THE REGIONAL FOREST NUTRITION RESEARCH PROJECT INFORMATION MANAGEMENT SYSTEM

RFNRP Report Number 3
1984

Rick Ells

College of Forest Resources AR-10
University of Washington
Seattle, Washington 98195

The author is the RFNRP Database Manager. The system described in this paper has developed over the fifteen year history of RFNRP and is the result of the efforts of many people. Primary among those people are Dr. Kenneth Turnbull, Dr. Stanley Gessel, Charley Peterson, and Albert Becker. The author would like to thank Dr. Robert Curtis, Dr. Kurt Riitters, Dr. Nick Chappell and the many others who helped in the preparation of this paper.

This report is a publication of the Regional Forest Nutrition Research Project, a cooperative program initiated in 1969 to provide forest managers with accurate growth data for managed stands of Douglas-fir and western hemlock in western Oregon and western Washington. Over 30 Pacific Northwest forest industry companies, state and federal agencies, and fertilizer manufacturers provide support and direction for the Project. The RFNRP Report Series is intended to enhance communication of forest fertilization research results within the RFNRP community. Prepared to meet internal RFNRP needs, reports in the series may be descriptions of work in progress as well as final statements of research results.

SUMMARY

Information management in a large scale, cooperative research project can become quite complex. The system for handling tree measurements, soils data, and installation history information used by the Regional Forest Nutrition Project is described. A key part of the system is a small database containing descriptive information about each plot and installation. This central database serves to direct users to the location of the information they are seeking in two much larger databases, one for tree measurements data and one for soils. The tree measurement data management system consists of a set of FORTRAN programs developed within RFNRP. This system includes programs for producing reports and data files summarizing the tree measurements data. The soils data is stored in a hierarchical database system. A system for sharing the data among RFNRP cooperators and other researchers is described.

TABLE OF CONTENTS

1. Introduction 1
   1.1 The Regional Forest Nutrition Project 1
   1.2 Information Managment System Description 2
2. Manager - Installation and Plot Information 2
3. PSP - Permanent Sample Plot Information 5
   3.1 Tree Measurements Data File 5
   3.2 Field Cards 6
   3.3 Reports 7
      3.3.1 Tree Measurements Listing 7
      3.3.2 PSP Report 7
      3.3.3 Stand Summary 8
   3.4 Data Files 9
4. Soils - SIR Database 10
   4.1 Soils Database Organization 10
      4.1.1 General Installation Information 10
      4.1.2 Forest Floor 12
      4.1.3 Qualitative Soil Description 12
      4.1.4 Soil Profile 12
   4.2 Soils Report 13

Appendix I - Sharing of RFNRP Data 15
   I.1 Data Sharing Policy 15
   I.2 Data Sharing Procedure 16

Appendix II - Standard Codes 17
   II.1 Tree Species Codes 17
   II.2 Treatment Codes 18

Appendix III - Summary of Available Data 19

Appendix IV - Example of Manager Interactive Session 27

Appendix V - Examples of Tree Measurements Data Management System Reports 28
   V.1 Field Card 28
   V.2 Measurements Listing 29
   V.3 PSP Report 30
   V.4 Stand Summary 44

Appendix VI - Example of Soils Report 45

THE REGIONAL FOREST NUTRITION RESEARCH PROJECT INFORMATION MANAGEMENT SYSTEM

Rick Ells

1 Introduction

Large scale cooperative research projects create complex data management problems. Measurements are taken on many different variables at many different sites. Remeasurements are taken on some variables at intervals over long periods of time. The purposes for which the data are used vary and may not have been predictable when the system for managing the data was set up. How may large amounts of information be handled such that it is safe, new information may be added, costs are minimized, and the information is readily accessible?

The Regional Forest Nutrition Research Project (RFNRP) has faced all of these problems in managing its large database. The purpose of this paper is to describe the overall data management system that has been developed at RFNRP. Such a description should encourage proper, efficent use of the database and should be helpful in planning future directions in RFNRP database management.

1.1 The Regional Forest Nutrition Research Project

RNFRP was initiated in 1969 as a cooperative effort to determine average regional growth response of Douglas-fir and western hemlock stands to nitrogen fertilizer.

Installations are established on cooperators' land and measured by the RFNRP field crew. Measurements are then loaded into the RFNRP IMS and preliminary analysis is done by a project mensurationist. Cooperators also may request data (see Appendix I).

The project is just completing its fourth phase. Phase One (1969-71) included the establishment of 117 installations. Phase Two (1971-75) added 43 new installations, Phase Three (1975-80) added 29 more installations, and Phase Four (1980-85) added 34 installations. In addition, 43 contract research installations have also been established. Data from all installations are stored in a single central file. The numbers of installations established in each phase and their general locations are summarized in Table 1. For a detailed

description of the designs of RFNRP installations, see Hazard and Peterson, 1984.

Geographically, the scope of RFNRP is limited to western Washington and western Oregon. For management and analysis purposes, this area has been divided into six units. Province numbers are assigned to a given installation depending on which unit the installation is located in and what the primary tree species of the installation is. A map of the provinces is shown in Figure 1. Note that three of the six units have two province numbers, one for Douglas fir (DF) installations and one for western hemlock (WH) installations.

1.2 Information Management System Description

At the heart of the RFNRP system is a simple relational database named "Manager" containing basic installation and plot description and history information. This central database is purposely kept small and simple to increase the speed of its operation and to lower costs. Using Manager, lists of information about installations or plots can quickly be produced. For example, a list of elevation, aspect, and site species of all installations in Oregon established before 1980 could be produced in less than a minute with only a few commands. Lists produced by Manager are used for planning further information retrievals and analysis.

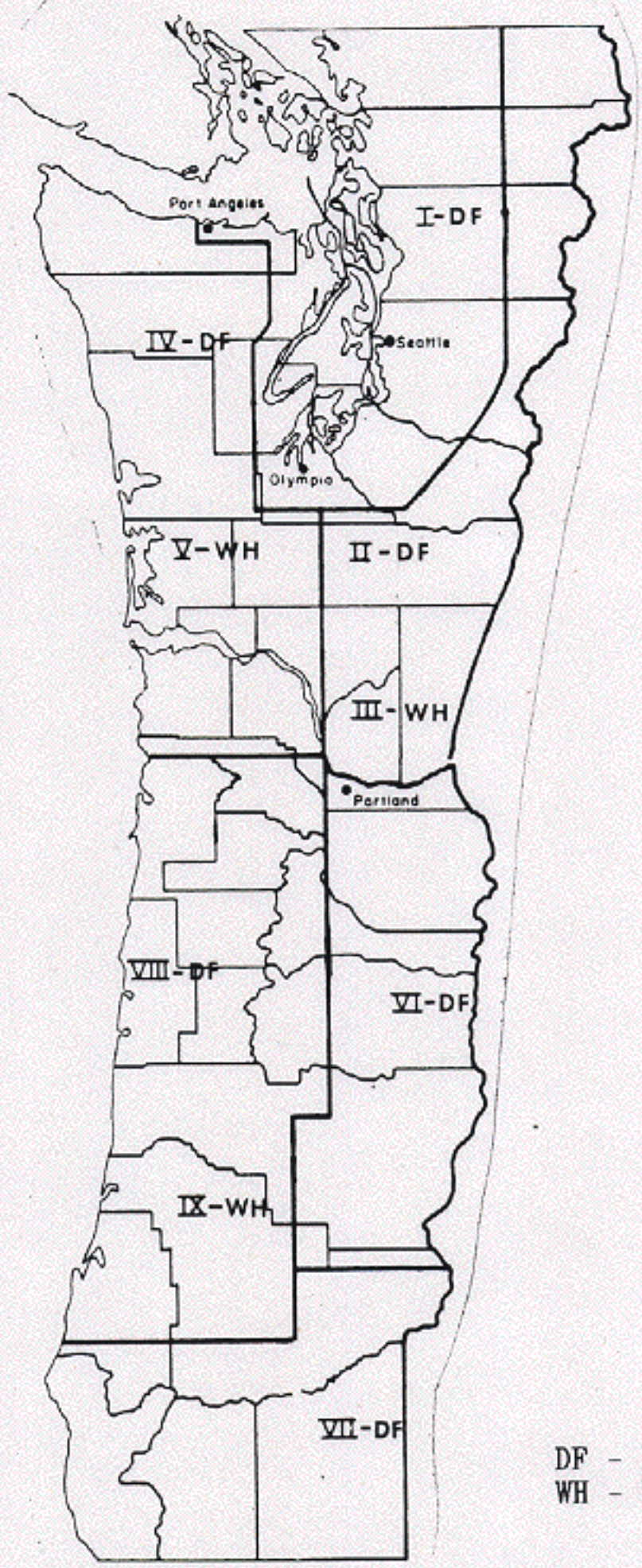
The actual lab and field measurement data are stored in two much larger database systems, one for tree measurements and the other for soils data. The tree measurements are handled by the "Permanent Sample Plot" (PSP) data management system, which consists of a large data file and a set of FORTRAN programs. Quantative and qualitative soils data is stored in "Soils", a hierarchical database using the Scientific Information Retrieval (SIR) package.

Each of these three systems, Manager, PSP, and Soils, will be described and the variables they contain will be listed. In addition, in appendices the RFNRP data sharing procedure, standard RFNRP data codes, and data availability are documented.

2 Manager - Installation and Plot Information

Descriptions of installations and plots and brief records of all actions relating to them are maintained in a small relational data base. Variables included in the system are as follows.

* Installation number
* Installation name



DF - Douglas fir
WH - Western hemlock

Figure 1 - Douglas fir and western hemlock provinces of the Regional Forest Nutrition Research Project

Table 1 - Installations established during each RFNRP phase.

Provinces	RFNRP Phases: Phase One 1969-71	Phase Two 1971-75	Phase Three 1975-80	Phase Four 1980-85	Contract Installations 1973-84	Totals
I-DF	15	7	11	2	6	41
II-DF	14	6	2	7	1	30
III-WH	11	4	0	3	0	18
IV-DF	19	7	3	2	1	32
V-WH	12	2	3	6	0	23
VI-DF	12	7	5	6	10	40
VII-DF	10	2	1	4	14	31
VIII-DF	18	6	3	4	7	38
IX-WH	6	2	1	0	0	9
E. Wash.	0	0	0	0	4	4
Totals	117	43	29	34	43	266

* Landowner
* Month and year installation was established
* RFNRP phase of establishment
* Site species
* Section, township, and range of installation
* Age of stand at time of establishment, year
* Site index, 50 year for Douglas fir installations (King, 1966), 100 year for western hemlock (Barnes, 1962)
* Province number
* Elevation, feet
* General slope of installation, percent
* Aspect of installation

* Plot number
* Plot size, acres
* Month and year of management action
* Description of action, (treatments, disturbances)

Information in Manager is stored in a series of small data sets called "relations", each with a small number of logically related variables. For example, one relation contains the names of installations and the names of the owners of the lands on which the installations are established. Another has location information, including province, section, township, and range. To use Manager, relations with relevant information for a given problem are first joined together into a new, larger relation. Next, information from the new relation is listed by stating the variables to be listed, the criteria by which cases are selected, and instructions on how they are to be listed (i.e., sorted). An example of such a Manager interactive session is shown in Appendix IV.

3 PSP - Permanent Sample Plot Information

The Permanent Sample Plot (PSP) data management system includes the large main data file and a number of programs for checking, correcting, listing, summarizing, and analyzing the data. The basic inputs and output of the system are depicted in Figure 2.

