PCNFCS

NORMAN FILE CREATION SYSTEM

PC VERSION

USER'S MANUAL

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INTRODUCTION

The PCNFCS program (PC Version, Norman File Creation System) is the result of a project funded through Forestry Canada's Northern Ontario Development Agreement (NODA). Implemented in September 1992, the PCNFCS program is based on an existing program titled "Norman File Creation System" which operates on the VAX/VMS platform. The program supplies users with forest management options and data analysis techniques through which they can create file inputs for three forest management models: NORMAN, FORMANCP & FORMAN 2.1.

Access to this earlier version of the program is limited as most forest companies use personal computers with MS-DOS operating systems. Through the NODA funding, the file creation tool is now accessible to forest companies via the new PC-based PCNFCS program compiled for MS-DOS.

The NODA project involved Forestry Canada, the Ontario Ministry of Natural Resources, and Forest Computer Consulting. The relationship of these parties throughout the project is as follows:

Forestry Canada - Ontario Region:

Brian Sykes, Senior Development Officer
Diana Callaghan, Departmental Representative

Ontario Ministry of Natural Resources

Brian Callaghan, Scientific Authority
David Hayhurst, Program Advisor

Forest Computer Consulting

Kevin Lindquist, Principal Investigator.

1.0 INSTALLATION

1.1 HARDWARE REQUIREMENTS

- 3 megabyte disk space for program installation

- recommended operating hard disk space:

    - **minimum three times size of STANF#.DAT files**

    eg. STANF999.dat = 1.2 megabytes,

    min hard disk space of 3.6 megabytes.

- 4 megabytes memory (RAM)

- VGA colour monitor (optional but preferred)

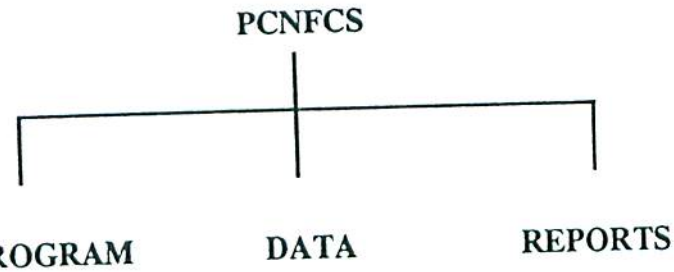
- mouse pointing device (optional but preferred)

1.2 SOFTWARE REQUIREMENTS

- MS-DOS 5.0 or greater
- Windows 3.1 (optional but preferred)

1.3 INSTALL.EXE

The PCNFCS program operates across three directories to facilitate easier data backups and file organization. The directory structure is as follows:



The PROGRAM directory stores the PCNFCS.EXE file along with data files which act as file structure templates for program operation. The DATA directory stores all data

files which are created and edited by the user. The install procedure loads a set of default files in this directory. The REPORTS directory is an output directory storing all reports written to file by the program.

This directory structure will be created automatically under the install procedure.

To install the PCNFCS program:

1. Place PCNFCS Disk 1 into drive A or B.

2. Change drive to A or B and type INSTALL.

3. You are prompted to enter the target drive (C, D, etc.) and the target directory under which the PCNFCS directory structure (above) will be created. The default directory is the root directory of the specified drive.

If the target directory is not on the drive specified, you will be asked if you want the directory created. An answer of "No" at this point will prompt re-entry of the target directory.

4. The install program proceeds to create the PCNFCS directory structure and load the default files into the DATA and PROGRAM directories. Once completed, you will be prompted to "Insert disk 1 into drive". Press any key at this point to begin the loading of the main PCNFCS.EXE program onto your hard disk. The program will prompt you to insert Disk 2.

5. Installation of the program is now complete. To start the program, type PCNFCS from the PCNFCS\PROGRAM directory.

NOTE: press CTRL-C to abort the install procedure.

1.4 MEMORY MANAGEMENT

The configuration of your computer's memory may or may not be required depending on the amount of total memory available and whether or not the application is set to run under Windows 3.1.

Windows 3.1

The PCNFCS program can run under the Windows environment in two ways:

1. as a program item under any program group where the item's properties would read as follows:

Command Line: PCNFCS
Working Directory: \PCNFCS\PROGRAM,

2. as a DOS executed (PCNFCS) command from the \PCNFCS\PROGRAM directory through the MS-DOS Prompt item in the "Main" Program Group.

Providing Windows has enough available memory, it's memory manager will allocate sufficient memory to the PCNFCS program. If the program does not load due to insufficient memory, you may have to exit windows and load the program from DOS ie. freeing up the memory used by the Windows software.

MS-DOS

Depending on your machine's available memory, the PCNFCS program will run without need of direct memory configuration. Try executing the PCNFCS.EXE command from the \PCNFCS\PROGRAM directory. If the program fails to load and the message "DOS/16M error" appears, your computer has less than 3 meg of available memory. There are two ways of correcting this problem.

1. Attempt to free memory space by removing TSR programs that may be running. Some examples may be DOSSHELL, SMARTDRV, SIDEKICK, etc. Reference to your DOS manual may be required.

2. Use the DOS command "MEM" to find out how much memory your computer has available. This amount is shown as "Total Memory - Free" with MS-DOS ver. 6.00 and depending on your memory allocation, "Total available contiguous extended" or "free EMS" plus "available XMS" with MS-DOS ver. 5.0

If your available memory is above 2 meg (required minimum) use the SET DOS16M command as follows:

SET DOS16M=:2M.

The PCNFCS program can now be executed from the DOS prompt.

If your available memory is less than 2 meg and attempts to free memory using step 1 have failed, a memory upgrade will be required.

2.0 PROGRAM DESCRIPTION

2.1 BACKGROUND INFO

The PCNFCS program is modelled after the VAX/VMS "Norman File Creation System"; a program compiled in VAX FORTRAN V5.0 and using RDM as a database manager. The VAX program was designed to assist in preliminary data preparation and input file production for the volumetric wood supply model NORMAN (NOrthern Region MANagement model).

The PCNFCS program has been developed to run on the MS-DOS operating system to facilitate use by non-VAX\VMS users. The program is written in dBASE IV V2.0 and compiled with Borland's DOS Compiler. Software selection was based on the data editing options, user interface, and the popularity of dBASE within the forest industry.

User's familiar with the VAX program will see many changes in the DOS program. The original program was studied in depth prior to the writing of the new program to find areas where user tasks could be simplified. The result is a program which reduces many of the steps in the original VAX program, provides detailed STANF file error checks, introduces new reporting options, and expands the file inputs for wood supply models to include FORMAN CP and FORMAN 2.1.

2.2 OVERVIEW

The PCNFCS program is comprised of four main components:

1. FRI File Check and Preparation,
2. Forest Class Aggregation,
3. Yield Curve Development, and
4. Forest Model File Export.

Figure 1 illustrates these components with their required user inputs and optional reporting outputs. File editing is available for associated data files. Each component requires completion of the previous component before it can proceed.

PCNFCS
PROGRAM FLOW CHART

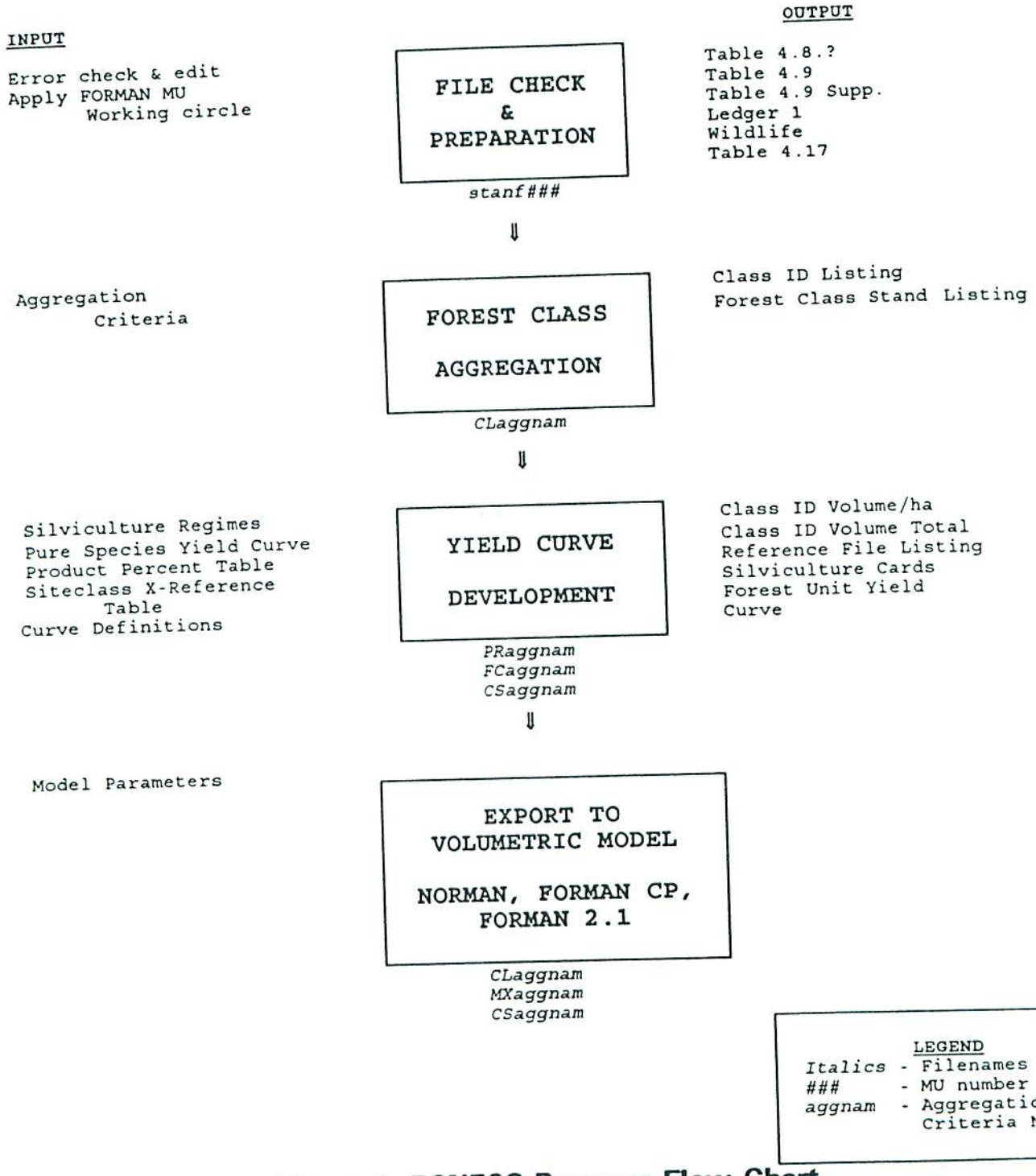


Figure 1. PCNFCS Program Flow Chart

The components can be described briefly as follows:

1. FRI File Check and Preparation:
   - import of the management unit's FRI STANF###.dat file
   - error check routine to identify stands which contain missing or mis-matched data items
   - edit options for correction of errors, addition of new stanf records, deletion of stands, or searches for specific data
   - conversion of working file to ASCII STANF###.dat file
   - application of FormanMu's to identify geographic division of landbase or to assign individual forest units

2. Forest Class Aggregation:
   - input and edit of forest class aggregation criteria
   - aggregation of STANF stand records into forest classes using aggregation criteria

3. Yield Curve Development:
   - input of silvicultural information specific to similar forest classes (future stand descriptions, operable age limits and silvicultural costs)
   - creation, edit and selection of pure species yield curves, product percent tables, and site class cross reference tables
   - species definition of primary, product and secondary curves
   - development of present and future yield curves
   - creation of silviculture cost file

4. Forest Model File Export:
   - conversion of yield and cost data to file sets suitable for input into NORMAN, FORMAN CP and FORMAN 2.1 volumetric wood supply models

2.3 PROCEDURE WALK - THROUGH

This section is intended to provide the user with a step - by - step walk through of the procedures used to produce volumetric input files from an inventory file. Details with respect to each procedure can be found in the sections of the manual as identified in each step.

Stanf Inventory File (Section 4.1, 4.2, 4.4)

- copy the stanf ascii file into the \PCNFCS\DATA directory
- IMPORT the file and view a few stands through the EDIT STANF FILE function to ensure that the conversion was successful ie. the original data structure was consistent with the program requirements

- perform the STANF ERROR CHECK
- utilize the EDIT STANF FILE function to correct errors identified by the Error Report; this is especially important where errors may affect the aggregation results ie. species comp, stocking, stand type, etc.

Tables 4.8 and 4.9 (Sections 8.1, 8.2, 8.3)

- produce TABLE 4.8 and TABLE 4.9 from the stanf file
- these reports are used to assist in developing aggregation criteria and verifying aggregation results

Apply FormanMu Working Circle (Section 4.5)

- required if management unit is to be divided into geographic regions
- required if individual working groups are to be removed from the "OH" or "OC" generic working groups
- required if aggregation is to be based on Forest Units; APPLY FORMANMU WORKING CIRCLE function can be used to assign forest units to stands

FormanMu Definition Report (Section 8.14)

- output FormanMu report to check the program's interpretations of criteria definitions as they were input

Aggregation (Section 5.1, 5.2)

- enter the aggregation criteria for either working group - siteclass - stocking or FormanMu aggregation methods
- run the forest class aggregation
- produce the CLASS ID LISTING report and verify area totals by working group or FormanMu against Tables 4.8 & 4.9
- refer to troubleshooting suggestions in section 5.2 if there are discrepancies in area totals

Forest Class Updates (Section 6.1)

- use the FOREST CLASS FILE edit function to view and modify the forest classes
- forest classes may be added, areas adjusted, attributes changed, etc. to more accurately reflect the state of the forest

Silviculture Cards (Section 7.1)

- assign silviculture cards to the strata2 criteria in the SILVICULTURE CARD DEFINITION SCREEN
- complete each silviculture card by assigning present curve to future or entering specific future curve attributes
- produce the SILVICULTURE CARD report to verify input and retain for records

Prepare Reference Files (Section 6.4, 6.5, 6.6)

- edit or create PURE SPECIES YIELD CURVE, PRODUCT PERCENT TABLE, and SITECLASS X-REFERENCE files to be used in the development of yield curves
- use REFERENCE FILE LISTING (Section 8.10) to produce hardcopy of reference tables

Build Yield Curves (Section 7.2, 7.3)

- use the VOLUME SETUP function to define primary, secondary and product species and select reference files to be used
- use the FOREST UNIT YIELD CURVE report (Section 8.13) to test various age class ranges if average yield curves for each forest unit are to be used
- run the YIELD CURVE DEVELOPMENT function to build present and future curves for all forest classes

Verify Yield Curves (Section 6.2, 6.3)

- edit present and future yield files to check operable volumes, y-factors, curve set volumes, etc.
- use the CLASS ID VOLUME reports (Section 8.8, 8.9) to verify forest class volumes

Export to Volumetric Model (Section 9.0)

- once all class and yield files are finalized, use the NORMAN / FORMAN EXPORT function to convert PCNFCS file sets to volumetric input files

3.0 MAIN MENU

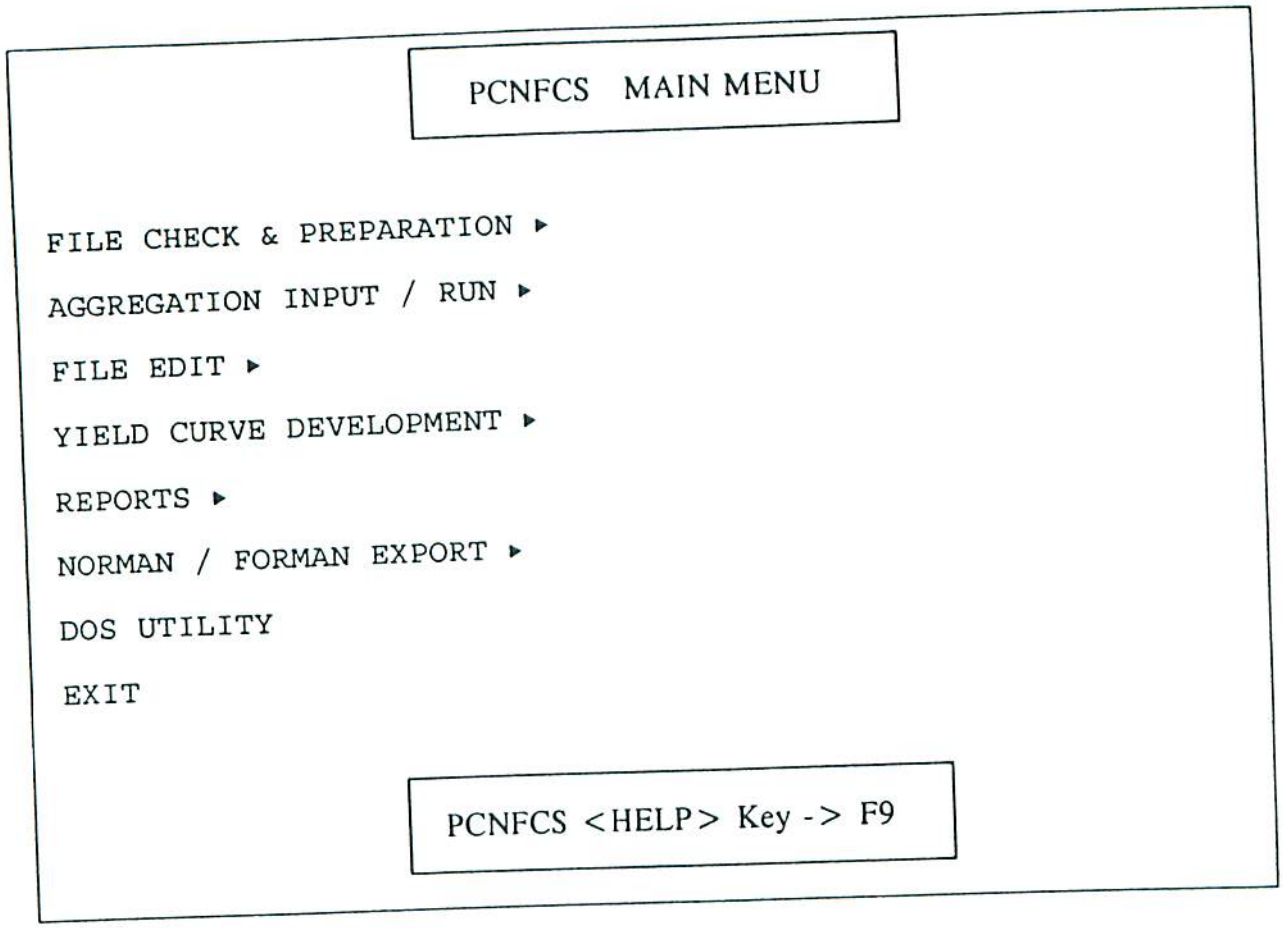


Figure 2. PCNFCS Main Menu

The PCNFCS main menu (Figure 2) has eight menu bars running vertically down the left side of the screen; those with a bullet indicating an options menu. The menu has been designed such that all options available within the program are presented and accessible from one level ie. there are no hidden or nested menu options. The completion of any selected options will return the user back to the main menu.

Navigation within the main menu can be done with the keyboard or a mouse pointing device. The use of a mouse pointer requires a click on the menu bar to reveal its options menu and a click on the menu option to select the appropriate option. A click on either the DOS UTILITY or EXIT menu bar (no option menus) will execute the command.

Keyboard navigation instructions are shown at the bottom of the screen where a mouse driver is not detected. The left or right arrow keys will move between the menu bars presenting the

option menus automatically. Menu options can be selected by moving up and down within the options menu and selecting the item with the ENTER key. The DOS UTILITY and EXIT menu bars are also selected with the ENTER KEY.

A HELP function is available throughout the program by pressing the F9 function key. This will present a help menu consisting of stand types, ownership codes, working group codes and stanf error codes to be used as a reference list as the user works through the various procedures. Exiting of the help menu will return the user to their original location.

4.0 FILE CHECK & PREPARATION

The file check and preparation options menu is shown in Figure 3. This menu provides the user with tools to prepare the FRI STANF data file for use within the PCNFCS program.

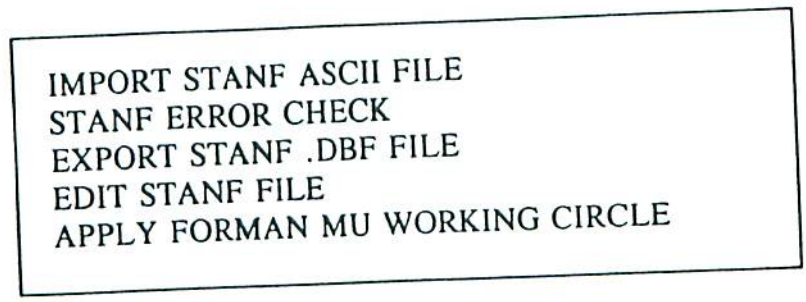


Figure 3. File Check & Preparation Options Menu

4.1 IMPORT STANF ASCII FILE

The PCNFCS program uses all data files in the dBASE *.DBF format. This data file structure differs from the ASCII version and a file conversion must be done before the STANF file can be used by the program. It is critical that the STANF file being imported by the program be of standard file format. The STANF file structure is listed in Appendix I.

Upon selecting the IMPORT STANF ASCII FILE option, the user will be presented with a menu displaying all STANF###.DAT files which are located in the \PCNFCS\DATA directory. (all STANF###.DAT files to be used by the program must be copied into the \PCNFCS\DATA directory). The selected file is then converted to the *.DBF format with the addition of a blank field titled FORMANMU. This field is used to store working circle numbers as provided by the user in the FORMAN MU WORKING CIRCLE menu option.

NOTE: The conversion time required depends on the number of records in the file but is generally no more than a minute.

4.2 STANF ERROR CHECK

The PCNFCS error check option is used to identify errors in the FRI STANF file which may corrupt forest class aggregation results. There are a total of 17 error types for which each record in the STANF file is scanned. These error types and their possible sources are shown in Table 1.

Table 1. STANF Error Types and Associated Sources.

