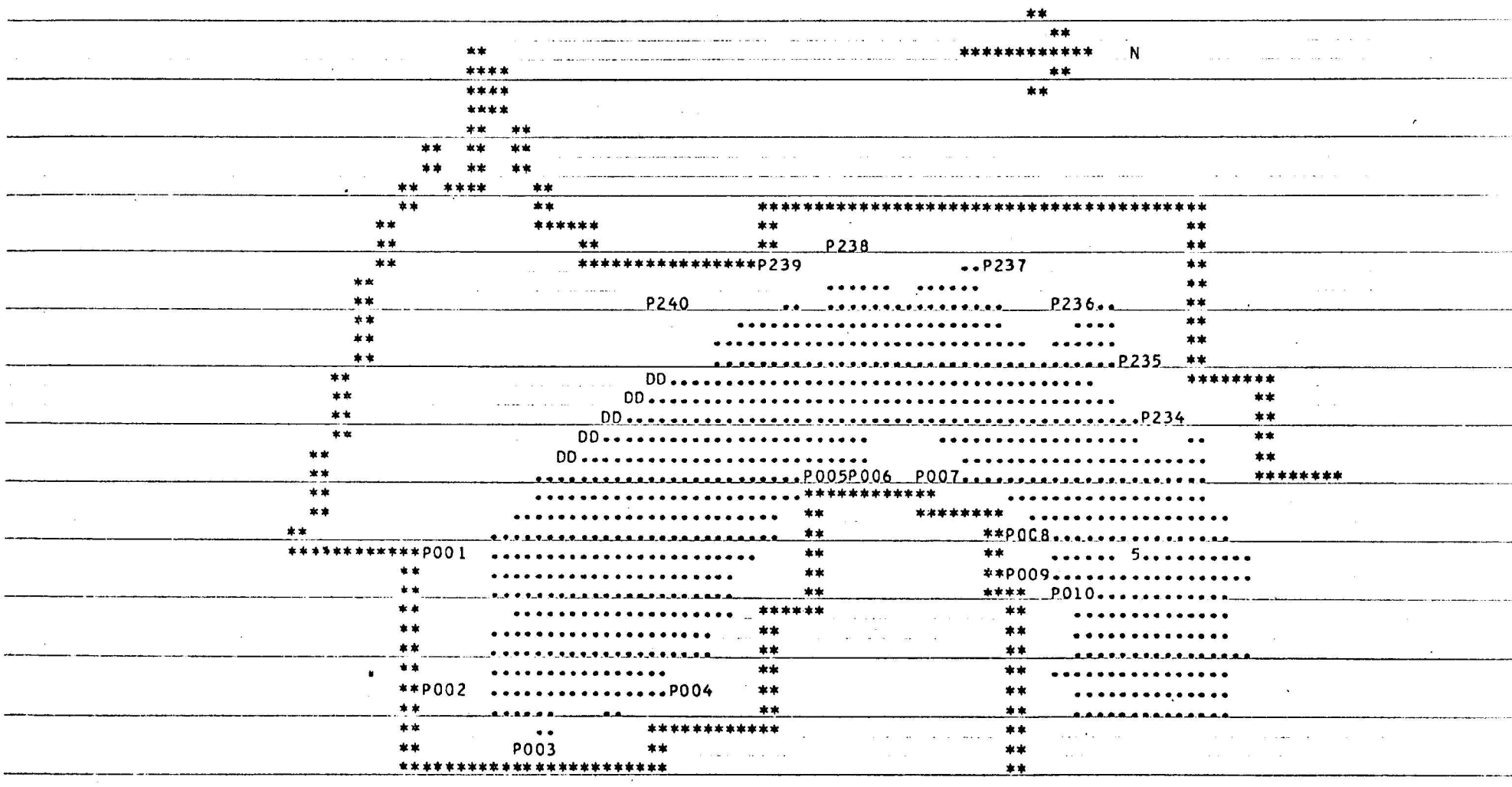
Animal Species

During the inventory process, several American osprey (Pandion haliactus carolinensis) were encountered along the reservoir edge. These birds have established several nests for reproductive purposes. The maintenance of these birds will probably be linked to the availability at nesting sites, the availability of food supply and disturbance during incubation or hatching periods.

Given the fisheries situation in the reservoir maintains its current level, food supply should not be limiting. Nesting sites, mainly snags, can be developed through artificial means. Snags near the water's edge can be selected as potential nest sites and surrounding trees cleared or topped to create an open type setting for the nesting of birds. Human disturbance of nesting birds during the incubation and hatching period should be kept to a minimum. Because of this human disturbance constraint and the safety hazard, artifical nesting sites should be developed in areas where public use is low or restricted.

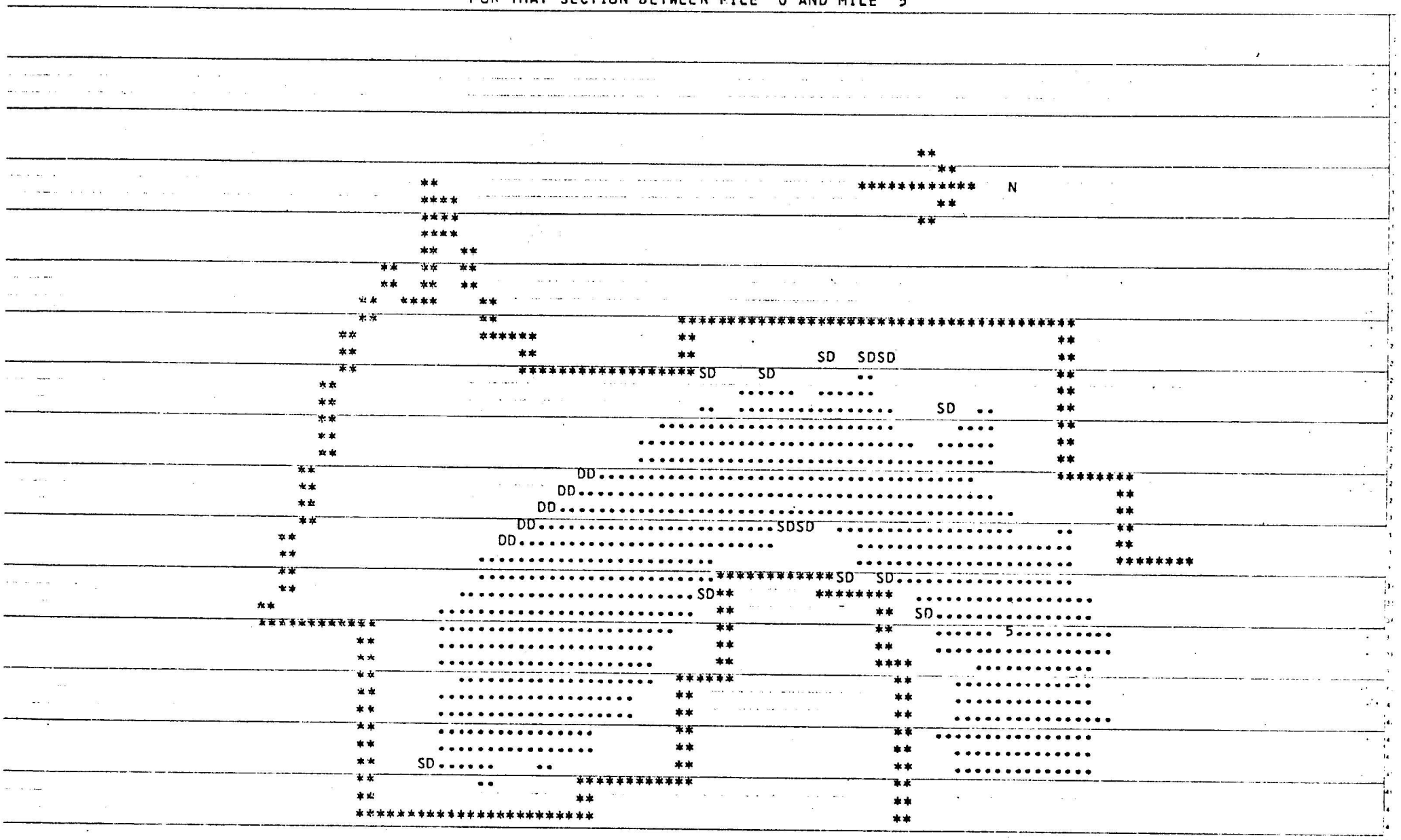

MILE 0 TO 5
LEGEND
Mixed Conifer
Douglas-fir
Western Redcedar
Ponderosa Pine
Grand Fir