3.1 Tree Measurements Data File

Most tree data recorded from RFNRP installations are stored in the main Tree Measurements Data File. The file now contains measurements from over 110,000 trees, including 600,000 diameter and 65,000 height measurements. The field cards for remeasurements are generated from this file and new data recorded on the cards is then loaded into the file. Variables in the file are as follows:

* Installation name and number
* Plot number
* Plot size
* Measurement years
* Tree number
* Species
* Crown Class

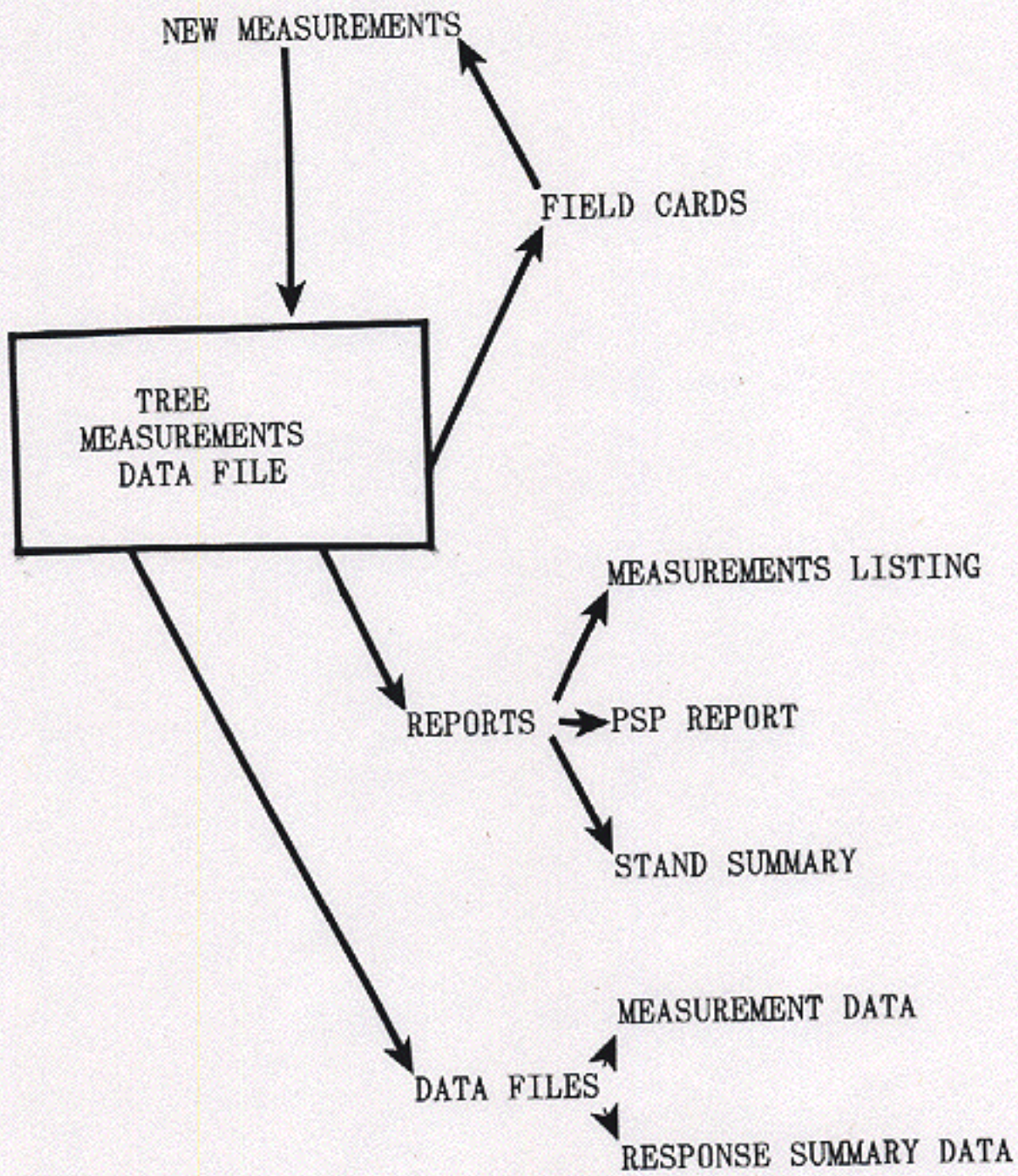


Figure 2. PSP Data Management System

* Diameter breast height, inches
* Total heights (usually only on tarif and site trees), feet
* Total age of tree at establishment of installation (usually only on site trees), years
* Notes on the condition of tree

3.2 Field Cards

To assure the quality of field measurements, RFNRP has used preprinted field measurement cards since the beginning of the project. The cards, printed on heavy, waterproof paper, show the measurements taken in the previous two periods, as well as providing space for new measurements. Such a system allows the field crew to check new measurements as they are taken, thus reducing errors. An example of an RFNRP field card is in Appendix V.1.

3.3 Reports

Several standard reports are generated from tree measurement data. These reports may be generated for any installation or set of installations. The standard reports are the Tree Measurements Listing, the Permanent Sample Plot (PSP) Report, and the Stand Summary.

3.3.1 Tree Measurements Listing

The Tree Measurements Listing is a list of the data as they currently exist in the main data file. The listing is labelled and formatted for easy reference. An example of a Tree Measurements Listing is shown in Appendix V.2.

3.3.2 PSP Report

The PSP Report is a large, detailed listing of information about each plot within a given installation, including stand tarifs, site indices, and tree diameters, heights, basal areas and volumes. An example of a PSP Report is in Appendix V.3. The report may be output onto either paper or microfiche.

Algorithms used in generating the PSP Report were developed by Dr. Turnbull from standard methods in the literature. Site indices have a 50 year index age for Douglas fir installations (King, 1966) and a 100 year index age for western hemlock installations (Barnes, 1962). Tarifs and volumes are calculated using formulas published by Brackett (1977). The volume measures available include the following:

CVT	Cubic volume with top only, cubic feet
CVTS	Cubic volume including top and stump, cubic feet
CV4	Cubic volume to four-inch top, cubic feet

CV6	Cubic volume to six-inch top, cubic feet
CV8	Cubic volume to eight-inch top, cubic feet
SV6	Scribner volume to six-inch top, board feet
SV8	Scribner volume to eight-inch top, board feet
IV6	International 1/4-inch volume to a six inch top, board feet
IV8	International 1/4-inch volume to an eight inch top, board feet

To generate a PSP Report, the type of volume to be calculated, the specific years of data to be used, and the minimum tree diameter for inclusion into the calculations are each specified. For example, for a given installation, a PSP Report may be wanted that uses cubic volume including top and stump (CVTS), all years of data, with a minimum tree diameter of 1.55 inches.

In an individual PSP Report, only one volume measure may be used. The following information is produced for each separate plot:

* Permanent sample plot report summary page
* Tarif sample data
* Site index sample data
* Site height summary
* Breast height age summary
* Site index summary
* Volumes by tree by year
* Stand tables by DBH class
    - Number of trees
        = Increment on plot
        = Increment per acre per year
    - Basal Area
        = Increment on plot
        = Increment per acre per year
    - Volume
        = Increment on plot
        = Increment per acre per year
* Species component data
    - Stems per acre
    - Basal area per acre
    - Volume per acre

3.3.3 Stand Summary

Information from the PSP Report is summarized in the Stand Summary. Each line of the summary gives information for one plot for one period of time.

Each line of the Stand Summary contains the following information:

* M OR T - Type of volume measure used, merchantable of total
* PERIOD - Period number
* BEGIN - Beginning year of period
* LENGTH - Length of period in years
* PLOT - Plot identification number
* AGE - Initial average beast height age of site index trees, years
* AGE CL - Age class
* SITE - Site index
* SITE CL - Site class
* STEMS - Initial number of stems per acre
* BA - Initial basal area, square feet per acre
* VOL - Initial volume, cubic feet per acre
* Gross increments during period
  . GSTINC - Trees per acre per year (ingrowth)
  . GBINC - Basal area in square feet per acre per year
  . GVINC - Volume in cubic feet per acre per year
* Net increments during period
  . NSTINC - Trees per acre per year (ingrowth minus mortality & thinning)
  . NBINC - Basal area, square feet per acre per year
  . NVINC - Volume, cubic feet per acre per year
* TARIF - Tarif number, 50 year for DF plots, 100 year for WH plots
* S HGT - Initial average height of site index trees, feet
* S HGTI - Net increment of average site height, feet per year
* % BA - Percent basal area of the site species
* S SPEC - Site species
* ACODE - Installation number
* TREAT - Treatment

An example of a Stand Summary listing is shown in Appendix V.4.

3.4 Data Files

Increasingly, researchers want data files in addition to printed reports. The data may be edited and used in computer programs such as SPSS, MINITAB, and BMDP. Both the tree measurements data and the Stand Summary data can be produced as data files suitable for direct analysis.

4 Soils SIR Database

Qualitative soil data and soil chemical and physical profile data are stored in a separate database, along with general installation information, and forest floor data. This soils database is implemented on S.I.R., the Scientific Information Retrieval data management system, a hierarchical data dictionary DBMS (Robinson et al., 1980).

4.1 Soils Database Organization

The Soils SIR database contains four record types. Three of the record types are sorted simply by installation, with one record for each installation. The fourth record type is sorted by both installation and soil profile horizon. Thus a given installation may have several Type 4 records, one for each horizon on which data was collected. The record types contain the following data:

Record Type 1: General Installation Information
Record Type 2: Forest Floor Data
Record Type 3: Qualitative Soil Data
Record Type 4: Soil Profile Chemical and Physical Data

The organization of the Soils SIR database is summarized in Figure 2.

4.1.1 General Installation Information

The variables contained in the general installation information record (Record Type 1) are as follows:

* Installation number
* Site species
* RFNRP province designation
* Site index
* State
* County
* Numerical code for installation owner
* Owner's name
* Installation location (section, township, range)
* Aspect
* Slope, percent
* Elevation, meters
* Mean annual precipitation, inches
* Total stand age, years
* Date of collection of original data

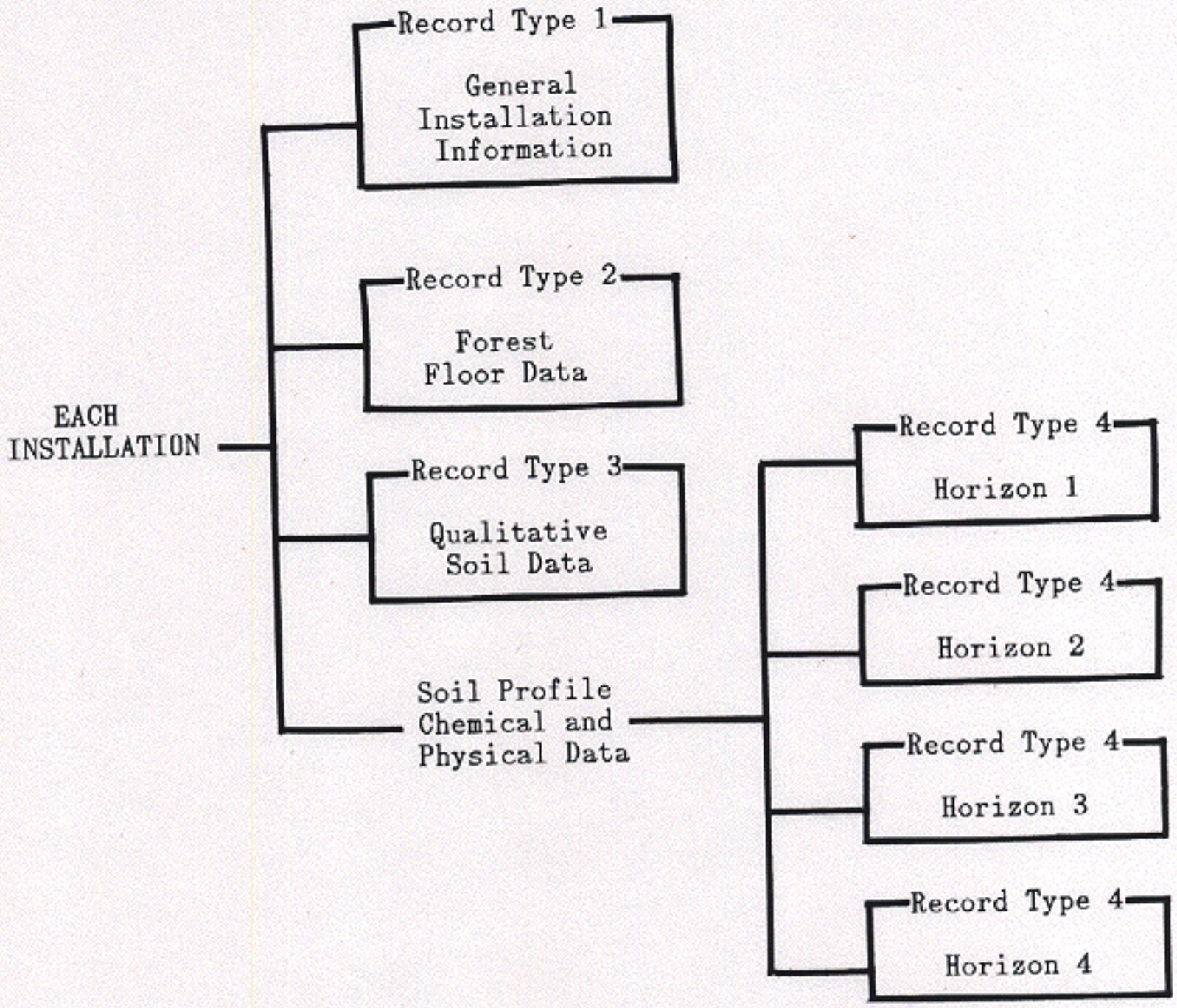


Figure 2. Heirarchical Organization of Data in the Soils SIR Database. Each box represents a record.