STANF ERROR CODES

TYPE #	MESSAGE	POSSIBLE SOURCES
1	MANAGEMENT UNIT NUMBER	MU # is a zero or non-numeric value
2	WORKING CIRCLE ID	Working Circle is non-numeric value
3	WORKING CIRCLE STATUS	WC Status is non-numeric value
4	WORKING GROUP NUMBER	WG # is not a valid code
5	STAND_TYPE or WORKING GROUP	Stand type is less than 20 or greater than 41
6	STAND TYPE NUMBER	Stand type # is not a valid code
7	STAND TYPE or SITE CLASS	Stand type = 40 and site class <> 4 Site class = 4 and stand type <> 40 Site class <> X, 1, 2, 3 or 4 for stand types 20-41
8	OWNERSHIP CODE	Ownership code is zero or non-numeric
9	LOCATION (DISTRICT) ID	Location ID is zero or non-numeric
10	STAND_TYPE or YR_ORIGIN	Year of origin is less than 650 for stand types 20-41
11	YR_UPDATE or YR_ORIGIN	Year of update is less than year of origin
12	YR_UPDATE or COMPUTER DATE	Year of update is greater than computer date
13	HEIGHT	Height is greater than 40.0 meters
14	STOCKING	Stocking is greater than 3.0
15	STOCKING or STAND_TYPE	Stocking is less than 0.3 for stand types 20-28
16	STAND_TYPE OR SPP_COMP	Species composition does not add up to 10 for stand types 20-41 One or more species are not recognized as valid

The error check options begins with the selection of the stanf file to be used. The menu presents the user with all stanf files in the DATA directory which have been converted or imported from the ASCII format to *.DBF format. The progress of the actual error check is then displayed to the user through a status bar. An abort feature is available to exit this procedure.

An error summary is displayed to the user upon completion of the error check routine. The number of records and total area checked are shown as well as a breakdown of errors by type number (Figure 4). The F2 function key is available to reference error type messages.

The resulting error summary can be sent directly to the printer or to a text file. The filename used for error text files is set by default to ERRORmu#.TXT and the file is written to the PCNFCS\REPORTS directory where it can be viewed, edited or printed using any DOS editor via the DOS PROMPT menu bar. Both reports are identical and list all errors by type with the mapsheet and stand number to assist the user in locating and correcting these errors.

Appendix II contains an example of the stanf error report. Appendix IV contains a list of valid working group codes and recognized species.

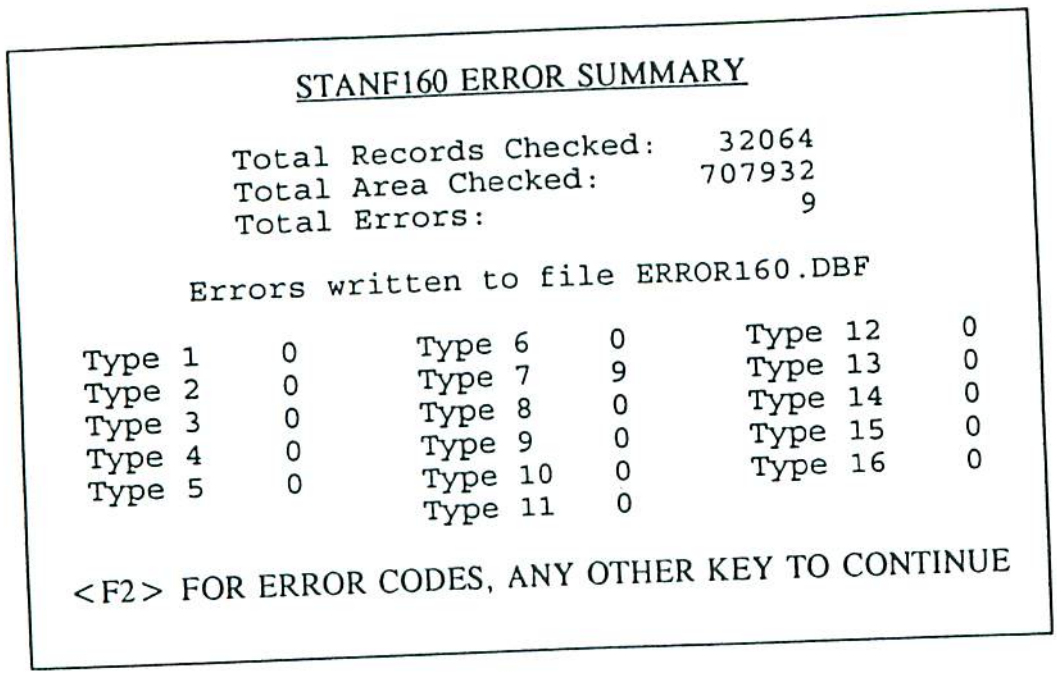


Figure 4. STANF Error Summary

NOTE: The user must be advised that the aggregation of stanf files which contain errors can result in inaccurate forest class aggregation thereby introducing errors in the volumetric wood supply analysis.

4.3 EXPORT STANF *.DBF FILE

The stanf export menu option converts the PCNFCS *.DBF stanf file back to the ASCII *.DAT format. During conversion, the extra field (FORMANMU) is dropped. The original *.DBF file is not damaged or altered in any way.

To activate this procedure, select the stanf file from the menu presented. A message is displayed while the conversion is in process with an abort function available. As with the import procedure, the time required is generally less than a minute.

4.4 EDIT STANF FILE

The edit option of the File Check & Preparation menu bar is a full screen editor of the selected stanf file (Figure 5). The screen contains all file attributes and is ordered by mapsheet, stand number and stand suffix. Movement between the fields is sequential and can be done using the <TAB>, <SHIFT-TAB>, <ENTER> keys or with a click of the mouse to open the specific field. Entry checks are built in to accept only applicable

field values ie. a character cannot be entered in the stand area field.

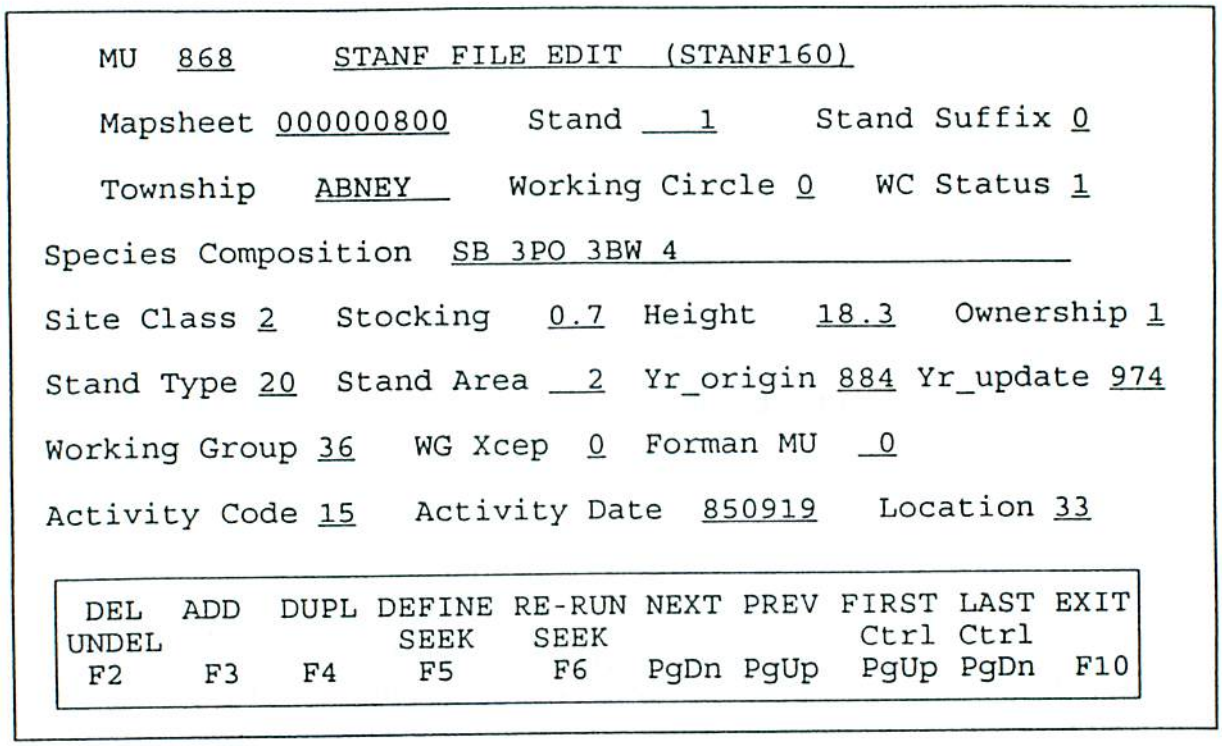


Figure 5. Stanf File Edit Screen

The error check procedure discussed previously is called each time the user attempts to leave the record which is active. A warning will be produced advising the user of an error, its type, and whether to ignore the error or return to the record to correct it.

There are several functions available to the user within the stanf edit screen. These are shown at the bottom of the screen (Figure 5) and can be selected by pressing the key or key combination on the keyboard or with the click of a mouse. These functions are explained in detail as follows:

Delete - F2

The delete function will mark the active record for deletion. A warning is immediately shown on the screen to advise the user of the record's status. To remove the delete status, press or click on F2 again and the warning will be removed. The actual removal of the record from the file takes place upon exiting the file edit mode with F10. The time to remove one or more records may be a minute or more as the file is re-written and indexed.

Add - F3

The add function will add or append a new record to the stanf file. The attributes or field values will be blank and require a full screen input. The error check procedure will be called upon completion of this new record and the record will be put in its place of order according to the new mapsheet, stand and stand suffix.

Duplicate - F4

The duplicate function adds or appends a new record to the file where the new record contains the same information as the active record ie. the new record is not blank. To avoid exact record duplication, the stand suffix of the new duplicate record is automatically incremented one. This function can be used to split stands into components when updating depletions, allocating harvest or reserve areas, re-assigning NSR areas, etc. The user must be cautioned to ensure the total stand area of the split stands does not exceed the original stand area.

Define Seek - F5

The define seek function is an efficient way to scan the stanf file in search of stands matching specific criteria. The define screen is similar to the edit screen in Figure 5 except the fields are blank. The seek definition can apply to a single stand ie. mapsheet, stand and stand suffix, or to a number of stands which meet the criteria.

The seek criteria is activated by pressing or clicking the F6 key from the define screen. The seek pointer begins at the top of the stanf file and stops at the first record matching the criteria. The user will be returned to the file edit mode with the new record. Should the seek be unsuccessful ie. no stand was found matching the criteria, a message will be displayed advising the user and the edit screen will return to the record which was active at the time the seek was initiated.
Once the define screen is exited, the PCNFCS program will save the last seek criteria and restore the same values to the define screen the next time it is entered.

This function is extremely useful in locating stands listed on the stanf error report discussed earlier.

NOTE: The Forman Mu value defaults to a blank value. Any other numeric value will be part of the seek criteria; including zero.

Re-Run Seek - F6

The re-run seek function activates the last defined seek criteria. The seek pointer begins at the active record and moves through the file until end of file is reached. For example, if the define seek criteria was a PJ working group, site class 4, the initial seek from the define screen would have produced the first stand found matching that criteria. Each subsequent "Re-Run Seek" will display to the user each PJ, site class 4 stand until the end of the file is reached.

The function can also be used to check the application of FormanMu working circles which is discussed in the next section.

Navigation Functions

There are four functions available to navigate through the stanf file: NEXT, PREV, FIRST, and LAST. Next and previous are sequential movements up and down the data file where first and last will position the curser at the top and end of the ordered file respectively.

Exit - F10

The exit function will save all changes to the stanf file, remove any records marked for deletion, and return the user to the PCNFCS main menu.

4.5 APPLY FORMAN MU WORKING CIRCLE

The FormanMu working circle is not to be confused with the WORKING CIRCLE and WORKING CIRCLE STATUS fields in the FRI stanf files. FORMANMU is a PCNFCS specific field and is appended to the *.DBF stanf files when they are converted or imported from the ASCII stanf files. As stated in the export option, the field is dropped when the PCNFCS *.DBF file is converted back to ASCII format. The new field has been added to prevent corruption of the original working circles and to provide the user with a maximum of 99 possible applications instead of the 9 available in the original WORKING CIRCLE field.

The purpose of the FORMANMU field is to collectively group and identify sets of stands which share similar attributes or end uses. Examples include harvest allocations, areas of concern, species or site types which require unique treatment, different management zones within a management unit, or actual forest units. The potential impact of this FormanMu working circle assignment becomes clear once the development of forest classes and yield curves begins. The user then has the flexibility to aggregate entirely on individual FormanMu's where these may represent forest units, or to aggregatie on working group - siteclass criteria within each of the FormanMu's.

The FormanMu's can also be used to split different working groups which would

normally be classified as OH - Other Hardwood or OC - other conifer. The user may wish to run the final volumetric analysis on yellow birch and hard maple differently. Without FormanMu's, forest class aggregations would combine each of these working groups into OH. Through FormanMu's, stands with a hard maple working group can be grouped separately from yellow birch working group with corresponding forest classes and yield curves.

Most of the reporting options available in PCNFCS provide the user with the option to enter a specific FormanMu. The particular reporting option is then performed for that FormanMu only.

The application procedure begins with the selection of a stanf file from the menu provided. The user is then presented with a menu prompting the definition of a new FormanMu or the editing of an existing FormanMu for that stanf file. If a new FormanMu is selected, the user may enter any number between 1 and 98 (Number 99 is reserved for internal use) and a 5 character label or name.

NOTE: if a new FormanMu is given a number which already exists, the program will present the existing label to the user for editing and load the current definition criteria.

The criteria to which the FormanMu number is applied is defined in a maximum of three separate screens: Part A (Figure 6), Part B and Part C. Each part can contain up to 10 fields with minimum and maximum values for applicable fields. The field criteria within each part are joined with 'AND' ie. each field criteria must be true; the field criteria between parts are joined by 'OR' ie. either part or set of field criteria must be true. The program first evaluates Part A to test whether <u>all</u> field criteria are true. If one criteria is false, the program evaluates Part B, then Part C until the entire three part definition is tested or a successful part is found.

For example, a part which contained working group ranges 01 - 07 and 10 - 13 would result in no stands being identified as a stand cannot have two different working groups at the same time. However, if Part A contained working group ranges 01 - 07 and Part B contained working group ranges 10 - 13, all stands meeting <u>either</u> range would be successful.

Delete - F2

The delete function prompts the user to select the field to be removed from the definition. The <ESC> key will abort the deletion option.

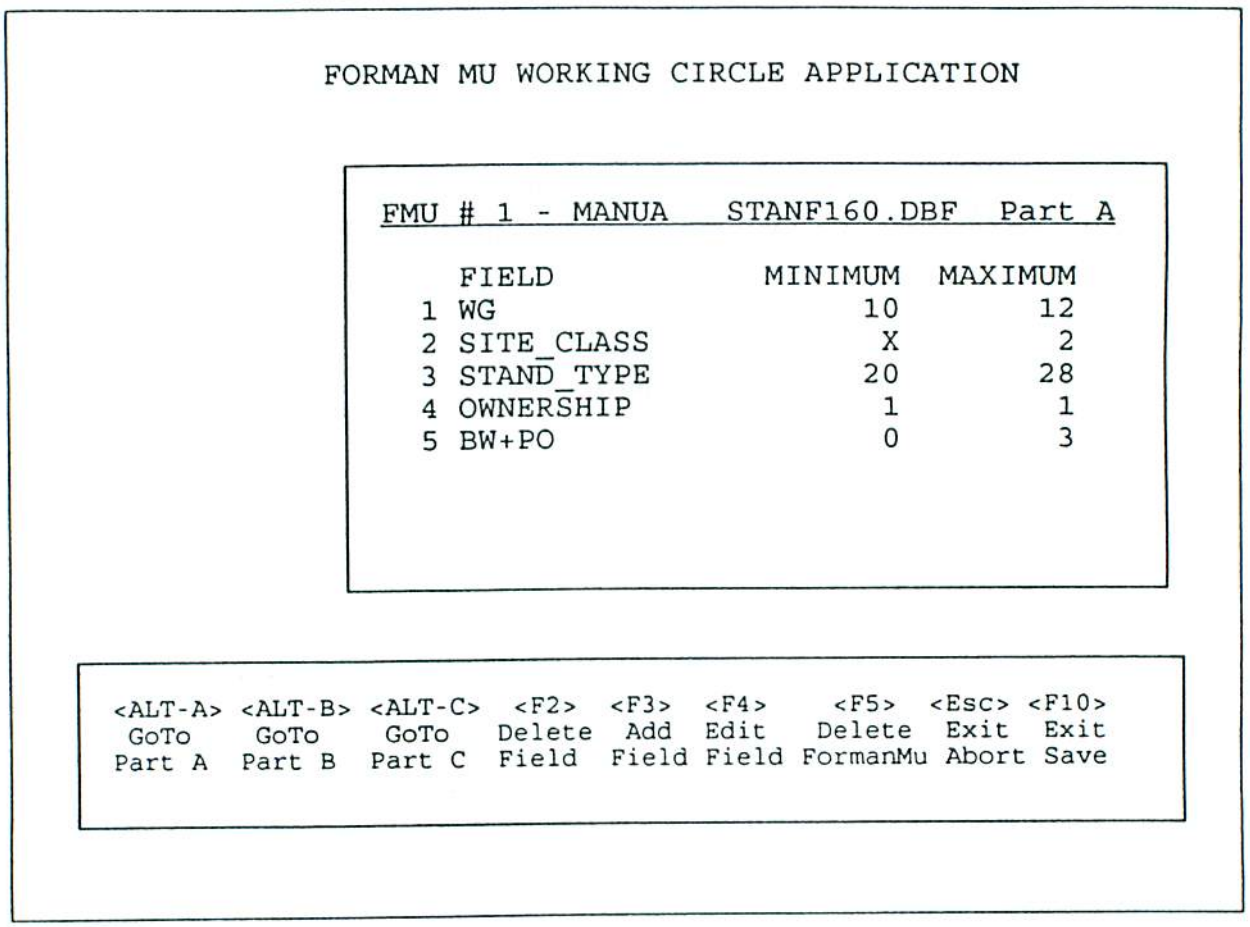


Figure 6. FORMAN MU Working Circle Application Screen

Add - F3

The add function presents a menu of fields to the user on the left side of the screen. The user then selects the appropriate field and inputs the range of values associated with that field.

Certain fields are automated in that the user is presented with an additional menu for the selection of minimum and maximum field values. These fields are working group, stand type, site class and ownership. These four sub-menus have been designed to reduce entry error by having the user select on code descriptions without the need to reference tables to find a particular working group code or stand type.

The working group field can be entered as a range of working group codes or as a list of codes. The user is prompted to select "Range" or "List" once the

working group field is selected. A total of six working groups may be listed.

The species composition field at the bottom of the field list is also unique. Users can enter a group of species to which a minimum and maximum range apply or a relationship between two species such as "SB>SW". Once the first species is selected, an operator menu is presented. A maximum of eight species may be chosen for the addition operator (+); two species for all other operator relationships. The example in Figure 6:

PO + BW 5 10
PO>=BW

translates into "apply the FormanMu to stands with a poplar + birch component between 50 and 100% where the poplar component is greater than or equal to the birch component. Other species combinations can also be added provided they allow overlap.

The maximum value for a given field defaults to the value of minimum if the user enters on the empty maximum field. A field with blank minimum and maximum values will automatically be removed from the definition.

Edit - F4

The edit function is used to change the minimum and maximum values of a field already entered. The user is prompted to select the field followed by the range of values. This function does not allow the user to edit the field name itself; that can only be done with the Add function. For this reason, working group lists and species composition relationships cannot be edited as they do not contain minimum or maximum values.

NOTE: the original minimum and maximum field values are removed once the user has selected the field to be edited.

Delete FormanMU - F5

The delete function allows the user to remove an entire FMU criteria definition, parts A, B & C. The user is first prompted to confirm the removal. The stanf file is not altered ie. any previous application of the FMU number will remain.

Exit & Abort - <ESC>

The abort function will exit the FormanMu screen without saving any changes. All definitions are restored to what they were prior to entering the active definition screen. Control returns to the PCNFCS main menu.

Exit & Save - F10

The save function exits the definition screen and asks if the user wants to apply the FormanMu to the stanf file. Selecting NO will save the recent definition and return the user to the main menu. If the user enters YES, the program will query the stanf file and apply the FormanMu to all stands meeting the definition criteria. A progress bar advises the user of the time required to complete the procedure.

WARNING: the FormanMu working circles applied to a stanf file are never removed and may or may not be re-assigned as each definition is applied. Repeated application of the FormanMu working circle may result in erroneous forest classes if caution is not used to avoid duplication and overlap in FormanMu assignment. (The FORMANMU field can be reset by assigning FormanMu = 0 to all records through a broad set of criteria.)

A user can prevent overlapping FormanMu applications by entering FORMANMU = 0 as a field criteria within each definition. This will limit the application of the FormanMu to those stands which have not met any previous definition criteria.

5.0 AGGREGATION INPUT / RUN

5.1 INPUT / EDIT AGGREGATION CRITERIA

Aggregation of the forest stands is a procedure which simplifies the FRI inventory by reducing the number of individual records; the many thousands of stands are compressed into a few hundred forest classes. A forest class can be defined as an aggregate of forest stands which share the following characteristics:

1. age class,
2. present state ie. working group(s), site type, volume growth, etc., and
3. silviculture treatment options and future growth patterns.

There are several tools in PCNFCS which can assist the user in assessing the present state of the forest. These tools come in the form of reports which are available through the REPORTS menu bar. Tables 4.8, 4.9 and 4.9 supplement provide the user with a detailed breakdown of the forest inventory by stand type, working group, site class and age class. These reports are discussed in greater detail further in this manual. Examples of all three reports are included in Appendix II.

There are two methods of defining aggregation criteria:

1. Working Group - Siteclass - Stocking Criteria, or
2. FormanMu working circles ie. Forest Units.

The user is prompted to select the type of aggregation upon entering new aggregation criteria. Aggregation by FormanMu uses the FormanMu's which are already assigned to the stanf file where working group - siteclass - stocking aggregation requires criteria input information. Figure 7 illustrates the aggregation screen used for working group - siteclass - stocking criteria; Figure 8 the aggregation screen used for aggregating by FormanMU.