MAP NO. 1 - INVENTO LOTS - BIG EDDY
OVERLA
FOR THAT SECTION BETWEEN MILE 0 AND MILE 5



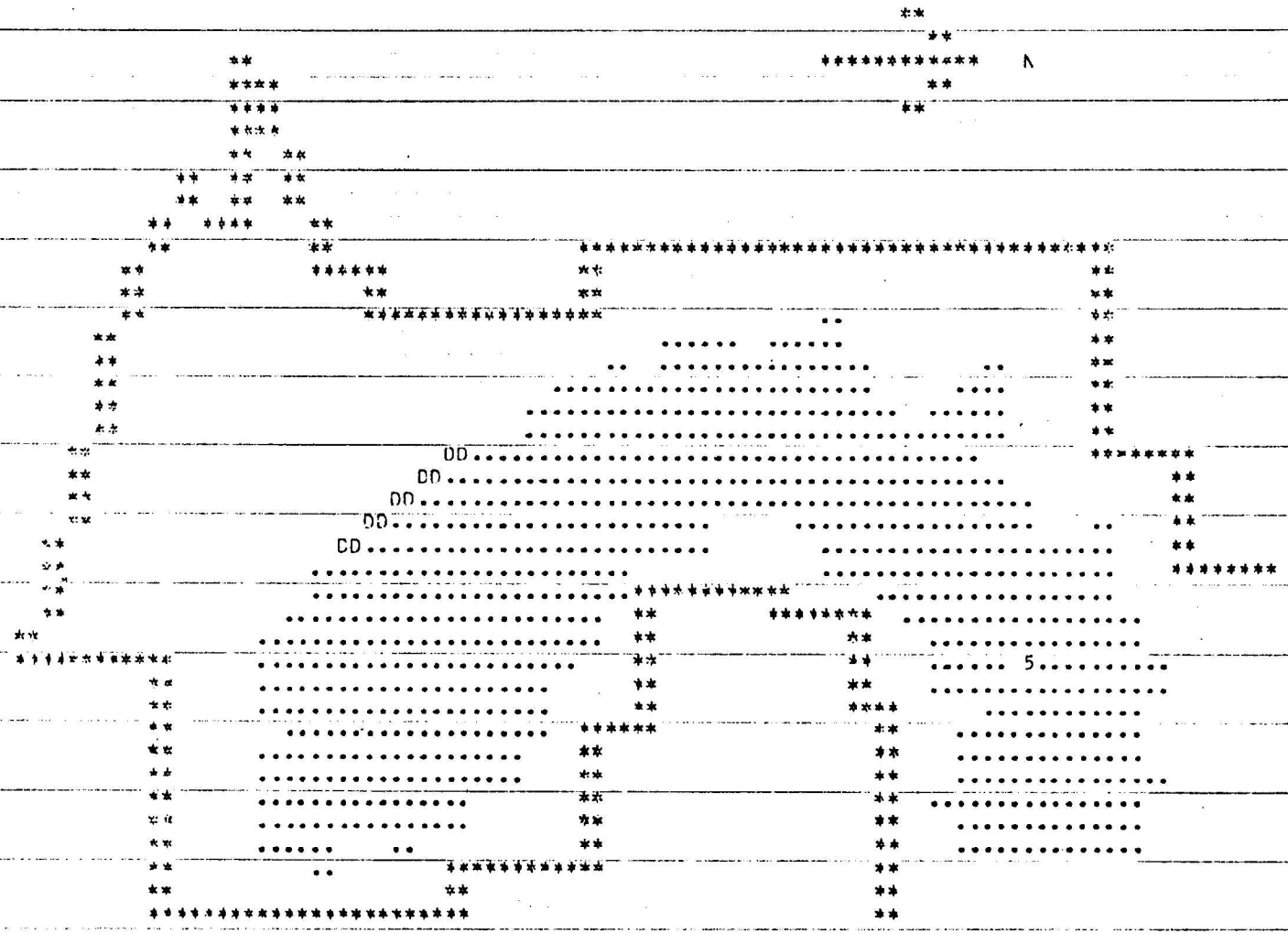
SCALE: 2 INCHES = 1 MILE

MAP NO. 1 - DISEASE AND ICT INFESTATICNS - BIG EDDY
OVERLAY
FOR THAT SECTION BETWEEN MILE 0 AND MILE 5

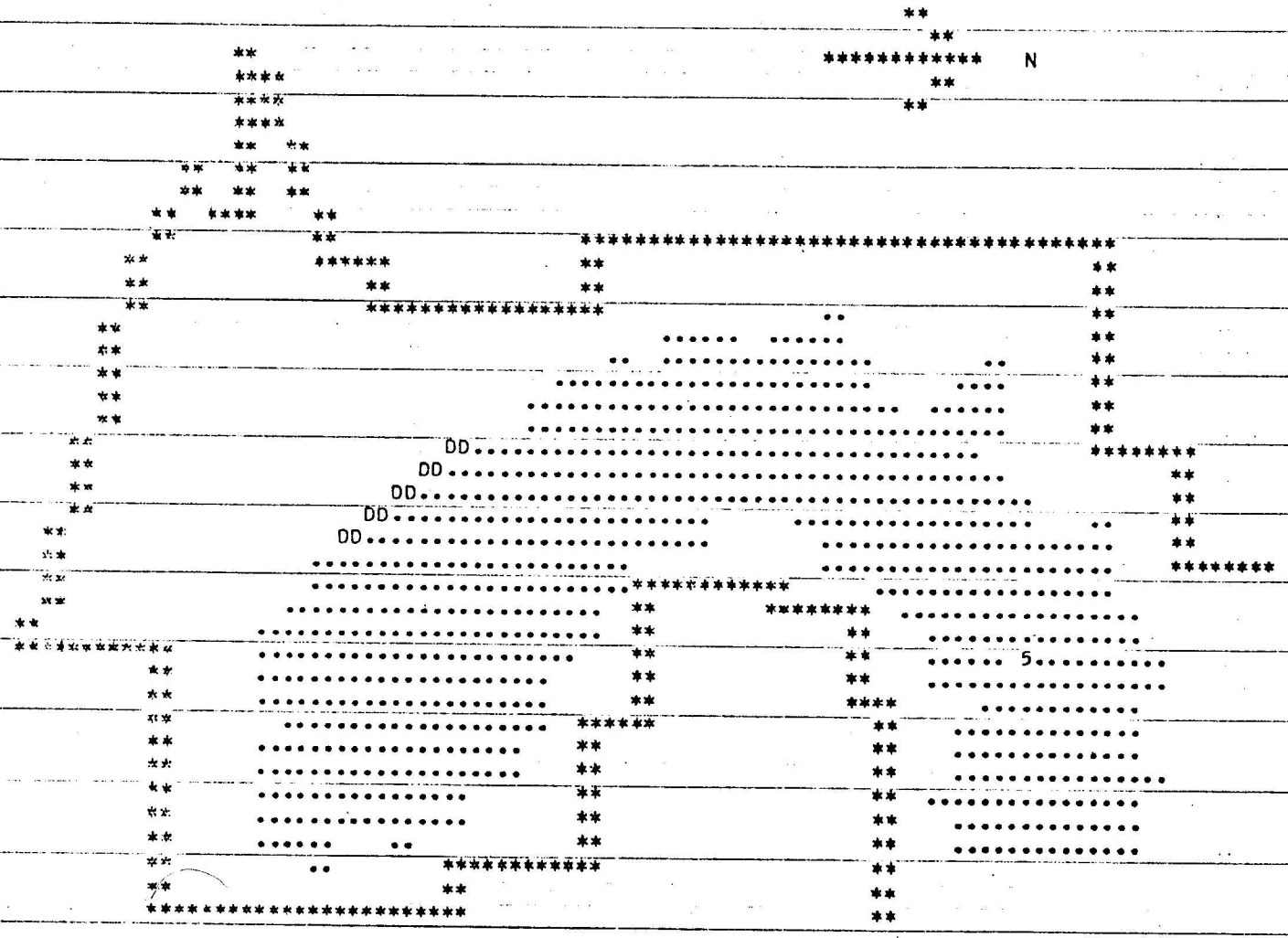


SCALE: 2 INCHES = 1 MILE

MAP NO. 1 - CUTTING ITS - BIG EDDY
OVERLAY
FOR THAT SECTION BETWEEN MILE 0 AND MILE 5

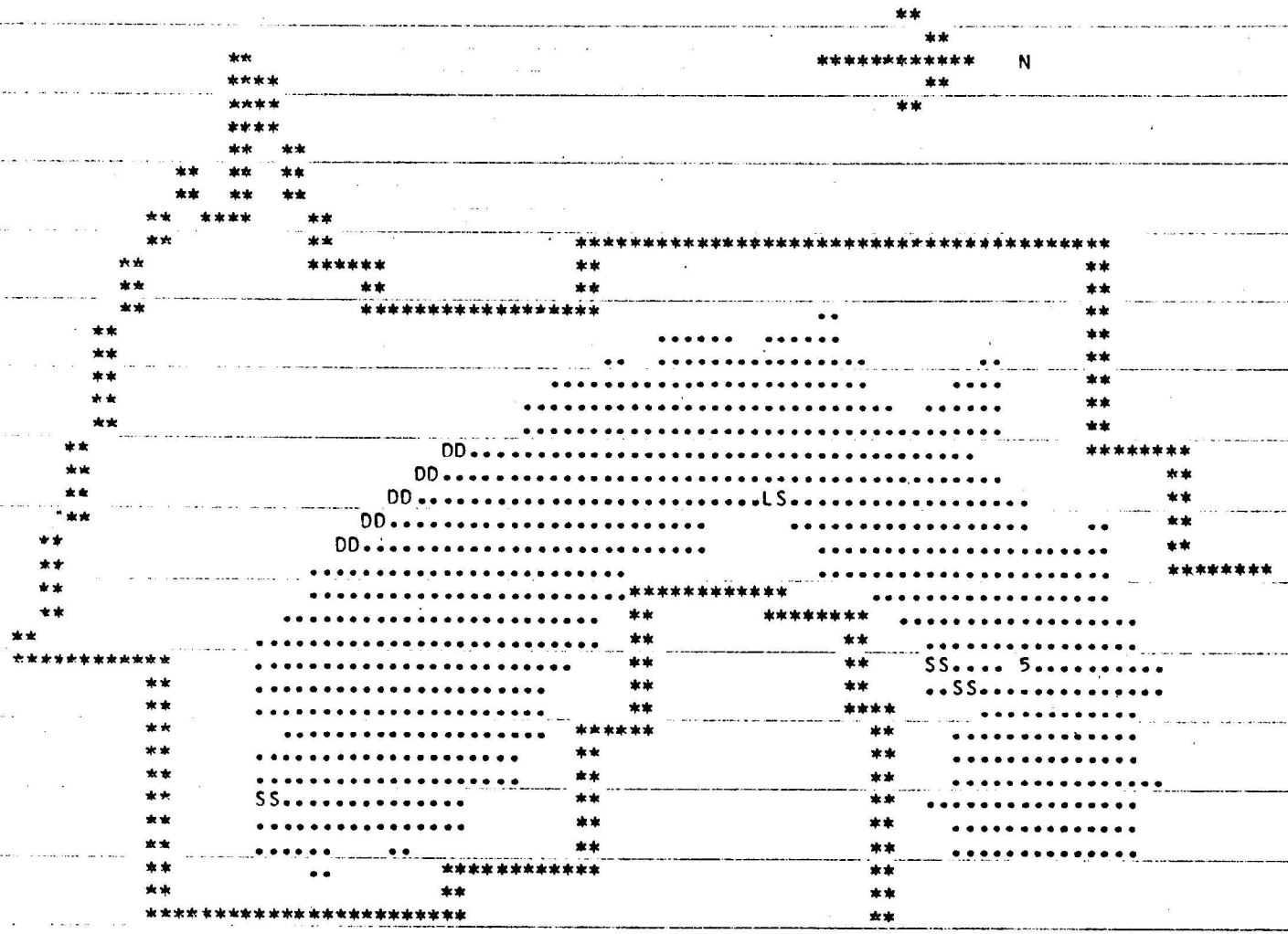


MAP NO. 1 - CA. ES - BIG EDDY
OVERLA.
FOR THAT SECTION BETWEEN MILE 0 AND MILE 5



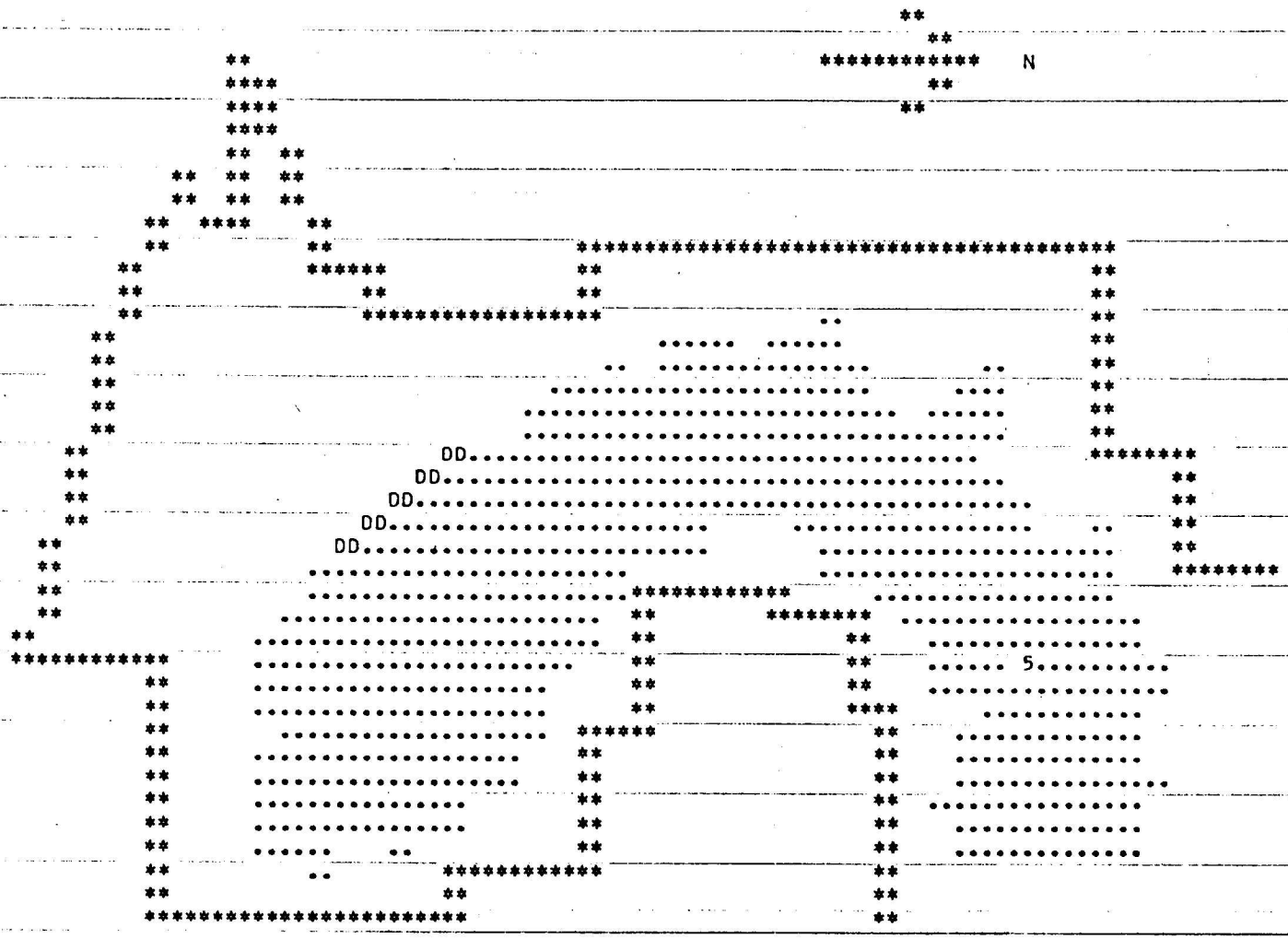
SCALE: 2 INCHES = 1 MILE

MAP NO. 1 - SLUMPAC EAS - BIG EDDY
OVERL.
FOR THAT SECTION BETWEEN MILE 0 AND MILE 5



SCALE: 2 INCHES = 1 MILE

MAP NO. 1 - OSPRE STS - BIG EDDY
OVERLA.
FOR THAT SECTION BETWEEN MILE 0 AND MILE 5



SCALE: 2 INCHES = 1 MILE

IMMARY – 18 PLOTS, MIX CON COVER TYPE, PLOT NOS 85 THRU 92 AND 116 THRU 142

		TRANSECT DATA					QUADRAT DATA	
	SPECIES	AVAIL	DECAD	WIDTH	HEIGHT	% COVER	FREQ	DENSITY
ACGL	MOUNTAIN MAPLE	11.4	5.7	1.7	3.3	3.3	7.4	74.
AMAL	SERVICEBERRY	1.9	2.1	0.4	1.9	0.6	7.4	111.
CESA	REDSTEM CEANOTHUS	4.7	0.7	0.2	0.4	0.3	0.0	0.
PHMA	NINEBARK	5.4	1.3	0.3	0.6	1.8	1.9	37.
SASP	WILLOW						0.9	9.
	TOTAL							231.

Stand Description

Mixed Conifer

Two plots were classified by habitat type as Douglas-fir/ninebark, one as cedar/pachistima and one as cedar/ladyfern. The Douglas-fir/ninebark areas occupy the drier sites whereas the cedar/ladyfern and cedar/pachistima habitat types will occupy the moister northerly aspects and creek bottoms. The cedar/ladyfern habitat type is not particularly common at these lower elevations. The plots are located on northeast facing aspects on slopes in excess of 60%.

Site index for this cover type is 83 for Douglas-fir and 115 for ponderosa pine. This indicates a high potential productivity for timber production for both ponderosa pine and Douglas-fir. This is consistent with the productivity rating associated with the habitat types for this stand.

An examination of the stand and stock table reveals that the majority of the volume is in ponderosa pine. This volume exists primarily in the diameter classes from 26 to 34 inches. The majority of trees in the 6 to 10 inch diameter classes are Douglas-fir. The remainder are grand fir and cedar. The volume per acre associated with this cover type is 6015 cu. ft. (38,060 bd. ft.).

Insect and disease activity was noted in these stands. These agents most likely occur in the large diameter grand fir and Douglas-fir portions of the stand.

Regeneration in this type is distributed equally between grand fir, Douglas-fir, cedar and some birch-aspen. The total estimate of seedlings per acre is 250.

SUMMARY - PLOTS, MIX CCN COVER TYPE, PLOT NOS 1 THRU 10 234 THRU 240

SPECIES	FREQ	DENSITY
GRAND FIR	6.3	62.5
DOUGLAS FIR	6.3	62.5
CEDAR	6.3	62.5
BIRCH - ASPEN	6.3	62.5
TOTAL		250.0

PER ACRE VALUES - VOLUMES IN CF

	GRAND FIR			DOUGLAS FIR			LARCH			PONDERSA PINE			WHITE PINE		
DBH	NT	BA	VOL	NT	BA	VOL	NT	BA	VOL	NT	BA	VOL	NT	BA	VOL
4	2.5	0.2	4.4	10.0	0.9	15.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6-10	28.5	8.1	204.8	21.8	7.3	145.0	0.0	0.0	0.0	2.5	0.9	19.6	0.0	0.0	0.0
SUBT	31.0	8.4	209.3	31.8	8.1	160.0	0.0	0.0	0.0	2.5	0.9	19.6	0.0	0.0	0.0
12	1.8	1.4	57.1	9.3	7.3	208.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
14	3.5	3.7	158.9	4.3	4.5	128.7	0.0	0.0	0.0	2.5	2.7	93.1	0.0	0.0	0.0
16	0.0	0.0	0.0	1.8	2.4	74.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18	0.0	0.0	0.0	1.8	3.1	120.3	0.0	0.0	0.0	2.5	4.4	240.6	0.0	0.0	0.0
20	1.8	3.8	221.9	1.8	3.8	197.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
22	0.0	0.0	0.0	2.5	6.6	230.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.5	7.9	502.0	0.0	0.0	0.0
26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.3	15.7	1017.7	0.0	0.0	0.0
28	0.0	0.0	0.0	2.5	10.7	366.6	0.0	0.0	0.0	2.5	10.7	607.1	0.0	0.0	0.0
30	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
32	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
34	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.5	15.8	1068.6	0.0	0.0	0.0
36	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SUBT	7.0	8.9	437.9	23.8	38.5	1326.8	0.0	0.0	0.0	16.8	57.1	3529.1	0.0	0.0	0.0
TOT	38.0	17.3	647.2	55.5	46.6	1486.9	0.0	0.0	0.0	19.3	57.9	3548.6	0.0	0.0	0.0

	HEMLOCK			CEDAR			OTHER CONIFERS			BIRCH - ASPEN			ALDER					
DBH	NT	BA	VOL	NT	BA	VOL	NT	BA	VOL	NT	BA	VOL	NT	BA	VOL	NT	BA	VOL
4	0.0	0.0	0.0	5.0	0.4	6.0	0.0	0.0	0.0	7.5	0.7	13.8	0.0	0.0	0.0			
6-10	0.0	0.0	0.0	7.5	2.3	43.5	0.0	0.0	0.0	5.0	1.0	23.2	0.0	0.0	0.0			