4.1.2 Forest Floor

The variables contained in the forest floor data record (Record Type 2) are as follows:

* Installation number
* Total surface litter weight, kg/ha
* Litter total nitrogen, % (Bremner, 1965)
* Total litter nitrogen weight, kg/ha
* Litter total carbon, % (Allison et al, 1965)
* Litter C:N ratio

4.1.3 Qualitative Soil Description

The variables contained in the qualitative soil description record (Record Type 3) are the following:

* Installation number
* Parent material type
* Parent material description
* Soilname or USDA-SCS soil series designation
* Soil classification system used
* USDA-SCS soil taxonomy family
* USDA-SCS soil taxonomy order
* USDA-SCS moisture regime
* USDA-SCS temperature regime
* USDA-SCS soil series

4.1.4 Soil Profile

The variables contained in the soil profile data record (Record Type 4) are as follows:

* Installation number
* Horizon sequence number
* Soil horizon designation
* Horizon thickness in cm.
* Total soil N, %, Kjeldahl method (Bremner, 1965)
* Total soil C, %, LECO combustion method (Allison et al., 1965)
* Bulk density, grams per cubic cm.
* Soil pH, 1:1 soil-water suspensions
* Exchangeable Ca, meq 100/g, ammonium acetate extraction (Jackson, 1958)
* Exchangeable Mg, meq 100/g, ammonium acetate extraction (Jackson, 1958)
* Exchangeable K, meq 100/g, ammonium acetate extraction

(Jackson, 1958)
* Cation exchange capacity, meq 100/g, ammonium acetate extraction (Jackson, 1958)
* Available phosphorous, ppm, Bray #2 extraction (Jackson, 1958)
* Total phosphorous, ppm, perchloric acid digestion (Jackson, 1958)
* Moist/dry Munsell soil color
* Presence of mottling
* USDA-SCS soil texture code
* Percentage silt, field determination
* Percentage clay, field determination
* USDA-SCS soil structure grade code
* USDA-SCS soil structure aggregate size code
* USDA-SCS soil structure aggregate form code
* USDA-SCS soil consistency code, dry
* USDA-SCS soil consistency code, moist
* USDA-SCS soil consistency code, wet
* USDA-SCS soil plasticity code
* Percent gravel by volume
* Horizon boundary thickness/topography

4.2 Soils Report

A standard report summarizing soils data can be generated for each installation. An example of such a report is shown in Appendix VI.

REFERENCES

1. Allison, L.E., W.B. Bollen, and C.D. Moodie. 1965. Total carbon. In C.A. Black et al. (ed) Methods of soil analysis, Part 2. Agronomy 9:1346-1366. A. Soc. of Agron., Inc., Madison, Wis.
2. Barnes, G.H. 1962. Yield of even-aged stands of western hemlock. Technical Bulletin No. 1273, USDA, Forest Service. September 1962.
3. Brackett, M. 1977. Notes on Tarif Tree Volume Computation. Washington State D.N.R. Resource Management Report No. 24. As amended, April 17, 1979.
4. Bremner, J.M. 1965. Total nitrogen. In C.A. Black et al. (ed.) Methods of soil analysis, Part 2. Agronomy 9:1149-1178. Am. Soc. of Agron., Inc., Madison, Wis.
5. Ensminger, L.E. 1954. Some factors affecting the adsorption of sulfate by Alabama soils. Soil Sci. Soc. Am. Proc. 18:259-264.
6. Hazard, J.W. and C. Peterson. 1984. Objectives and analytical methods of the Regional Forest Nutrition Research Project. Contr. no. 53. Institute of Forest Resources, University of Washington.
7. Husch, B., C.I. Miller and T.W. Beers. 1972. Forest Mensuration. Second edition. John Wiley & Sons.
8. Jackson, M.L. 1958. Soil chemical analysis. Prentice-Hall, Inc., Englewood Cliffs, N.J.
9. King, James E. 1966. Site index curves for Douglas-fir in the Pacific Northwest. Weyerhaeuser Forestry Paper No. 8. Weyerhaeuser Forestry Research Center, Centralia, Washington.
10. Robinson, B. N., G.D. Anderson & E. Cohen. 1980. Scientific Information Retrieval user's manual, version two. SIR, Inc., Evanston Illinois
11. Soil Survey Staff. 1975. Soil taxonomy; A basic system of soil classification for making and interpreting soil surveys. USDA Soil Conservation Service. Agriculture Handbook No. 436.

APPENDIX I
SHARING OF RFNRP DATA

RFNRP benefits in many ways by making the data available to legitimate users. While it is the intent of this policy to encourage such use, it is necessary to impose some limitations on the use of this information. The intent of this policy is to obtain some benefit to all Cooperators from the use made of their data. The College of Forest Resources Advisory Committee has promulgated a policy for use and availability of RFNRP data.

I.1 Data Sharing Policy

Cooperators in the RFNRP have access to data from plots on their land at any time. They will, however, pay any expenses incurred by the Project to prepare the data. The following points apply to request for data from plots of other ownership, and individuals, companies and organizations not members of the Cooperative.

I.1.1 Review

Each request for use will be carefully considered by the Principal Investigator and his staff on an individual basis and details of the request will be negotiated.

I.1.2 Requests

In order to evaluate whether the request can be honored, each request for information must include (a) description of general project for which the data are requested; (b) questions to be examined; (c) analytical technique to be used; (d) other data involved; (e) expected results of analysis and how results will be used; (f) how the Regional Project and Cooperators may benefit from use of the data; and (g) the specific data requested.

I.1.3 Ownership Anonymity

Access to data will be approved only under conditions of ownership anonymity (i.e., legal descriptions of locations will not be provided). In cases where anonymity cannot be guaranteed, the landowner's written permission must be obtained.

I.1.4 Signed Agreement

Requests for extensive use of Project data will require a signed agreement.

I.1.5 Results

Results and conclusions from studies involving the use of Project data must be shared with Cooperators.

I.1.6 Release and Credit

Data on which the Project intends to publish will not be released until after publication by Project personnel. All publications using RFNRP data must credit that fact.

I.2 Data Sharing Procedure

Once a data sharing agreement has been reached, the person or organization receiving the data should provide RFNRP with (1) a purchase order to which costs for the data retrieval and transfer may be charged, and (2) a magnetic tape or tapes. Alternatively, RFNRP can arrange for the purchase of tapes, with the costs being charged to the purchase order.

The standard tape format for data transfer is nine-track, 1600 bpi, unlabelled, ASCII, 80 character maximum record length, and 1600 character maximum blocking length (20 records per block). Other formats can be arranged by contacting the RFNRP Database Manager.

Data may also be transferred by phone line data transmission or by 5 1/4 inch floppy disk. Contact the Database Manager for further information.

APPENDIX II
Standard Codes

II.1 Tree Species Codes

The following species codes are used in the RFNRP database

Conifers

Douglas-fir	(Pseudotsuga menziesii)	DF
western hemlock	(Tsuga heterophylla)	WH
western redcedar	(Thuja plicata)	RC
western white pine	(Pinus monticola)	WP
ponderosa pine	(Pinus ponderosa)	PP
lodgepole pine	(Pinus contorta)	LP
western larch	(Larix occidentalis)	WL
Sitka spruce	(Picea sitchensis)	SS
Pacific silver fir	(Abies amabilis)	SF
grand fir	(Abies grandis)	GF
noble fir	(Abies procera)	NF
Alaska yellow cedar	(Chamaecyparis nootkatensis)	YC
sugar pine	(Pinus lambertina)	SP
Jeffry pine	(Pinus jeffrei)	JP
knobcone pine	(Pinus attenuata)	KP
California red fir	(Abies magnifica)	RF
white fir	(Abies concolor)	WF
incense-cedar	(Libocedrus decurrens)	IC
Port Orford cedar	(Chamaecyparis lawsoniana)	PC
western yew	(Taxus brevifolia)	WY
juniper	(Juniperus spp.)	JU

Hardwoods

bigleaf maple	(Acer macrophyllum)	MA
black cottonwood	(Populus trichocarpa)	BC
red alder	(Alnus rubra)	RA
Oregon ash	(Fraxinus latifolia)	OA
madrone	(Arbutus menziesii)	MD
waxmyrtle	(Myrica spp.)	WM
hazel	(Corylus cornuta)	HZ
golden chinkapin	(Castanopsis chrysophylla)	GC
tanoak	(Lithocarpus densiflorus)	TO
Oregon myrtle	(Umbellularia californica)	MY
mountain ash	(Sorbus spp.)	MT
quaking aspen	(Populus tremuloides)	QA
willow	(Salix spp.)	SX
birch	(Betula spp.)	BR

Sitka alder	(Alnus sinuata)	SA
Oregon white oak	(Quercus garryana)	OO
crab-apple	(Malus diversifolia)	AP
hawthorn	(Crataegus douglasii)	HW
bitter cherry	(Prunus emarginata)	CH
Douglas maple	(Acer glabrum)	DM
vine maple	(Acer circinatum)	VM
cascara	(Rhamnus purshiana)	CA
dogwood	(Cornus nuttallii)	DW
serviceberry	(Amelanchier spp.)	SB

II.2 Treatment Codes

Treatment codes, which are used on several RFNRP reports summarize the treatments a given plot received at establishment and first retreatment.

0N	No fertilizer and no thinning
2N	200 lbs N per acre initially with urea fertilizer
4N	400 lbs N per acre initially with urea fertilizer
0T	No fertilizer, initially thinned
2T	2N + thinned initially
4T	4N + thinned initially
02	No fertilizer initially, 200 lbs N per acre after 8 years using urea
22	2N + 02
42	4N + 02
1T	0T + 02
3T	2T + 02
5T	4T + 02
2A	200 lbs N per acre intially with ammonium nitrate
4F	4N + other nutrients
2D	0T + 200 lbs N per acre with urea after 2 years

APPENDIX III
Summary of Available Data

Field years (YEARS) are identified by the year they begin. Thus, the field year identified by "70" includes the period from September 1970 to August 1971.

Codes used are as follows.

- E - Established, including surveying, marking, initial treatment, and measurements
- R - Remeasured. Measurements taken on all original plots.
- r - Remeasured, but at least one of the original plots has been dropped.
- D - Dropped. Final remeasurements taken during same field year.

NUMBER	INSTALLATION NAME	OWNER	YEARS 677777777778888 901234567890123
1	CEDAR FALLS	SEATTLE WATERSHED	E R R R R R R R
2	ELK RIVER	BOISE CASCADE	E R R R D
3	COPALIS CROSSING	BOISE CASCADE	E R R R R R R R
4	HUMPTULIPS	ITT RAYONIER	E R R R R R R D
5	CEDAR FALLS POWER LINE	SEATTLE WATERSHED	E R R R R R R R
6	CALLIGAN LAKE	WEYERHAEUSER	E R D
7	EAST HUMPTULIPS	ITT RAYONIER	E R R R R R R R
8	PROMISED LAND	ITT RAYONIER	E R R R R R R R
9	BURNT HILL LOOKOUT	ITT RAYONIER	E R R R R R R D
10	COLTON/OREGON CITY	PUBLISHERS PAPER	E R R R R R R R
11	MAPLE GROVE/MOLALLA	PUBLISHERS PAPER	E R R R R R R R
12	CAMP WILLARD	BROUGHTON LUMBER	D
13	PORT LUDLOW ROAD	POPE & TALBOT	E R R R R R R R
14	HOOD CANAL BRIDGE	POPE & TALBOT	E R R R D
15	SAPPHO	MERRILL & RING	E R R R R R R D
16	SOUTH FORK OHOP	ST. REGIS	E R R R R R R D