The aggregation screen can be divided into three main sections: 1. header information in the upper left quadrant, 2. strata1 information in the top right quadrant of the screen, and 3. strata2 information inside the strata2 window (applicable to working group - siteclass - stocking criteria only). These sections or groups of information have been identified as such because of their use in the PCNFCS aggregation and yield procedures.

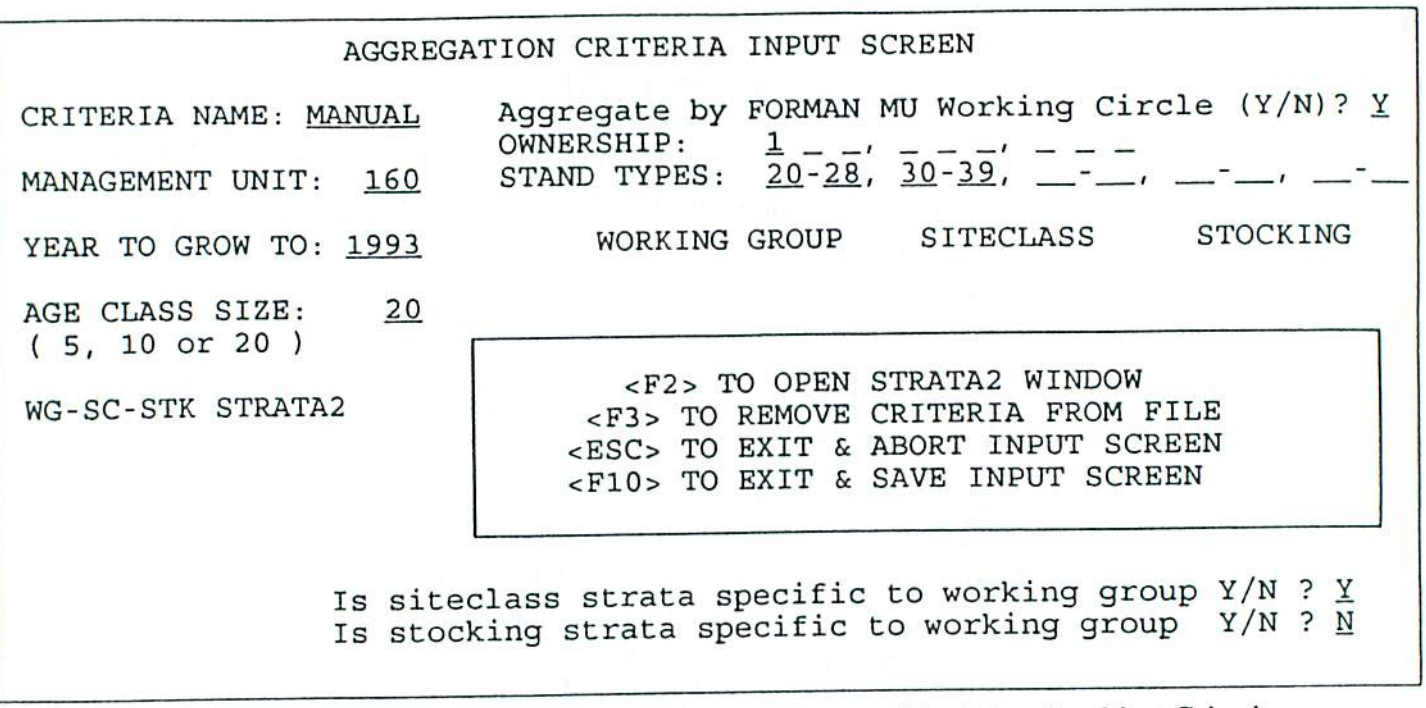


Figure 7. Aggregation Criteria Input Screen for Working Group - Siteclass - Stocking Criteria.

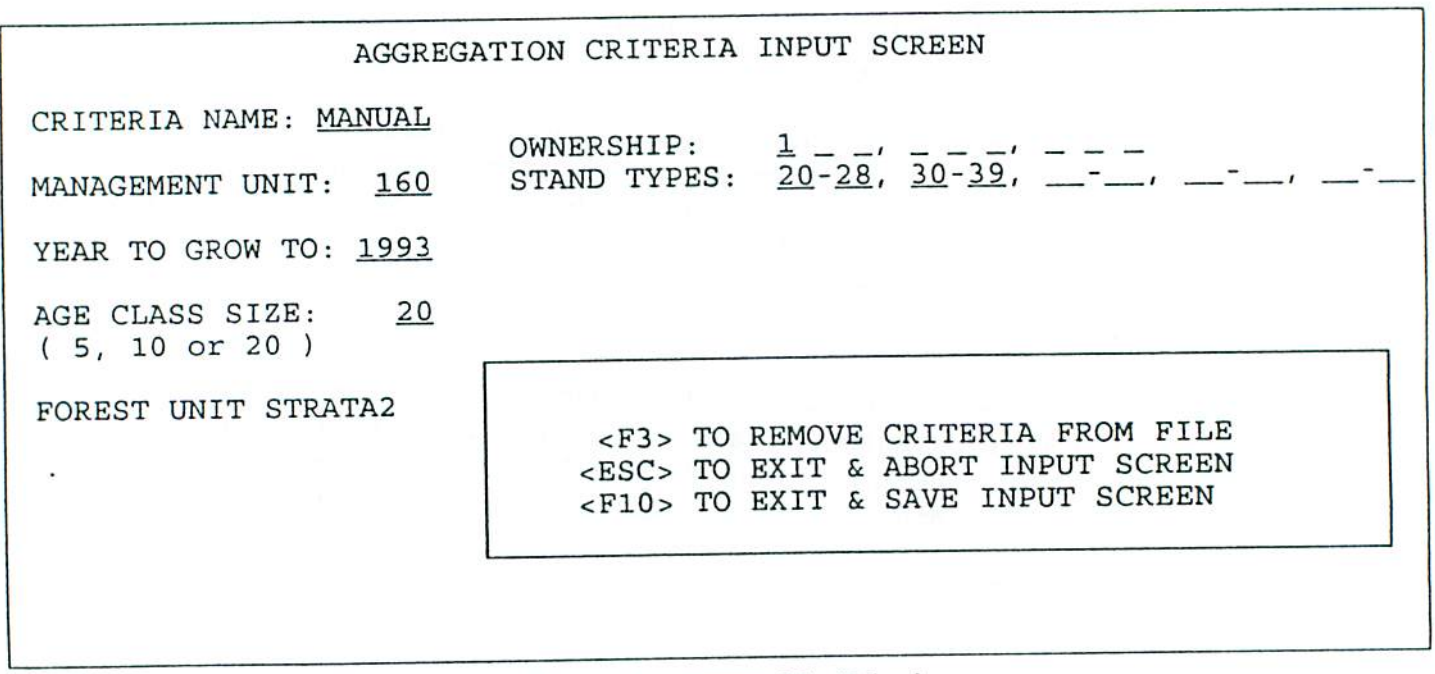


Figure 8. Aggregation Criteria Input Screen for FormanMu Criteria.

Header Information

The aggregation header information establishes some basic guidelines for the aggregation process. The criteria name is used in the name of all files generated from the aggregation and yield curve development. This standard naming system ensures that the complete file set produced from aggregation through to export to a volumetric model can be identified with the one criteria name. The user should select a name which will identify the content or objective of the entire file set.

The MU or management unit number tells the program which stanf file to use in the aggregation of forest classes. The three digit numeric ID must match the last three digits in the stanf file name ie. MU 160 translates into STANF160.

"Year to Grow to" asks for the calender year to which the forest inventory in the stanf file will be updated. Ages and heights are increased to reflect the present state of the inventory for the year entered. This year is usually the beginning of a planning period and must no be less than the most recent year of update in the stanf file.

The age class size of the forest classes produces a further stratification of all aggregation criteria; the smaller the age class size, the higher the number of forest classes. Valid entries are 5, 10 or 20 years.

The answer to the question at the top right of the screen in Figure 7:

"Aggregate by FORMAN MU Working Circle?",

is also stored in the header file. The user has the choice of doing an initial stratification of the stanf file by the FormanMu's which were applied directly to the stanf file. ie. FormanMu'S were used to identify geographic divisions in the landbase or to separate individual "Other Hardwood" / "Other Conifer" working groups. The use of FormanMu's in working group - siteclass - stocking aggregation will produce forest classes within each FormanMu on file. For example, each FormanMu would have a Spruce - SC X,1 stratification by age class.

This question does not appear in Figure 8 as FormanMu's are already identified as the primary unit of aggregation.

All aggregation criteria header information is stored in the AGG_HEAD.DBF file.

Strata1 Criteria

The strata1 criteria includes ownership and stand type. The user is allowed to combine up to 3 ownership codes in each of three ownership sets. For example:

OWNERSHIP: 1 _ _ , 2 3 4, _ _ _ ,

would translate into a set of forest classes for ownership code 1 (Crown Land) and a set of forest classes for codes 2, 3 and 4 (Patent Land). Stands of ownerships other than these would not be included in the aggregation.

The default of including all ownership types with no stratification is identified by no entries in the ownership spaces.

The stand type options presented to the user are in the form of a maximum of five ranges. For example, the user may wish to aggregate the inventory separately for regular production, barren & scattered, NSR, and exclude reserves. This would be achieved by entering stand type ranges as follows:

STAND TYPES: 20-23, 30-33, 35-39, _-_, _-_

The ownership and stand type aggregation instructions are stored in the file AGG_ONE.DBF.

Strata2 Criteria

The strata2 criteria only applies to working group - siteclass - stocking aggregation. Aggregation which is based on FormanMu's or Forest Units defines the strata2 criteria internally using FormanMu ID's and labels.

The defining of aggregation criteria by working group - siteclass and stocking involves some preliminary investigation of the stanf file prior to entering the specific criteria. These investigative steps are described in some detail in the following text.

Working groups are the main criteria in forest class aggregation which is based on working group - siteclass - stocking. The PCNFCS program limits the number of working groups to eleven. This has been done to standardize file structures and yield reference tables. Table 2 lists all of the FRI working groups and the eleven groups specific to PCNFCS.

Table 2. PCNFCS Working Groups and Associated FRI Working Groups and Codes.

PCNFCS Working Group	FRI Working Groups & Codes
SB	SB (11), SP (10)
SW	SW, SR (12)
PJ	PJ (07)
BF	B (13)
CE	CE (17)
PW	PW (01)
PR	PR (04), PS (08)
OC	OC (19), L (18), HE (16)
BW	BW (36)
PO	PO (33), PB (34)
OH	OH (29), AB, AW (20), M (22), MH (23), MS (24), BY (26), OR, OW (28)

These eleven working groups are a form of aggregation in themselves in that the user is not required to specify that all tolerant hardwoods are to be combined with other hardwood. Where these eleven working groups become restrictive, there are methods of working around them such as the application of FormanMu's discussed in the previous section.

Table 3 shows an example of a forest unit's working groups and the weight of each over the total productive forest area. These figures are drawn from the Table 4.82 report which is specific to Crown land ownership.

Table 3. Productive Forest Working Group Distribution.

Working Group	Area (ha)	Percent %
PW	3287	0.6
PR	116	<0.1
PJ	135461	25.9
SP	140738	26.9
BF	28823	5.5
OC	3873	0.7
MH	5480	1.0
BY	2028	0.4
OH	1084	0.2
PO	108751	20.8
BW	94027	18.0
	523668	100.0

Given that the MH and BY areas will be combined with OH, the user must decide if any of the other small areas should be combined with larger areas. Table 4 illustrates one possible solution.

Table 4. Revised Working Groups for Aggregation.

Combined Working Groups	Percent of Area
Pine (PW + PR)	0.6
Jack Pine (PJ)	25.9
Spruce (SP)	26.9
Balsam (BF)	5.5
Other Conifer (OC)	0.7
Other Hdwd (OH+MH+BY)	1.6
Poplar (PO)	20.8
White Birch (BW)	18.0
	100.0

Several working groups are not combined with any other working groups because they each have unique volume yields, site characteristics, and silvicultural requirements.

The next step in establishing aggregation criteria may be to consider the site productivity of the working groups. Site class is an attribute commonly used to indicate site productivity. The Table 4.9 Supplement report is referenced and summarized to produce the figures in Table 5.

Table 5. Siteclass Area Distribution within Aggregate Working Groups.

Working Group Strata	Siteclass (percent of WG Area)			
	X	1	2	3
Pine (PW+PR)		0.2	95.2	4.5
Jack Pine (PJ)	1.1	37.4	55.6	6.0
Spruce (SP)	46.1	44.8	8.0	1.1
Balsam (BF)	86.0	11.4	2.5	0.1
Other Conifer (OC)	3.2	41.8	46.8	8.3
Other Hardwood (OH)		0.9	15.1	84.0
Poplar (PO)		0.9	36.9	62.2
White Birch (BW)	0.2	2.9	67.5	29.4

The PCNFCS program will allow different site class aggregations within each working group strata. This decision is based in part on the area distribution as in Table 5 but primarily on growth, yield and the physical product which is to be harvested on a site. Other factors include potential stand conversions (eg. BF SC X to SW), regeneration treatments (eg. plant on SC X, 1 & 2 but seed on SC 3), tending or thinning trials (eg. PJ X & 1 only), operable ages for harvesting (eg. 80-100 yrs on spruce SC X & 1, 100 + yrs on SC 2 & 3), etc. The user must decide which site class and working group aggregations on the present forest will result in the best possible future model.

Table 6 is only one of many possible solutions to this scenario, each dependent upon the information which is available at the time.

The user need not include all working groups or all site classes in the aggregation criteria. Depending on the objective of the volumetric analysis, many working groups and site classes may be excluded to reduce the number of records even further. A reminder that the exclusion of working groups will also exclude sub-species volumes within those areas from the total volumetric analysis. For example, there may be a small black spruce component in the Other Conifer working group which could impact future wood supplies.

Table 6. Final Working Group and Siteclass Aggregation Criteria.

Working Group Strata	Site Class
Pine (PW + PR)	X, 1, 2
Pine (PW + PR)	3
Jack Pine (PJ)	X, 1, 2
Jack Pine (PJ)	3
Spruce (SP)	X, 1
Spruce (SP)	2, 3
Balsam (BF)	X, 1
Balsam (BF)	2, 3
Other Conifer (OC)	X, 1, 2
Other Conifer (OC)	3
Other Hardwood (OH)	X, 1, 2, 3
Poplar (PO)	X, 1, 2
Poplar (PO)	3
White Birch (BW)	X, 1, 2
White Birch (BW)	3

Once a basic criteria plan has been developed, the aggregation criteria can be entered into the program. This is done by selecting INPUT/EDIT from the options menu. A menu is then presented with the option to edit an existing criteria or to enter new criteria. Where a new criteria is chosen, the first type of aggregation: "WG - SC - STK" must be selected.

The criteria section referred to as strata2 is the working group, siteclass and stocking stratification. The window is accessed with the F2 function key. Figure 9 shows a completed strata2 window which uses the solution arrived at in Table 6. A total of 30 entries are allowed in the strata2 window. The manner in which this information is entered depends on the two questions situated at the bottom of the main screen.

The working group strata line allows up to four separate working groups to be aggregated into one working group class. Care should be taken to ensure that the working groups not only match the inventory breakdown (Table 6) but that they reflect all subsequent yield curve reference files.

WORKING GROUP SITECLASS STOCKING

NUM	WG1	WG2	WG3	WG4	SC1	SC2	SC3	SC4	STK1	STK2
1.	PW	PR			X	1	2		0.3	0.8
2.	PW	PR			3				0.9	3.0
3.	PJ				X	1	2		0.0	0.0
4.	PJ				3				0.0	0.0
5.	SB	SW			X	1			0.0	0.0
6.	SB	SW			2	3			0.0	0.0
7.	BF				X	1			0.0	0.0
8.	BF				2	3			0.0	0.0
9.	OC				X	1	2		0.0	0.0
10.	OC				3				0.0	0.0
11.	OH				X	1	2	3	0.0	0.0
12.	PO				X	1	2		0.0	0.0
13.	PO				3				0.0	0.0
14.	BW				X	1	2		0.0	0.0

PRESS <CTRL^END> TO SAVE SCREEN

Figure 9. Aggregation Criteria - Strata 2 Window.

1. Is siteclass strata specific to working group?

This question is asking the user if the working group(s) and site classes go together on a line by line basis. In Figure 9 the answer is yes; the working groups and site classes together form a list of stratifications. The information in this example cannot be entered with an answer of "NO" because the site class divisions are not the same across all working groups. Table 7 illustrates the entry of a set of working group - site class strata using the answer "NO". Each working group line is combined with each site class line to form the overall stratification.

2. Is stocking strata specific to working group?

The stocking question is identical to the site class question. An answer of "YES" matches each line in the stocking column to each line of working group(s). "NO" implies that each line of stocking range will be applied to each line of working group(s). The sample entry in Figure 9 has answered "NO" to instruct the

program to combine each working group(s) & site class strata with the two stocking ranges. A stocking range must be entered; minimum and maximum values of zero will result in aggregation of stands with zero stocking (0.0) only.

Table 7. Strata2 Entry where Siteclass Strata is not Specific to Working Group.

NUM	WG1	WG2	WG3	WG4	SC1	SC2	SC3	SC4	. .
1	PJ				X	1	2		
2	SB				3				
3	BF								
4	PO								
5	BW								

TRANSLATION:

1.	PJ	X, 1, 2
2.	PJ	3
3.	SB	X, 1, 2
4.	SB	3
5.	BF	X, 1, 2
6.	BF	3
7.	PO	X, 1, 2
8.	PO	3
9.	BW	X, 1, 2
10.	BW	3

NOTE: The stocking range of 0.0 to 0.2 is automatically applied internally where the user has identified the inclusion of stand types 30 - 39 in the strata1 section.

5.2 RUN FOREST CLASS AGGREGATION

The actual running of the aggregation procedure is done by selecting "RUN FOREST CLASS AGGREGATION" from the aggregation options menu. The user is then prompted to select the aggregation criteria name from those defined.

Forest class aggregation is done in two steps:

1. Primary Sort on Stanf File, and

2. Class Attribute Calculation.

The first step involves a sequential query through the stanf file to locate all records which match the aggregation criteria. As successful stands are located, they are "grown" to the year provided in the aggregation definition ie. new heights are equated given the siteclass and new stand age. Each stand is then written to a temporary file. The length of time required for this procedure can be significant depending on the size of the stanf file and the detail of the aggregation criteria. A status bar is displayed to show the procedure's progress.

The second step in the development of forest classes, calculating class attributes, uses the temporary file created in step 1. These attributes are averages of the individual stand attributes and are weighted by stand area. Table 8 gives an example of class attribute calculations.

The average siteclass attribute is <u>not</u> determined with weighted averages; it is recalculated given the forest class age, working group species and height. This average siteclass is used in the building of forest class yield curves. The "siteclass all" attribute contains each siteclass found in the aggregated stands. The order of the siteclasses is determined by the total area of each ie. in Table 8, SC X = 60 ha, SC 2 = 10 ha.

Two files are created in the aggregation procedure: the forest class file and the class stand file. These files are stored in the PCNFCS\DATA directory and are named internally using the aggregation criteria name.

The forest class file stores the attributes for each forest class developed including key fields identifying strata1 and strata2 aggregation criteria information which is stored in AGG_ONE.DBF and AGG_TWO.DBF respectively. The filename of the forest class file contains the criteria name and the prefix "CL". For example, an aggregation using criteria name "MANUAL" would produce the forest class file named "CLMANUAL.DBF".

Table 8. Calculation of Forest Class Attributes.

STANF RECORDS MEETING AGGREGATION CRITERIA

Std #	Species Composition	Stand Area	Age	Stocking	Height	Site Class
1	CE 50C 3SB 2	10	54	0.8	7.3	2
2	CE 40C 3SB 3	11	59	0.7	16.0	X
3	CE 40C 3SB 3	9	59	0.7	16.0	X

AREA WEIGHTED AVERAGES

FOREST CLASS ATTRIBUTES

Species Composition	Area	Age	Stocking	Height	Siteclass All	Siteclass Avg
CE 40C 3SB 3	70	58	0.7	14.8	X2	X

The class stand file links each forest class with the individual stands aggregated from the stanf file. This file is used to produce the report "FOREST CLASS STAND LISTING" (Appendix II). The filename of the class stand file contains the criteria name and the prefix "ST". Using the example above, "STMANUAL.DBF" would be the name of the stand file produced during aggregation.

Once the forest class aggregation is complete, the user must examine the results to ensure that the information is accurate. The "CLASS ID LISTING" report is one tool available to the user. This report (example in Appendix II), lists each forest class with its new attributes. The total area of the forest classes can then be compared with the areas in the Table 4.8, Table 4.9 and Table 4.9 supplement reports which were used to setup the aggregation criteria.

Another important tool available to the user is the forest class edit option available in the "FILE EDIT" options menu. The user is able to view each forest class's attributes and see which aggregation criteria was used to develop the forest class. These options are discussed in more detail further in the manual.

Differences in area totals should be accounted for before moving on to the development of yield curves. The following are techniques that may be used in troubleshooting area discrepancies:

- Check that the Class ID Listing report criteria is consistent with the areas being

checked.

- Check the ownership criteria in the strata1 section of the aggregation input screen remembering that Table 4.9 is Crown ownership only. Additional Table 4.8 reports may have to be run where ownerships other than Crown are used in the aggregation.

- Check the stand type definitions in the aggregation criteria; there may be unintentional exclusions.

- Reference the Stanf Error Check Summary report to see if any of there are any uncorrected errors which may conflict with the aggregation.

- If FormanMu's are used in the aggregation, check that the Table 4.9 and Class ID Listing are both specific to the FormanMu being tested.

- Sum the forest class area for each working group or FormanMu using the Class ID Listing report and compare with the working group / FormanMu information in Table 4.9 supplement.

- Attempt to isolate working group area differences by examining siteclass and stand types in Table 4.9 supplement.