SUBT	0.0	0.0	0.0	12.5	2.8	49.5	0.0	0.0	0.0	12.5	1.6	36.9	0.0	0.0	0.0	90.3	21.8	475.3
12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
14	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
18	0.0	0.0	0.0	1.8	3.1	89.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
22	0.0	0.0	0.0	1.8	4.6	155.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
28	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
30	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
32	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
34	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
36	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
SUBT	0.0	0.0	0.0	3.5	7.7	244.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	51.0	112.2	5538.7
TOT	0.0	0.0	0.0	16.0	10.5	294.4	0.0	0.0	0.0	12.5	1.6	36.9	0.0	0.0	0.0	141.2	134.0	6014.0

SUMMARY - PLOTS, MIX CON COVER TYPE, PLOT NOS 1 THRU 10 A 234 THRU 240

SPECIES	FREQ	DENSITY
GRAND FIR	6.3	62.5
DOUGLAS FIR	6.3	62.5
CEDAR	6.3	62.5
BIRCH - ASPEN	6.3	62.5
TOTAL		250.0

PER ACRE VALUES - VOLUMES IN BF

DBH	GRAND FIR NT	GRAND FIR BA	GRAND FIR VOL	DOUGLAS FIR NT	DOUGLAS FIR BA	DOUGLAS FIR VOL	LARCH NT	LARCH BA	LARCH VOL	PONDEROSA PINE NT	PONDEROSA PINE BA	PONDEROSA PINE VOL	WHITE PINE NT	WHITE PINE BA	WHITE PINE VOL
4	2.5	0.2	0.0	10.0	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6-10	28.5	8.1	587.2	21.8	7.3	390.9	0.0	0.0	0.0	2.5	0.9	50.4	0.0	0.0	0.0
SUBT	31.0	8.4	587.2	31.8	8.1	390.9	0.0	0.0	0.0	2.5	0.9	50.4	0.0	0.0	0.0
12	1.8	1.4	283.1	9.3	7.3	883.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
14	3.5	3.7	871.6	4.3	4.5	621.0	0.0	0.0	0.0	2.5	2.7	512.2	0.0	0.0	0.0
16	0.0	0.0	0.0	1.9	2.4	393.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18	0.0	0.0	0.0	1.8	3.1	673.6	0.0	0.0	0.0	2.5	4.4	1509.3	0.0	0.0	0.0
20	1.8	3.8	1425.7	1.8	3.8	1154.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
22	0.0	0.0	0.0	2.5	6.6	1431.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.5	7.9	3495.4	0.0	0.0	0.0
26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.3	15.7	7249.9	0.0	0.0	0.0
28	0.0	0.0	0.0	2.5	10.7	2482.4	0.0	0.0	0.0	2.5	10.7	4418.9	0.0	0.0	0.0
30	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
32	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
34	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.5	15.8	8092.3	0.0	0.0	0.0
36	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SUBT	7.0	8.9	2580.4	23.3	38.5	7639.8	0.0	0.0	0.0	16.8	57.1	25278.0	0.0	0.0	0.0
TOT	38.0	17.3	3167.7	55.5	46.6	8030.7	0.0	0.0	0.0	19.3	57.9	25328.4	0.0	0.0	0.0

DBH	HEMLOCK NT	HEMLOCK BA	HEMLOCK VOL	CEDAR NT	CEDAR BA	CEDAR VOL	OTHER CONIFERS NT	OTHER CONIFERS BA	OTHER CONIFERS VOL	BIRCH - ASPEN NT	BIRCH - ASPEN BA	BIRCH - ASPEN VOL	ALDER NT	ALDER BA	ALDER VOL	NT	BA	VOL
4	0.0	0.0	0.0	5.0	0.4	0.0	0.0	0.0	0.0	7.5	0.7	0.0	0.0	0.0	0.0			
6-10	0.0	0.0	0.0	7.5	2.3	102.5	0.0	0.0	0.0	5.0	1.0	23.2	0.0	0.0	0.0			
SUBT	0.0	0.0	0.0	12.5	2.8	102.5	0.0	0.0	0.0	12.5	1.6	23.2	0.0	0.0	0.0	90.3	21.8	1154.2
12	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
14	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
18	0.0	0.0	0.0	1.8	3.1	493.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
22	0.0	0.0	0.0	1.9	4.6	916.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
28	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
30	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
32	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
34	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0			
36	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
SUBT	0.0	0.0	0.0	3.5	7.7	1409.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	51.0	112.2	36507.7
TOT	0.0	0.0	0.0	16.0	10.5	1511.9	0.0	0.0	0.0	12.5	1.6	23.2	0.0	0.0	0.0	141.2	134.0	38061.9

Browse Description

Mixed Conifer

All six of the major browse species were located in this cover type. Density of serviceberry, ninebark, and redstem ceanothus totaled 300 stems per acre.

Redstem ceanothus is 27% available but was 21% decadent. This indicates it is probably being heavily utilized for browse. All other species had lower availability ratings. Only redstem ceanothus, snowbrush and willow average more than 2 feet in height.

SUMMARY – 4 PLOTS, MIX CON COVER TYPE, PLOT NOS 1 THRU 10 AND 234 THRU 24

	SPECIES	TRANSECT DATA AVAIL	DECAD	WIDTH	HEIGHT	% COVER	QUADRAT DATA FREQ	DENSITY
ACGL	MOUNTAIN MAPLE						4.2	42.
AMAL	SERVICEBERRY	3.8	1.9	0.6	0.7	10.3	50.0	1958.
CESA	REDSTEM CEANOTHUS	27.5	21.1	3.8	3.2	9.1	25.0	542.
CEVE	SNOWBRUSH	6.3	9.5	3.0	2.5	5.3	0.0	0.
PHMA	NINEBARK	3.8	3.0	0.6	0.8	14.6	25.0	708.
SASP	WILLOW	2.5	12.6	0.9	3.3	3.1	8.3	83.
	TOTAL							3333.