NUMBER	INSTALLATION NAME	OWNER	YEARS 677777777778888 901234567890123
17	LITTLE OHOP CREEK	ST. REGIS	E R R R R R R R
18	FRAME CREEK	ST. REGIS	E R R R R R R R
19	FALL CREEK	LONGVIEW FIBRE	E R R R R r r r
20	DEEP CREEK	LONGVIEW FIBRE	E R R R R R R R
21	CRAWFORD MTN.	WEYERHAEUSER	E R R R R R R R
22	WICKERSHAM	GEORGIA PACIFIC	E R R R R R R R
23	BALD MTN.	GEORGIA PACIFIC	E R R R R R D
24	ANDERSON LAKE	GEORGIA PACIFIC	E R R R R D
25	WOLF CREEK/SWING LOG ROAD	B.L.M.	E R R R R R R R
26	WALTON/BISHOP ROAD	B.L.M.	E R R R R R R R
27	W. FORK LONG TOM RIVER	B.L.M.	E R R R R R R R
28	PRAIRIE MT. ROAD	B.L.M.	E R R R R R R R
29	SNOW PEAK	WILLAMETTE INDUSTRIES	E R R R R R R R
30	HAMILTON CREEK	WILLAMETTE INDUSTRIES	E R R R R R R R
31	SOCIALIST VALLEY	WILLAMETTE INDUSTRIES	E R R R R R R R
32	BLACK ROCK	WILLAMETTE INDUSTRIES	E R R R R R R R
33	MINERAL CREEK	WEYERHAEUSER	E R R R R D
34	DAVIDSON LAKE	BOISE CASCADE	E R R R R R R R
35	KING CREEK ACCESS ROAD	ST. REGIS	E R R D
36	BIG CREEK	BOISE CASCADE	E R R R D
37	CAMP 10 ROAD	BOISE CASCADE	E R R R R R R R
38	PALM ROSE ROAD	BOISE CASCADE	E R R R R R R D
39	VOLMER CREEK	CROWN ZELLERBACH	E R R R R R R D
40	BARNEY CREEK	CROWN ZELLERBACH	E R D
41	FISH HAWK CREEK	CROWN ZELLERBACH	E R R R r r r r
42	CATHLAMET	CROWN ZELLERBACH	E R R R R R R D
43	SKYKOMISH	WA. D.N.R.	E R R R R R R R
44	MUD LAKE	SCOTT PAPER	E R R R R D
45	FRENCH CREEK	WA. D.N.R.	E R R R R R R R
46	MONUMENT PEAK-UPPER	BOISE CASCADE	E R R R R R R R
47	MONUMENT PEAK-LOWER	BOISE CASCADE	E R R R R R R R
48	ROOT CREEK	BOISE CASCADE	E R R R R R R R
49	NORTH BEAVER CREEK	CROWN ZELLERBACH	E R R R R R D
50	STORY MTN. BURN	CROWN ZELLERBACH	E R R R R R R R
51	MIDDLE FORK ROGUE RIVER	BOISE CASCADE	E R R R R R R R
52	DUDLEY MTN.	B.L.M.	E R R R D
53	CAMP GRISDALE	SIMPSON TIMBER	E R R R R R R R
54	MATLOCK NORTH	WA. D.N.R.	E R R R R R R R
55	MATLOCK EAST	WA. D.N.R.	E R R R R R R R
56	RHODE LAKE	WA. D.N.R.	E R R D
57	HEADQUARTER CAMP	WEYERHAEUSER	E R R R R R R R

NUMBER	INSTALLATION NAME	OWNER	YEARS 677777777778888 901234567890123
58	ECHO GLEN	WA. D.N.R.	E R R R R R R
59	TIGER MTN.	WA. D.N.R.	E R R R R R D
60	LAKE NAWATZEL	WA. D.N.R.	E R R R R R R
61	CALAPOOYA RIVER	WEYERHAEUSER	E R R R R R R
62	DOLLAR ROAD	B.L.M.	E R R R R R R
63	MT. JUNE ROAD	B.L.M.	E R R R R R R
64	GIBSON CREEK	U.S.F.S.	E R R R R R R
65	FOURTH CREEK	U.S.F.S.	E R R R R R R
66	DEAD MTN. ROAD	U.S.F.S	E R R R R R R
67	BEAVER CREEK/TILLER	U.S.F.S.	E R R R R R R
68	FISH-HAWK LAKE	LONGVIEW FIBRE	E R R R R R R
69	ROCK CREEK	LONGVIEW FIBRE	E R R R R R R
70	GOLD CREEK 100 ROAD	PUBLISHERS PAPER	E R R R D
71	CEDAR LAKE	U.S.F.S.	E R R R R R R
72	CLOVERDALE	PUBLISHERS PAPER	E R R R D
73	KELLOW CREEK	PUBLISHERS PAPER	E R R R R R D
74	WALDPORT	U.S.F.S.	E R R R R R R
75	TAHUYA RIVER	WA. D.N.R.	D
76	PROJECT 3 ROAD	WA. D.N.R.	E R R R R R R
77	MID FORK OF SATSOP RIVER	WA. D.N.R.	E R R R R R R
78	EATONVILLE TRIANGLE	WA. D.N.R.	E r r r r r r
79	EAST FORT LEWIS	WA. D.N.R.	E R R D
80	LITTLETON CREEK	U.S.F.S.	E R R R R R D
81	NORTH POINT LOOKOUT	WA. D.N.R.	E R R R R R R
82	KUGEL CREEK	U.S.F.S.	E R R R R R R
83	HUNGER MTN.	U.S.F.S.	E R R R R R R
84	MT. GUNDERSON	WA. D.N.R.	E R R R R R D
85	GREEN PETER RESERVOIR	BARRINGER & ASSOCIATES	E R R R R R r
86	KLICAT MTN.	U.S.F.S.	E R R D
87	CROCHLINE SADDLE	U.S.F.S.	E R R R R R R
88	BURNT RIDGE	B.L.M.	E R R R R R r
89	ELK CREEK	B.L.M.	E R R R R R R
90	SINGLE TREE LOOKOUT	B.L.M.	E R R R R R R
91	WONDER	B.L.M.	E R R R D
92	AZALEA	B.L.M.	E R R R R R R
93	LUSBY CABIN	B.L.M.	E R R R R R R
94	JUNIPER FALLS	U.S.F.S.	E R R R D
95	LITTLE WHITE SALMON RIVER	BROUGHTON LUMBER	E R R R R R R

NUMBER	INSTALLATION NAME	OWNER	YEARS 677777777778888 901234567890123
96	CATHLAMET EAST	CROWN ZELLERBACH	E R R D
97	YACOLT BURN/ROCK CREEK	LONGVIEW FIBRE	E R R R R R R
98	TONGUE MTN.	U.S.F.S.	E R R R R R R
99	SOLEDUCK RIVER	ITT RAYONIER	E R R R R R R
100	NEAH BAY	CROWN ZELLERBACH	E R R R R R D
101	THORNDYKE HOMESTEAD	POPE & TALBOT	E R R R R R R
102	CASPER CREEK	HAMPTON TREE FARMS	E R R R R R R
103	CRISTY FLATS	U.S.F.S.	E R R R R R R
104	VAUGHN	INTERNATIONAL PAPER	E R R R R R D
105	ANATUVIC SADDLE	B.L.M.	E R R R R R R
106	MILL CREEK	U.S.F.S.	E R R R R R R
107	ABBOT CREEK	U.S.F.S.	E R R R D
108	JAP LAKE NUDIST COLONY	WA. D.N.R.	E R R R D
109	BEAVER LAKE/ECHO LAKE	SCOTT PAPER	E R R R R R R
110	WHITE CHUCK MTN.	U.S.F.S.	E R r r r r r
111	MARCKWORTH FOREST	WA. D.N.R.	E R R R R R D
112	CAMP 7	ST. REGIS	E R R R R R R
113	ROCKPORT	SCOTT PAPER	E R R R R R R
114	LUCERNE CREEK	MENASHA CORP.	E R R R R R R
115	BRUSH CREEK	B.L.M.	E R R R R R D
116	NEAL CREEK	CHAMPION INTERNATIONAL	E R R R D
117	LANDERS CREEK	CHAMPION INTERNATIONAL	E R R R R R R
118	PROJECT 3	WA. D.N.R.	E R R R R R R
119	LAKE NAWATZEL/PROJECT 5	WA. D.N.R.	E R R R R R R
120	MATLOCK SOUTH	WA. D.N.R.	E R R R R R R
121	RAYMOND	ITT RAYIONER	E R R R R R R
122	FRAME CREEK	ST. REGIS	E R R R R R R
123	COPALIS CROSSING	BOISE CASCADE	E R R R R R R
124	KLAHOWYA	WA. D.N.R.	E R R R R R R
125	CURTIN	B.L.M.	E R R R R R R
126	MAPLETON	U.S.F.S.	E R R R R R R
127	ECHO LAKE	SCOTT PAPER	E R R R R R D
128	RANDLE	U.S.F.S.	E R R R R R R
129	SNOW PEAK	WILLAMETTE INDUSTRIES	E R R R R R R
130	LANDERS CREEK	CHAMPION INTERNATIONAL	E R R R R R R
131	BIRKENFELD	LONGVIEW FIBRE	E R R R R R R
132	ROOTS CREEK	BOISE CASCADE	E R R R R R R
133	CAMP 7	ST. REGIS	E R R R R R r
134	PACK FOREST	UNIVERSITY OF WASH.	E R R R R R
135	FOUNTAIN OF YOUTH	FRUIT GROWERS SUPPLY	E R R R R R
136	VOIGHT CREEK	ST. REGIS	E R R R R R

NUMBER	INSTALLATION NAME	OWNER	YEARS 677777777778888 901234567890123
137	KING CREEK #2	ST. REGIS	E R R R R r
138	BECKLER RIVER	U.S.F.S.	E R R R R R
139	GARLAND SPRINGS	U.S.F.S.	E R R R R R
140	VAUGHN	B.L.M.	E R R R R R
141	SOCIALIST VALLEY	WILLAMETTE INDUSTRIES	E R R R R R
142	BAKER CREEK	WILLAMETTE INDUSTRIES	E R R R R R
143	SWEET HOME/JACKSON CREEK	BARRINGER & ASSOCIATES	E R R R R R
144	GRAVEL CREEK	REX TIMBER	E R R R R R
145	DOLLAR ROAD #2	WILLAMETTE INDUSTRIES	E R R R R R
146	MOSBY CREEK	REX TIMBER	E R R R R R
147	JEWELL	OREGON ST. FORESTRY DEPT	E R R R R R
148	WHEELER ROAD	OREGON ST. FORESTRY DEPT	E R R R R R
149	CAMP JOY	U.S.F.S.	E R R R R R
150	LESTER	U.S.F.S.	E R R R R R
151	OLD BALDY	B.L.M.	E R R R R R
152	LAYING CREEK	U.S.F.S.	E R R R R R
153	BUN CREEK	PUBLISHERS PAPER	E R R R R R
154	DETROIT ROAD	U.S.F.S.	E R R D
155	BREMERTON WATERSHED	POPE & TALBOT	E R R R R R
156	COYLE	POPE & TALBOT	E R R R R R
157	SOUTH FORK-SOLEDUCK RIVER	U.S.F.S.	E R R R R R
158	SNIDER WORK CENTER	U.S.F.S.	E R R R R R
159	CEDAR RIVER	SEATTLE WATERSHED	E R R R R R
160	ORTING	WEYERHAEUSER	E R R R D
161	YELLOW BOTTOM ROAD	B.L.M.	E R R R D
162	MARY'S PEAK	B.L.M.	E R R R D
163	NORTH FORK-UMPQUA RIVER	B.L.M.	E R R R D
164	BOTTLE CREEK	B.L.M.	E R R R D
165	MAJORS CREEK	B.L.M.	E R R R D
166	HULT LUMBER COMPANY	B.L.M.	E R R R D
167	HANKS LAKES	SIMPSON TIMBER CO.	E R R R R
168	SIMPSON LOG YARD	SIMPSON TIMBER CO.	E R R R R
169	CROCKER GRANGE	ST. REGIS	E r r r r
170	BENSON LAKE	POPE & TALBOT	E r r r r
171	WIND RIVER	U.S.F.S.	E R R R R
172	COUGAR DAM	U.S.F.S.	E R R R R
173	BUCK MTN. TOWERS	B.L.M	E R R R R
174	MACE MOUNTAIN	B.L.M.	E R R R R
175	WEAVER CREEK	B.L.M.	E R R R R
176	MOUNT SHEP	B.L.M.	E R R R R
177	PACK FOREST LOOK-OUT	UNIVERSITY OF WASH.	E R R R R
178	(NO INSTALLATION)		
179	MAYTOWN	BOISE CASCADE	E R R R r