- Ensure that the siteclass and stocking strata questions at the bottom of the aggregation input screen properly correspond with your working group, siteclass and stocking inputs (for WG - SC - STK type aggregation)

- If one or more FormanMu's are missing in class file when aggregating by FormanMu or Forest Units, you may have applied additional FormanMu's after entering and saving aggregation criteria. Only those FormanMu's which were assigned at the time the aggregation criteria is saved are defined as strata2.

Most errors can be attributed to incorrect aggregation criteria. Once these errors are addressed, the forest class aggregation procedure will have to be rerun and tested.

6.0 FILE EDIT

The FILE EDIT options menu (Figure 10) presents the user with six file types. The editing functions available with each of these file types is discussed below.

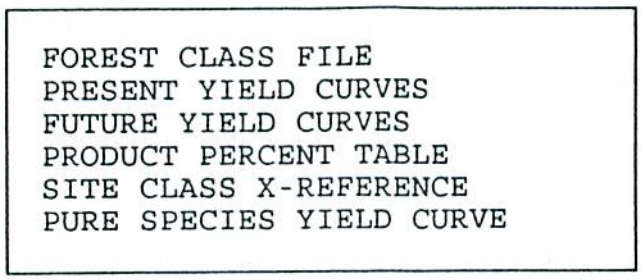


Figure 10. File Edit Options Menu.

6.1 FOREST CLASS FILE

The forest class file edit option begins with the selection of the class file to edit. The user is then presented with the forest class edit screen as is illustrated in Figure 11. The edit screen contains both aggregation criteria and forest class attributes.

The aggregation criteria is presented to the user as "view only" ie. no editing is allowed. Changes to the aggregation criteria must be done through the aggregation input/edit screen. The aggregation criteria has been included with the forest class attributes to provide a direct link between criteria and classes. Either the working group - siteclass - stocking strata2 is listed or the FormanMu ID and label depending on the type of aggregation selected. The aggregation criteria can assist the user in troubleshooting area conflicts and in determining the optimum criteria solution for the particular volumetric analysis.

There are several functions available to the user in the forest class edit screen. Each is discussed in detail below.

Del / Undel - F2

The delete function will mark the current forest class for removal from the class file. A message is displayed above the function box stating the delete status of the record. The undelete function removes this message and the record is no longer marked for deletion. All records marked for deletion are removed once the edit screen is exited. The class id's are automatically renumbered.

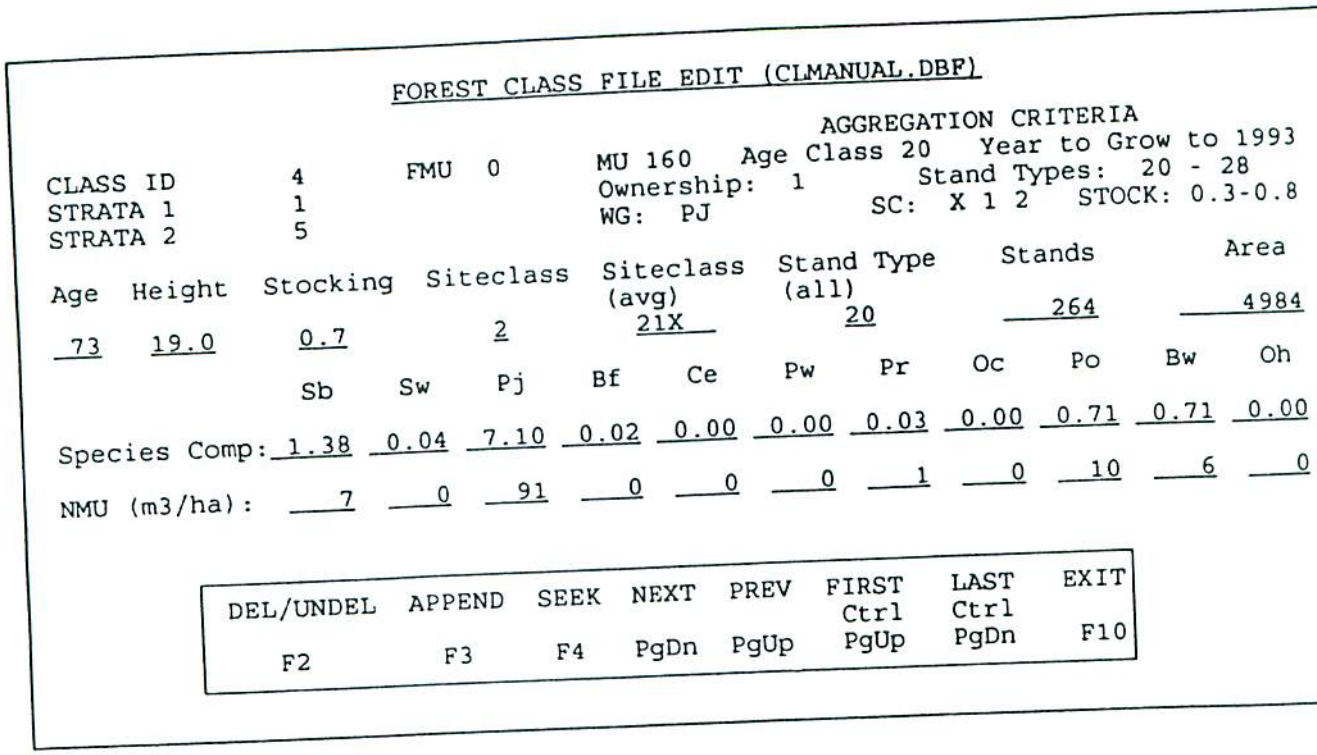


Figure 11. Forest Class File Edit Screen.

Append - F3

The append function allows the user to add forest classes to the class file. This function is commonly used to update the inventory by splitting or combining existing forest classes. The updating of forest classes is often easier at a class level than on individual stands in the stanf file. Some examples include conversion of barren and scattered or NSR areas into production, stand conversion of over-mature areas and depletion of mature areas.

The append screen is identical to the edit screen except for the absence of strata1 and strata2 aggregation criteria. These criteria will be added automatically once all of the class attributes have been entered. This step has been automated to prevent changes to the existing aggregation criteria. The new class id number is also applied to the new record.

There are a series of internal checks that occur when the user attempts to exit the

append screen. The error check routine first scans the class attributes to ensure that all of the required information for yield curve development is present. The second step is to compare the attributes with the existing aggregation criteria. Where aggregation is based on wg - sc - stk criteria, the working group determined from the species composition of the forest class must fit into one of the working group strata. Where aggregation is based on FormanMu's or Forest Units, the FMU ID which is entered by the user must match a FormanMu ID in the aggregation criteria.

The strata1 criteria is checked to ensure that the siteclass matches a siteclass strata, the stocking fits into one of the stocking ranges and the stand type fits into one of the stand type ranges.

Table 9. New Forest Class Error Checks.

1. Age must be greater than 0.
2. Height must be 0.0 - 40.0.
3. Stocking must be 0.0 - 3.1.
4. Stocking must match stand type.
5. Siteclass must be X, 1, 2, 3, or 4.
6. Stand type must be entered.
7. Area must be greater than 0.
8. Species composition must add to 10.
9. Stand type must fit an aggregation criteria range.

WG - SC - STK Aggregation

10. Working group must match an aggregation criteria working group.
11. Siteclass must match aggregation criteria.
12. Stocking must fit an aggregation criteria range.

Forest Unit Aggregation

13. FMU must match a FormanMu in aggregation criteria.

The comparing of new class attributes to the aggregation criteria is done to determine under which criteria the forest class fits. New aggregation criteria must be entered through the proper input / edit screen with a new aggregation run.

Seek - F4

The seek function provides the user with quick movement to any forest class. Once selected, the user is prompted to enter a class ID number and the new class is presented to the user on the edit screen. A message will appear if a class ID is entered which doesn't exist.

Navigation Keys

There are four navigation keys available in the forest class edit screen:

1. Next - PgDn,
2. Previous - PgUp,
3. First - Ctrl-PgUp, and
4. Last - Ctrl-PgDn.

Exit - F10

The exit function saves all changes made to the forest classes and returns the user to the PCNFCS main menu. If any forest classes have been marked for deletion, the class file is re-written and re-numbered. The stand listing is also updated to corresponde with the new forest class ID's.

NOTE: This removal of forest classes and updating of the stand file can take considerable time due to the size of the stand file (often as large as the original stanf file).

6.2 PRESENT YIELD CURVES

The present yield curve menu option allows the user to view and/or edit a present yield curve file. These files are created during forest class aggregation but the attribute values are not determined until after the yield curve development process is complete. The present curve file is named with the same technique as the forest class file. The aggregation name is used with a "PR" prefix. Using our example of aggregation criteria name "MANUAL", the present yield curve filename is "PRMANUAL.DBF".

PRESENT CURVE FILE - PRMANUAL.DBF

CLASS_ID	SPACEATRIB	OP_MINAGE	OP_MAXAGE	OPERABLEF	OPERABLEL	YFACTOR	PRI_10
1	63	55	100	97	131	100	0.0
2	63	55	100	69	102	100	0.0
3	63	55	100	68	100	100	0.0
4	63	55	100	75	112	100	0.0
5	63	55	100	62	99	100	0.0
6	63	55	100	62	99	100	0.0
7	63	55	100	54	85	100	0.0
8	63	55	100	42	70	100	0.0
9	63	55	100	135	187	100	0.0
10	63	55	100	108	156	100	0.0
11	63	55	100	148	204	100	0.0

NAVIGATION IN EDIT MODE

Within Fields		Between Fields		Between Records		ABORT	EXIT SAVE
←	→	Tab	Shift-Tab	↑	↓	<ESC>	<F10>

Figure 12. Present Yield Curve Edit Screen.

Selection of the present yield curve menu option prompts the user to select a file from the menu of all present yield curve files. The present yield curve edit screen (Figure 12) is in fact a window of the curve file. Movement between the curve attributes is done with the <Tab> and <Shift-Tab> keys (right and left directions respectively). The screen will scroll horizontally through to the last attribute at which time it will return to the home attributes for the next record. The <Enter> key will work the same as the <Tab> key.

The first two attributes, CLASS_ID and SPACEATRIB are read-only, no editing is allowed. These values are directly related to the forest class and future curve files and changes could destroy these links.

The next five attributes, OP_MINAGE, OP_MAXAGE, OPERABLEF, OPERABLEL and YFACTOR are a result of input from the silviculture cards. These are discussed in more detail in the silviculture card input section. The user should be cautioned that the operablef and operablel operable volume limits are calculated from the operable age limits and the actual primary yield curve set during yield curve development. Changes to either the volumes or ages may not reflect the points on the curve.

Four curve sets comprise the remaining curve attributes. These are primary (PRI_age),

secondary (SEC_age), product (PRD_age) and total (TOT_age) curve sets; each broken down by 10 year age classes from 10 to 200 years. The defining of species which are included in each curve set and how the volumes are determined are discussed in the yield curve development section of the manual.

The user may exit the present yield curve edit screen by aborting (<ESC> key) ie. not saving any changes or through the <F10> key which will save all changes made to the file.

NOTE: a yield curve file which has all of its curve set attributes equal to zero may indicate that the yield curve development process has not been fully completed.

6.3 FUTURE YIELD CURVES

The future yield curve menu option presents the user with a menu of all future curve files in the DATA directory. These files are created during the silviculture card input process with the curve set attribute values determined during the actual yield curve development run. The files are identified with the "FC" prefix followed by the aggregation criteria name eg. "FCMANUAL.DBF".

Once a file has been selected, the future curve edit screen (Figure 13) appears displaying a portion of the curve file. Navigation within this window is the same as with present curve editing where the <Tab> or <Enter> keys scroll right between attributes and the <Shift-Tab> key scrolls left between attributes.

There are four curve attributes which are read-only and cannot be edited: FC_ID, FC_TYPE, SPACEATRIB, and CARD_NO. Each of these attributes contain key information which links this future curve file with present curves, forest classes and silviculture costs.

Other forest class attributes include the species composition, stocking, site class, curve priority, yfactor, and the age and volume operability limits. All of these attributes are derived from the silviculture input. If major changes are required during editing of the future curves, the user should consider using the silviculture input/edit screen and re - running the yield curve development. Wide scale editing of curve attributes can only increase the potential for errors in the volumetric analysis.

FUTURE CURVE FILE - FCMANUAL.DBF

FC_ID	FC_TYPE	PRIORITY	TIME_REF	SPP_COMP
60	INTENSIVE	1	55	PJ10
61	BASIC	2	55	PJ 9PO 1
62	NATURAL	0	60	PJ 7PO 2BW 1
63	SPACING	0	50	PJ10
64	BASIC	1	60	PJ 8PO 1SB 1
65	NATURAL	0	60	PJ 6PO 3SB 1
66	INTENSIVE	2	80	SB10
67	NATURAL	0	80	SB 6SW 2BW 2
68	BASIC	3	80	SB 9BF 1
69	NATURAL	0	80	SB 8BF 1BW 1
70	NATURAL	9999	70	PJ10

NAVIGATION IN EDIT MODE						ABORT	EXIT SAVE
Within Fields		Between Fields		Between Records			
←	→	Tab	Shift-Tab	↑	↓	<ESC>	<F10>

Figure 13. Future Yield Curve Edit Screen.

The four curve sets in the future curve file: primary (PRI_age), secondary (SEC_age), product (PRD_age) and total (TOT_age) comprise the majority of the future curve attributes. As with the present curve file, these are broken down by ten year age classes from 10 to 200 years.

The user has the option to abort the edit screen (<Esc>) or to save all changes upon exiting (<F10>).

6.4 PRODUCT PERCENT TABLE

The product percent table is used in the yield curve development process to determine the product curve set for both present and future curves. This reference table is fixed in structure ie. the number and type of species, site classes and age classes are pre-set.

There are two species categories in the product percent tables: 1. Natural, and 2. Plantation. The former is identified by it's regular abbreviation (eg. SB) while the latter has an undercase "p" as a suffix (eg. SBp). The eleven natural species and seven plantation species are listed in Table 10. Each species is further divided into site classes X, 1, 2 and 3 for a total of 72 records.

Table 10. Natural and Plantation Species in the Product Percent and Pure Species Yield Reference Tables.

Natural Species	Plantation Species
SB	SB
SW	SW
PJ	PJ
BF	BF
CE	CE
PW	PW
PR	PR
PO	
BW	
OH	
OC	

After selecting the Product Percent Table menu option, the user is given the choice of creating a new table or editing an existing one from the DATA directory. If a new table is selected, a name must be provided for the new product percent file. The filename prefix is automatically assigned as "PROD" with the remaining four characters to be provided by the user.

The screen for both new and existing tables is identical except for the actual values of the product percent attributes. Figure 14 illustrates an example of the file PROD_MAN.DBF. This edit screen is a window with horizontal scrolling through the attributes and vertical scrolling through the records. The SPECIES and SITECLASS fields are read-only as the structure of the file must remain constant. The fields PROD_age, where age ranges from 10 to 200 years, represent the percent of total volume which can be applied to the specific product.

For example, if the product curve set is to represent sawlog volumes, the product percent attribute must estimate the portion of total volume at any given age which can be recovered in sawlog volume. This percentage would be expected to grow with the age and size of the species. Rot and cull are not factors in the product percentages as they are removed in the actual volume calculations using the pure species yield curves. The four siteclasses have been included to more accurately represent the species' growth over various site types.

PRODUCT PERCENT TABLE EDIT - PRODGOG.DBF

SPECIES	SITECLASS	PROD_10	PROD_20	PROD_30	PROD_40	PROD_50	PROD_60	PROD_70
SB	X	0	0	10	22	34	46	58
SB	1	0	0	10	22	34	46	58
SB	2	0	0	0	0	0	15	30
SB	3	0	0	0	0	0	0	0
SW	X	0	0	0	0	5	10	23
SW	1	0	0	0	0	0	15	30
SW	2	0	0	0	0	0	13	26
SW	3	0	0	0	0	0	0	0
PJ	X	0	0	0	14	28	42	56
PJ	1	0	0	0	14	28	42	56
PJ	2	0	0	0	0	18	36	54
PJ	3	0	0	0	0	0	12	24

NAVIGATION IN EDIT MODE

Within Fields	Between Fields		Between Records		ABORT	EXIT SAVE
←	→	Tab	Shift-Tab	↑	↓	<ESC>	<F10>

Figure 14. Product Percent Edit Screen.

The user can exit the edit screen by either aborting (<Esc>) and not saving any changes or with Exit Save (<F10>) and saving all changes to the file.

NOTE: the product percentages apply to the species in the PRODUCT curve definition only; hence all species need not be filled out in each product percent table. If the end use of any given table is restricted to a single product such as white birch veneer or spruce-pine-fir sawlogs, considerable time can be saved by only filling in the appropriate species. Reference can be made to the Volume Setup Procedure described in this manual for further information on curve species definition.

6.5 SITECLASS X-REFERENCE

The Siteclass X-Reference menu option under the File Edit menu bar provides the user with the option to create or edit a siteclass cross reference table. This table is used in the yield curve development process when determining the volumes of non-working group species. The siteclass attribute in both the forest class and future curve files always refers to the working group species only. This reference table allows the user

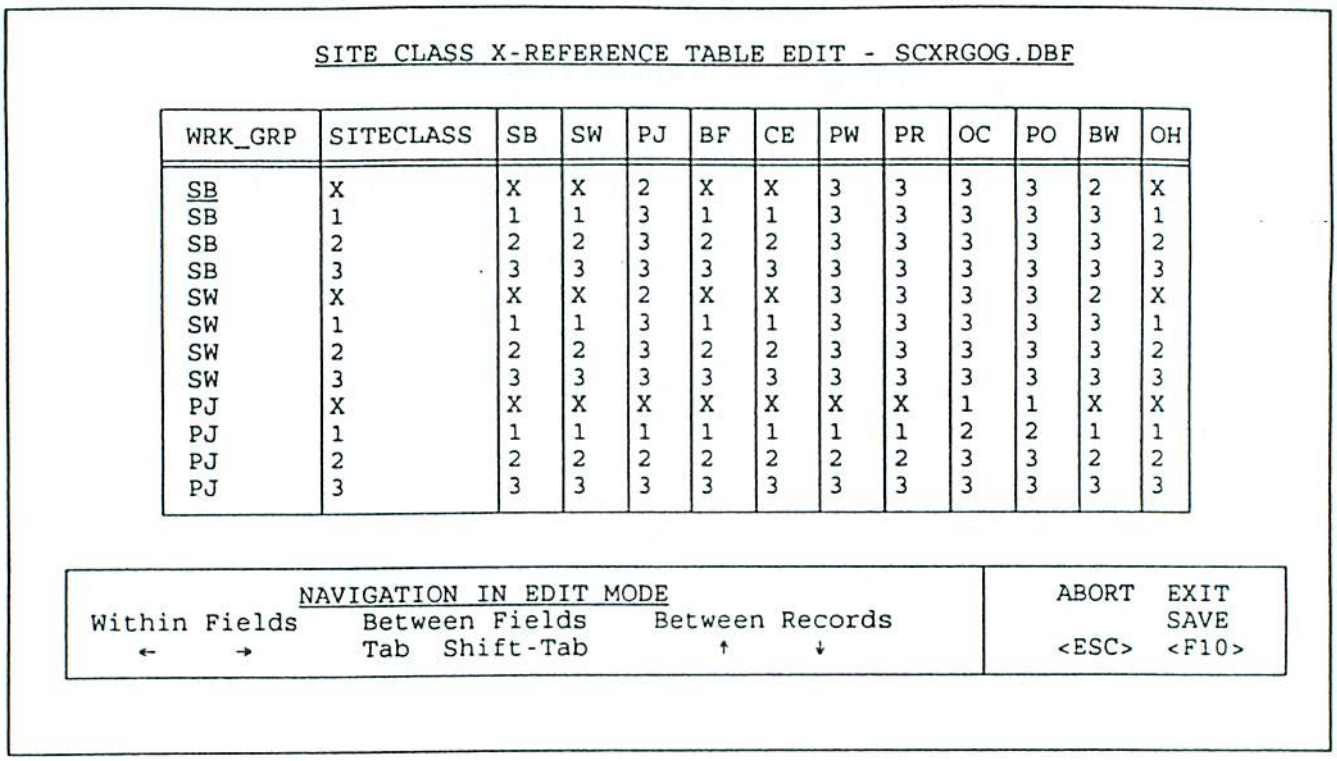
to more accurately describe species' growth relationships on the same site.

Siteclass is a function of a given species' height and age. For example, a forest class with siteclass X and species composition PJ 8BW 2 has had its siteclass calculated based on the jack pine height and age. The white birch's growth on the same site may be different but its siteclass cannot be determined based on its age and height because the height is not known (age is assumed to be equal to the working group's in even-aged management). The user has the flexibility with the siteclass cross reference table to input actual sub-species' siteclasses given the working group and working group siteclass.

When creating a new table, the values of all sub-species' siteclasses are, by default, the same as the working group's. Each siteclass cross reference table is fixed in structure with eleven working groups, siteclasses X, 1, 2 and 3, and eleven sub-species. Editing is not allowed on the working group or working group siteclass attributes.

The user is presented with a menu prompting creation of a new table or editing of an existing table. New tables are named using prefix "SCXR" and a maximum four character suffix provided by the user ie. "_MAN". Figure 15 illustrates the siteclass x-reference edit screen using SCXR_MAN.DBF as an example. There is no horizontal scrolling as all attributes are visible on the screen; vertical scrolling is necessary to see all working groups.

The siteclass x-reference screen has both the Abort and Exit Save options.