SUMMARY - 4 PLOTS, MIX CCR COVER TYPE, PLOT NOS 1 THRU 10 AND 234 THRU 24

SPECIES PRESENT

SCIENTIFIC NAME	COMMON NAME	FREQUENCY
GRASSES		
CALAMAGROSTIA RUBESCENS	PINEGRASS	50.0
FORBS		
ADENOCAULON BICOLOR	AMERICAN TRAIL PLANT	6.3
ANEMONE PIPERI	PIPER ANEMONE	43.8
ARENARIA SPP	SANDWORT	75.0
ARNICA CORDIFOLIA	HEARTLEAF ARNICA	75.0
ATHYRIUM FELIX-FEMINA	LADYFERN	43.8
BALSAMORHIZA SPP	BALSAMROOT	6.3
CLINTONIA UNIFLORA	QUEENCUP BEADLILY	6.3
COLLINSIA SPP	COLLINSIA	12.5
COPTIS OCCIDENTALIS	GOLDTHREAD	37.5
EPILOBIUM SPP	WILLOWWEED	18.8
FRAGARIA VESCA	WOODS STRAWBERRY	25.0
GALIUM APARINE	CLEAVERS BEDSTRAW	56.3
GALIUM TRIFLORUM	SWEETSCENTED BEDSTRAW	18.8
GERANIUM SPP	GERANIUM	18.8
GOODYERA OBLONGIFOLIA	WESTERN RATTLESNAKE PLANTAI	6.3
LATHYRUS SPP	PEAVINE	37.5
OSMORHIZA OCCIDENTALIS	SWEETANISE	68.8
POLYSTICHUM MUNITUM	SWORDFERN	18.8
PTERIDIUM AQUILINUM	BRACKENFERN	31.3
PYROLA SPP	WINTERGREEN	6.3
SENECIO SPP	BUTTERWEED	18.8
SMILACINA SPP	SOLOMONPLUME	43.8
STREPTOPUS AMPLEXIFOLIUS	CLASPLEAF TWISTEDSTALK	37.5
TRILLIUM OVATUM	WHITE TRILLIUM	31.3
VIOLA SPP	VIOLET	12.5
SHRUBS		
CORNUS SPP	DOGWOOD	50.0
LONICERA SPP	HONEYSUCKLE	6.3
PRUNUS VIRGINIANA	CHOKECHERRY	6.3
ROSA GYMNOCARPA	BALDHIP ROSE	31.3
RUBUS PARVIFLORUS	THIMBLEBERRY	12.5
SYMPHORICARPOS ALBUS	SNOWBERRY	62.5
VACCINIUM MEMBRANACEUM	HUCKLEBERRY	25.0

Stand Description

Douglas-fir

In this forest type five plots were classified by habitat type as Douglas-fir/ninebark and one as Douglas-fir/snowberry habitat type. The one plot that was classified as Douglas-fir/snowberry is located on the south side of the reservoir on a directly north facing slope. This habitat type is not wide spread throughout the reservoir and is restricted to small areas. The plots were generally located on north facing aspects on slopes in excess of 50%. Site index for this stand was estimated as 75 for Douglas-fir. A site index of 75 indicates an average potential productivity for timber production. This is consistent with the habitat productivity ratings associated with this stand.

Examination of the stand and stock table indicates that Douglas-fir comprises all the volume in this cover type. This volume is distributed through the 4 to 18 inch diameter classes. The majority of the trees are in the 4 to 10 inch diameter classes indicating a young, even-aged Douglas-fir stand. The volume per acre associated with this cover type is 2690 cu. ft. (11,160 bd. ft.)

Little insect and disease activity was noted in this stand. This situation would be expected since the stand is very young and appears to be fairly thrifty.

Regeneration consists entirely of Douglas-fir. The estimated number of seedlings/acre is 170.

SUMMARY - PLOTS, DOUG FIR COVER TYPE, PLOT NOS 1 THRU 10 . 234 THRU 240

SPECIES	FREQ	DENSITY
DOUGLAS FIR	16.7	166.7
TOTAL		166.7

PER ACRE VALUES - VOLUMES IN CF

DBH	GRAND FIR NT	GRAND FIR BA	GRAND FIR VOL	DOUGLAS FIR NT	DOUGLAS FIR BA	DOUGLAS FIR VOL	LARCH NT	LARCH BA	LARCH VOL	PONDEROSA PINE NT	PONDEROSA PINE BA	PONDEROSA PINE VOL	WHITE PINE NT	WHITE PINE BA	WHITE PINE VOL
4	0.0	0.0	0.0	66.8	5.8	95.8	0.0	0.0	0.0	4.7	0.4	5.2	0.0	0.0	0.0
6-10	0.0	0.0	0.0	109.2	33.1	721.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SUBT	0.0	0.0	0.0	176.0	39.0	816.8	0.0	0.0	0.0	4.7	0.4	5.2	0.0	0.0	0.0
12	0.0	0.0	0.0	15.2	11.9	350.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
14	0.0	0.0	0.0	14.7	15.7	497.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
16	0.0	0.0	0.0	10.3	14.4	468.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18	0.0	0.0	0.0	7.8	13.8	541.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
22	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
28	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
30	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
32	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
34	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
36	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SUBT	0.0	0.0	0.0	48.0	55.9	1857.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOT	0.0	0.0	0.0	224.0	94.8	2674.8	0.0	0.0	0.0	4.7	0.4	5.2	0.0	0.0	0.0

DBH	HEMLOCK NT	HEMLOCK BA	HEMLOCK VOL	CEDAR NT	CEDAR BA	CEDAR VOL	OTHER CONIFERS NT	OTHER CONIFERS BA	OTHER CONIFERS VOL	BIRCH - ASPEN NT	BIRCH - ASPEN BA	BIRCH - ASPEN VOL	ALDER NT	ALDER BA	ALDER VOL	NT	BA	VOL
4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.0	0.7	8.0	0.0	0.0	0.0			
6-10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
SUBT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.0	0.7	8.0	0.0	0.0	0.0	188.7	40.1	830.1
12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
14	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
18	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
22	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
28	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
30	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
32	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
34	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
36	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
SUBT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	48.0	55.9	1857.9
TOT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.0	0.7	8.0	0.0	0.0	0.0	236.7	95.9	2688.0

SUMMARY - PLOTS, DOUG FIR COVER TYPE, PLOT NOS 1 THRU 10 , 234 THRU 240

SPECIES	FREQ	DENSITY
DOUGLAS FIR	16.7	166.7
TOTAL		166.7

PER ACRE VALUES - VOLUMES IN BF

DBH	GRAND FIR NT	GRAND FIR BA	GRAND FIR VOL	DOUGLAS FIR NT	DOUGLAS FIR BA	DOUGLAS FIR VOL	LARCH NT	LARCH BA	LARCH VOL	PONDEROSA PINE NT	PONDEROSA PINE BA	PONDEROSA PINE VOL	WHITE PINE NT	WHITE PINE BA	WHITE PINE VOL
4	0.0	0.0	0.0	66.8	5.8	0.0	0.0	0.0	0.0	4.7	0.4	0.0	0.0	0.0	0.0
6-10	0.0	0.0	0.0	109.2	33.1	1795.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SUBT	0.0	0.0	0.0	176.0	39.0	1795.4	0.0	0.0	0.0	4.7	0.4	0.0	0.0	0.0	0.0
12	0.0	0.0	0.0	15.2	11.9	1482.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
14	0.0	0.0	0.0	14.7	15.7	2387.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
16	0.0	0.0	0.0	10.3	14.4	2468.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18	0.0	0.0	0.0	7.8	13.8	3027.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
22	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
28	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
30	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
32	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
34	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
36	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SUBT	0.0	0.0	0.0	48.0	55.9	9366.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOT	0.0	0.0	0.0	224.0	94.8	11161.3	0.0	0.0	0.0	4.7	0.4	0.0	0.0	0.0	0.0

DBH	HEMLOCK NT	HEMLOCK BA	HEMLOCK VOL	CEDAR NT	CEDAR BA	CEDAR VOL	OTHER CONIFERS NT	OTHER CONIFERS BA	OTHER CONIFERS VOL	BIRCH - ASPEN NT	BIRCH - ASPEN BA	BIRCH - ASPEN VOL	ALDER NT	ALDER BA	ALDER VOL	NT	BA	VOL
4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.0	0.7	0.0	0.0	0.0	0.0			
6-10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
SUBT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.0	0.7	0.0	0.0	0.0	0.0	188.7	40.1	1795.4
12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
14	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
18	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
22	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
28	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
30	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
32	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
34	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
36	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
SUBT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	48.0	55.9	9366.0
TOT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.0	0.7	0.0	0.0	0.0	0.0	236.7	95.9	11161.3

Browse Description

Douglas-fir

Five of the six major browse species were observed in this stand. Densities of serviceberry, redstem ceanothus, mountain maple, ninebark and willow were 972, 500, 167, 167 and 56 stems per acre respectively. Serviceberry was most frequent occurring on 42% of the quadrats.

Availability estimates for redstem ceanothus are high at 39%. Decadence estimates were 25% for mountin maple, redstem ceanothus and ninebark. All species had heights averaging 2 feet or more. Mountain maple averaged approximately 18 feet in height and is therefore not as available as it might be.

UMMARY - 6 PLOTS, DOUG FIR COVER TYPE, PLOT NOS 1 THRU 10 AND 234 THRU 240

	SPECIES	TRANSECT DATA AVAIL	DECAD	WIDTH	HEIGHT	% COVER	QUADRAT DATA FREQ	DENSITY
ACGL	MOUNTAIN MAPLE	11.7	25.4	10.9	17.7	26.2	16.7	167.
AMAL	SERVICEBERRY	15.8	9.9	3.1	5.7	15.2	41.7	972.
CESA	REDSTEM CEANOTHUS	39.0	24.2	1.9	3.2	10.6	19.4	500.
PHMA	NINEBARK	10.0	23.7	0.8	1.8	3.3	8.3	167.
SASP	WILLOW	0.8	10.5	2.7	5.0	4.8	5.6	56.
	TOTAL							1861.

MMARY — 6 PLOTS, DOUG FIR COVER TYPE, PLOT NOS 1 THRU 10 AND 234 THRU 240

SPECIES PRESENT

SCIENTIFIC NAME	COMMON NAME	FREQUENCY
GRASSES		
AGROPYRON CRISTATUM	CRESTED WHEATGRASS	12.5
BROMUS SPP	BROME	33.3
CALAMAGROSTIA RUBESCENS	PINEGRASS	25.0
STIPA SPP	NEEDLEGRASS	4.2
FORBS		
ACHILLEA MILLEFOLIUM	YARROW	12.5
ADENOCAULON BICOLOR	AMERICAN TRAIL PLANT	25.0
ANEMONE PIPERI	PIPER ANEMONE	29.2
ARENARIA SPP	SANDWORT	58.3
ARNICA CORDIFOLIA	HEARTLEAF ARNICA	91.7
ATHYRIUM FELIX-FEMINA	LADYFERN	37.5
COLLINSIA SPP	COLLINSIA	4.2
COPTIS OCCIDENTALIS	GOLDTHREAD	25.0
FRAGARIA VESCA	WOODS STRAWBERRY	8.3
FRAGARIA VIRGINIANA	VIRGINIA STRAWBERRY	4.2
GALIUM APARINE	CLEAVERS BEDSTRAW	62.5
GALIUM TRIFLORUM	SWEETSCENTED BEDSTRAW	8.3
LATHYRUS SPP	PEAVINE	20.8
LUPINUS SPP	LUPINE	12.5
OSMORHIZA OCCIDENTALIS	SWEETANISE	75.0
PTERIDIUM AQUILINUM	BRACKENFERN	29.2
SMILACINA SPP	SOLOMONPLUME	12.5
SOLIDAGO SPP	GOLDENROD	8.3
STREPTOPUS AMPLEXIFOLIUS	CLASPLEAF TWISTEDSTALK	50.0
THALICTRUM SPP	MEADOWRUE	41.7
THERMOPSIS MONTANA	MOUNTAIN THERMOPSIS	4.2
TRILLIUM OVATUM	WHITE TRILLIUM	20.8
VIOLA SPP	VIOLET	12.5
SHRUBS		
CORNUS SPP	DOGWOOD	37.5
HOLODISCUS DISCOLOR	OCEANSPRAY	16.7
LONICERA SPP	HONEYSUCKLE	16.7
LONICERA UTAHENSIS	UTAH HONEYSUCKLE	12.5
RHAMUS SPP	BUCKTHORN	4.2
ROSA GYMNOCARPA	BALDHIP ROSE	20.8
RUBUS PARVIFLORUS	THIMBLEBERRY	45.8
SYMPHORICARPOS ALBUS	SNOWBERRY	4.2
SYMPHORICARPOS MOLLIS	SNOWBERRY	12.5

Stand Description

Cedar

Only one plot was located on this cover type and it was classified by habitat type as cedar/pachistima. The plot was located on a north facing aspect on a slope of 60%.