NUMBER	INSTALLATION NAME	OWNER	YEARS 677777777778888 901234567890123
180	GREENWATER	WEYERHAEUSER	E R R R R
181	ALOHA TAVERN	BOISE CASCADE	E R R R R
182	MORTON	BOISE CASCADE	E R R R r
183	BROWNSVILLE	WILLAMETTE INDUSTRIES	E R R R r
184	VESTA CREEK	WEYERHAEUSER	E R R R R
185	BELLINGHAM G.P.	GEORGIA PACIFIC	E R r r r
186	GRANITE FALLS	SCOTT PAPER	E R R R R
187	SOUTH BEND	ITT RAYONIER	E R R D
188	CRANE CREEK	QUINAULT INDIAN RES.	E R R R R
189	COUGAR MOUNTAIN	REX TIMBER	E R R R R
190	HORNER RANCH	REX TIMBER	E R R R R
191	NAPAVINE/STEARNS CREEK	WA. D.N.R.	E R R R r
192	WHITE RIVER	WEYERHAEUSER	E R R R R
193	COW CREEK	BOISE CASCADE	E R R R R
194	GIUSTINA BROS.	GIUSTINA BROS.	E R R R R
195	CADY LAKE	WA. D.N.R.	E R R R R
196	PORT GAMBLE	POPE & TALBOT	E R R R R
197	MCKENZIE BRIDGE	U.S.F.S.	E R R D
198	MONGOLD PARK	U.S.F.S.	E R R D
199	FALL CREEK A	U.S.F.S.	E R R D
200	FALL CREEK B	U.S.F.S.	E R R D
201	SOURCE OF N		
202	(NO INSTALLATION)		
203	ESTACADA	U.S.F.S.	E R D
204	BUCK PEAK	U.S.F.S.	E R R R
205	PAGE MOUNTAIN	U.S.F.S.	E R R R
206	ELKO CAMPGROUND	U.S.F.S.	E R R R
207	EAST LOOKOUT	U.S.F.S.	E R R R
208	BRUSH MOUNTAIN	U.S.F.S.	E R R R
209	SALMON MOUNTAIN	U.S.F.S.	E R R R
210	FOGGY CREEK	U.S.F.S.	E R R R
211	CHINA CREEK	U.S.F.S.	E R R R
212	EVANS CREEK	B.L.M.	E R R R
213	BUNNY MEADOWS	B.L.M.	E R R R
214	PLEASANT CREEK	B.L.M.	E R D
215	LICK GULCH	B.L.M.	E R R R
216	SPENCER CREEK	B.L.M.	E R R R
217	DEER CREEK	B.L.M.	E R R R
218	KENADY-MARTIN	UNIV. OF WASH. (SPECIAL STUDY)	
219	MAC-STENNIS	UNIV. OF WASH. (SPECIAL STUDY)	
220	MASHEL RIVER	WEYERHAEUSER	E R R D
221	ROCHESTER	WEYERHAEUSER	E R R D
222	MCBEE CREEK	U.S.F.S.	E
223	TIMBER MOUNTAIN	U.S.F.S.	E R R D
224	BESTROM MEADOW	U.S.F.S.	E R R D

NUMBER	INSTALLATION NAME	OWNER	YEARS 677777777778888 901234567890123
225	BOD-TUR	U.S.F.S.	E D
226	HENRY CREEK	U.S.F.S.	E R R
227	MCKENNA	WEYERHAEUSER	ERRRR
228	MOLALLA	PUBLISHERS PAPER	ERRRR
229	SUTHERLIN	CHAMPION INTERNATIONAL	ERRRR
230	BEAVER DAM ROAD	OREGON ST. FORESTRY	ERRR
231	ELKTON	INTERNATIONAL PAPER	ERRR
232	ELECTRON LOOKOUT	ST. REGIS	E R
233	DIVIDE ROAD	ST. REGIS	E R
234	RAINIER SCHOOL	ST. REGIS	E R
235	MUD MOUNTAIN DAM	ST. REGIS	E R
236	FEDERATION FOREST	WEYERHAEUSER	E R
237	FEDERATION FOREST	WEYERHAEUSER	E R
238	GREENWOOD ROAD	BOISE CASCADE	E R
239	PACIFIC BEACH CUTOFF	BOISE CASCADE	E R
240	(NO INSTALLATION)		
241	RIPPLEBROOK	U.S.F.S.	E R
242	CLACKAMAS	CROWN ZELLERBACH	E R
243	ABIQUA MAIN LINE	LONGVIEW FIBRE	E R
244	WHISKEY BUTTE	BARRINGER & ASSOCIATES	E R
245	SADDLE MTN. ROAD	OREGON DEPT. FORESTRY	E R
246	BELL MOUNTAIN ROAD	LONGVIEW FIBRE	E R
247	RADIO HILL	WEYERHAEUSER	E R
248	GREEN MOUNTAIN	CHAMPION INTERNATIONAL	E R
249	DENNIE-AHL	U.S.F.S.	E R
250	BROWNS CREEK	U.S.F.S.	E R
251	SCHAEFFER STATE PARK	BOISE CASCADE	E R
252	NEILTON	ITT RAYONIER	E D
253	SNAG CREEK	CROWN ZELLERBACH	E R
254	FOX CREEK	U.S.F.S.	E R
255	EMILY RIDGE	U.S.F.S.	E R
256	SNAKETOOTH BUTTE	U.S.F.S.	E R
257	SILVER PANTHER	CHAMPION INTERNATIONAL	E R
258	SWAMP CREEK	INTERNATIONAL PAPER	
259	MARSH CREEK	INTERNATIONAL PAPER	E R
260	CULTUS MOUNTAIN	GEORGIA PACIFIC	E R
261	CAMP MCGREGOR	INTERNATIONAL PAPER	E R
262	NECANICUM JUNCTION	BOISE CASCADE	E R
263	UPPER METHENY CREEK	U.S.F.S.	E R
264	DEER CREEK	POPE & TALBOT	E R
265	BARNABY SLOUGH	SCOTT PAPER	E R
266	SATSOP CEMETARY	BOISE CASCADE	E R
267	ENUMCLAW MCI	WEYERHAEUSER	E
268	MOLALLA MCI	CROWN ZELLERBACH	E
269	SHELTON MCI	SIMPSON	E

APPENDIX IV - Example of MANAGER Interactive Session

```
F> UWRIM                                                    [ Enter the relational
                                                              database program ]
R> USER PASSWRD                                             [ Identify user ]
R> OPEN MANAGER                                             [ Open MANAGER database ]
R> LISTREL INAME                                            [ Request listing of
                                                              variables in relation
                                                              INAME.]
                    RELATION : INAME
     LAST MOD : 84/08/17            READ PASSWORD : YES
     SCHEMA : MANAGER               MODIFY PASSWORD : YES

       NAME          TYPE           LENGTH          KEY

       INNUM         INT               1            YES
       INNAME        TEXT         25 CHARACTERS
       OWNER         TEXT         25 CHARACTERS
       SECTION       TEXT          8 CHARACTERS
       TWNSHP        TEXT          8 CHARACTERS
       RANGE         TEXT          8 CHARACTERS

R> LISTREL IFACT                                            [ Request listing of
                                                              variables in relation
                                                              IFACT.]
                    RELATION : IFACT
     LAST MOD : 84/08/17            READ PASSWORD : YES
     SCHEMA : MANAGER               MODIFY PASSWORD : YES

       NAME          TYPE           LENGTH          KEY

       INNUM         INT               1            YES
       ESTMN         INT               1
       ESTYR         INT               1
       TOTAGE        INT               1
       SI            INT               1
       SIZE          REAL              1
       ELEV          INT               1
       SLOPE         INT               1
       ASPECT        TEXT           8 CHARACTERS
          CURRENT NUMBER OF ROWS =      262

R> UNION INAME WITH IFACT FORMING IALL                      [ Create a union of INAME
                                                              and IFACT and name it
                                                              IALL, which will contain
                                                              all the variables from
                                                              INAME and IFACT.]
       SUCCESSFUL UNION
       CURRENT NUMBER OF ROWS =      262

R> SELECT INNUM INNAME ELEV SLOPE ASPECT FROM IALL SORTED BY INNUM +   [ Select out and list
R> WHERE INNUM GT 660                                                    several specific
                                                                         variables. The list
                                                                         will be sorted by
     INNUM    INNAME                    ELEV     SLOPE    ASPECT        INNUM and only
     -------  ------------------------  -------  -------  -------       installations with
        661   CEDAR STAND                1130        5   WEST          INNUM greater than
        662   DEER CREEK                   30        0   LEVEL         660 will be listed.]
        663   YELM ISLAND                  80        5   WEST
        664   ELK PARK                    380       10   NORTH
        665   CEDAR FALLS                 900       10   EAST
        666   FOREST GLEN                 100        0   LEVEL

R> EXIT
```

APPENDIX V - PSP Data Management System Reports
V.1 Field Card

UNIVERSITY OF WASHINGTON
COLLEGE OF FOREST RESOURCES

EXPERIMENTAL PLOTS REMEASUREMENT SHEET

AREA CODE	CONTROL PLOT	LOCATION AND PLOT	PAGE NO.
566	9001	200N-FOREST GLEN-PLOT 1	1
		TALLIED BY:	PLOT AREA IN ACRES .150

TREE NO.	SPEC.	CROWN CLASS	DBH-INCHES 1979	DBH-INCHES 1981	DBH-INCHES 1983	HEIGHT-FEET 1979	HEIGHT-FEET 1981	HEIGHT-FEET 1983	AGE 1969	SITE	CUT	COMMENTS
101	DF	D	12.9	13.0								
103	DF	D	15.1	15.7								
104	DF	D	20.9	21.4		117.0	120.0		35.	*		
105	DF	CD	9.5	9.7								
106	DF	CD	10.7	10.9								BASAL SCAR
108	WH	S	4.5	4.9								
109	WH	S	2.3	2.5								
110	DF	D	15.8	16.2								FROST SCARS
111	DF	CD	10.6	10.7								
112	DF	CD	11.1	11.4								
113	DF	CD	12.1	12.3								
114	DF	CD	11.3	11.5								
115	DF	CD	12.4	12.8								
116	DF	D	16.3	16.8								
117	DF	CD	9.5	9.6		86.0	0.0		32.			TOPOUT
118	DF	CD	8.6	8.7		79.0	80.0					
119	DF	CD	17.6	18.2		110.0	116.0		34.	*		
121	DF	CD	11.5	11.7								
122	DF	CD	8.8	9.0								
123	DF	CD	8.4	8.7								
124	DF	CD	10.2	10.4		88.0	93.0		31.			
126	DF	CD	10.4	10.6								
127	DF	CD	8.3	8.4								
129	DF	CD	8.2	8.2								
130	DF	CD	8.3	8.4								
131	DF	D	12.0	12.3								
133	DF	D	16.5	16.9		116.0	119.0		33.	*		
134	DF	CD	9.1	9.2								
135	DF	D	13.8	14.1								
136	DF	CD	9.0	9.1								
137	DF	D	14.1	14.4								
139	DF	CD	10.0	10.2								
140	DF	I	9.2	9.4								

V.2 Measurements Listing

AREA PLOT PAGE 1 ACRES
CODE NO. TREATMENT AND LOCATION .150
666 9001
200N-FOREST GLEN-PLOT 1

TREE NO.	SPEC	CRWN CLSS	DBH-INCHES YEARS 1969	1971	1973	1975	1977	HEIGHT-FEET YEARS 1969	1971	1973	1975	1977	AGE YEAR 1969	S F	C F	NOTES
			1979	1981				1979	1981							
101	DF	D	11.9	12.2	12.4	12.6	12.8									
			12.9	13.0												
103	DF	D	12.8	13.4	13.9	14.0	14.7									
			15.1	15.7												
104	DF	D	18.0	18.6	19.2	19.8	20.3	96.	0.	105.	107.	112.	35.	1		
			20.9	21.4				117.	120.							
105	DF	CD	8.7	9.0	9.1	9.2	9.5									
			9.5	9.7												
106	DF	CD	10.0	10.2	10.3	10.4	10.6									BASAL SCAR
			10.7	10.9												
107	WH	S	1.6	1.6	.0	.0	.0									
			.0	.0												
108	WH	S	3.8	3.8	4.0	4.1	4.4									
			4.5	4.9												
109	WH	S	1.9	1.9	2.0	2.1	2.2									
			2.3	2.5												
110	DF	D	14.0	14.3	14.8	15.1	15.5									FROST SCARS
			15.8	16.2												
111	DF	CD	10.3	10.5	10.5	10.5	10.6									
			10.6	10.7												
112	DF	CD	9.5	9.9	10.2	10.5	10.8									
			11.1	11.4												
113	DF	CD	11.8	12.0	12.0	12.0	12.1									
			12.1	12.3												
114	DF	CD	10.0	10.4	10.5	10.7	11.1									
			11.3	11.5												
115	DF	CD	10.5	10.9	11.3	11.7	12.2									
			12.4	12.8												
116	DF	D	13.5	13.9	14.7	15.1	15.7									
			16.3	16.8												
117	DF	CD	9.2	9.4	9.4	9.4	9.5	77.	0.	84.	86.	86.	32.			TOPOUT
			9.5	9.6				86.	0.							
118	DF	CD	7.8	8.2	8.3	8.3	8.6	69.	0.	75.	77.	78.				
			8.6	8.7				79.	80.							