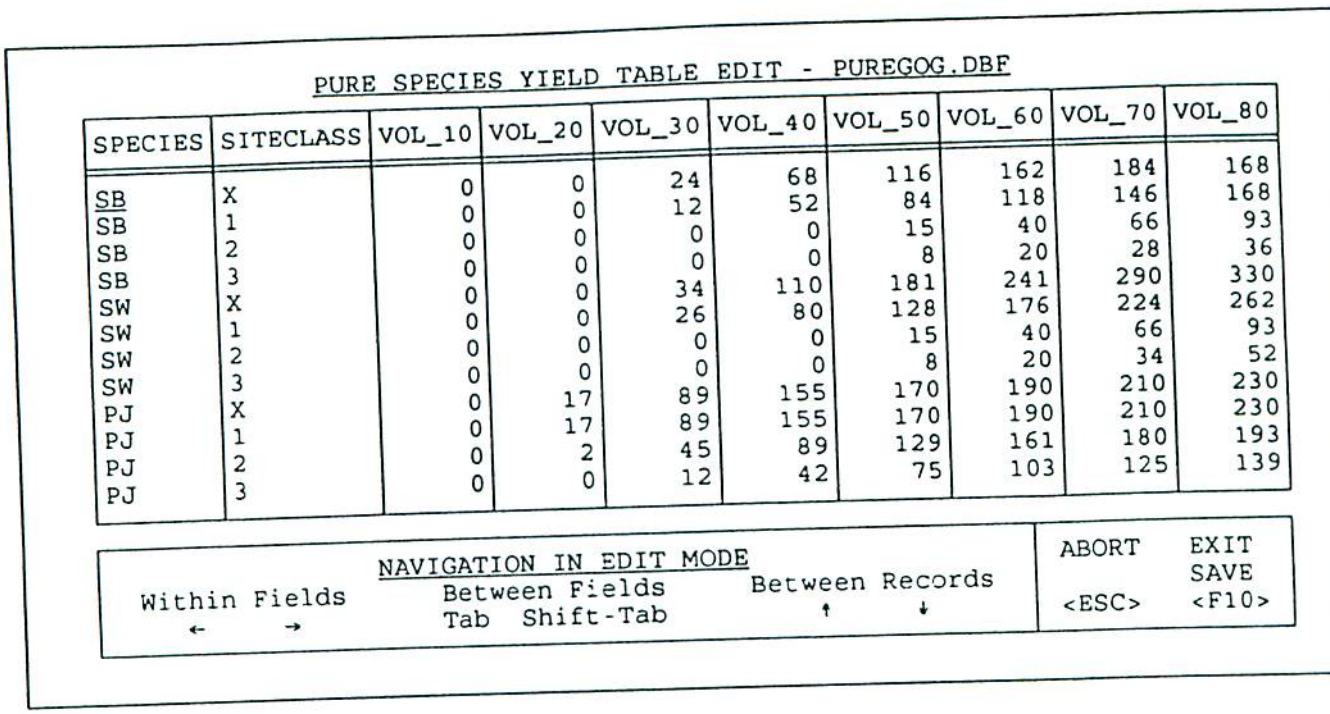
WRK_GRP	SITECLASS	SB	SW	PJ	BF	CE	PW	PR	OC	PO	BW	OH
SB	X	X	X	2	X	X	3	3	3	3	2	X
SB	1	1	1	3	1	1	3	3	3	3	3	1
SB	2	2	2	3	2	2	3	3	3	3	3	2
SB	3	3	3	3	3	3	3	3	3	3	3	3
SW	X	X	X	2	X	X	3	3	3	3	2	X
SW	1	1	1	3	1	1	3	3	3	3	3	1
SW	2	2	2	3	2	2	3	3	3	3	3	2
SW	3	3	3	3	3	3	3	3	3	3	3	3
PJ	X	X	X	X	X	X	X	X	1	1	X	X
PJ	1	1	1	1	1	1	1	1	2	2	1	1
PJ	2	2	2	2	2	2	2	2	3	3	2	2
PJ	3	3	3	3	3	3	3	3	3	3	3	3

Figure 15. Siteclass X-Reference Table Edit Screen.

6.6 PURE SPECIES YIELD CURVE

The pure species yield curve edit option provides the user with the choice to create a new set of yield curves or to edit an existing set. The filenames of these yield reference tables have "PURE" as the prefix and a user supplied suffix of up to four characters. The example used in this manual is "PURE_MAN.DBF".

The pure species yield curve table is used in the yield curve development process. Each table's structure is fixed and identical to the product percent tables. Table 10 lists the species available for both natural and plantation curves. Each species is further broken down by siteclass (X, 1, 2 and 3) and by 10 year age class from 10 to 200 years. Figure 16 displays the pure species yield curve edit screen. The window has horizontal scrolling between attributes and vertical scrolling between records. The SPECIES and SITECLASS fields are read-only to maintain the constant structure.



PURE SPECIES YIELD TABLE EDIT - PUREGOG.DBF

SPECIES	SITECLASS	VOL_10	VOL_20	VOL_30	VOL_40	VOL_50	VOL_60	VOL_70	VOL_80
SB	X	0	0	24	68	116	162	184	168
SB	1	0	0	12	52	84	118	146	168
SB	2	0	0	0	0	15	40	66	93
SB	3	0	0	0	0	8	20	28	36
SW	X	0	0	34	110	181	241	290	330
SW	1	0	0	26	80	128	176	224	262
SW	2	0	0	0	0	15	40	66	93
SW	3	0	0	0	0	8	20	34	52
PJ	X	0	17	89	155	170	190	210	230
PJ	1	0	17	89	155	170	190	210	230
PJ	2	0	2	45	89	129	161	180	193
PJ	3	0	0	12	42	75	103	125	139

NAVIGATION IN EDIT MODE

Within Fields ← →
Between Fields Tab Shift-Tab
Between Records ↑ ↓

ABORT <ESC>
EXIT SAVE <F10>

Figure 16. Pure Species Yield Curve Edit Screen.

The user can return to the PCNFCS main menu by using either the abort (<Esc>) or exit and save (<F10>) keys.

7.0 YIELD CURVE DEVELOPMENT

The yield curve development process is broken into three components: silviculture card input, volume setup and the curve development run. Figure 17 illustrates the three as they appear in the options menu. Briefly, the silviculture card input option allows entry and editing of all present and future operability limits, future curve types and descriptions, silvicultural regimes and costs, and relationships between present forest classes and future curves. The volume setup procedure establishes which reference files to use and assigns species to the primary, secondary and product curves. The actual development run is an internal procedure which creates and compiles all present and future curve sets and associated cost file. Each procedure is discussed in detail in the sections that follow.

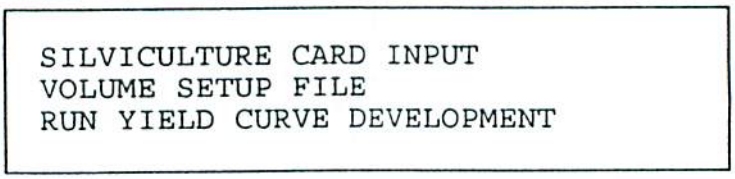


Figure 17. Yield Curve Development Options Menu.

7.1 SILVICULTURE CARD INPUT

The silviculture card input process has been designed to minimize the steps in assigning harvesting and silviculture information to the present and future curves. Input is based on the aggregation criteria which was used to create the class file; specifically the strata2 criteria (working group - siteclass - stocking or FormanMu). The user need not keep track of curve id numbers or present to future relationships as this is all done internally.

The silviculture card information is not stored in any one file; information is distributed across several related data files. The first step in creating silviculture cards is assigning aggregation strata2 (working group - siteclass - stocking or FormanMu) to cards through the silviculture card definition screen (Figure 18). After each aggregation run, forest classes are developed based on the aggregation criteria. The successful criteria ie. those for which stands were found and forest classes aggregated, become potential silviculture cards. Once a forest class file has been selected through the silviculture card input menu option, these working group - siteclass - stocking or FormanMu strata are presented to the user in one or more pages as is shown in Figure 18.

NOTE: The silviculture card definition screen is only presented to the user when no silviculture card information exists for the class file. This is the case with any new forest class files or those for which aggregation has been re-run ie. aggregation criteria was changed.

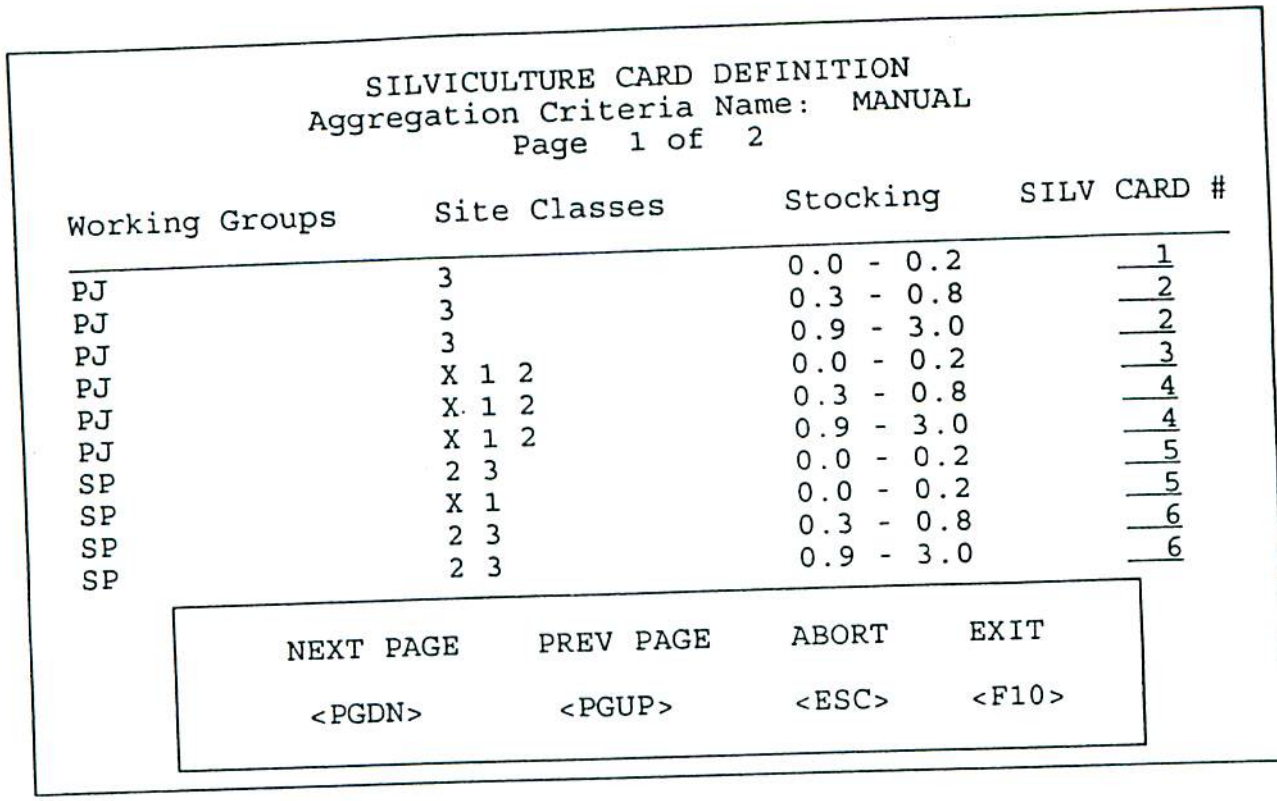


Figure 18. Silviculture Card Definition Screen for WG-SC-STK Type Aggregation.

The silviculture definition screen provides the user with the ability to combine the unique strata2 from the class file into silviculture cards. The page number at the top of the screen shows the current and total strata pages. These can be accessed with the PgUp and PgDn keys as shown in the navigation menu. The purpose of this card definition procedure is to allow the collective application of silviculture treatments to groups of aggregation criteria which share similar harvest and silviculture treatments. This reduces the number of silviculture cards to input.

Those forest classes with stocking levels 0.0 - 0.2 must be treated differently than productive forest classes with stocking levels greater than 0.3. Classes with stocking range 0.0 to 0.2 have been developed from inventory stands of stand type 30 - 39 and represent N.S.R. or B&S areas. The silviculture cards for these stand types offer different future curves than those available to the productive stand types. The N.S.R. and B&S forest class strata can be combined with each other provided they share future treatments. For example, the two spruce 0.0 - 0.2 strata in Figure 18 are combined. The two jack pine strata are not combined (cards 1 and 3) as they will be provided with

different silviculture treatments.

The user should continue to apply silviculture card numbers until each strata has been assigned to a card. Incomplete card information may be entered but the complete definition will be required at some point prior to running the yield curve development. The card definition screen is only accessible while there are aggregation strata that have not been assigned a card. Once all strata have been assigned, the definition procedure is closed for all subsequent edits of the silviculture cards. Should the user wish to reassign strata to different silviculture cards, the aggregation / edit procedure will have to be entered and saved. This will remove the future, cost and present curve files from the disk. When this is done, all previous silviculture card information will be deleted.

There are no limits with respect to number of strata per card or combination of different working groups, siteclasses, etc. If the situation arises where many strata are combined into a few cards, the user may wish to examine the aggregation criteria strategy again. Perhaps the initial aggregation plan was too detailed if classes are re-aggregated for the application of silviculture information.

Where previous silviculture information exists, the silviculture cards are built from the present, future and cost files. The program deletes these files once the information has been retrieved. All files are then re-written once the silviculture cards are saved. The future and cost files are regenerated with the absence of yield volumes ie. the yield curve development will have to be re-run. This process is done to eliminate future curve duplications and poor relational links between the present, future and cost files.

Once the definition screen is saved (Exit & Abort returns control to the PCNFCS main menu), the user is presented with the first silviculture card input screen. Figure 19 illustrates Card # 1 with stocking strata 0.0 - 0.2 and Figure 20 shows Card # 2 where the stocking ranges represent productive forest. The difference between these cards is in the types of future curves which are made available. In Figure 19, only the "Natural" and "NSR / B&S" future curves are available for input by the user. This forces the user the treat these under stocked areas separately from the productive areas. Productive forest classes as in Figure 20 have four future curve types available: Intensive, Basic, Natural and Spacing.

The silviculture input screen includes file information, aggregation criteria, present curve harvesting information and future curve descriptions. The first line displays the four files to which information is applied:

1. Forest Class File - prefixed by "CL",
2. Present Curve File - prefixed by "PR",
3. Future Curve File - prefixed by "FC", and
4. Cost File - prefixed by "CS".

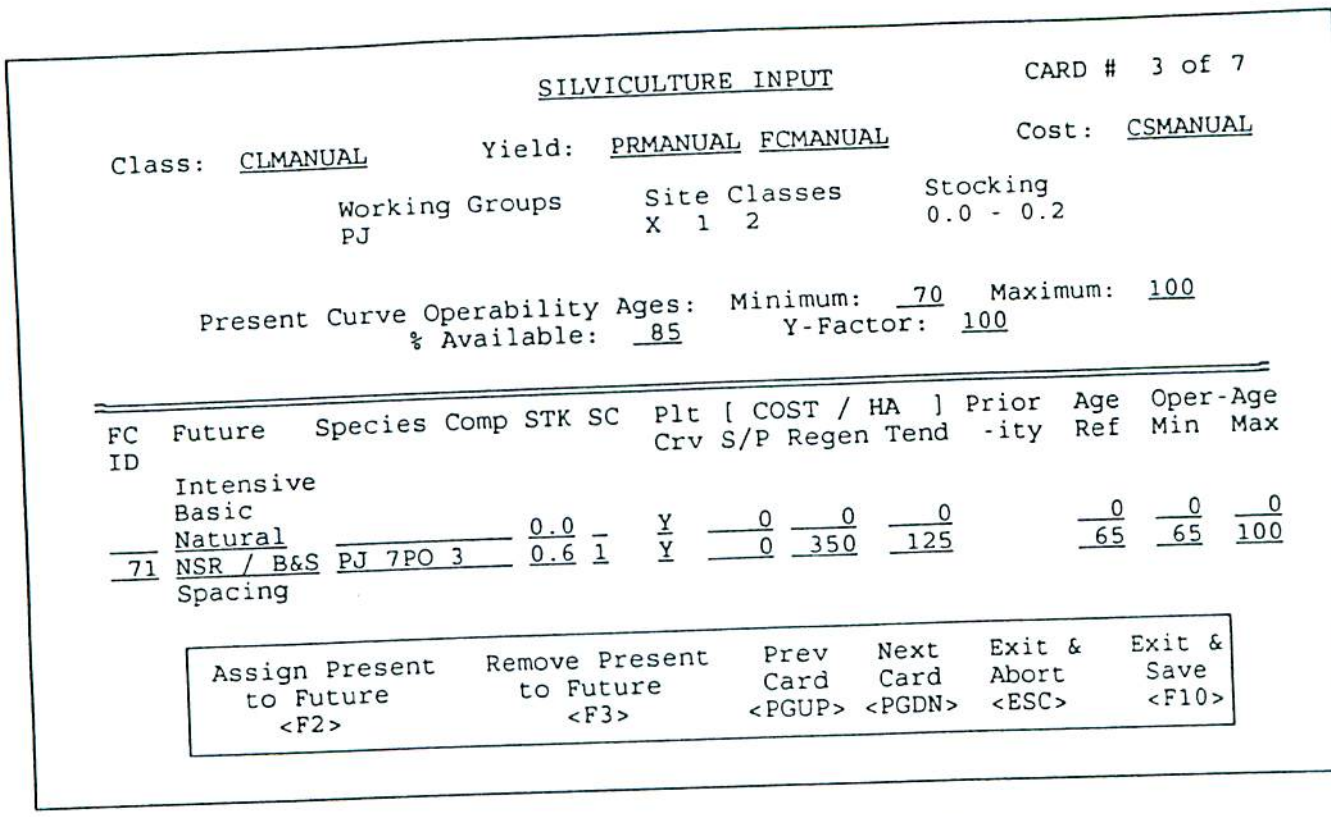


Figure 19. Silviculture Input Screen for N.S.R. and B&S Forest Classes.

The next lines list the aggregation strata2 criteria which was defined as being part of the silviculture card. The working group - siteclass - stocking or FormanMu criteria are only displayed for the first four strata due to screen space.

Four pieces of information are applied to the forest classes and their present curves. The minimum and maximum operability ages will be converted internally to represent actual volumes on the primary curve. The "% Available" attribute represents the portion of forest class area which is physically available for harvest. Examples of reductions include wildlife reserves, roads and landings, fire, insects, fish habitat, etc. The actual area reduction is done in the volumetric models, not in this program.

The fourth attribute which is applied to present curve information is the "Y-Factor". Used in the volumetric models, this attribute is applied to the yield curves as a scaling factor. Through examination of the yield curves which are produced, the user may wish to scale them up or down without the effort of modifying each pure species yield curve. This value is usually set at 100%.

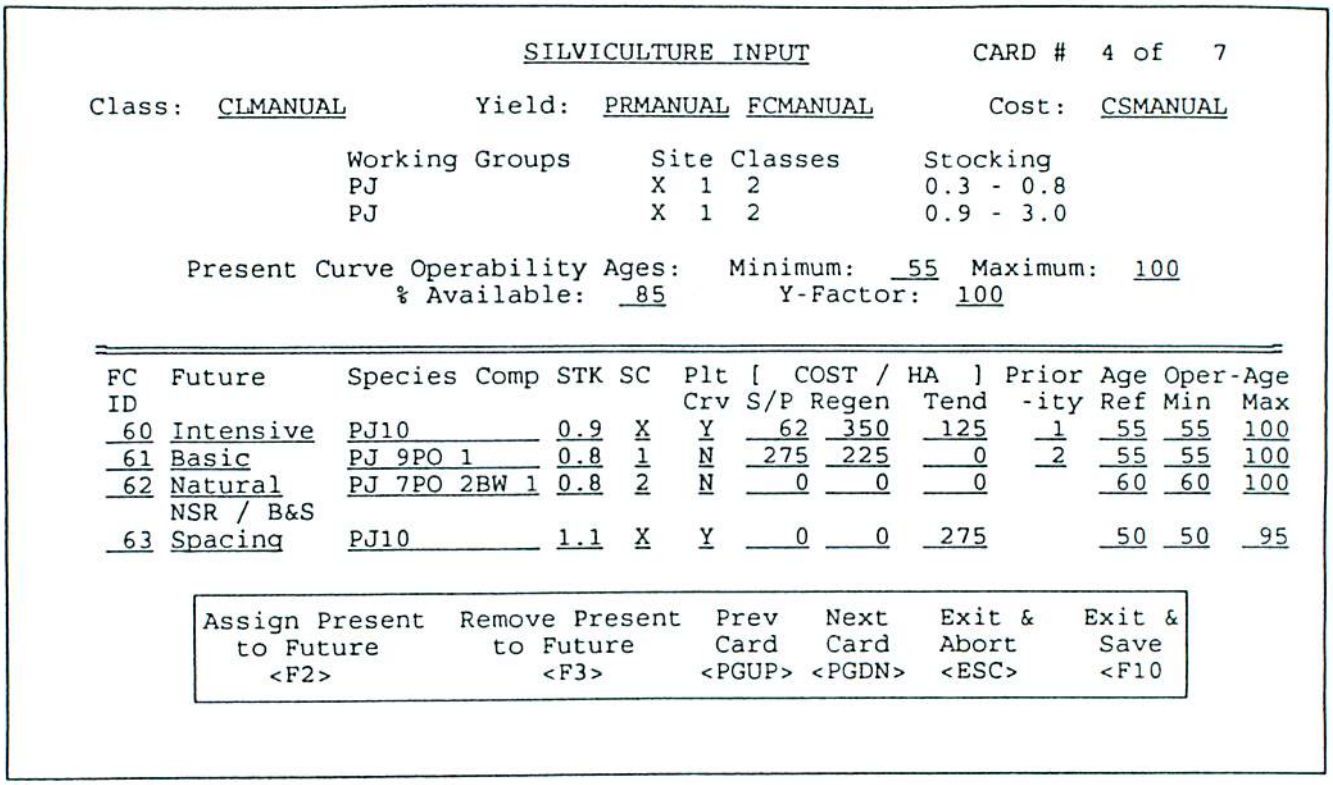


Figure 20. Silviculture Input Screen for Productive Forest Classes.

The future curve section of the silviculture card input takes up the middle portion of the screen. The user has two options in assigning future curves to the set of present curves represented by the aggregation criteria:

1. assign the present curve to the future curve, or

2. assign specific curve descriptions to one or more future curve types.

The first option of assigning the present curve to the future curve will copy each present curve in the forest classes represented by the card to a future curve. These curves will be of type "NATURAL" in the future curve file and can be identified within the future curve edit by having a priority equal to 9999. The priority number for natural future curves is not applicable in any of the three volumetric models.

Removing the "present to future assignment" can be done at any time while in the silviculture card input screen.