Site index information was not recorded for trees on this plot. However, the cedar/pachistima habitat type is considered high in potential productivity for timber production.

Examination of the stand and stock table indicates the majority of the volume in this cover type is grand fir in the 20 to 28 inch diameter classes. The remaining volume is cedar in the 4 thru 18 inch diameter classes. The volume per acre associated with this cover type is 10,140 cu. ft. (61,930 bd. ft.).

Insect and disease activity was noted in these stands. These agents most likely occur in the large diameter grand fir portion of the stand.

Regeneration in stands located in this cover type is estimated to be 750 trees/acre. Grand fir was the only species observed on the sample quadrats.

SUMMARY - 1PLOTS, CEDAR COVER TYPE, PLOT NOS 1 THRU 10 & 34 THRU 240

SPECIES	FREQ	DENSITY
GRAND FIR	75.0	750.0
TOTAL		750.0

PER ACRE VALUES - VOLUMES IN CF

CBH	GRAND FIR NT	GRAND FIR BA	GRAND FIR VOL	DOUGLAS FIR NT	DOUGLAS FIR BA	DOUGLAS FIR VOL	LARCH NT	LARCH BA	LARCH VCL	PONDEROSA PINE NT	PONDEROSA PINE BA	PONDEROSA PINE VOL	WHITE PINE NT	WHITE PINE BA	WHITE PINE VOL
4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6-10	20.0	3.9	83.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SUBT	20.0	3.9	83.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
14	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
20	10.0	21.8	1564.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
22	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
26	10.0	36.9	2588.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
28	10.0	42.8	2737.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
30	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
32	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
34	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
36	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SUBT	30.0	101.4	6890.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOT	50.0	105.4	6974.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

CBH	HEMLOCK NT	HEMLOCK BA	HEMLOCK VOL	CEDAR NT	CEDAR BA	CEDAR VOL	OTHER CONIFERS NT	OTHER CONIFERS BA	OTHER CONIFERS VOL	BIRCH - ASPEN NT	BIRCH - ASPEN BA	BIRCH - ASPEN VOL	ALDER NT	ALDER BA	ALDER VOL	NT	BA	VOL
4	0.0	0.0	0.0	40.0	3.5	74.6	0.0	0.0	0.0	10.0	0.9	13.2	0.0	0.0	0.0			
6-10	0.0	0.0	0.0	50.0	16.4	398.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
SUBT	0.0	0.0	0.0	90.0	19.9	473.2	0.0	0.0	0.0	10.0	0.9	13.2	0.0	0.0	0.0	120.0	24.7	569.9
12	0.0	0.0	0.0	50.0	39.3	1032.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
14	0.0	0.0	0.0	10.0	10.7	404.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
16	0.0	0.0	0.0	10.0	14.0	571.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
18	0.0	0.0	0.0	10.0	17.7	671.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
22	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
28	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
30	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
32	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
34	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
36	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
SUBT	0.0	0.0	0.0	80.0	81.6	2680.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	110.0	183.0	9570.8
TOT	0.0	0.0	0.0	170.0	101.4	3153.2	0.0	0.0	0.0	10.0	0.9	13.2	0.0	0.0	0.0	230.0	207.7	10140.7

SUMMARY - PLOTS, CEDAR COVER TYPE, PLOT NOS 1 THRU 10 , 134 THRU 240

SPECIES	FREQ	DENSITY
GRAND FIR	75.0	750.0
TOTAL		750.0

PER ACRE VALUES - VOLUMES IN BF

DBH	GRAND FIR NT	GRAND FIR BA	GRAND FIR VOL	DOUGLAS FIR NT	DOUGLAS FIR BA	DOUGLAS FIR VOL	LARCH NT	LARCH BA	LARCH VOL	PONDEROSA PINE NT	PONDEROSA PINE BA	PONDEROSA PINE VOL	WHITE PINE NT	WHITE PINE BA	WHITE PINE VOL
4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6-10	20.0	3.9	121.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SUBT	20.0	3.9	121.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
14	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
20	10.0	21.8	10054.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
22	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
26	10.0	36.9	17940.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
28	10.0	42.8	19251.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
30	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
32	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
34	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
36	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SUBT	30.0	101.4	47246.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOT	50.0	105.4	47367.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

DBH	HEMLOCK NT	HEMLOCK BA	HEMLOCK VOL	CEDAR NT	CEDAR BA	CEDAR VOL	OTHER CONIFERS NT	OTHER CONIFERS BA	OTHER CONIFERS VOL	BIRCH - ASPEN NT	BIRCH - ASPEN BA	BIRCH - ASPEN VOL	ALDER NT	ALDER BA	ALDER VOL	NT	BA	VOL
4	0.0	0.0	0.0	40.0	3.5	0.0	0.0	0.0	0.0	10.0	0.9	0.0	0.0	0.0	0.0			
6-10	0.0	0.0	0.0	50.0	16.4	1052.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
SUBT	0.0	0.0	0.0	90.0	19.9	1052.3	0.0	0.0	0.0	10.0	0.9	0.0	0.0	0.0	0.0	120.0	24.7	1173.5
12	0.0	0.0	0.0	50.0	39.3	4584.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
14	0.0	0.0	0.0	10.0	10.7	2035.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
16	0.0	0.0	0.0	10.0	14.0	3098.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
18	0.0	0.0	0.0	10.0	17.7	3796.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
22	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
28	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
30	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
32	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
34	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
36	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
SUBT	0.0	0.0	0.0	80.0	81.6	13514.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	110.0	183.0	6071.2
TOT	0.0	0.0	0.0	170.0	101.4	14567.1	0.0	0.0	0.0	10.0	0.9	0.0	0.0	0.0	0.0	230.0	207.7	51934.7

Browse Description

Cedar

None of the major browse species were observed on plots located in this cover type. This would be expected since the stand was very dense and has had complete forest tree crown cover for several years.

UMMARY - 1 PLOTS, CEDAR COVER TYPE, PLOT NOS 1 THRU 10 AND 234 THRU 240

SPECIES	TRANSECT DATA AVAIL	DECAD	WIDTH	HEIGHT	% COVER	QUADRAT DATA FREQ	DENSITY
NO BROWSE							

MARY – 1 PLOTS, CEDAR COVER TYPE, PLOT NOS 1 THRU 10 AND 234 THRU 240

SPECIES PRESENT

SCIENTIFIC NAME	COMMON NAME	FREQUENCY
GRASSES		
NONE		
FORBS		
ARENARIA SPP	SANDWORT	75.0
ARNICA CORDIFOLIA	HEARTLEAF ARNICA	75.0
ATHYRIUM FELIX-FEMINA	LADYFERN	50.0
CLINTONIA UNIFLORA	QUEENCUP BEADLILY	50.0
COPTIS OCCIDENTALIS	GOLDTHREAD	75.0
GALIUM APARINE	CLEAVERS BEDSTRAW	25.0
GOODYERA OBLONGIFOLIA	WESTERN RATTLESNAKE PLANTAI	25.0
SMILACINA SPP	SOLOMONPLUME	75.0
TRILLIUM OVATUM	WHITE TRILLIUM	25.0
VIOLA SPP	VIOLET	25.0
SHRUBS		
CORNUS SPP	DOGWOOD	50.0
RUBUS PARVIFLORUS	THIMBLEBERRY	25.0
SYMPHORICARPOS ALBUS	SNOWBERRY	25.0

Stand Description

Ponderosa pine

Three of the plots located in the cover type are classified by habitat type as Douglas-fir/ninebark, are as ponderosa pine/fescue and are as ponderosa pine/ninebark. This cover type is somewhat unique in that it does have areas that are habitat typed as ponderosa pine. Soils in this type are probably quite shallow and of low productivity. The plots were generally on south facing aspects. Slopes ranged from 25 to 80 percent.

Site index for ponderosa pine was estimated to be 97. This would indicate a medium potential productivity for timber production. This is slightly higher than might be expected based on the habitat type classification.

Examination of the stand and stock table indicates ponderosa pine comprises the majority of volume in this cover types. Douglas-fir is restricted to the smaller diameter classes whereas ponderosa pine is in the 26 to 28 inch classes. The volume per acre associated with this cover type is 1795 cu. ft. (11,410 bd. ft.)

Little insect and disease activity was rated in this cover type. This condition occurs because the major species are old ponderosa pine which would be infrequently attacked by mountain pine beetle and Douglas-fir that is relatively vigorous.

Regeneration in stands located in this cover type is estimated to be 250 seedlings per acre. All of the observed seedlings were Douglas-fir.

SUMMARY - PLOTS, P PINE COVER TYPE, PLOT NOS 1 THRU 10 A B4 THRU 240

SPECIES	FREQ	DENSITY
DOUGLAS FIR	15.0	250.0
TOTAL		250.0

PER ACRE VALUES - VOLUMES IN CF

DBH	GRAND FIR NT	GRAND FIR BA	GRAND FIR VOL	DOUGLAS FIR NT	DOUGLAS FIR BA	DOUGLAS FIR VOL	LARCH NT	LARCH BA	LARCH VOL	PONDEROSA PINE NT	PONDEROSA PINE BA	PONDEROSA PINE VOL	WHITE PINE NT	WHITE PINE BA	WHITE PINE VOL
4	0.0	0.0	0.0	22.0	1.9	24.0	0.0	0.0	0.0	2.0	0.2	1.3	0.0	0.0	0.0
6-10	0.0	0.0	0.0	10.0	2.3	31.1	0.0	0.0	0.0	8.0	3.0	42.6	0.0	0.0	0.0
SUBT	0.0	0.0	0.0	32.0	4.2	55.1	0.0	0.0	0.0	10.0	3.1	43.9	0.0	0.0	0.0
12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.4	4.2	76.1	0.0	0.0	0.0
14	0.0	0.0	0.0	1.4	1.5	30.0	0.0	0.0	0.0	3.4	3.6	100.5	0.0	0.0	0.0
16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.0	8.4	221.2	0.0	0.0	0.0
18	0.0	0.0	0.0	1.4	2.5	55.1	0.0	0.0	0.0	2.0	3.5	117.1	0.0	0.0	0.0
20	0.0	0.0	0.0	1.4	3.1	68.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
22	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	7.4	505.3	0.0	0.0	0.0
28	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	8.6	512.8	0.0	0.0	0.0
30	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
32	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
34	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
36	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SUBT	0.0	0.0	0.0	4.2	7.0	153.5	0.0	0.0	0.0	20.8	35.7	1533.1	0.0	0.0	0.0
TOT	0.0	0.0	0.0	36.2	11.2	208.6	0.0	0.0	0.0	30.8	38.9	1577.0	0.0	0.0	0.0

DBH	HEMLOCK NT	HEMLOCK BA	HEMLOCK VOL	CEDAR NT	CEDAR BA	CEDAR VOL	OTHER CONIFERS NT	OTHER CONIFERS BA	OTHER CONIFERS VOL	BIRCH - ASPEN NT	BIRCH - ASPEN BA	BIRCH - ASPEN VOL	ALDER NT	ALDER BA	ALDER VOL	NT	BA	VOL
4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.0	0.9	9.3	0.0	0.0	0.0			
6-10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
SUBT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.0	0.9	9.3	0.0	0.0	0.0	52.0	8.2	108.3
12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
14	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
18	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
22	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
28	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
30	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
32	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
34	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
36	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
SUBT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	25.0	42.7	1686.6
TOT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.0	0.9	9.3	0.0	0.0	0.0	77.0	50.9	1794.9