6669001HEADING 200N-FOREST GLEN-PLOT 1

PERMANENT SAMPLE PLOT REPORT FOR

AREA CODE	PLOT NUMBER	NAME AND LOCATION	AREA IN ACRES
666	9001	200N-FOREST GLEN-PLOT 1	.150

PUNCHED OUTPUT	TREE LIST	DIAMETER GRTH.CHCK.	SPECIES BREAKDOWN	BREAKDOWN PERIOD	LOWER DBH LIMIT	TOP DIAMETER	SELECTED PERIODS	VOLUME TYPE
YES	YES	YES	NO	1	1.55	0.00	YES	CVTS

MEASUREMENT YEARS USED

	1969	1971	1973	1975	1977	1979
RECORDS READ			NUMBER OF LIVE TREES READ (BY PERIOD)			
67	67	66	55	52	52	52
RECORDS USED			NUMBER OF LIVE TREES USED			
67	67	66	55	52	52	52

GROWTH CHECK SUMMARY

NUMBER OF TREES SHRINKING

0	0	0	0	0

NUMBER OF TREES WITH GROWTH OVER .3 INCH/YEAR

4	2	1	6	3

NUMBER OF TREES WITH MISSING MEASURMENTS

0	0	0	0	0	0

SHRINKING TREES DESIGNATED BY -CHECK IN TREE LISTING
TREES GROWING OVER .3 INCH/YEAR DESIGNATED BY +CHECK IN TREE LISTING
TREES WITH MISSING MEASUREMENTS DESIGNATED BY 0CHECK IN TREE LISTING

6669001TARIFTREES200N-FOREST GLEN-PLOT 1

TARIF SAMPLE DATA ** (TARIF NUMBERS OUTSIDE THE RANGE OF TWO STANDARD DEVIATIONS HAVE BEEN REJECTED)

		1969	1971	1973	1975	1977	1979
104 DF	H	96.0	0.0	105.0	107.0	112.0	117.0
	D	18.0	18.6	19.2	19.8	20.3	20.9
	T	32.94	0.00	35.36	35.66	37.06	38.37
117 DF	H	77.0	0.0	84.0	86.0	86.0	86.0
	D	9.2	9.4	9.4	9.4	9.5	9.5
	T	33.62	0.00	36.57	37.49	37.33	37.33
118 DF	H	69.0	0.0	75.0	77.0	78.0	79.0
	D	7.8	8.2	8.3	8.3	8.6	8.6
	T	32.02	0.00	34.11	35.09	35.05	35.53
119 DF	H	91.0	0.0	100.0	103.0	107.0	110.0
	D	14.7	15.3	15.8	16.2	17.0	17.6
	T	33.53	0.00	36.06	36.85	37.68	38.29
124 DF	H	75.0	0.0	82.0	86.0	87.0	88.0
	D	9.3	9.5	9.7	9.9	10.1	10.2
	T	32.54	0.00	35.20	36.72	36.88	37.18
133 DF	H	89.0	0.0	96.0	101.0	107.0	116.0
	D	13.4	14.1	14.7	15.3	16.0	16.5
	T	33.90	0.00	35.47	36.86	38.51	41.39
148 DF	H	98.0	0.0	107.0	111.0	117.0	122.0
	D	17.0	17.6	18.0	18.4	19.2	19.9
	T	34.37	0.00	36.91	38.04	39.55	40.76
154 DF	H	61.0	0.0	0.0	0.0	0.0	0.0
	D	5.1	5.1	0.0	0.0	0.0	0.0
	T	34.63	0.00	0.00	0.00	0.00	0.00
155 DF	H	88.0	0.0	94.0	94.0	97.0	99.0
	D	11.7	12.1	12.4	12.8	13.3	13.5
	T	35.26	0.00	36.97	36.53	37.21	37.81
156 DF	H	67.0	0.0	71.0	74.0	74.0	74.0
	D	6.6	6.7	6.7	6.7	6.7	6.7
	T	33.46	0.00	35.37	36.97	36.97	36.97
163 DF	H	64.0	0.0	0.0	0.0	0.0	0.0
	D	5.2	5.3	0.0	0.0	0.0	0.0
	T.	36.07	0.00	0.00	0.00	0.00	0.00
167 DF	H	95.0	0.0	105.0	109.0	115.0	123.0
	D	15.3	15.9	16.4	16.9	17.5	17.8
	T	34.57	0.00	37.43	38.49	40.17	42.77

6669001TARIF SUM 200N-FOREST GLEN-PLOT 1

TARIF SUMMARY

	1969	1971	1973	1975	1977	1979
DF TARIF	33.9	34.9	35.9	36.9	37.6	38.6
STNDRD ERR	.331	0.000	.323	.319	.461	.717
N OF TREES	12.	0.	10.	10.	10.	10.
** TARIF	33.9	34.9	35.9	36.9	37.6	38.6
STNDRD.ERR	0.000	0.000	0.000	0.000	0.000	0.000
N OF TREES	0.	0.	0.	0.	0.	0.

6669001SITE TREES200N-FOREST GLEN-PLOT 1

SITE INDEX SAMPLE DATA

		1969	1971	1973	1975	1977	1979
104 DF	H	96.0	0.0	105.0	107.0	112.0	117.0
	A	35.	37.	39.	41.	43.	45.
	D	18.0	18.6	19.2	19.8	20.3	20.9
119 DF	H	91.0	0.0	100.0	103.0	107.0	110.0
	A	34.	36.	38.	40.	42.	44.
	D	14.7	15.3	15.8	16.2	17.0	17.6
133 DF	H	89.0	0.0	96.0	101.0	107.0	116.0
	A	33.	35.	37.	39.	41.	43.
	D	13.4	14.1	14.7	15.3	16.0	16.5
148 DF	H	98.0	0.0	107.0	111.0	117.0	122.0
	A	37.	39.	41.	43.	45.	47.
	D	17.0	17.6	18.0	18.4	19.2	19.9
155 DF	H	88.0	0.0	94.0	94.0	97.0	99.0
	A	33.	35.	37.	39.	41.	43.
	D	11.7	12.1	12.4	12.8	13.3	13.5
167 DF	H	95.0	0.0	105.0	109.0	115.0	123.0
	A	35.	37.	39.	41.	43.	45.
	D	15.3	15.9	16.4	16.9	17.5	17.8

6669001SITE SUM 200N-FOREST GLEN-PLOT 1

SITE HEIGHT SUMMARY

SPECIES	MEASUREMENT YEARS 1969	1971	1973	1975	1977	1979
DF	92.8	0.0	101.2	104.2	109.2	114.5
NO.	6.	0.	6.	6.	6.	6.

BREAST HEIGHT AGE SUMMARY

SPECIES	MEASUREMENT YEARS 1969	1971	1973	1975	1977	1979
DF	34.5	36.5	38.5	40.5	42.5	44.5
NO.	6.	6.	6.	6.	6.	6.

SITE INDEX SUMMARY

SPECIES	INDEX AGE	1969	1971	1973	1975	1977	1979
DF	50	120.6	0.0	121.0	120.2	121.7	123.6

6669001TREE LIST 200N-FOREST GLEN-PLOT 1

			MEASUREMENT YEARS 1969	1971	1973	1975	1977	1979
	101 DF	DBH	11.9	12.2	12.4	12.6	12.8	12.9
		BA	.772	.812	.839	.866	.894	.908
		VOL	26.9	29.2	31.2	33.1	34.9	36.5
+CHECK	103 DF	DBH	12.8	13.4	13.9	14.0	14.7	15.1
		BA	.894	.979	1.054	1.069	1.179	1.244
		VOL	31.5	35.8	39.8	41.4	46.9	51.0
+CHECK	104 DF	DBH	18.0	18.6	19.2	19.8	20.3	20.9
		BA	1.767	1.887	2.011	2.138	2.248	2.382
		VOL	64.8	71.4	78.5	85.9	92.3	100.6
	105 DF	DBH	8.7	9.0	9.1	9.2	9.5	9.5
		BA	.413	.442	.452	.462	.492	.492
		VOL	13.5	15.0	15.8	16.6	18.2	18.7
	106 DF	DBH	10.0	10.2	10.3	10.4	10.6	10.7
		BA	.545	.567	.579	.590	.613	.624
		VOL	18.4	19.8	20.8	21.8	23.2	24.3
	107 WH	DBH	1.6	1.6				
		BA	.014	.014				
		VOL	.2	.2				
	108 WH	DBH	3.8	3.8	4.0	4.1	4.4	4.5
		BA	.079	.079	.087	.092	.106	.110
		VOL	1.8	1.9	2.2	2.4	3.0	3.2
	109 WH	DBH	1.9	1.9	2.0	2.1	2.2	2.3
		BA	.020	.020	.022	.024	.026	.029
		VOL	.3	.3	.3	.4	.4	.5
	110 DF	DBH	14.0	14.3	14.8	15.1	15.5	15.8
		BA	1.069	1.115	1.195	1.244	1.310	1.362
		VOL	38.1	41.1	45.5	48.7	52.5	56.1
	111 DF	DBH	10.3	10.5	10.5	10.5	10.6	10.6
		BA	.579	.601	.601	.601	.613	.613
		VOL	19.6	21.1	21.7	22.3	23.2	23.8
	112 DF	DBH	9.5	9.9	10.2	10.5	10.8	11.1
		BA	.492	.535	.567	.601	.636	.672
		VOL	16.4	18.5	20.4	22.3	24.2	26.3
	113 DF	DBH	11.8	12.0	12.0	12.0	12.1	12.1
		BA	.759	.785	.785	.785	.799	.799
		VOL	26.4	28.2	29.0	29.8	30.9	31.8
	114 DF	DBH	10.0	10.4	10.5	10.7	11.1	11.3
		BA	.545	.590	.601	.624	.672	.696
		VOL	18.4	20.7	21.7	23.2	25.7	27.4
	115 DF	DBH	10.5	10.9	11.3	11.7	12.2	12.4
		BA	.601	.648	.696	.747	.812	.839
		VOL	20.5	22.9	25.5	28.2	31.5	33.5

6669001TREE LIST 200N-FOREST GLEN-PLOT 1

	117 DF	DBH	9.2	9.4	9.4	9.4	9.5	9.5
		BA	.462	.482	.482	.482	.492	.492
		VOL	15.3	16.5	17.0	17.5	18.2	18.7
	118 DF	DBH	7.8	8.2	8.3	8.3	8.6	8.6
		BA	.332	.367	.376	.376	.403	.403
		VOL	10.6	12.2	12.9	13.2	14.6	15.0
+CHECK	119 DF	DBH	14.7	15.3	15.8	16.2	17.0	17.6
		BA	1.179	1.277	1.362	1.431	1.576	1.689
		VOL	42.3	47.4	52.2	56.5	63.8	70.4
	120 DF	DBH	4.5	4.6				
		BA	.110	.115				
		VOL	2.8	3.1				
	121 DF	DBH	10.3	10.5	10.7	11.0	11.3	11.5
		BA	.579	.601	.624	.660	.696	.721
		VOL	19.6	21.1	22.6	24.7	26.7	28.5
	122 DF	DBH	8.5	8.6	8.7	8.7	8.8	8.8
		BA	.394	.403	.413	.413	.422	.422
		VOL	12.8	13.6	14.3	14.7	15.4	15.8
	123 DF	DBH	7.7	7.9	8.2	8.2	8.4	8.4
		BA	.323	.340	.367	.367	.385	.385
		VOL	10.3	11.2	12.5	12.9	13.9	14.2
	124 DF	DBH	9.3	9.5	9.7	9.9	10.1	10.2
		BA	.472	.492	.513	.535	.556	.567
		VOL	15.7	16.9	18.2	19.6	20.9	21.9
	125 DF	DBH	5.3	5.3				
		BA	.153	.153				
		VOL	4.3	4.4				
	126 DF	DBH	8.8	9.1	9.5	9.7	10.2	10.4
		BA	.422	.452	.492	.513	.567	.590
		VOL	13.9	15.4	17.4	18.7	21.3	22.9
	127 DF	DBH	7.8	8.0	8.1	8.1	8.3	8.3
		BA	.332	.349	.358	.358	.376	.376
		VOL	10.6	11.5	12.2	12.5	13.5	13.9
	128 DF	DBH	6.8					
		BA	.252					
		VOL	7.7					
	129 DF	DBH	7.9	8.0	8.1	8.1	8.2	8.2
		BA	.340	.349	.358	.358	.367	.367
		VOL	10.9	11.5	12.2	12.5	13.1	13.5
	130 DF	DBH	8.1	8.2	8.2	8.2	8.3	8.3
		BA	.358	.367	.367	.367	.376	.376
		VOL	11.5	12.2	12.5	12.9	13.5	13.9
	131 DF	DBH	10.1	10.5	10.9	11.2	11.6	12.0
		BA	.556	.601	.648	.684	.734	.785
		VOL	18.8	21.1	23.6	25.6	28.2	31.2