The second option requires that the user enter a minimum of one future curve description for an available future curve type. The future curve id (FCID) is not entered by the user as it is assigned internally based on the forest class id's and the number of future curves already entered. Each of the future curve attributes shown in Figures 19 and 20 are discussed in detail below.

Species Comp

The species composition attribute can contain a maximum of 40 characters (10 species). The entering of the species composition must be consistent with the FRI stanf format:

- first species entered is working group
- each species takes four characters of space
- the first two characters are species abbreviation ie. PJ
- the second two characters of each species set is the numeric composition justified to the right of the two character space
- total species composition must add to 10.

NOTE: composition of 10 should be entered as 10; not as 0.

For example: PJ 8PO 1SB 1, PJ10

Stk

The stocking of the future curve type must fall between 0.0 and 3.0. The stocking level of the future curve should consider the present curve stocking range (aggregation criteria range in upper portion of screen), amount and intensity of silvicultural work, site type, and the presence of sub-species in the future stand.

SC

The siteclass of the future curve is a reflection of it's height versus age growth and may be different than the present curves given the intensity of silviculture treatment. This siteclass will be used to calculate the volumes for the yield curve sets.

Plt Crv

The planting curve attribute is a "yes" or "no" answer. This question asks whether the program should use the plantation curves in the pure species yield file or the standard natural curves. The answer is again dependent on the intensity of the silviculture treatment.

COST / HA

There are three attributes which store silviculture cost information for the future curve: S/P or site preparation, REGEN ie. seeding or planting, and TENDING ie. mechanical or chemical tending costs. The sum of these three costs is transferred to the volumetric analysis input files.

Priority

Curve priority is an attribute used in the volumetric models and is applicable to the intensive and basic curves only. An order of priority must be provided for each curve type independently across all silviculture cards. The user can flip between cards after all curves have been entered to ensure priorities are entered correctly or use the future curve edit option of the File Edit menu bar to enter curve priorities.

Age Ref

The age reference attribute is the point in time at which the future curve description will be applicable. Species compositions, stocking and siteclass are often dynamic as the stand grows; this attribute establishes a point of reference.

Oper-Age - Min, Max

The minimum and maximum operability ages for the future curve are converted internally to volumes once the yield curves have been developed. The first and last volume limits can be edited through the future curve edit once the yield curve process has been run.

The names of the future curve types may or may not be consistent with the volumetric model to be used. Table 11 lists the future curve names used in the PCNFCS program and their equivalents in each of the three models.

Table 11. Future Curve Names in PCNFCS and Volumetric Models.

PCNFCS	NORMAN	FORMAN 2.1	FORMAN CP
Intensive	Intensive	Planting	Planting
Basis	Basic	n/a	n/a
Natural	Natural	Future	Future
NSR / B&S	NSR	n/a	n/a

The spacing curve in the silviculture card input screen is referenced indirectly in the volumetric models through the spacing attribute (SPACEATRIB). The actual curve is stored in the future curve file but its only link within the models is with its curve id. This attribute is stored in the present and future curve files and can be viewed but not edited through the present and future curve file edit screens. The value of spaceatrib is assigned internally in the same way all curve id's are assigned.

NOTE: Deletions to the forest class file after silviculture cards are defined may result in some cards becoming inactive ie. they do not represent strata which are in the forest class file. The program will notify the user of any occurrences of this type. Yield curve development is not affected.

7.2 VOLUME SETUP FILE

The volume setup file acts as the volume development instruction list. The user selects a volume definition name and is presented with the Volume Setup Definition Screen (Figure 21). The names are obtained from the aggregation criteria file (naming is consistent from aggregation to class files to yield and cost files).

The selection of the reference files for the volume development is done with the F3, F4 and F5 function keys. Each function key produces a menu of all available tables from which the user selects the appropriate one for the definition.

The species curve definitions allow up to 10 species to be selected for each curve type. The species lists are used in calculating present and future curve sets in the yield curve development process. The species are selected from a menu of 11 possible species which match those used in the forest class aggregation and in the reference tables.

Volume setup definition's can be marked for deletion using the F2- Delete Definition function. They will be removed once the screen is exited with the F10 function.

The yield curve development process cannot be run without a completed volume setup screen.

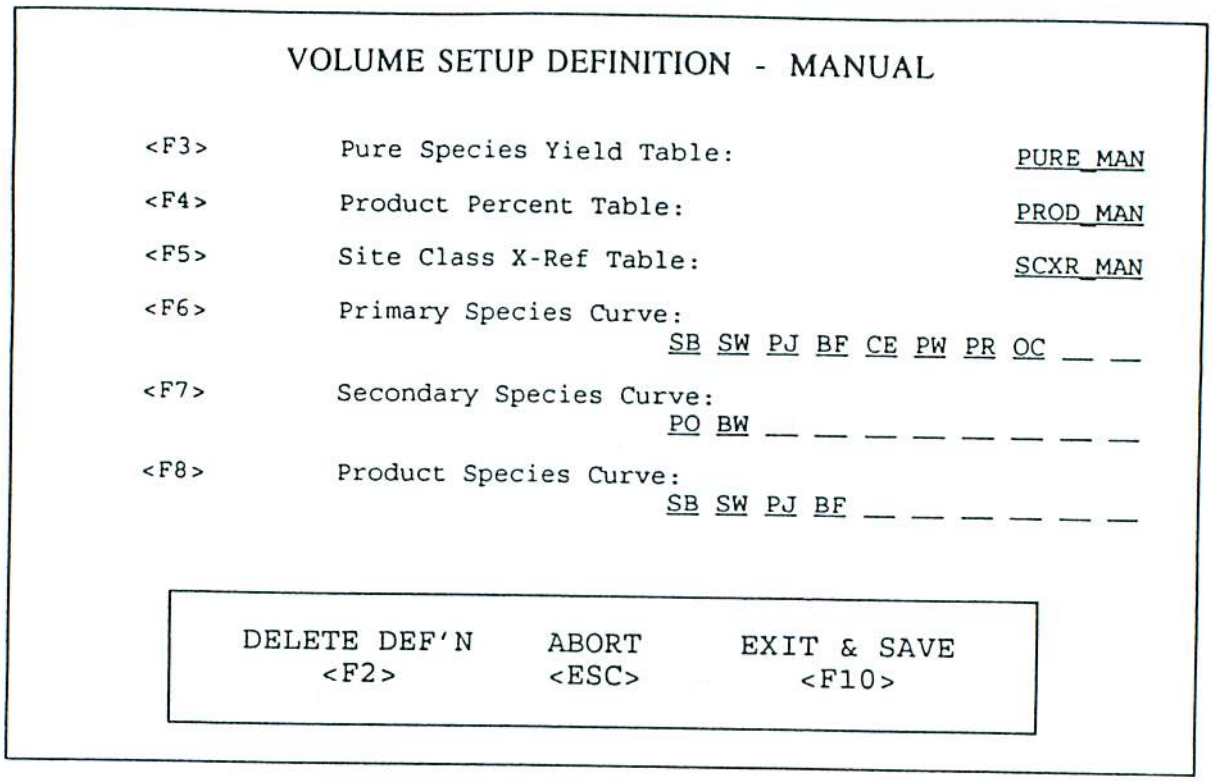


Figure 21. Volume Setup Definition Screen.

7.3 RUN YIELD CURVE DEVELOPMENT

The yield curve development process prompts the user to select the volume setup file to run. The volume setup definition is then checked to ensure all required reference files are listed.

The procedure then reviews the silviculture cards for the selected file set. A message is displayed and the procedure is aborted if the cards are incomplete in any way. Once all checks have passed, the user is presented with the question:

Calculate average yield curves for each forest unit? [Y / N]

This provides the user with the choice to produce volumetric files which have the same yield curve for each age class in a forest unit (answer "Y") or to produce individual curves for each age class based on each forest class's attributes (answer "N"). Should the user select "YES", minimum and maximum ages must be entered to determine from which range of age classes the average yield curves will be developed.

The resulting average curves are identical to those which can be produced in the "Forest Unit Yield Report" from a curve file which is produced from individual forest class curves.

The yield curve procedure then calculates all present curve sets followed by all future curve sets. A progress bar is displayed for each process. The total, primary, secondary and product curves are determined using 10 year increments from age 10 to 200. Operability ages are converted to volumes once yield curves have been developed.

The present and future curve sets can be viewed and/or edited through the File Edit options menu. The complete file set is now ready for export to the volumetric models.

8.0 REPORTS

There are a total of fourteen report types offered in the PCNFCS program; many with data querying options. Figure 22 illustrates the options menu of the reports menu bar. Each report type's extension is shown in parenthesis at the end of the report name.

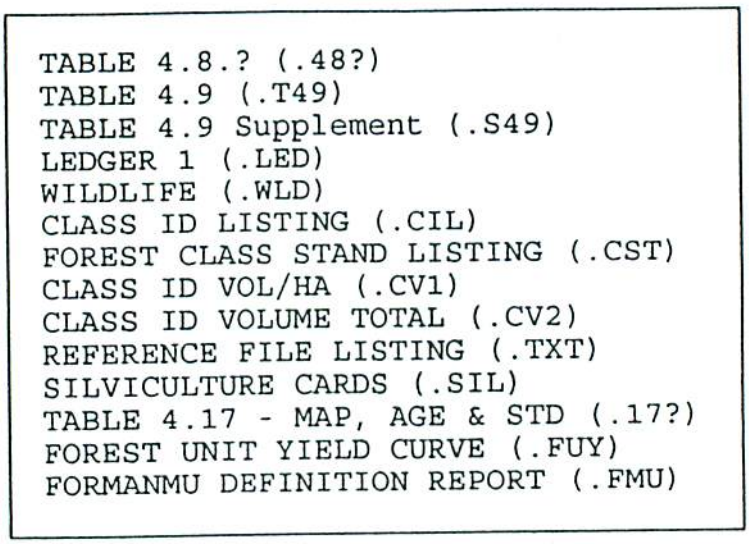


Figure 22. Reports Options Menu.

Reports can be written to ASCII text files or directly to the printer. The text files are stored in the PCNFCS\REPORTS directory and can be edited through any text editor from the DOS prompt. Reports which are sent directly to the printer prompt the user to prepare the printer for normal or condensed pitch. It is recommended that reports be written to file where they can be viewed, edited or printed at convenient times.

Each report is discussed in detail in the following sections. Examples of the reports can be found in Appendix II.

8.1 TABLE 4.8.? (.48?)

Table 4.8 is an area summary of the forest unit inventory by ownership. The report also summarizes working group areas for productive forest stand types. This report can be used within the Timber Management Planning process and is a valuable reference for determining aggregation criteria and validating aggregation results. A detailed example of one use of the table is provided in the aggregation section of the manual.

A total of 9 different reports can be generated depending on the ownership that is selected. Table 12 lists the ownerships as they appear to the user.

Table 12. Ownership Options for Table 4.8.

```
0 - Table 4.8.1:  Area Summary of All Land Ownerships
1 - Table 4.8.2:  Area Summary of All Crown Land
2 - Table 4.8.3:  Area Summary of Patent Land (Timber Rights Crown)
3 - Table 4.8.3:  Area Summary of Patent Land (Normal)
4 - Table 4.8.4:  Area Summary of Patent Land (Company Freehold)
5 - Table 4.8.5:  Area Summary of Provincial Parks
6 - Table 4.8.6:  Area Summary of Indian Reserves
7 - Table 4.8.7:  Area Summary of Recreational Reserves
8 - Table 4.8.8:  Area Summary of Agreement Forests
9 - Table 4.8.9:  Area Summary of Federal Reserve
```

The user is then prompted to select the stanf file to be compiled and the option to select a specific mapsheet or Formanmu (FMU) for the report. The program default is to include all mapsheets and Formanmu's; a blank entry on a cell will assign default. The user is next prompted for the name of the management unit. This name is used in the report header with the management unit number. The first year of the five year period is asked of the user to identify the five year planning period which is also included in the report header.

A filename must be entered if the user selects to output the report to a file. The extension of the filename is set by default using the ownership type.

Because this report compiles the inventory file, reports of large files may take considerable time to generate. A progress bar is displayed to the user.

8.2 TABLE 4.9 (.T49)

Table 4.9 is an area summary by working group and age class. The report is compiled from crown ownership only (ownership code 1) and for the productive forest (stand types 20 - 39). Table 4.9 is used in the Timber Management Planning process and as a reference document in forest class aggregation. The user can select 5, 10 or 20 year age classes and choose how those ages will be determined; to year of update or to start of planning period. Table 13 lists the six options presented to the user upon selecting the Table 4.9 report option.

Table 13. Age Class and Age Calculation Options for Table 4.9.

```
1 - 20 year age classes, ages adjusted to start of planning period
2 - 20 year age classes, ages determined using year of update
3 - 10 year age classes, ages adjusted to start of planning period
4 - 10 year age classes, ages determined using year of update
5 -  5 year age classes, ages adjusted to start of planning period
6 -  5 year age classes, ages determined using year of update
```

Once an age selection has been made, the program prompts the user to select a stanf file, choose an optional mapsheet and/or Formanmu, enter the name of the management unit, and enter the first year of the five year planning period. If the user had chose to determine ages based on the start of the planning year, an additional prompt will appear for the year to update ages to. The first year of the five year planning period is assigned by default to the year to update to but can be changed by the user.

The report can be written to file or sent to the printer. Reports written to file require a filename from the user; filename extension is set by default to .T49. The compilations required to produce the report are extensive with the length of time needed dependent on file size. Once the file is indexed, a status bar is displayed to the user.

8.3 TABLE 4.9 Supplement (.S49)

Table 4.9 supplement is a further breakdown of the standard Table 4.9 age classes by siteclass. A working group summary is also provided by stand type. This report is a useful reference in the forest class aggregation process. All prompts are identical to those in Table 4.9. It is recommended however, that the five year age class be avoided because of the large amount of information that will be produced.

Filename extensions for reports written to file are set by default to .S49.

8.4 LEDGER 1 (.LED)

The Ledger 1 report option produces stand listings by mapsheet for a set of criteria input by the user. This criteria is called the Ledger 1 report definition; each definition identified by a name provided by the user. All definitions are stored in the file LEDGER1.DBF in the DATA directory for future editing. The adhoc reporting capabilities of this report prove useful in tracking down inventory or forest class aggregation errors.

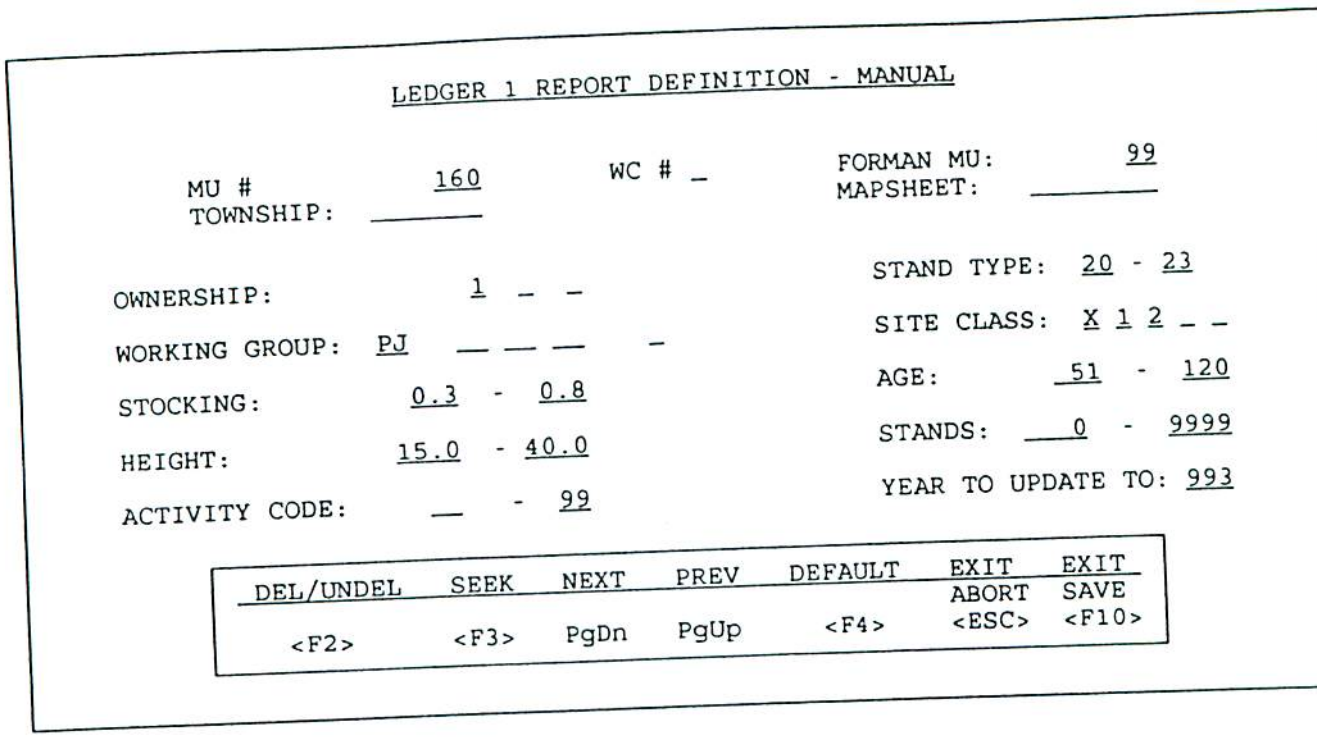


Figure 23. Ledger 1 Report Definition Screen.

Figure 23 illustrates the Ledger 1 definition screen using the example MANUAL The top portion of the screen contains the header information. The management number (MU) identifies which inventory file is to be used to compile the report ie. STANF160.DBF. The working circle (WC), TOWNSHIP and MAPSHEET attributes each act as primary filters on the inventory file. The FORMANMU attribute is also a primary filter and represents the user-defined working circles applied with the FormanMu working circle application procedure.

NOTE: a blank entry for the FORMANMU attribute translates to a value of zero ie. the inventory file will be compiled for stands meeting FormanMu = 0. To instruct the procedure to include all stands regardless of FormanMu status ie. shut off the FormanMu filter, enter the value of 99.

The central portion of the Ledger 1 definition screen presents the user with common query attributes allowing the user to insert specific criteria for the report. A stand must meet each attribute's value set to be successfully written to the report. For example, the criteria statement produced from Figure 23 would translate as follows:

all FormanMu's,
ownership code = 1,
stand type 20 to 23,

working group PJ (code = 07),
siteclass = X, 1 or 2,
stocking 0.3 to 0.8,
age (using year to update to of 1993) 51 to 120,
height 15.0 to 40.0 m,
stands numbered 0 to 9999, and
any activity code.

There are several functions available to the user at the bottom of the Ledger 1 definition screen. These are discussed in detail in the following text.

Del/Undel - F2

The delete function will mark the entire report definition for removal from the LEDGER1 file. The definition will not be removed until the screen is exited with the <F10> key. The aborting of a definition which is marked for deletion will not remove the record from the file.

Seek - F3

The seek function activates a menu of all other Ledger 1 report definitions. The selected definition then becomes the active one.

Default - F4

The default function will automatically set all attributes to a default value to speed data input. These values are as follows:

FormanMu:	99
Stand Type:	20 - 39
Siteclass:	X 1 2 3 4
Stocking:	0.0 - 3.0
Age:	0 - 299
Height:	0.0 - 30.0
Stands:	0 - 9999
Activity Code:	0 - 99
Year to Update to:	current year.

Next - PgDn, Prev - PgUp

These navigation keys will move the user sequentially through the LEDGER1 file making each NEXT or PREVIOUS record the current definition.

Exit Abort - ESC

The abort function returns control to the PCNFCS main menu without saving changes to any definitions which may have been added or edited. For example, a new definition is input named NEWONE and the user moves to the MANUAL definition using the seek function. An abort from the MANUAL definition will not save the new definition NEWONE. Definitions which are marked for deletion when the abort function is used will not be deleted from the file.

Upon selection of the Ledger 1 report option, the program stores the original LEDGER1 file in memory. This original file is restored if the Abort function is used.

Exit Save - F10

The exit and save function writes all changes to the LEDGER1 file and begins the reporting procedure for the current screen definition. The stanf file is indexed prior to actual compilation. A progress bar is then displayed to help estimate processing time. Once compilations have completed, the user is prompted to select the output device ie. file or printer. Reports written to file may take a few minutes to write for larger inventory files. The filename used for the Ledger 1 report is made of the definition name and the extension .LED ie. MANUAL.LED.

8.5 WILDLIFE (.WLD)

The Wildlife report is similar to the Ledger 1 report with respect to it having adhoc reporting capabilities using a stanf inventory file. The main difference is that the Wildlife report has a species composition attribute instead of the working group attribute in Ledger 1. The Wildlife report was originally designed to provide information valuable to the managing of fish and wildlife.

Wildlife definitions are stored in WILDLIFE.DBF in the DATA directory. Once the report option is selected, the user is prompted to select an existing definition from the WILDLIFE file or create a new one. Figure 24 illustrates the Wildlife report definition screen.

The top quarter of Figure 24 contains the definition header information. The management unit number establishes the inventory file to be used (STANF160.DBF) while the WC, FORMANMU, TOWNSHIP and MAPSHEET attributes act as the initial file filters. The FormanMu attribute is the same in the Wildlife definition as in the Ledger 1: a blank entry is translated as FormanMu = 0. The user must enter the value 99 if the FormanMu filter is to be disabled.