SUMMARY - PLOTS, P PINE COVER TYPE, PLOT NOS 1 THRU 10 A 34 THRU 240

SPECIES	FREQ	DENSITY
DOUGLAS FIR	15.0	250.0
TOTAL		250.0

PER ACRE VALUES - VOLUMES IN BF

DBH	GRAND FIR NT	GRAND FIR BA	GRAND FIR VOL	DOUGLAS FIR NT	DOUGLAS FIR BA	DOUGLAS FIR VOL	LARCH NT	LARCH BA	LARCH VOL	PONDEROSA PINE NT	PONDEROSA PINE BA	PONDEROSA PINE VOL	WHITE PINE NT	WHITE PINE BA	WHITE PINE VOL
4	0.0	0.0	0.0	22.0	1.9	0.0	0.0	0.0	0.0	2.0	0.2	0.0	0.0	0.0	0.0
5-10	0.0	0.0	0.0	10.0	2.3	56.4	0.0	0.0	0.0	8.0	3.0	151.8	0.0	0.0	0.0
SUBT	0.0	0.0	0.0	32.0	4.2	56.4	0.0	0.0	0.0	10.0	3.1	151.8	0.0	0.0	0.0
12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.4	4.2	369.1	0.0	0.0	0.0
14	0.0	0.0	0.0	1.4	1.5	148.9	0.0	0.0	0.0	3.4	3.6	555.3	0.0	0.0	0.0
16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.0	8.4	1330.0	0.0	0.0	0.0
18	0.0	0.0	0.0	1.4	2.5	316.7	0.0	0.0	0.0	2.0	3.5	743.7	0.0	0.0	0.0
20	0.0	0.0	0.0	1.4	3.1	413.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
22	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	7.4	3595.9	0.0	0.0	0.0
28	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	8.6	3729.4	0.0	0.0	0.0
30	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
32	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
34	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
36	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SUBT	0.0	0.0	0.0	4.2	7.0	878.9	0.0	0.0	0.0	20.8	35.7	10323.4	0.0	0.0	0.0
TOT	0.0	0.0	0.0	36.2	11.2	935.3	0.0	0.0	0.0	30.8	38.9	10475.2	0.0	0.0	0.0

DBH	HEMLOCK NT	HEMLOCK BA	HEMLOCK VOL	CEDAR NT	CEDAR BA	CEDAR VOL	OTHER CONIFERS NT	OTHER CONIFERS BA	OTHER CONIFERS VOL	BIRCH - ASPEN NT	BIRCH - ASPEN BA	BIRCH - ASPEN VOL	ALDER NT	ALDER BA	ALDER VOL	NT	BA	V
4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.0	0.9	0.0	0.0	0.0	0.0			
5-10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
SUBT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.0	0.9	0.0	0.0	0.0	0.0	52.0	8.7	203.
12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
14	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
18	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
22	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
28	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
30	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
32	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
34	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
36	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
SUBT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	25.0	42.7	11202.
TOT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.0	0.9	0.0	0.0	0.0	0.0	77.0	50.9	11410.

Browse Description

Ponderosa pine

Four out of the six major browse species were found in this type. Densities of serviceberry and redstem ceanothus were 400 and 300 stems per acre respectively. Both were equally frequent, occurring on over 20 percent of the quadrats.

Except for mountain maple which average 7 feet in height, the browse species averaged less than 2 feet in height. Therefore, they generally had availability and decadence ratings under 10%.

UMMARY - 5 PLOTS, P PINE COVER TYPE, PLOT NOS 1 THRU 10 AND 234 THRU 240

		TRANSECT DATA					QUADRAT DATA	
	SPECIES	AVAIL	DECAD	WIDTH	HEIGHT	% COVER	FREQ	DENSITY
ACGL	MOUNTAIN MAPLE	4.0	5.1	1.6	6.5	6.2	0.0	0.
AMAL	SERVICEBERRY	2.0	0.0	0.2	0.4	1.0	23.3	400.
CESA	REDSTEM CEANOTHUS	9.8	5.6	1.6	1.8	15.9	20.0	300.
PHMA	NINEBARK	15.0	7.6	0.4	1.2	1.6	3.3	33.
	TOTAL							733.

MARY – 5 PLOTS, P PINE COVER TYPE, PLOT NOS 1 THRU 10 AND 234 THRU 240

SPECIES PRESENT

SCIENTIFIC NAME	COMMON NAME	FREQUENCY
GRASSES		
AGROSTIS SPP	BENTGRASS	15.0
BROMUS SPP	BROME	85.0
BROMUS TECTORUM	CHEATGRASS	25.0
CALAMAGROSTIA RUBESCENS	PINEGRASS	5.0
CAREX SPP	SEDGE	20.0
DACTYLIS SPP	ORCHARDGRASS	10.0
FESTUCA IDAHOENSIS	IDAHO FESCUE	5.0
POA SPP	BLUEGRASS	15.0
STIPA SPP	NEEDLEGRASS	10.0
FORBS		
ACHILLEA MILLEFOLIUM	YARROW	45.0
ALLIUM SPP	WILD ONION	10.0
ANEMONE PIPERI	PIPER ANEMONE	5.0
ANTENNARIA SPP	PUSSYTOES	25.0
ARENARIA SPP	SANDWORT	30.0
ARNICA CORDIFOLIA	HEARTLEAF ARNICA	20.0
ATHYRIUM FELIX-FEMINA	LADYFERN	5.0
BALSAMORHIZA SPP	BALSAMROOT	15.0
CASTILLEJA SPP	INDIAN PAINTBRUSH	5.0
COLLINSIA SPP	COLLINSIA	30.0
DELPHINIUM SPP	LARKSPUR	10.0
EPILOBIUM SPP	WILLOWWEED	50.0
FRAGARIA VESCA	WOODS STRAWBERRY	10.0
GALIUM APARINE	CLEAVERS BEDSTRAW	45.0
GALIUM TRIFLORUM	SWEETSCENTED BEDSTRAW	5.0
GERANIUM SPP	GERANIUM	20.0
HIERACIUM ALBERTINUM	WESTERN HAWKWEED	10.0
LATHYRUS SPP	PEAVINE	20.0
LOMATIUM SPP	BISCUITROOT	25.0
LUPINUS SPP	LUPINE	45.0
OSMORHIZA OCCIDENTALIS	SWEETANISE	20.0
PENSTEMON SPP	BEARDTONGUE	20.0
PHACELIA SPP	PHACELIA	10.0
POLYSTICHUM MUNITUM	SWORDFERN	5.0
POTENTILLA GLANDULOSA	GLAND CINQUEFOIL	35.0
PTERIDIUM AQUILINUM	BRACKENFERN	55.0
SEDUM STENOPETALUM	WORMLEAF STONECROP	5.0
SOLIDAGO SPP	GOLDENROD	5.0
STREPTOPUS AMPLEXIFOLIUS	CLASPLEAF TWISTEDSTALK	20.0
TARAXACUM SPP	DANDELION	30.0
THERMOPSIS MONTANA	MOUNTAIN THERMOPSIS	5.0
TRAGOPOGON SPP	GOATSBEARD	30.0
VIOLA SPP	VIOLET	10.0
SHRUBS		
CORNUS SPP	DOGWOOD	20.0
HOLODISCUS DISCOLOR	OCEANSPRAY	5.0
PRUNUS VIRGINIANA	CHOKECHERRY	20.0
ROSA GYMNOCARPA	BALDHIP ROSE	15.0
ROSA NUTKANA	BRISTLY NOOTKA ROSE	25.0
RUBUS PARVIFLORUS	THIMBLEBERRY	20.0
SYMPHORICARPOS ALBUS	SNOWBERRY	35.0

Stand Description

Grand fir

Only one plot fell within the grand fir cover type. This plot was classified by habitat type as grand fir/pachistima. The grand fir cover type only exists on a very very small amount of land in this management unit. The plot was located on a northwest facing aspect on a 70% slope.

Site index was not recorded for the plot located in this cover type. However the grand fir/pachistima habitat type is generally considered high in potential productivity for timber production.

Examination of the stand and stock table indicates the primary volume is in grand fir in the 16 to 18 inch diameter classes. Douglas-fir in the stand was observed only in the 4 inch diameter class. Birch and aspen exist but are in the 4 to 10 inch diameter classes. The volume per acre associated with this cover type is 1075 cu. ft. (5810 bd. ft.). This stand could be described as an understock, immature grand fir stand.

There does not appear to be significant disease or insect activity in this cover type. This may be attributed to the fact that the stand has a low density and is immature, thus more insect and disease resistant.

Regeneration in stands located in this cover type is estimated to be 500 seedlings per acre. These are equally distributed between grand fir and Douglas-fir.

SUMMARY - PLOTS, GD FIR COVER TYPE, PLOT NOS 1 THRU 10 A 34 THRU 240

SPECIES	FREQ	DENSITY
GRAND FIR	25.0	250.0
DOUGLAS FIR	25.0	250.0
TOTAL		500.0

PER ACRE VALUES - VOLUMES IN CF

DBH	GRAND FIR NT	GRAND FIR BA	GRAND FIR VOL	DOUGLAS FIR NT	DOUGLAS FIR BA	DOUGLAS FIR VOL	LARCH NT	LARCH BA	LARCH VOL	PONDEROSA PINE NT	PONDEROSA PINE BA	PONDEROSA PINE VOL	WHITE PINE NT	WHITE PINE BA	WHITE PINE VOL
4	20.0	1.7	15.1	40.0	3.5	33.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6-10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SUBT	20.0	1.7	15.1	40.0	3.5	33.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
14	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
16	10.0	14.0	414.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18	10.0	17.7	541.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
22	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
28	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
30	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
32	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
34	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
36	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SUBT	20.0	31.6	955.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOT	40.0	33.4	970.7	40.0	3.5	33.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

DBH	HEMLOCK NT	HEMLOCK BA	HEMLOCK VOL	CEDAR NT	CEDAR BA	CEDAR VOL	OTHER CONIFERS NT	OTHER CONIFERS BA	OTHER CONIFERS VOL	BIRCH - ASPEN NT	BIRCH - ASPEN BA	BIRCH - ASPEN VOL	ALDER NT	ALDER BA	ALDER VOL	NT	BA	VOL
4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20.0	1.7	18.7	0.0	0.0	0.0			
6-10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20.0	3.9	53.1	0.0	0.0	0.0			
SUBT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	40.0	5.7	71.8	0.0	0.0	0.0	100.0	10.9	120.4
12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
14	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
18	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
22	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
28	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
30	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
32	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
34	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
36	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
SUBT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20.0	31.6	955.6
TOT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	40.0	5.7	71.8	0.0	0.0	0.0	120.0	42.5	1076.0

SUMMARY - PLOTS, SD FIR COVER TYPE, PLOT NOS 1 THRU 10 / 234 THRU 240

SPECIES	FREQ	DENSITY
GRAND FIR	25.0	250.0
DOUGLAS FIR	25.0	250.0
TOTAL		500.0

PER ACRE VALUES - VOLUMES IN BF

DBH	GRAND FIR NT	GRAND FIR BA	GRAND FIR VOL	DOUGLAS FIR NT	DOUGLAS FIR BA	DOUGLAS FIR VOL	LARCH NT	LARCH BA	LARCH VOL	PONDEROSA PINE NT	PONDEROSA PINE BA	PONDEROSA PINE VOL	WHITE PINE NT	WHITE PINE BA	WHITE PINE VOL
4	20.0	1.7	0.0	40.0	3.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6-10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SUBT	20.0	1.7	0.0	40.0	3.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
14	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
16	10.0	14.0	2427.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18	10.0	17.7	3319.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
22	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
28	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
30	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
32	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
34	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
36	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SUBT	20.0	31.6	5747.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOT	40.0	33.4	5747.5	40.0	3.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

DBH	HEMLOCK NT	HEMLOCK BA	HEMLOCK VOL	CEDAR NT	CEDAR BA	CEDAR VOL	OTHER CONIFERS NT	OTHER CONIFERS BA	OTHER CONIFERS VOL	BIRCH - ASPEN NT	BIRCH - ASPEN BA	BIRCH - ASPEN VOL	ALDER NT	ALDER BA	ALDER VOL	NT	BA	VOL
4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20.0	1.7	0.0	0.0	0.0	0.0			
6-10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20.0	3.9	65.2	0.0	0.0	0.0			
SUBT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	40.0	5.7	65.2	0.0	0.0	0.0	100.0	10.9	65.2
12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
14	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
18	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
22	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
28	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
30	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
32	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
34	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
36	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
SUBT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20.0	31.6	5747.5
TOT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	40.0	5.7	65.2	0.0	0.0	0.0	120.0	42.5	5812.7

Browse Description

Grand fir

Four of the six major browse species were observed on plots located in this cover type. Densities of ninebark, serviceberry and redstem ceanothus were 833, 500 and 167 stems per acre respectively. Serviceberry and ninebark both occurred on one-third of the plots.