6669001TREE LIST 200N-FOREST GLEN-PLOT 1

	132 DF	DBH	6.0	6.0	6.0		
		BA	.196	.196	.196		
		VOL	5.8	5.9	6.1		
+CHECK	133 DF	DBH	13.4	14.1	14.7	15.3	16.0	16.5
		BA	.979	1.084	1.179	1.277	1.396	1.485
		VOL	34.7	39.9	44.8	50.0	56.1	61.5
	134 DF	DBH	8.7	8.9	9.0	9.0	9.1	9.1
		BA	.413	.432	.442	.442	.452	.452
		VOL	13.5	14.6	15.5	15.8	16.6	17.0
	135 DF	DBH	12.5	12.9	13.1	13.3	13.7	13.8
		BA	.852	.908	.936	.965	1.024	1.039
		VOL	29.9	33.0	35.1	37.1	40.4	42.1
	136 DF	DBH	8.5	8.8	8.8	8.9	9.0	9.0
		BA	.394	.422	.422	.432	.442	.442
		VOL	12.8	14.3	14.7	15.5	16.2	16.6
	137 DF	DBH	13.1	13.4	13.5	13.8	14.0	14.1
		BA	.936	.979	.994	1.039	1.069	1.084
		VOL	33.1	35.8	37.4	40.2	42.3	44.1
	138 DF	DBH	8.6	8.6				
		BA	.403	.403				
		VOL	13.2	13.6				
	139 DF	DBH	9.2	9.5	9.7	9.7	10.0	10.0
		BA	.462	.492	.513	.513	.545	.545
		VOL	15.3	16.9	18.2	18.7	20.4	21.0
	140 DF	DBH	8.5	8.8	8.8	8.8	9.1	9.2
		BA	.394	.422	.422	.422	.452	.462
		VOL	12.8	14.3	14.7	15.1	16.6	17.4
	141 DF	DBH	6.7	6.8				
		BA	.245	.252				
		VOL	7.5	7.9				
	142 DF	DBH	5.0	5.0	5.0			
		BA	.136	.136	.136			
		VOL	3.7	3.8	3.9			
	143 DF	DBH	7.6	8.0	8.2	8.2	8.4	8.4
		BA	.315	.349	.367	.367	.385	.385
		VOL	10.0	11.5	12.5	12.9	13.9	14.2
	144 DF	DBH	9.4	9.5	9.6	9.7	9.8	9.9
		BA	.482	.492	.503	.513	.524	.535
		VOL	16.1	16.9	17.8	18.7	19.5	20.5
	145 DF	DBH	9.8	10.2	10.3	10.5	10.7	10.9
		BA	.524	.567	.579	.601	.624	.648
		VOL	17.6	19.8	20.8	22.3	23.7	25.3
	146 DF	DBH	5.7	5.8				
		BA	.177	.183				
		VOL	5.1	5.5				

6669001TREE LIST 200N-FOREST GLEN-PLOT 1

	147	WH	DBH	1.9	1.9	2.0	2.1	2.2	2.3
			BA	.020	.020	.022	.024	.026	.029
			VOL	.3	.3	.3	.4	.4	.5
+CHECK	148	DF	DBH	17.0	17.6	18.0	18.4	19.2	19.9
			BA	1.576	1.689	1.767	1.847	2.011	2.160
			VOL	57.5	63.6	68.6	73.7	82.2	90.9
	149	DF	DBH	7.3	7.3	7.3			
			BA	.291	.291	.291			
			VOL	9.1	9.4	9.6			
	150	DF	DBH	9.2	9.3	9.5	9.5	9.5	9.5
			BA	.462	.472	.492	.492	.492	.492
			VOL	15.3	16.1	17.4	17.9	18.2	18.7
	151	DF	DBH	5.0	5.0				
			BA	.136	.136				
			VOL	3.7	3.8				
	152	DF	DBH	4.5	4.5				
			BA	.110	.110				
			VOL	2.8	2.9				
	153	DF	DBH	13.2	13.6	13.8	14.1	14.6	14.8
			BA	.950	1.009	1.039	1.084	1.163	1.195
			VOL	33.6	36.9	39.2	42.1	46.3	48.9
	154	DF	DBH	5.1	5.1				
			BA	.142	.142				
			VOL	3.9	4.0				
	155	DF	DBH	11.7	12.1	12.4	12.8	13.3	13.5
			BA	.747	.799	.839	.894	.965	.994
			VOL	25.9	28.7	31.2	34.2	37.9	40.2
	156	DF	DBH	6.6	6.7	6.7	6.7	6.7	6.7
			BA	.238	.245	.245	.245	.245	.245
			VOL	7.2	7.7	7.9	8.1	8.3	8.5
	157	DF	DBH	6.1	6.2	6.2	6.2	6.3	6.3
			BA	.203	.210	.210	.210	.216	.216
			VOL	6.0	6.4	6.6	6.8	7.2	7.4
	158	DF	DBH	7.5	7.7	7.8	7.9	8.1	8.2
			BA	.307	.323	.332	.340	.358	.367
			VOL	9.7	10.6	11.2	11.8	12.8	13.5
	159	DF	DBH	10.6	11.0	11.2	11.6	12.0	12.4
			BA	.613	.660	.684	.734	.785	.839
			VOL	20.9	23.4	25.0	27.7	30.4	33.5
	160	DF	DBH	8.2	8.5	8.6	8.7	8.9	8.9
			BA	.367	.394	.403	.413	.432	.432
			VOL	11.8	13.2	14.0	14.7	15.8	16.2
+CHECK	161	DF	DBH	11.5	12.0	12.5	12.9	13.5	13.8
			BA	.721	.785	.852	.908	.994	1.039
			VOL	25.0	28.2	31.7	34.8	39.1	42.1

6669001TREE LIST 200N-FOREST GLEN-PLOT 1

	162 DF DBH	16.9	17.3	17.7	18.2	18.8	19.3
	BA	1.558	1.632	1.709	1.807	1.928	2.032
	VOL	56.7	61.4	66.3	72.1	78.7	85.3
	163 DF DBH	5.2	5.3				
	BA	.147	.153				
	VOL	4.1	4.4				
	164 DF DBH	10.3	10.8	11.1	11.3	11.6	11.8
	BA	.579	.636	.672	.696	.734	.759
	VOL	19.6	22.4	24.5	26.1	28.2	30.1
	165 DF DBH	13.7	14.0	14.3	14.7	15.2	15.5
	BA	1.024	1.069	1.115	1.179	1.260	1.310
	VOL	36.4	39.3	42.3	46.0	50.4	53.9
	166 DF DBH	4.7	4.7				
	BA	.120	.120				
	VOL	3.2	3.3				
+CHECK	167 DF DBH	15.3	15.9	16.4	16.9	17.5	17.8
	BA	1.277	1.379	1.467	1.558	1.670	1.728
	VOL	46.0	51.4	56.5	61.7	67.8	72.1
	168 DF DBH	14.4	14.9	15.3	15.6	16.0	16.3
	BA	1.131	1.211	1.277	1.327	1.396	1.449
	VOL	40.5	44.8	48.8	52.1	56.1	59.9

6669001N OF TREES200N-FOREST GLEN-PLOT 1

ALL SPECIES

NUMBER OF TREES ** SUMMARY

TOTAL PER DBH CLASS

DBH	1969	1971	1973	1975	1977	1979
2	20.	20.	13.	13.	13.	13.
3	0.	0.	0.	0.	0.	0.
4	20.	13.	7.	7.	7.	7.
5	40.	47.	7.	0.	0.	0.
6	20.	20.	13.	7.	7.	7.
7	33.	20.	13.	7.	7.	7.
8	67.	53.	47.	47.	40.	40.
9	67.	80.	60.	53.	60.	60.
10	53.	47.	53.	53.	27.	27.
11	13.	20.	33.	27.	40.	40.
12	27.	27.	27.	20.	33.	33.
13	33.	20.	13.	27.	20.	13.
14	20.	33.	20.	20.	13.	20.
15	13.	13.	27.	27.	27.	20.
16	0.	7.	13.	13.	20.	27.
17	13.	7.	0.	7.	13.	0.
18	7.	7.	13.	13.	0.	13.
19	0.	7.	7.	0.	13.	7.
20	0.	0.	0.	7.	7.	7.
21	0.	0.	0.	0.	0.	7.
PLOT TOTAL	67.	66.	55.	52.	52.	52.
TOTAL/ACRE	446.7	440.0	366.7	346.7	346.7	346.7

INCREMENT ON PLOT

INGROWTH	0.	0.	0.	0.	0.
MORTALITY	1.	11.	3.	0.	0.
THINNINGS	0.	0.	0.	0.	0.
THIN + MORT	1.	11.	3.	0.	0.
NET (W INGRO)	-1.	-11.	-3.	0.	0.
GROSS(NO INGR)	0.	0.	0.	0.	0.
GROSS (W INGR)	0.	0.	0.	0.	0.

INCREMENT PER ACRE PER YEAR

INGROWTH	0.00	0.00	0.00	0.00	0.00
MORTALITY	3.33	36.67	10.00	0.00	0.00
THINNINGS	0.00	0.00	0.00	0.00	0.00
THIN + MORT	3.33	36.67	10.00	0.00	0.00
NET (W INGRO)	-3.33	-36.67	-10.00	0.00	0.00
GROSS(NO INGR)	0.00	0.00	0.00	0.00	0.00
GROSS (W INGR)	0.00	0.00	0.00	0.00	0.00

INCREMENT TOTALS (ALL PERIODS) IN PLOT						********** GRAND MEANS (PER ACRE PER YEAR) **********					
NET W INGR	INGROWTH	MORTALITY +THINNING	GROSS NO INGRO	GROSS W INGR	THINNINGS	NET W INGR	INGROWTH	MORTALITY +THINNING	GROSS NO INGRO	GROSS W INGR	THINNINGS
-15.	0.	15.	0.	0.	0.	-10.	0.	10.	0.	0.	0.

6669001BASAL AREA200N-FOREST GLEN-PLOT 1

ALL SPECIES

BASAL AREA ** SUMMARY

TOTAL PER DBH CLASS

DBH	1969	1971	1973	1975	1977	1979
2	.4	.4	.3	.3	.4	.4
3	0.0	0.0	0.0	0.0	0.0	0.0
4	2.0	1.3	.6	.6	.7	.7
5	5.6	6.4	.9	0.0	0.0	0.0
6	3.8	3.9	2.7	1.4	1.4	1.4
7	8.9	5.3	3.6	1.6	1.6	1.6
8	23.7	18.9	16.8	16.9	15.0	15.0
9	29.9	36.0	26.8	23.7	27.2	27.3
10	30.1	27.1	29.7	29.8	14.6	14.9
11	8.9	13.0	22.2	17.8	25.7	26.5
12	20.9	21.2	22.1	15.1	25.8	26.8
13	31.7	19.1	12.9	24.2	19.0	12.7
14	21.5	35.5	21.4	21.3	14.0	21.1
15	16.4	16.6	32.2	33.0	32.7	25.0
16	0.0	9.2	18.9	18.4	27.6	38.3
17	20.9	10.9	0.0	10.4	21.6	0.0
18	11.8	11.3	23.2	24.4	0.0	22.8
19	0.0	12.6	13.4	0.0	26.3	13.5
20	0.0	0.0	0.0	14.3	15.0	14.4
21	0.0	0.0	0.0	0.0	0.0	15.9
PLOT TOTAL	35.4	37.3	37.1	38.0	40.3	41.8
TOTAL/ACRE	236.2	248.6	247.5	253.0	268.6	278.4

INCREMENT ON PLOT

INGROWTH	0.00	0.00	0.00	0.00	0.00
MORTALITY	.25	1.78	.62	0.00	0.00
THINNINGS	0.00	0.00	0.00	0.00	0.00
THIN + MORT	.25	1.78	.62	0.00	0.00
NET (W INGRO)	1.85	-.15	.83	2.33	1.47
GROSS(NO INGR)	2.10	1.63	1.45	2.33	1.47
GROSS (W INGR)	2.10	1.63	1.45	2.33	1.47

INCREMENT PER ACRE PER YEAR

INGROWTH	0.00	0.00	0.00	0.00	0.00
MORTALITY	.84	5.95	2.08	0.00	0.00
THINNINGS	0.00	0.00	0.00	0.00	0.00
THIN + MORT	.84	5.95	2.08	0.00	0.00
NET (W INGRO)	6.16	-.51	2.76	7.75	4.91
GROSS(NO INGR)	7.00	5.44	4.83	7.75	4.91
GROSS (W INGR)	7.00	5.44	4.83	7.75	4.91