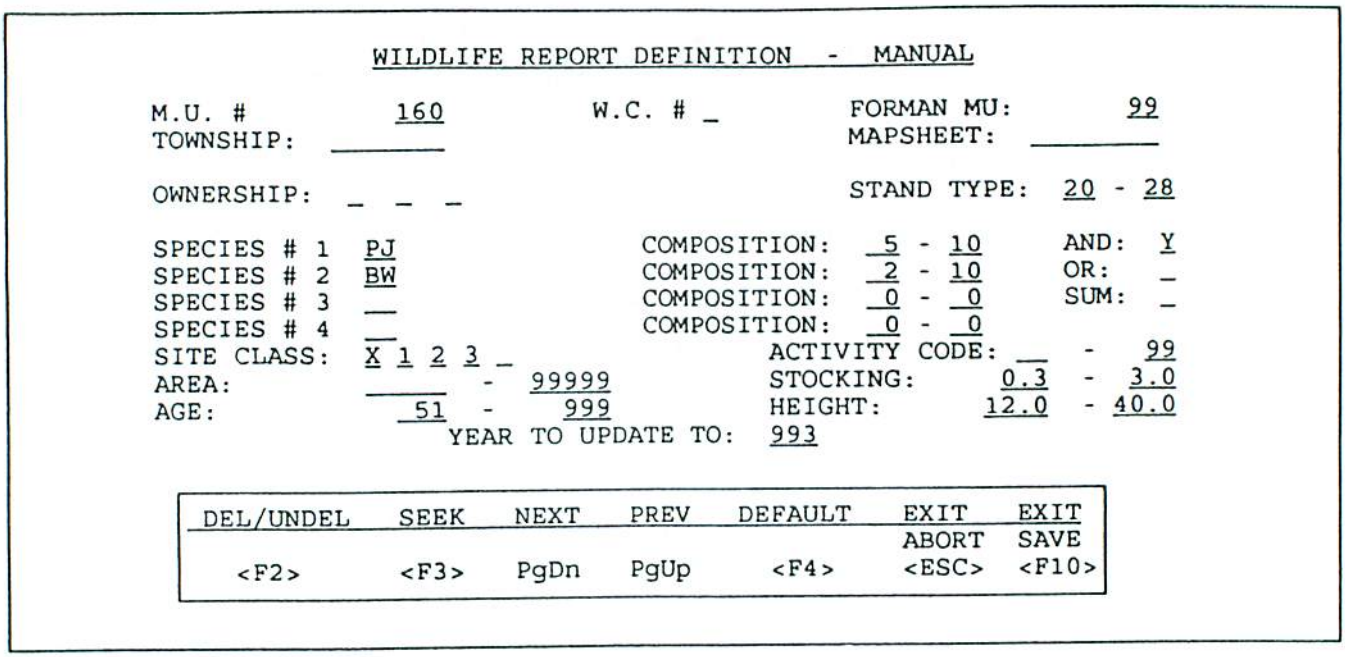


Figure 24. Wildlife Report Definition Screen.

OWNERSHIP and STANDTYPE provide basic query statements within the definition. The example in Figure 24 queries all ownership codes and stand types 20 to 28. The section of the screen containing four species and composition is the unique component of this reporting option.

The actual query statement produced by the species compositions is dependent on the answers to "AND", "OR", and "SUM". Only one of the three attributes may be flagged as "YES" (true). Each attribute is discussed in detail.

And = "Y"

When the AND attribute is flagged as yes, each of the species compositions entered must be true for each stand that is successfully written to the report. For example, if the species criteria were entered as follows:

Species #1	PJ	Composition	5 - 10	AND: Y
Species # 2	BW	Composition	2 - 10	OR: N
Species # 3	PO	Composition	2 - 10	SUM: N,
Species # 4		Composition		

the query statement would translate as follows:

PJ >= 50% and BW >= 20% and PO >= 20%.

The number of possible stand compositions matching this criteria is limited:

PJ 5 BW 3 PO 2 PJ 6 BW 2 PO 2
PJ 5 PO 2 BW 2

Or = "Y"

The OR attribute separates the four species compositions such that only one need be true for a stand to successfully meet the criteria. The following example shows the relationship:

Species #1	PJ	Composition	7	- 10	AND: N
Species # 2	SB	Composition	6	- 10	OR: Y
Species # 3	SW	Composition	7	- 10	SUM: N
Species # 4		Composition			

The translated query statement is:

PJ >=70 % or SB >= 60% or SW >= 70%.

The possible stand compositions which meet this criteria are numerous. For example:

PJ 8 BW 2 SB 6 CE 3 L 1 SW 8 BF 2.

Sum = "Y"

The SUM attribute requires that each species composition range be the same. If each entry is not the same, the species composition for the first species is used by default. When the SUM attribute is flagged as "YES", the sum of the species entered must fall within the given range for a stand to be successful. For example:

Species # 1	PJ	Composition	5	- 10	AND: N
Species # 2	SB	Composition	5	- 10	OR: Y
Species # 3	SW	Composition	5	- 10	SUM: N
Species # 4	BF	Composition	5	- 10,	

translates into the query statement:

PJ + SB + SW + BF >= 50% and <= 100% .

The remaining Wildlife definition criteria are similar to those in the Ledger 1 report definition with the exception of AREA and STANDS. An area range has been added to the Wildlife definition while the stand range has been removed. Each successful stand must contain attributes which meet these criteria ranges or sets of values.

The functions at the bottom of the Wildlife definition screen are discussed in detail in the following text.

Del/Undel - F2

The delete function will mark the entire report definition for removal from the WILDLIFE file. The definition will not be removed until the screen is exited with the <F10> key. The aborting of a definition which is marked for deletion will not remove the record from the file.

Seek - F3

The seek function activates a menu of all other Wildlife report definitions. The selected definition then becomes the active one.

Default - F4

The default function will automatically set all attributes to a default value to speed data input. These values are as follows:

FormanMu:	99
Stand Type:	20 - 39
Siteclass:	X 1 2 3 4
Activity Code:	0 - 99
Area:	0 - 32767
Stocking:	0.0 - 3.0
Age:	0 - 299
Height:	0.0 - 30.0
Year to Update to:	current year.

Next - PgDn, Prev - PgUp

These navigation keys will move the user sequentially through the WILDLIFE file making each next or previous record the current definition.

Exit Abort - ESC

The abort function returns control to the PCNFCS main menu without saving changes to any definitions which may have been added or edited. Definitions

which are marked for deletion when the abort function is used will not be deleted from the file.

Exit Save - F10

The exit and save function writes all changes to the WILDLIFE file and begins the reporting procedure for the current screen definition. The stanf file is indexed before compilation begins. A progress bar is then displayed to help estimate processing time. The report may be sent to file or printer. Filenames are determined automatically based on the definition name and the extension .WLD ie. MANUAL.WLD.

8.6 CLASS ID LISTING (.CIL)

The Class ID Listing is an adhoc reporting procedure that allows the user to output all or parts of the forest class file. The report lists the area weighted averages for each forest class that successfully meets the criteria. The Class Id Listing can be used as a summary of aggregation and to compare the aggregated areas against those found in other reports (Table 4.8, Table 4.9, Ledger 1, Wildlife, etc.).

The user must select a forest class file from the menu presented. A criteria definition screen is opened for the report as shown in Figure 25. The criteria is not written to file for future editing. Each selection of the Class ID Listing opens a new, blank criteria screen. Exiting the blank screen with the <F10> key will generate a complete listing of the forest class file (default report setting).

There are several functions available within the Class ID criteria definition screen. Each is discussed in more detail below.

Delete Field - F2

The delete function transforms the criteria field list to a menu from which the user selects the field to remove from the criteria definition. As is stated in the message box, the <ECS> key will abort the delete function.

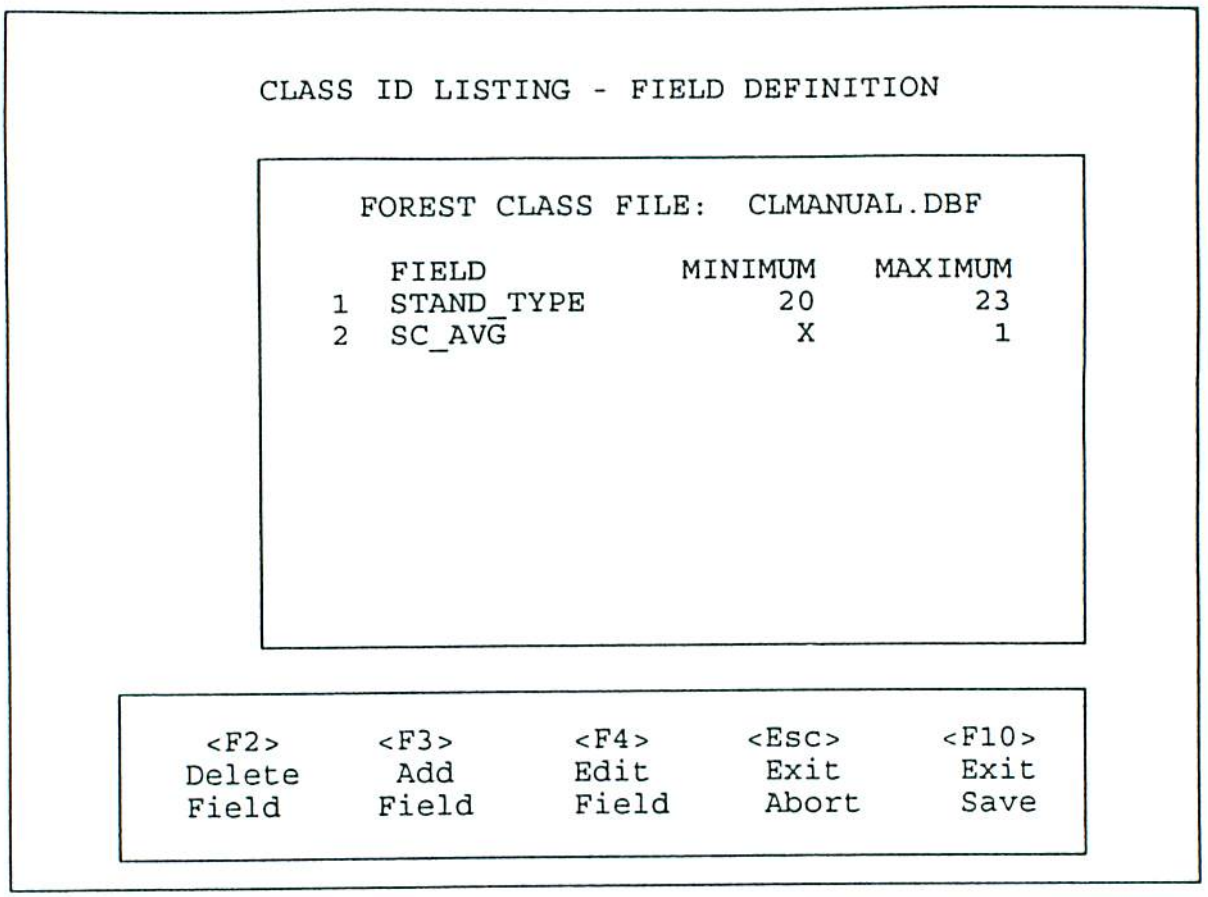


Figure 25. Class ID Listing Criteria Definition Screen.

Add Field - F3

The add function presents the user with a menu of forest class file attributes or fields as listed in Table 14. Once a field is selected, the minimum and maximum values can be input. The program will not accept null entries ie. minimum and maximum values equal to zero.

Table 14. Forest Class Field List for Class ID Listing.

FORMANMU	SB	SB_VOL
STANDS	SW	SW_VOL
AREA	PJ	PJ_VOL
AGEFORMAN	BF	BF_VOL
HEIGHT	CE	CE_VOL
STOCKING	PW	PW_VOL
SC_AVG	PR	PR_VOL
STAND_TYPE	PO	PO_VOL
CROWN	BW	BW_VOL
	OH	OH_VOL
	OC	OC_VOL

Edit Field - F4

The edit field function allows editing of the minimum and maximum field values. The user is prompted to select a field from the menu in the criteria list. The original values are reset and ready for new input. The <ESC> key will abort the edit function.

Exit Abort - ESC

The abort function returns control to the PCNFCS main menu. No report is generated.

Exit Save - F10

The exit and save function stores all criteria to memory and prompts the user to select the output device (file or printer). Reports written to file require a filename from the user. The filename extension (.CIL) is applied automatically. Report compilation time is minimal because of the relatively small number of records in the forest class file.

8.7 FOREST CLASS STAND LISTING (.CST)

The Forest Class Stand report lists the inventory stands that are associated with each forest class ie. the stands that were aggregated. The mapsheet number, stand number and stand suffix of each stand are identified by forest class. The Forest Class Stand Listing can be used as a reference in troubleshooting aggregation results. The user should be cautioned however: this report can be very lengthy for class files which have been created from large data files. A maximum of 135 stands can be listed on a page;

a forest class file which aggregated 13500 stands would produce a report of approximately 100 pages. The Class ID Listing or forest class file edit can be used to estimate the number of stands (STANDS field in class file).

The user is presented a menu of forest class files followed by the option to send the output to file or printer. Reports which are written to file are assigned filenames by default. The aggregation criteria name is prefixed by "ST" with an extension .CST (eg. STMANUAL.CST).

8.8 CLASS ID VOL/HA (.CV1)

The Class ID Volume per Hectare report lists the species's volumes for each forest class by aggregation criteria. The user is prompted to select a forest class file and whether the report is to be written to file or sent to the printer. A filename is required for reports which are written to file. The extension .CV1 is applied by default.

NOTE: all volumes will be zero if the yield curve development process has not been run for the selected forest class file.

8.9 CLASS ID VOLUME TOTAL (.CV2)

The Class ID Volume Total report is similar in design to the Class ID Vol/Ha report except that the total volumes by species are listed for each forest class instead of volume per ha. The total volume is calculated by multiplying forest class area with the species' volume per ha. Forest classes are grouped by aggregation criteria. User entered filenames are provided with the .CV2 extension.

As with the Class ID Vol/Ha report, volumes will be zero prior to running the yield curve development process.

8.10 REFERENCE FILE LISTING (.TXT)

The Reference File Listing report option includes all three types of reference files: Pure Species Yield Curve, Product Percent Table and Siteclass X-Reference Table. The user is presented with a menu of all reference files from the DATA directory and prompted to enter a title for the text report. Filenames are set by default using the reference filename and the .TXT extension (eg. PURE_MAN.TXT).

The Pure Species Yield and Product Percent listings are two pages in length; the Siteclass X-Reference is one page.

8.11 SILVICULTURE CARDS (.SIL)

The Silviculture Card report provides the user with a listing of the actual silviculture input screens for a present and future curve file set. All information is contained in the report: aggregation criteria, present operability age limits, future curve description and cost information. The user is prompted to select a forest class file from which all present and future curves have been developed. The silviculture cards are generated and sent to the printer or written to file. Filenames are set internally using the criteria name and the .SIL extension (eg. MANUAL.SIL).

It is recommended that this report be generated after the silviculture information has been entered. These cards require significant preparation and input time and the user should have a hard copy of the information in the event that the aggregation criteria is changed. (Modification of aggregation criteria will remove any previous present and future curve information).

This report will abort if all silviculture cards have not been defined.

8.12 TABLE 4.17 - MAP, AGE & STD (.17?)

Table 4.17 is a species volume summary by mapsheet, working group, age class or individual stand. The report compiles area and species's volume information from stanf inventory files and reference files.

The user is first prompted to select a stanf file and one of the three report options as shown in Table 15. An ownership type must then be selected from an options menu (Table 16).

Table 15. Table 4.17 Report Options.

Mapsheet by Working Group	(.17M)
Mapsheet by Age Class by WG	(.17A)
Mapsheet by Individual Stand	(.17S)

Table 4.17 is mapsheet and/or Forman MU specific; the user has the option to generate the report for one mapsheet or one Forman MU or both. Once this option has been entered, a management unit name is requested for the report title. The user is then prompted to enter the volume calculation year. All ages will be grown to the year entered with subsequent volume calculations based on the stand age.

Table 16. Table 4.17 Ownership Options.

```
Species Vol/Area Summary of All Land Ownerships
Species Vol/Area Summary of All Crown Land
Species Vol/Area Summary of Patent Land (Timber Rights Crown)
Species Vol/Area Summary of Patent Land (Normal)
Species Vol/Area Summary of Patent Land (Company Freehold)
Species Vol/Area Summary of Provincial Parks
Species Vol/Area Summary of Indian Reserve
Species Vol/Area Summary of Recreational Reserves
Species Vol/Area Summary of Agreement Forests
Species Vol/Area Summary of Federal Reserve
```

If the user selected Table 4.17 by age class, the size of the age class is prompted. Five, 10 or 20 year age classes may be entered. The user should be cautioned that the 5 year age class may produce a very large report.

The user is prompted to select Total or Product volumes. The total volume report includes all species with no volume deductions whereas the product volume report applies the product percent table to the total volumes. This report does not utilize the product species list in the volume setup file; all species which are in the product percent table are used.

Operability age limits are required for Table 4.17. Volumes are calculated only on stands which meet the upper and lower operability range. The reference tables must then be selected by the user. The pure species yield tables, site class x-reference tables and, if applicable, product percent tables are all presented to the user in menu format.

Reports which are sent to file must be given a filename by the user. Extensions are applied by default depending on the main table option selected (Table 15).

The report compilation time is significant with large stanf files. A progress bar is displayed showing the approximate time required.

8.13 FOREST UNIT YIELD CURVE (.FUY)

The Forest Unit Yield Curve report is a summary of "aggregated" forest class yield curves. The various age-related forest classes with similar working group, siteclass and stocking criteria are combined by area weighting one of the four curve sets. The new curve set provides the user with the input information for the MADCALC area based model.

The user is prompted to select the forest class file and to choose one of the four yield curve types: primary, secondary, product or total. A filename is required for reports which are written to file. The extension .FUY is applied to the filename ie. MANUAL.FUY.

8.14 FORMANMU DEFINITION REPORT (.FMU)

The FormanMu Definition Report is a hard copy of all FormanMu definitions for a selected stanf file. The field ranges and values appear in a query type format similar to the actual query string used in dBASE IV. For example, the FormanMu definition:

1. STAND TYPE	20	28
2. WORKING GROUP	10	13

would appear in the report as:

STAND_TYPE>=20 .AND. STAND_TYPE<=28
WG>=10 .AND. WG<=13.

This report is useful when interpretting Forest Unit descriptions for a specific management unit to ensure that each description has been transferred properly to the FormanMu defintion screens.

The user is prompted to select a stanf file and the output device - printer or file. Filenames are required for reports written to file. The extension .FMU is applied automatically ie. MANUAL.FMU. An example of the report can be found in Appendix II.

9.0 NORMAN / FORMAN EXPORT

The PCNFCS program has been designed to create input files for three forest modelling tools:

1. NORMAN,
2. FORMAN CP, and
3. FORMAN 2.1.

The file structures of the class, yield and cost file sets for the models are similar with the exception of a few unique variables specific to each model. The file structures can be found in Appendix III.

The user is first prompted to select the name of the file set to export from a menu of aggregation criteria names. Once selected, the program checks that all required files are in the DATA directory (forest class, present yield, future yield, cost file). The procedure will be aborted if any of the file set are incomplete.

The unique model attributes are then asked of the user. The use of these variables within each model is not discussed in this manual as they appear in greater detail in the user manuals of the specific volumetric model. Table 17 lists the required variables for each model as they are prompted by the program.

Table 17. Variable Inputs for Development of Export Files to Volumetric Models.

NORMAN	FORMAN CP	FORMAN 2.1
1. # of 5 yr iterations	1. # of 5 yr iterations	1. # of 5 yr iterations
2. year to start model	2. year to start model	2. year to start model
3. area factor	3. area factor	3. area factor
	4. Timber Values ($/m3)	
	- Product	
	- Non-product	
	- Secondary	
	- Discount Rate	

The building of the export files is done in three steps; each displaying a progress bar. The class file is built first, followed by the cost file and yield file. The new files are all written to the REPORTS directory with filenames consistent with the description in Table 18.

Table 18. Filename Description for Export File Sets.

File Type	Filename Prefix	Example
Class	CL	CLMANUAL
Cost	CS	CSMANUAL
Yield	MX	MXMANUAL

Model Type	Filename Extension
NORMAN	.NOR
FORMAN CP	.FCP
FORMAN 2.1	.FOR

10.0 DOS UTILITY

The DOS Utility option provides the user with the flexibility to move to the DOS environment without having to close the PCNFCS program. This allows for file copying or moving, file or report editing within the REPORTS directory, printing, etc. To return to the program, the user must type EXIT at the DOS prompt.

Some memory restrictions may apply while using DOS editors if the amount of available RAM is small.