Mountain maple, redstem ceanothus and ninebark were observed on the line transect. All three had availability estimates in excess of 50%. Redstem ceanothus was estimated to be 40% decadent. This would be indicative of heavy browsing.

SUMMARY - 1 PLOTS, GD FIR COVER TYPE, PLOT NOS 1 THRU 10 AND 234 THRU 240

	SPECIES	TRANSECT DATA AVAIL	DECAD	WIDTH	HEIGHT	% COVER	QUADRAT DATA FREQ	DENSITY
ACGL	MOUNTAIN MAPLE	53.3	8.7	4.7	9.8	51.8	0.0	0.
AMAL	SERVICEBERRY						33.3	500.
CESA	REDSTEM CEANOTHUS	65.0	38.0	3.5	4.5	12.9	16.7	167.
PHMA	NINEBARK	78.3	29.7	3.5	6.0	19.6	33.3	833.
	TOTAL							1500.

SUMMARY — 1 PLOTS, GD FIR COVER TYPE, PLOT NOS 1 THRU 10 AND 234 THRU 240

SPECIES PRESENT

SCIENTIFIC NAME	COMMON NAME	FREQUENCY
GRASSES		
BROMUS TECTORUM	CHEATGRASS	50.0
CALAMAGROSTIA RUBESCENS	PINEGRASS	50.0
CAREX SPP	SEDGE	25.0
FORBS		
ADENOCAULON BICOLOR	AMERICAN TRAIL PLANT	25.0
ANEMONE PIPERI	PIPER ANEMONE	25.0
ARENARIA SPP	SANDWORT	75.0
ARNICA CORDIFOLIA	HEARTLEAF ARNICA	100.0
ATHYRIUM FELIX-FEMINA	LADYFERN	100.0
CLINTONIA UNIFLORA	QUEENCUP BEADLILY	25.0
COPTIS OCCIDENTALIS	GOLDTHREAD	100.0
GALIUM APARINE	CLEAVERS BEDSTRAW	100.0
LOMATIUM SPP	BISCUITROOT	50.0
OSMORHIZA OCCIDENTALIS	SWEETANISE	50.0
PTERIDIUM AQUILINUM	BRACKENFERN	50.0
STREPTOPUS AMPLEXIFOLIUS	CLASPLEAF TWISTEDSTALK	100.0
THALICTRUM SPP	MEADOWRUE	75.0
TRILLIUM OVATUM	WHITE TRILLIUM	25.0
VIOLA SPP	VIOLET	25.0
SHRUBS		
CORNUS SPP	DOGWOOD	50.0
ROSA GYMNOCARPA	BALDHIP ROSE	25.0
RUBUS PARVIFLORUS	THIMBLEBERRY	100.0
SYMPHORICARPOS ALBUS	SNOWBERRY	50.0

SUMMARY - PLOTS; ALL COVER TYPE, PLOT NOS 1 THRU 10 , 234 THRU 240

SPECIES	FREQ	DENSITY
GRAND FIR	7.4	73.5
DOUGLAS FIR	13.2	161.8
CEDAR	1.5	14.7
BIRCH - ASPEN	1.5	14.7
TOTAL		264.7

PER ACRE VALUES - VOLUMES IN CF

	GRAND FIR			DOUGLAS FIR			LARCH			PONDEROSA PINE			WHITE PINE		
DBH	NT	BA	VOL	NT	BA	VOL	NT	BA	VOL	NT	BA	VOL	NT	BA	VOL
4	1.8	0.2	1.9	34.8	3.0	46.4	0.0	0.0	0.0	2.2	0.2	2.2	0.0	0.0	0.0
6-10	7.9	2.1	53.1	46.6	14.1	297.7	0.0	0.0	0.0	2.9	1.1	17.1	0.0	0.0	0.0
SUBT	9.6	2.3	55.0	81.4	17.1	344.1	0.0	0.0	0.0	5.2	1.3	19.4	0.0	0.0	0.0
12	0.4	0.3	13.4	7.5	5.9	172.7	0.0	0.0	0.0	1.6	1.2	22.4	0.0	0.0	0.0
14	0.8	0.9	37.4	6.6	7.0	214.8	0.0	0.0	0.0	1.6	1.7	51.5	0.0	0.0	0.0
16	0.6	0.8	24.4	4.1	5.7	182.9	0.0	0.0	0.0	1.8	2.5	65.1	0.0	0.0	0.0
18	0.6	1.0	31.8	3.6	6.3	235.4	0.0	0.0	0.0	1.2	2.1	91.1	0.0	0.0	0.0
20	1.0	2.2	144.2	0.8	1.8	66.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
22	0.0	0.0	0.0	0.6	1.6	54.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	1.8	118.1	0.0	0.0	0.0
26	0.6	2.2	152.3	0.0	0.0	0.0	0.0	0.0	0.0	1.6	5.9	388.1	0.0	0.0	0.0
28	0.6	2.5	161.0	0.6	2.5	86.3	0.0	0.0	0.0	1.2	5.0	293.7	0.0	0.0	0.0
30	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
32	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
34	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	3.7	251.4	0.0	0.0	0.0
36	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SUBT	4.6	9.9	564.6	23.8	30.8	1013.1	0.0	0.0	0.0	10.1	23.9	1281.3	0.0	0.0	0.0
TOT	14.2	12.2	619.6	105.1	47.9	1357.2	0.0	0.0	0.0	15.2	25.2	1300.6	0.0	0.0	0.0

	HEMLOCK			CEDAR			OTHER CONIFERS			BIRCH - ASPEN			ALDER					
DBH	NT	BA	VOL	NT	BA	VOL	NT	BA	VOL	NT	BA	VOL	NT	BA	VOL	NT	BA	VOL
4	0.0	0.0	0.0	3.5	0.3	5.8	0.0	0.0	0.0	9.3	0.8	10.7	0.0	0.0	0.0			
6-10	0.0	0.0	0.0	4.7	1.5	33.7	0.0	0.0	0.0	2.4	0.5	8.6	0.0	0.0	0.0			
SUBT	0.0	0.0	0.0	8.2	1.8	39.5	0.0	0.0	0.0	11.6	1.3	19.3	0.0	0.0	0.0	116.1	23.8	477.3
12	0.0	0.0	0.0	2.9	2.3	60.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
14	0.0	0.0	0.0	0.6	0.6	23.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
16	0.0	0.0	0.0	0.6	0.8	33.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
18	0.0	0.0	0.0	1.0	1.8	60.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
22	0.0	0.0	0.0	0.4	1.1	36.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
28	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
30	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
32	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
34	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
36	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
SUBT	0.0	0.0	0.0	5.5	6.6	215.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	43.9	71.3	3074.2
TOT	0.0	0.0	0.0	13.8	8.4	254.8	0.0	0.0	0.0	11.6	1.3	19.3	0.0	0.0	0.0	160.0	95.1	3551.5

SUMMARY - 4 PLOTS, ALL COVER TYPE, PLOT NOS 1 THRU 10 234 THRU 240

SPECIES	FREQ	DENSITY
GRAND FIR	7.4	73.5
DOUGLAS FIR	13.2	161.8
CEDAR	1.5	14.7
BIRCH - ASPEN	1.5	14.7
TOTAL		264.7

PER ACRE VALUES - VOLUMES IN BF

	GRAND FIR			DOUGLAS FIR			LARCH			PONDEROSA PINE			WHITE PINE		
DBH	NT	BA	VOL	NT	BA	VOL	NT	BA	VOL	NT	BA	VOL	NT	BA	VOL
4	1.8	0.2	0.0	34.9	3.0	0.0	0.0	0.0	0.0	2.2	0.2	0.0	0.1	0.0	0.0
6-10	7.9	2.1	145.3	46.6	14.1	742.2	0.0	0.0	0.0	2.9	1.1	56.5	0.1	0.0	0.0
SUBT	9.6	2.3	145.3	81.4	17.1	742.2	0.0	0.0	0.0	5.2	1.2	56.5	0.1	0.0	0.0
12	0.4	0.3	66.6	7.5	5.9	730.9	0.0	0.0	0.0	1.6	1.2	103.5	0.1	0.0	0.0
14	0.8	0.9	205.1	6.6	7.0	1032.6	0.0	0.0	0.0	1.6	1.7	283.8	0.2	0.0	0.0
16	0.6	0.8	142.8	4.1	5.7	963.8	0.0	0.0	0.0	1.8	2.5	391.2	0.2	0.0	0.0
18	0.6	1.0	155.3	3.6	6.3	1320.3	0.0	0.0	0.0	1.2	2.1	573.9	0.1	0.0	0.0
20	1.0	2.2	926.9	0.9	1.8	393.2	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
22	0.0	0.0	0.0	0.6	1.6	336.9	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	1.3	822.4	0.1	0.0	0.0
26	0.6	2.2	1055.3	0.0	0.0	0.0	0.0	0.0	0.0	1.6	5.9	2763.7	0.1	0.0	0.0
28	0.6	2.5	1132.4	0.6	2.5	584.1	0.0	0.0	0.0	1.2	5.1	2136.6	0.1	0.1	0.0
30	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
32	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0
34	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	3.7	1904.1	0.1	0.1	0.0
36	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
SUBT	4.6	9.9	3724.5	23.8	20.8	5361.7	0.0	0.0	0.0	10.1	23.9	8334.1	0.1	0.0	0.0
TOT	14.2	12.2	3869.8	105.1	47.7	6104.0	0.0	0.0	0.0	15.2	25.2	8040.6	0.1	0.0	0.0

	HEMLOCK			CEDAR			OTHER CONIFERS			BIRCH - ASPEN			ALDER					
DBH	NT	BA	VOL	NT	BA	VOL	NT	BA	VOL	NT	BA	VOL	NT	BA	VOL	NT	BA	VOL
4	0.0	0.0	0.0	2.5	0.3	0.0	0.0	0.0	0.0	9.3	0.9	0.0	0.1	0.0	0.0			
6-10	0.0	0.0	0.0	4.7	1.3	86.0	0.0	0.0	0.0	2.4	0.5	9.3	0.1	0.0	0.0			
SUBT	0.0	0.0	0.0	8.2	1.6	86.0	0.0	0.0	0.0	11.6	1.3	9.3	0.1	0.0	0.0	112.1	12.1	1.1
12	0.0	0.0	0.0	2.3	2.3	269.7	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0			
14	0.0	0.0	0.0	0.6	0.6	119.7	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0			
16	0.0	0.0	0.0	0.6	0.9	182.3	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.0			
18	0.0	0.0	0.0	1.0	1.8	379.2	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0			
20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0			
22	0.0	0.0	0.0	0.4	1.1	215.6	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0			
24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0			
26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0			
28	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0			
30	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0			
32	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0			
34	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0			
36	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
SUBT	0.0	0.0	0.0	5.5	6.6	1125.5	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.0	42.0	71.2	11.1
TOT	0.0	0.0	0.0	13.8	8.4	1212.6	0.0	0.0	0.0	11.6	1.3	9.3	0.1	0.1	0.0	154.3	83.4	12.2

UMMARY – 17 PLOTS, ALL COVER TYPE, PLOT NOS 1 THRU 10 AND 234 THRU 240

		TRANSECT DATA					QUADRAT DATA	
	SPECIES	AVAIL	DECAD	WIDTH	HEIGHT	% COVER	FREQ	DENSITY
ACGL	MOUNTAIN MAPLE	8.4	11.0	4.6	8.7	14.1	6.9	69.
AMAL	SERVICEBERRY	7.1	4.0	1.3	2.3	8.1	35.3	951.
CESA	REDSTEM CEANOTHUS	27.0	17.4	2.3	2.7	11.3	19.6	402.
CEVE	SNOWBRUSH	1.5	2.2	0.7	0.6	1.2	0.0	0.
PHMA	NINEBARK	13.4	13.1	0.7	1.5	6.2	11.8	284.
SASP	WILLOW	0.9	6.7	1.1	2.5	2.4	3.9	39.
	TOTAL							1745.