INCREMENT TOTALS (ALL PERIODS) IN PLOT						********** GRAND MEANS (PER ACRE PER YEAR) **********					
NET W INGR	INGROWTH	MORTALITY +THINNING	GROSS NO INGRO	GROSS W INGR	THINNINGS	NET W INGR	INGROWTH	MORTALITY +THINNING	GROSS NO INGRO	GROSS W INGR	THINNINGS
6.32	0.00	2.66	8.98	8.98	0.00	4.21	0.00	1.77	5.99	5.99	0.00

6669001VOLUME 200N-FOREST GLEN-PLOT 1

ALL SPECIES

VOLUME ** SUMMARY

TOTAL PER DBH CLASS

DBH	1969	1971	1973	1975	1977	1979
2	4.9	5.0	4.2	4.8	5.5	6.4
3	0.0	0.0	0.0	0.0	0.0	0.0
4	49.7	31.8	14.6	16.1	19.7	21.5
5	151.7	178.1	26.1	0.0	0.0	0.0
6	112.2	118.6	84.6	45.1	47.8	49.1
7	274.2	166.6	116.9	54.1	55.2	56.7
8	760.6	626.4	574.2	591.3	537.7	554.4
9	987.6	1228.0	938.8	851.6	999.1	1028.4
10	1017.4	947.2	1064.9	1095.5	547.9	574.9
11	305.9	457.8	807.7	664.2	977.6	1037.8
12	727.4	762.3	820.1	570.8	995.5	1066.9
13	1120.8	696.4	482.9	928.1	746.6	511.0
14	766.5	1305.0	808.2	824.7	551.4	855.5
15	588.7	614.8	1225.8	1288.9	1307.2	1025.2
16	0.0	342.7	724.5	723.9	1108.2	1583.2
17	761.3	409.2	0.0	411.3	877.0	0.0
18	431.7	424.2	899.4	971.8	0.0	949.9
19	0.0	476.1	523.5	0.0	1072.9	568.9
20	0.0	0.0	0.0	572.4	615.4	606.2
21	0.0	0.0	0.0	0.0	0.0	671.0
PLOT TOTAL	1209.1	1318.5	1367.5	1442.2	1569.7	1675.0
TOTAL/ACRE	8060.5	8790.3	9116.5	9614.4	10464.7	11166.8

INCREMENT ON PLOT

INGROWTH	0.00	0.00	0.00	0.00	0.00
MORTALITY	7.72	53.00	19.65	0.00	0.00
THINNINGS	0.00	0.00	0.00	0.00	0.00
THIN + MORT	7.72	53.00	19.65	0.00	0.00
NET (W INGRO)	109.47	48.93	74.68	127.55	105.31
GROSS(NO INGR)	117.19	101.93	94.33	127.55	105.31
GROSS (W INGR)	117.19	101.93	94.33	127.55	105.31

INCREMENT PER ACRE PER YEAR

INGROWTH	0.00	0.00	0.00	0.00	0.00
MORTALITY	25.73	176.67	65.49	0.00	0.00
THINNINGS	0.00	0.00	0.00	0.00	0.00
THIN + MORT	25.73	176.67	65.49	0.00	0.00
NET (W INGRO)	364.91	163.10	248.94	425.16	351.05
GROSS(NO INGR)	390.64	339.78	314.43	425.16	351.05
GROSS (W INGR)	390.64	339.78	314.43	425.16	351.05

INCREMENT TOTALS (ALL PERIODS) IN PLOT						********** GRAND MEANS (PER ACRE PER YEAR) **********					
NET W INGR	INGROWTH	MORTALITY +THINNING	GROSS NO INGRO	GROSS W INGR	THINNINGS	NET W INGR	INGROWTH	MORTALITY +THINNING	GROSS NO INGRO	GROSS W INGR	THINNINGS
465.95	0.00	80.37	546.31	546.31	0.00	310.63	0.00	53.58	364.21	364.21	0.00

6669001SPEC SUM 200N-FOREST GLEN-PLOT 1

SPECIES COMPONENT DATA

SPECIES	1969	1971	1973	1975	1977	1979
NUMBER OF STEMS PER ACRE						
DF	420.0	413.3	346.7	326.7	326.7	326.7
WH	26.7	26.7	20.0	20.0	20.0	20.0
ALL SPECIES	446.7	440.0	366.7	346.7	346.7	346.7
BASAL AREA PER ACRE						
DF	235.4	247.7	246.7	252.1	267.5	277.2
WH	.9	.9	.9	.9	1.1	1.1
ALL SPECIES	236.2	248.6	247.5	253.0	268.6	278.4
VOLUME PER ACRE						
DF	8043.6	8772.9	9097.7	9593.6	10439.5	11139.0
WH	16.9	17.4	18.8	20.8	25.2	27.8
ALL SPECIES	8060.5	8790.3	9116.5	9614.4	10464.7	11166.8

REGIONAL FOREST NUTRITION RESEARCH PROJECT
STAND SUMMARY

84/09/10.

MORT	PERIOD	BEGIN	LENGTH	PLOT	AGE	AGE CL	SITE	SITE CL	STEMS	BA	VOL	GSTINC	GBINC	GVINC	NSTINC	NBINC	NVINC	TARIF	SHGT	SHGTI	% BA	SSPEC	ACODE	TREAT	CRD NO
1	1	69	2	9001	35	4	121	2	447	236.2	8060	0	7.0	391	-3	6.2	365	34	93	0.0	100	DF	666	2N	1
1	2	71	2	9001	37	4	0	5	440	248.6	8790	0	5.4	340	-37	-.5	163	35	0	0.0	100	DF	666	2N	2
1	3	73	2	9001	39	4	121	2	367	247.5	9117	0	4.8	314	-10	2.8	249	36	101	1.5	100	DF	666	2N	3
1	4	75	2	9001	41	4	120	2	347	253.0	9614	0	7.8	425	0	7.8	425	37	104	2.5	100	DF	666	2N	4
1	5	77	2	9001	43	4	122	2	347	268.6	10465	0	4.9	351	0	4.9	351	38	109	3.0	100	DF	666	2N	5
1	1	69	2	9002	37	4	109	3	513	233.9	7793	0	7.5	456	-7	6.8	438	34	88	0.0	99	DF	666	42	6
1	2	71	2	9002	39	4	0	5	500	247.6	8670	0	4.3	346	-27	-.6	198	35	0	0.0	99	DF	666	42	7
1	3	73	2	9002	41	4	112	3	447	246.4	9067	0	6.6	406	-30	-.6	171	37	98	1.0	99	DF	666	42	8
1	4	75	2	9002	43	4	112	3	387	245.3	9409	0	7.0	475	-3	6.4	457	38	100	3.0	99	DF	666	42	9
1	5	77	2	9002	45	5	114	3	380	258.2	10322	0	6.0	431	-3	5.2	404	39	106	2.0	99	DF	666	42	10
1	1	69	2	9003	36	4	115	3	487	211.2	7020	3	7.5	392	0	7.3	386	34	92	0.0	98	DF	666	22	11
1	2	71	2	9003	38	4	0	5	487	225.8	7791	0	5.1	308	-30	-1.7	98	35	0	0.0	98	DF	666	22	12
1	3	73	2	9003	40	4	117	2	427	222.4	7987	0	4.6	320	-30	-3.8	41	36	101	2.5	98	DF	666	22	13
1	4	75	2	9003	42	4	119	2	367	214.9	8070	0	7.1	424	-7	6.1	393	37	106	2.5	98	DF	666	22	14
1	5	77	2	9003	44	4	120	2	353	227.1	8855	0	5.4	451	-10	3.6	391	38	111	3.0	98	DF	666	22	15
1	1	69	2	9004	33	3	117	2	407	209.0	7123	0	5.9	307	-3	4.7	270	34	88	0.0	100	DF	666	0N	16
1	2	71	2	9004	35	4	0	5	400	218.5	7662	0	3.0	201	-17	.5	131	35	0	0.0	100	DF	666	0N	17
1	3	73	2	9004	37	4	115	2	367	219.5	7925	0	5.2	328	-13	2.0	224	36	94	2.0	100	DF	666	0N	18
1	4	75	2	9004	39	4	115	3	340	223.4	8373	0	5.8	347	-3	3.7	270	37	98	2.0	100	DF	666	0N	19
1	5	77	2	9004	41	4	116	2	333	230.8	8914	0	4.6	394	-7	3.2	348	38	102	3.0	100	DF	666	0N	20
1	1	69	2	9005	36	4	110	3	507	220.0	7198	0	6.9	409	-17	4.3	338	33	88	0.0	100	DF	666	4N	21
1	2	71	2	9005	38	4	0	5	473	228.6	7873	0	4.7	339	-27	-.3	188	35	0	0.0	100	DF	666	4N	22
1	3	73	2	9005	40	4	110	3	420	228.0	8250	0	6.9	403	-30	-1.2	137	36	95	1.5	100	DF	666	4N	23
1	4	75	2	9005	42	4	110	3	360	225.6	8523	0	6.6	426	-3	5.8	398	37	98	2.5	100	DF	666	4N	24
1	5	77	2	9005	44	4	112	3	353	237.1	9318	0	5.9	414	-7	3.9	342	39	103	2.0	100	DF	666	4N	25
1	1	69	2	9006	35	4	108	3	460	196.3	6152	0	6.1	306	-7	5.4	290	32	85	0.0	100	DF	666	02	26
1	2	71	2	9006	37	4	0	5	447	207.1	6733	0	4.7	267	-30	-.7	115	33	0	0.0	100	DF	666	02	27
1	3	73	2	9006	39	4	109	3	387	205.7	6962	0	3.9	284	-10	.8	186	34	92	2.5	100	DF	666	02	28
1	4	75	2	9006	41	4	111	3	367	207.2	7335	0	6.3	414	-7	5.1	378	35	97	2.5	100	DF	666	02	29
1	5	77	2	9006	43	4	113	3	353	217.5	8092	0	6.9	510	-3	6.0	480	37	102	2.5	100	DF	666	02	30

1

INSTALLATION NUMBER 666 SURVEY= RFNRP-INITIAL STATE WA PHASE 6

A--GENERAL SITE DATA

SPECIES	DF	COUNTY	OCEAN	PROVINCE	XI
SLOPE %	0.0	ELEVATION (M)	30	OWNER	UNITED TIMBER
SITE INDEX	113	SITE CLASS	III	LOCATION	S18,T2N,R8E
TOTAL AGE	43	ASPECT	LEVEL	PRECIPITION (IN)	80
COLLECTION DATE	SEP 2 71				

B--SOIL CLASSIFICATION DATA

SOIL NAME	ALDERWOOD	SYSTEM	USDA-SCS
SOIL CLASSIFICATION	DYSTRIC ENTIC DUROCHREPTS-LOAMY-SKELETAL,MIXED,MESIC		
PARENT MATERIAL	GLACIAL MATERIAL		
TEMPERATURE REGIME	MESIC		
MOISTURE REGIME	XERIC		

C--FOREST FLOOR DATA -MEANS OF THE CONTROL PLOT SAMPLES

TOTAL WGT(KG/HA)	% N	N KG/HA	% C	C KG/HA	C:N
16586	1.169	194.00	44.69	7397	38.2

D--SOIL COMPOSITE A-HORIZON DATA -MEAN VALUES OF 4 REPLICATES FROM THE CONTROL PLOTS

PH H2O	%N	%C	C/N	EXCH. BASES CA	MG	K	CEC %	BS PPM	TOT-P PPM	AV-P PPM	AV-S PPM
4.88	.406	9.71	24.15	5.62	.76	.56	40.40	18.3	2306.3	156.1	7.3

E--SOIL PROFILE DATA

HOR	DEPTH CM	COLOR	TEXT	BD G/CC	PH H2O	%N	%C	C/N	EXCH. BASES CA	MG	K	CEC	BS %	TOT-P PPM	AV-P PPM	STRUCT	CONSISTENCE D	M	W	PI	GR %
A1	0- 1	M10YR2/3 - GL		.800	4.37	.714	19.95	27.94	8.20	1.56	.71	63.72	16.4	1879.6	------	1F GR	SO	FR	SO	SP	20
B21	1- 18	M10YR3/3 - VGSL		1.000	4.85	.229	6.00	26.20	.23	.07	.19	27.36	1.8	1172.6	------	1F GR	SH	FR	SO	PO	50
B22	18- 48	M10YR3/4 - VGSL		1.200	5.14	.179	3.82	21.34	.12	.03	.07	23.32	.9	1495.3	------	1F GR	SH	FI	SO	PO	70
B3-C	48- 63	M10YR4/4 - VGCOS		1.600	5.54	.077	1.31	17.01	------	------	------	------	------	------	------	0--SG	H	FI	SO	PO	90

	TOTAL SOIL DEPTH-CM	NITROGEN KG/HA	CARBON KG/HA
TOTAL SOIL	63	4521	108167
TOTAL SOIL + LITTER		4715	115564

1