MARY — 17 PLOTS, ALL COVER TYPE, PLOT NOS 1 THRU 10 AND 234 THRU 240

SPECIES PRESENT

SCIENTIFIC NAME	COMMON NAME	FREQUENCY
GRASSES		
AGROPYRON CRISTATUM	CRESTED WHEATGRASS	4.4
AGROSTIS SPP	BENTGRASS	4.4
BROMUS SPP	BROME	36.8
BROMUS TECTORUM	CHEATGRASS	10.3
CALAMAGROSTIA RUBESCENS	PINEGRASS	25.0
CAREX SPP	SEDGE	7.4
DACTYLIS SPP	ORCHARDGRASS	2.9
FESTUCA IDAHOENSIS	IDAHO FESCUE	1.5
POA SPP	BLUEGRASS	4.4
STIPA SPP	NEEDLEGRASS	4.4
FORBS		
ACHILLEA MILLEFOLIUM	YARROW	17.6
ADENOCAULON BICOLOR	AMERICAN TRAIL PLANT	11.8
ALLIUM SPP	WILD ONION	2.9
ANEMONE PIPERI	PIPER ANEMONE	23.5
ANTENNARIA SPP	PUSSYTOES	7.4
ARENARIA SPP	SANDWORT	55.9
ARNICA CORDIFOLIA	HEARTLEAF ARNICA	66.2
ATHYRIUM FELIX-FEMINA	LADYFERN	33.8
BALSAMORHIZA SPP	BALSAMROOT	5.9
CASTILLEJA SPP	INDIAN PAINTBRUSH	1.5
CLINTONIA UNIFLORA	QUEENCUP BEADLILY	5.9
COLLINSIA SPP	COLLINSIA	13.2
COPTIS OCCIDENTALIS	GOLDTHREAD	27.9
DELPHINIUM SPP	LARKSPUR	2.9
EPILOBIUM SPP	WILLOWWEED	19.1
FRAGARIA VESCA	WOODS STRAWBERRY	11.8
FRAGARIA VIRGINIANA	VIRGINIA STRAWBERRY	1.5
GALIUM APARINE	CLEAVERS BEDSTRAW	55.9
GALIUM TRIFLORUM	SWEETSCENTED BEDSTRAW	8.8
GERANIUM SPP	GERANIUM	10.3
GOODYERA OBLONGIFOLIA	WESTERN RATTLESNAKE PLANTAI	2.9
HIERACIUM ALBERTINUM	WESTERN HAWKWEED	2.9
LATHYRUS SPP	PEAVINE	22.1
LOMATIUM SPP	BISCUITROOT	10.3
LUPINUS SPP	LUPINE	17.6
OSMORHIZA OCCIDENTALIS	SWEETANISE	51.5
PENSTEMON SPP	BEARDTONGUE	5.9
PHACELIA SPP	PHACELIA	2.9
POLYSTICHUM MUNITUM	SWORDFERN	5.9
POTENTILLA GLANDULOSA	GLAND CINQUEFOIL	10.3
PTERIDIUM AQUILINUM	BRACKENFERN	36.8
PYROLA SPP	WINTERGREEN	1.5
SEDUM STENOPETALUM	WORMLEAF STONECROP	1.5
SENECIO SPP	BUTTERWEED	4.4
SMILACINA SPP	SOLOMONPLUME	19.1
SOLIDAGO SPP	GOLDENROD	4.4
STREPTOPUS AMPLEXIFOLIUS	CLASPLEAF TWISTEDSTALK	38.2
TARAXACUM SPP	DANDELION	8.8
THALICTRUM SPP	MEADOWRUE	19.1
THERMOPSIS MONTANA	MOUNTAIN THERMOPSIS	2.9
TRAGOPOGON SPP	GOATSBEARD	8.8
TRILLIUM OVATUM	WHITE TRILLIUM	17.6
VIOLA SPP	VIOLET	13.2

CORNUS SPP	DOGWOOD	36.8
HOLODISCUS DISCOLOR	OCEANSPRAY	7.4
LONICERA SPP	HONEYSUCKLE	7.4
LONICERA UTAHENSIS	UTAH HONEYSUCKLE	4.4
PRUNUS VIRGINIANA	CHOKECHERRY	7.4
RHAMNUS SPP	BUCKTHORN	1.5
ROSA GYMNOCARPA	BALDHIP ROSE	20.6
ROSA NUTKANA	BRISTLY NOOTKA ROSE	7.4
RUBUS PARVIFLORUS	THIMBLEBERRY	32.4
SYMPHORICARPOS ALBUS	SNOWBERRY	30.9
SYMPHORICARPOS MOLLIS	SNOWBERRY	4.4
VACCINIUM MEMBRANACEUM	HUCKLEBERRY	5.9

MANAGEMENT ALTERNATIVES

This management unit includes the Dam and Big Eddy boat launching facility. Both receive heavy recreational use. Consequently, any management actions taken in this unit should be tempered with respect to the aesthetic impact they will have.

Poison ivy occurs in this management unit on south facing slopes. Also, larkspur and lupine were encountered during the inventory process. The existance of these three noxious plants requires special consideration when planning domestic livestock grazing and recreational development.

Mixed Conifer

Shelterwood or partial cutting could be used in this cover type. The stand and stock table indicates this stand is in a transition stage between a ponderosa pine and a typical mixed conifer cover type. Partial cutting or shelterwood should remove the large ponderosa pine as they reach maturity. This would aid the stand in reaching a climax situation. Because of the steep terrain (60 to 80%) an aerial or cable logging system would be required to harvest this unit. Small interlocking, running skyline systems have the capability of downhill yarding to the lake's edge. These logging systems can be effectively used in a partial cutting silvicultural system.

Slash disposal following harvesting could be a problem. The cutting system precludes broadcast burning and the steepness of terrain would discourage piling and burning unless done by hand. Tree length logging and complete tree utilization would greatly reduce the slash disposal

problem. Use of a shelterwood system should stimulate browse production. There appears to be an adequate stocking of browse in this cover type but it has a low average height. Increased amount of sunlight on the forest floor should significantly increase the amounts of browse available.

If this stand were opened up enough to stimulate browse production, it is anticipated there would be some aesthetic impact. This is particularly true if a majority of the ponderosa pine is removed in the initial cutting (approximately 24000 bd. ft. per acre). It is suggested that a partial cut be applied to this stand within the next ten years. Based on the large amounts of mature ponderosa pine in this cover type, it is likely that within the near future the ponderosa pine will drop out of the stand fairly rapidly. If this stand were cut by a shelterwood method at least one additional entry into the stand to remove the overstory would be required in approximately 30 years. This type of silvicultural system has the following disadvantage. Seedlings and reproduction is damaged when the residual overstory is removed.

Douglas-fir

Based on the stand stucture (a majority of the trees less than 18 inches in diameter) it is suggested that a selection thinning be applied. A selection thinning removes trees in the upper crown classes with the objective of stimulating the growth of trees in the lower crown classes. This type of management action would reduce the number of trees per acre and help maintain a thrifty stand.

Since some of the trees removed in the selection thinning will be of commercial size, a skidding system will be required. Slopes in this

cover type are steep (50% to 80%) and therfore ground skidding would be considered undesireable. Small cable systems could be used to skid the felled material to the lake's edge. If old skid trails are present in this cover type, it would be possible to use horses to skid the small material to the water edge.

A thinning of this type would leave a substantial amount of slash on the ground. This slash could either be piled by hand and burned or lopped and scattered. If the project forester determines the amount of slash following thinning to be insignificant as far as fire hazard, insect buildup and visual impact is concerned, no slash removal in this cover type would be necessary.

A selection thinning of this type would probably not significantly increase the amount of browse material available in this cover type. Thinnings are designed to create stands which fully utilize the site. The aesthetic impact of the selection thinning will be minimal. Only about one-third of the trees per acre would be removed and this would not change the visual appearance of the forest to a significant degree.

The stand currently appears to be in a fairly healthy condition based on the low insect and disease activity. Therefore it is not anticipated that any action in this cover type is critical. It is suggested that a thinning of the type described be applied to this area sometime within the next 20 years.

Cedar

This cover type is not extensive in the 0 to 5 mile management unit. Therefore any management action taken in this cover type would

have to be integrated with actions taken in surrounding stands. From the stand and stock table it is evident that this cover type has very high volumes (62,000 bd. ft. per acre). A partial cut or shelterwood system could be used in this cover type. If this system were used, the majority of the volume removed would be grand fir in the 20 to 28 inch diameter classes. If no silvicultural treatment is applied, the grand fir will become over-mature and the stand will take on a very decadent appearance. Slopes in this cover type are very steep. The type of logging system employed can not utilize ground skidding.

Slash disposal following treatment could be by hand piling and burning or by lopping and scattereng. If a partial cut were conducted in this stand and all of the grand fir removed, the browse situation will probably not change significantly. Significant amounts of browse do not currently exist in the understory and removal of the grand fir will probably not encourage browse production. The type of logging system and slash removal required on these steep slopes will probably not encourage sprouting of browse material.

The aesthetic impact of a partial cut in this cover type will not be significant. An excellent stand of immature cedar exists and this canopy cover will mask any management action which removed the grand fir.

Based on the size of the grand fir, it is suggested that a partial cut be accomplished in this cover type as soon as possible. Grand fir normally matures at about 100 years. Therefore it is imperative to remove the over-mature grand fir and establish a young, healthy, pure cedar stand.

Ponderosa pine

The only silvicultural treatment that could be applied to this cover type is a single tree selection method of harvest. Some individual trees are dead and dying and are very visible from the Dam and visitor center. Therefore, it is recommended that those decadent trees be removed on a single tree basis. The type of logging system needed to remove these individual trees would have to be some form of aerial or cable yarding system. The steepness of terrain in this type negates the use of any ground yarding system.

If a single tree selection system of harvesting is employed, it is not anticipated that htere will be a substantial increase in the amount of browse available. Numerious browse-shrub species currently exist. However, the heights of these species generally do not qualify them as winter range forage. Due to the geographical location of this cover type the standard 2 to 8 foot availability rating may not be appropriate. The amount of snow received on this south facing slope is probably not significant. Therefore the availability ratings may not give an accurate picture in terms of browse availability.

Since this stand has only a few decadent trees at this time, the urgency for silvicultural treatment is not great. It is anticipated that this stand could be left untreated for some time without significantly affecting the thrift and vigor of the entire cover type.

Grand fir

This cover type accounts for a very small proportion of the area

in this management unit. Therefore, any management action implemented in this cover type would have to be coordinated with management actions in adjacent cover types.

The stand and stock table indicates this stand is currently understocked. Therefore, it is recommended that no management action be taken in this cover type for several years.

Adequate amounts of coniferous regeneration currently exist in the stand. If no management action is taken dureing the next 30 to 50 years the density of this cover type will probably increase to the point where it fully utilizes the site. The current status of the browse will not change for several years.