APPENDIX 1

STANF FILE STRUCTURE

FIELD NAME	dBASE TYPE	WIDTH	DECIMAL
MU	Character	3	
WC	Character	1	
WC_STATUS	Character	1	
MS	Character	9	
TWP	Character	7	
DISKETTE	Character	6	
TRANS_DATE	Character	6	
STAND	Numeric	4	
STAND_SUFF	Numeric	1	
WG	Character	2	
WG_XCEP_IN	Numeric	1	
STAND_TYPE	Numeric	2	
STAND_AREA	Numeric	4	
OWNERSHIP	Character	1	
LOCATION	Character	2	
YR_ORIGIN	Numeric	3	
YR_UPDATE	Numeric	3	
SPP_VERS	Character	1	
HT	Numeric	4	1
STOCKING	Numeric	4	1
SITE_CLASS	Character	1	
SPP_COMP	Character	40	
ACT_CODE	Character	2	
ACT_DATE	Character	6	

APPENDIX II

PCNFCS REPORTS

FRI STAND ERROR LISTING

TABLE 4.8.2

TABLE 4.9

TABLE 4.9 SUPPLEMENT

LEDGER 1 REPORT

WILDLIFE HABITAT REPORT

CLASS ID LISTING

FOREST CLASS STAND LISTING

CLASS ID VOLUME / HA

CLASS ID TOTAL VOLUME

REFERENCE FILE LISTINGS

- PURE SPECIES YIELD TABLE
- PRODUCT PERCENT TABLE
- SITECLASS X-REFERENCE TABLE

SILVICULTURE CARD LISTING

TABLE 4.17 MAPSHEET

- MAPSHEET
- MAPSHEET & AGE CLASS
- INDIVIDUAL STAND

FOREST UNIT YIELD CURVE

FORMANMU DEFINITION REPORT

FRI STAND ERROR LISTING
FRI STANF FILE - STANF160.DBF
ERROR FILE - ERROR160.DBF

MAPSHEET	STAND	SUFF	MAPSHEET	STAND	SUFF	MAPSHEET	STAND	SUFF
ERROR TYPE ID # 7			STAND TYPE or SITE CLASS					
000020100	244	0	000025300	33	0	000048400	267	0
000062600	278	0	000066500	253	0	000109200	62	0
000183900	173	0	000230000	18	0	000230900	259	0

Total Records Checked: 32064
Total Area Checked: 707932
Total Errors: 9

Type 1	0	Type 6	0	Type 12	0
Type 2	0	Type 7	9	Type 13	0
Type 3	0	Type 8	0	Type 14	0
Type 4	0	Type 9	0	Type 15	0
Type 5	0	Type 10	0	Type 16	0
		Type 11	0		

TABLE 4.8.2
AREA SUMMARY OF ALL CROWN LAND

for the five-year term
from 1993/94 - 1998/99

UPPER SPANISH FOREST MU # 160 10/05/93

SUMMARY OF TOTAL AREA (HA)

Water		68049
Unsurveyed Land		0
Non-Forested Land		2437
Forested Land		
Non-Productive Forest	77459	
Productive Forest	544403	
		621862
Total Area		692348

SUMMARY OF PRODUCTIVE FOREST (HA)

WG	Protection Forest SC4 & Islands	B & S and/or NSR 2-6	Production Forest PFR	Production Forest Regular	Production Forest Subtotal	Total
PW	0	0	511	2776	3287	3287
PR	0	0	20	96	116	116
PJ	4570	9404	17375	108682	135461	140031
SP	2522	3159	6051	131528	140738	143260
BF	226	278	833	27712	28823	29049
OC	708	6	0	3867	3873	4581
MH	606	0	1257	4223	5480	6086
BY	71	9	176	1843	2028	2099
OH	520	0	241	843	1084	1604
PO	7021	1569	17908	89274	108751	115772
BW	4491	1245	16142	76640	94027	98518
TOTAL	20735	15670	60514	447484	523668	544403

TABLE 4.9 Supp

SUMMARY OF CROWN PRODUCTION FOREST AREA BY WORKING GROUP BY AGE CLASS
for the five-year term
from 1993/94 - 1998/99
UPPER SPANISH FOREST MU # 160

10/04/93

WG	SC	AGE CLASS	AREA (HA)
PR	X	B & S	0
		FTG - 20	0
		21 - 40	0
		41 - 60	0
		61 - 80	0
		81 - 100	0
		101 - 120	0
		121 - 140	0
		141 - 160	0
		161 - 180	0
		181 - 200	0
		201 +	0
PR	X	TOTAL	0
PR	2	B & S	0
		FTG - 20	0
		21 - 40	0
		41 - 60	0
		61 - 80	0
		81 - 100	60
		101 - 120	0
		121 - 140	14
		141 - 160	32
		161 - 180	10
		181 - 200	0
		201 +	0
PR	2	TOTAL	116
PR	ALL	B & S	0
		FTG - 20	0
		21 - 40	0
		41 - 60	0
		61 - 80	0
		81 - 100	60
		101 - 120	0
		121 - 140	14
		141 - 160	32
		161 - 180	10
		181 - 200	0
		201 +	0
PR	ALL	TOTAL	116

WG	SC	AGE CLASS	AREA (HA)
PR	1	B & S	0
		FTG - 20	0
		21 - 40	0
		41 - 60	0
		61 - 80	0
		81 - 100	0
		101 - 120	0
		121 - 140	0
		141 - 160	0
		161 - 180	0
		181 - 200	0
		201 +	0
PR	1	TOTAL	0
PR	3	B & S	0
		FTG - 20	0
		21 - 40	0
		41 - 60	0
		61 - 80	0
		81 - 100	0
		101 - 120	0
		121 - 140	0
		141 - 160	0
		161 - 180	0
		181 - 200	0
		201 +	0
PR	3	TOTAL	0
PR	ALL	REG 20-22	96
		PLANT 23	0
		PFR 25-28	20
		B&S 30-33	0
		NSR 2 35	0
		NSR 3 36	0
		NSR 4 37	0
		NSR 5 38	0
		NSR 6 39	0
		TYPE 24	0
		TYPE 29	0
		TYPE 34	0
PR	ALL	TOTAL	116

TABLE 4.9 Supp
SUMMARY OF CROWN PRODUCTION FOREST AREA BY WORKING GROUP BY AGE CLASS
for the five-year term
from 1993/94 - 1998/99
UPPER SPANISH FOREST MU # 160

10/04/93

WG	SC	AGE CLASS	AREA (HA)
PW	X	B & S	0
		FTG - 20	0
		21 - 40	0
		41 - 60	0
		61 - 80	0
		81 - 100	0
		101 - 120	0
		121 - 140	0
		141 - 160	0
		161 - 180	0
		181 - 200	0
		201 +	0
PW	X	TOTAL	0
PW	2	B & S	0
		FTG - 20	0
		21 - 40	0
		41 - 60	0
		61 - 80	0
		81 - 100	34
		101 - 120	211
		121 - 140	155
		141 - 160	1472
		161 - 180	1253
		181 - 200	0
		201 +	0
PW	2	TOTAL	3125
PW	ALL	B & S	0
		FTG - 20	0
		21 - 40	0
		41 - 60	0
		61 - 80	0
		81 - 100	34
		101 - 120	330
		121 - 140	155
		141 - 160	1472
		161 - 180	1296
		181 - 200	0
		201 +	0
PW	ALL	TOTAL	3287

WG	SC	AGE CLASS	AREA (HA)
PW	1	B & S	0
		FTG - 20	0
		21 - 40	0
		41 - 60	0
		61 - 80	0
		81 - 100	0
		101 - 120	8
		121 - 140	0
		141 - 160	0
		161 - 180	0
		181 - 200	0
		201 +	0
PW	1	TOTAL	8
PW	3	B & S	0
		FTG - 20	0
		21 - 40	0
		41 - 60	0
		61 - 80	0
		81 - 100	0
		101 - 120	111
		121 - 140	0
		141 - 160	0
		161 - 180	43
		181 - 200	0
		201 +	0
PW	3	TOTAL	154
PW	ALL	REG 20-22	2776
		PLANT 23	0
		PFR 25-28	511
		B&S 30-33	0
		NSR 2 35	0
		NSR 3 36	0
		NSR 4 37	0
		NSR 5 38	0
		NSR 6 39	0
		TYPE 24	0
		TYPE 29	0
		TYPE 34	0
PW	ALL	TOTAL	3287

TABLE 4.9

SUMMARY OF CROWN PRODUCTION FOREST AREA BY WORKING GROUP BY AGE CLASS

for the five-year term

from 1993/94 - 1998/99

UPPER SPANISH FOREST MU # 160

WG	SC	AGE CLASS	AREA (HA)
MH		B & S	0
		FTG - 20	0
		21 - 40	0
		41 - 60	0
		61 - 80	87
		81 - 100	127
		101 - 120	1555
		121 - 140	624
		141 - 160	1138
		161 - 180	1949
		181 - 200	0
		201 +	0
MH		TOTAL	5480
OH		B & S	0
		FTG - 20	0
		21 - 40	0
		41 - 60	182
		61 - 80	276
		81 - 100	275
		101 - 120	329
		121 - 140	22
		141 - 160	0
		161 - 180	0
		181 - 200	0
		201 +	0
OH		TOTAL	1084
BW		B & S	1245
		FTG - 20	36
		21 - 40	784
		41 - 60	16731
		61 - 80	27126
		81 - 100	37497
		101 - 120	10394
		121 - 140	87
		141 - 160	26
		161 - 180	101
		181 - 200	0
		201 +	0
BW		TOTAL	94027
BY		B & S	9
		FTG - 20	0
		21 - 40	0
		41 - 60	0
		61 - 80	0
		81 - 100	0
		101 - 120	167
		121 - 140	165
		141 - 160	688
		161 - 180	999
		181 - 200	0
		201 +	0
BY		TOTAL	2028
PO		B & S	1569
		FTG - 20	0
		21 - 40	4583
		41 - 60	4936
		61 - 80	14663
		81 - 100	62661
		101 - 120	17078
		121 - 140	3235
		141 - 160	0
		161 - 180	26
		181 - 200	0
		201 +	0
PO		TOTAL	108751
		PRODUCTION FOREST TOTAL	523668

TABLE 4.9
SUMMARY OF CROWN PRODUCTION FOREST AREA BY WORKING GROUP BY AGE CLASS
for the five-year term
from 1993/94 - 1998/99
UPPER SPANISH FOREST MU # 160

WG	SC	AGE CLASS	AREA (HA)
PW		B & S	0
		FTG - 20	0
		21 - 40	0
		41 - 60	0
		61 - 80	0
		81 - 100	34
		101 - 120	330
		121 - 140	155
		141 - 160	1472
		161 - 180	1296
		181 - 200	0
		201 +	0
PW		TOTAL	3287
PJ		B & S	9404
		FTG - 20	73
		21 - 40	8924
		41 - 60	10294
		61 - 80	16281
		81 - 100	78344
		101 - 120	8899
		121 - 140	3073
		141 - 160	169
		161 - 180	0
		181 - 200	0
		201 +	0
PJ		TOTAL	135461
BF		B & S	278
		FTG - 20	0
		21 - 40	1224
		41 - 60	18028
		61 - 80	8916
		81 - 100	370
		101 - 120	7
		121 - 140	0
		141 - 160	0
		161 - 180	0
		181 - 200	0
		201 +	0
BF		TOTAL	28823

WG	SC	AGE CLASS	AREA (HA)
PR		B & S	0
		FTG - 20	0
		21 - 40	0
		41 - 60	0
		61 - 80	0
		81 - 100	60
		101 - 120	0
		121 - 140	14
		141 - 160	32
		161 - 180	10
		181 - 200	0
		201 +	0
PR		TOTAL	116
SP		B & S	3159
		FTG - 20	0
		21 - 40	1063
		41 - 60	6077
		61 - 80	17640
		81 - 100	51440
		101 - 120	26379
		121 - 140	26727
		141 - 160	6665
		161 - 180	1568
		181 - 200	20
		201 +	0
SP		TOTAL	140738
OC		B & S	6
		FTG - 20	0
		21 - 40	22
		41 - 60	180
		61 - 80	86
		81 - 100	1272
		101 - 120	1279
		121 - 140	696
		141 - 160	320
		161 - 180	12
		181 - 200	0
		201 +	0
OC		TOTAL	3873

TABLE 4.9 Supp

SUMMARY OF CROWN PRODUCTION FOREST AREA BY WORKING GROUP BY AGE CLASS

for the five-year term

from 1993/94 - 1998/99

UPPER SPANISH FOREST MU # 160

10/04/93

WG	SC	AGE CLASS	AREA (HA)
PJ	X	B & S	0
		FTG - 20	0
		21 - 40	219
		41 - 60	0
		61 - 80	204
		81 - 100	740
		101 - 120	147
		121 - 140	174
		141 - 160	0
		161 - 180	0
		181 - 200	0
		201 +	0
PJ	X	TOTAL	1484
PJ	2	B & S	8261
		FTG - 20	36
		21 - 40	6336
		41 - 60	8431
		61 - 80	10756
		81 - 100	36728
		101 - 120	3722
		121 - 140	943
		141 - 160	82
		161 - 180	0
		181 - 200	0
		201 +	0
PJ	2	TOTAL	75295
PJ ALL		B & S	9404
		FTG - 20	73
		21 - 40	8924
		41 - 60	10294
		61 - 80	16281
		81 - 100	78344
		101 - 120	8899
		121 - 140	3073
		141 - 160	169
		161 - 180	0
		181 - 200	0
		201 +	0
PJ ALL		TOTAL	135461

WG	SC	AGE CLASS	AREA (HA)
PJ	1	B & S	1086
		FTG - 20	37
		21 - 40	2032
		41 - 60	429
		61 - 80	4182
		81 - 100	36952
		101 - 120	3997
		121 - 140	1808
		141 - 160	87
		161 - 180	0
		181 - 200	0
		201 +	0
PJ	1	TOTAL	50610
PJ	3	B & S	57
		FTG - 20	0
		21 - 40	337
		41 - 60	1434
		61 - 80	1139
		81 - 100	3924
		101 - 120	1033
		121 - 140	148
		141 - 160	0
		161 - 180	0
		181 - 200	0
		201 +	0
PJ	3	TOTAL	8072
PJ ALL		REG 20-22	108682
		PLANT 23	0
		PFR 25-28	17375
		B&S 30-33	9404
		NSR 2 35	0
		NSR 3 36	0
		NSR 4 37	0
		NSR 5 38	0
		NSR 6 39	0
		TYPE 24	0
		TYPE 29	0
		TYPE 34	0
PJ ALL		TOTAL	135461

TABLE 4.9 Supp
SUMMARY OF CROWN PRODUCTION FOREST AREA BY WORKING GROUP BY AGE CLASS
for the five-year term
from 1993/94 - 1998/99
UPPER SPANISH FOREST MU # 160

10/04/93

WG	SC	AGE CLASS	AREA (HA)
SP	X	B & S	169
		FTG - 20	0
		21 - 40	198
		41 - 60	3182
		61 - 80	11639
		81 - 100	29740
		101 - 120	12289
		121 - 140	6564
		141 - 160	1140
		161 - 180	0
		181 - 200	0
		201 +	0
SP	X	TOTAL	64921
SP	2	B & S	633
		FTG - 20	0
		21 - 40	362
		41 - 60	151
		61 - 80	212
		81 - 100	1810
		101 - 120	1764
		121 - 140	3685
		141 - 160	2148
		161 - 180	453
		181 - 200	0
		201 +	0
SP	2	TOTAL	11218
SP	ALL	B & S	3159
		FTG - 20	0
		21 - 40	1063
		41 - 60	6077
		61 - 80	17640
		81 - 100	51440
		101 - 120	26379
		121 - 140	26727
		141 - 160	6665
		161 - 180	1568
		181 - 200	20
		201 +	0
SP	ALL	TOTAL	140738

WG	SC	AGE CLASS	AREA (HA)
SP	1	B & S	2144
		FTG - 20	0
		21 - 40	482
		41 - 60	2732
		61 - 80	5789
		81 - 100	19736
		101 - 120	12175
		121 - 140	16065
		141 - 160	2939
		161 - 180	926
		181 - 200	20
		201 +	0
SP	1	TOTAL	63008
SP	3	B & S	213
		FTG - 20	0
		21 - 40	21
		41 - 60	12
		61 - 80	0
		81 - 100	154
		101 - 120	151
		121 - 140	413
		141 - 160	438
		161 - 180	189
		181 - 200	0
		201 +	0
SP	3	TOTAL	1591
SP	ALL	REG 20-22	131528
		PLANT 23	0
		PFR 25-28	6051
		B&S 30-33	3159
		NSR 2 35	0
		NSR 3 36	0
		NSR 4 37	0
		NSR 5 38	0
		NSR 6 39	0
		TYPE 24	0
		TYPE 29	0
		TYPE 34	0
SP	ALL	TOTAL	140738

TABLE 4.9 Supp

SUMMARY OF CROWN PRODUCTION FOREST AREA BY WORKING GROUP BY AGE CLASS

for the five-year term

from 1993/94 - 1998/99

UPPER SPANISH FOREST MU # 160

10/04/93

WG	SC	AGE CLASS	AREA (HA)
MH	X	B & S	0
		FTG - 20	0
		21 - 40	0
		41 - 60	0
		61 - 80	0
		81 - 100	0
		101 - 120	0
		121 - 140	0
		141 - 160	0
		161 - 180	0
		181 - 200	0
		201 +	0
MH	X	TOTAL	0
MH	2	B & S	0
		FTG - 20	0
		21 - 40	0
		41 - 60	0
		61 - 80	59
		81 - 100	89
		101 - 120	211
		121 - 140	41
		141 - 160	0
		161 - 180	328
		181 - 200	0
		201 +	0
MH	2	TOTAL	728
MH	ALL	B & S	0
		FTG - 20	0
		21 - 40	0
		41 - 60	0
		61 - 80	87
		81 - 100	127
		101 - 120	1555
		121 - 140	624
		141 - 160	1138
		161 - 180	1949
		181 - 200	0
		201 +	0
MH	ALL	TOTAL	5480

WG	SC	AGE CLASS	AREA (HA)
MH	1	B & S	0
		FTG - 20	0
		21 - 40	0
		41 - 60	0
		61 - 80	0
		81 - 100	0
		101 - 120	0
		121 - 140	0
		141 - 160	0
		161 - 180	0
		181 - 200	0
		201 +	0
MH	1	TOTAL	0
MH	3	B & S	0
		FTG - 20	0
		21 - 40	0
		41 - 60	0
		61 - 80	28
		81 - 100	38
		101 - 120	1344
		121 - 140	583
		141 - 160	1138
		161 - 180	1621
		181 - 200	0
		201 +	0
MH	3	TOTAL	4752
MH	ALL	REG 20-22	4223
		PLANT 23	0
		PFR 25-28	1257
		B&S 30-33	0
		NSR 2 35	0
		NSR 3 36	0
		NSR 4 37	0
		NSR 5 38	0
		NSR 6 39	0
		TYPE 24	0
		TYPE 29	0
		TYPE 34	0
MH	ALL	TOTAL	5480

TABLE 4.9 Supp
SUMMARY OF CROWN PRODUCTION FOREST AREA BY WORKING GROUP BY AGE CLASS
for the five-year term
from 1993/94 - 1998/99
UPPER SPANISH FOREST MU # 160

10/04/93

WG	SC	AGE CLASS	AREA (HA)
BY	X	B & S	0
		FTG - 20	0
		21 - 40	0
		41 - 60	0
		61 - 80	0
		81 - 100	0
		101 - 120	0
		121 - 140	0
		141 - 160	0
		161 - 180	0
		181 - 200	0
		201 +	0
BY	X	TOTAL	0
BY	2	B & S	0
		FTG - 20	0
		21 - 40	0
		41 - 60	0
		61 - 80	0
		81 - 100	0
		101 - 120	15
		121 - 140	19
		141 - 160	21
		161 - 180	53
		181 - 200	0
		201 +	0
BY	2	TOTAL	108
BY ALL		B & S	9
		FTG - 20	0
		21 - 40	0
		41 - 60	0
		61 - 80	0
		81 - 100	0
		101 - 120	167
		121 - 140	165
		141 - 160	688
		161 - 180	999
		181 - 200	0
		201 +	0
BY ALL		TOTAL	2028

WG	SC	AGE CLASS	AREA (HA)
BY	1	B & S	0
		FTG - 20	0
		21 - 40	0
		41 - 60	0
		61 - 80	0
		81 - 100	0
		101 - 120	0
		121 - 140	0
		141 - 160	0
		161 - 180	0
		181 - 200	0
		201 +	0
BY	1	TOTAL	0
BY	3	B & S	9
		FTG - 20	0
		21 - 40	0
		41 - 60	0
		61 - 80	0
		81 - 100	0
		101 - 120	152
		121 - 140	146
		141 - 160	667
		161 - 180	946
		181 - 200	0
		201 +	0
BY	3	TOTAL	1920
BY ALL		REG 20-22	1843
		PLANT 23	0
		PFR 25-28	176
		B&S 30-33	9
		NSR 2 35	0
		NSR 3 36	0
		NSR 4 37	0
		NSR 5 38	0
		NSR 6 39	0
		TYPE 24	0
		TYPE 29	0
		TYPE 34	0
BY ALL		TOTAL	2028

TABLE 4.9 Supp
SUMMARY OF CROWN PRODUCTION FOREST AREA BY WORKING GROUP BY AGE CLASS
for the five-year term
from 1993/94 - 1998/99
UPPER SPANISH FOREST MU # 160

10/04/93

WG	SC	AGE CLASS	AREA (HA)
BF	X	B & S	158
		FTG - 20	0
		21 - 40	543
		41 - 60	16199
		61 - 80	7635
		81 - 100	256
		101 - 120	0
		121 - 140	0
		141 - 160	0
		161 - 180	0
		181 - 200	0
		201 +	0
BF	X	TOTAL	24791
BF	2	B & S	10
		FTG - 20	0
		21 - 40	304
		41 - 60	380
		61 - 80	21
		81 - 100	0
		101 - 120	0
		121 - 140	0
		141 - 160	0
		161 - 180	0
		181 - 200	0
		201 +	0
BF	2	TOTAL	715
BF	ALL	B & S	278
		FTG - 20	0
		21 - 40	1224
		41 - 60	18028
		61 - 80	8916
		81 - 100	370
		101 - 120	7
		121 - 140	0
		141 - 160	0
		161 - 180	0
		181 - 200	0
		201 +	0
BF	ALL	TOTAL	28823

WG	SC	AGE CLASS	AREA (HA)
BF	1	B & S	92
		FTG - 20	0
		21 - 40	377
		41 - 60	1434
		61 - 80	1260
		81 - 100	114
		101 - 120	7
		121 - 140	0
		141 - 160	0
		161 - 180	0
		181 - 200	0
		201 +	0
BF	1	TOTAL	3284
BF	3	B & S	18
		FTG - 20	0
		21 - 40	0
		41 - 60	15
		61 - 80	0
		81 - 100	0
		101 - 120	0
		121 - 140	0
		141 - 160	0
		161 - 180	0
		181 - 200	0
		201 +	0
BF	3	TOTAL	33
BF	ALL	REG 20-22	27712
		PLANT 23	0
		PFR 25-28	833
		B&S 30-33	278
		NSR 2 35	0
		NSR 3 36	0
		NSR 4 37	0
		NSR 5 38	0
		NSR 6 39	0
		TYPE 24	0
		TYPE 29	0
		TYPE 34	0
BF	ALL	TOTAL	28823

TABLE 4.9 Supp
SUMMARY OF CROWN PRODUCTION FOREST AREA BY WORKING GROUP BY AGE CLASS
for the five-year term
from 1993/94 - 1998/99
UPPER SPANISH FOREST MU # 160

10/04/93

WG	SC	AGE CLASS	AREA (HA)
OC	X	B & S	0
		FTG - 20	0
		21 - 40	0
		41 - 60	49
		61 - 80	11
		81 - 100	57
		101 - 120	7
		121 - 140	0
		141 - 160	0
		161 - 180	0
		181 - 200	0
		201 +	0
OC	X	TOTAL	124
OC	2	B & S	0
		FTG - 20	0
		21 - 40	22
		41 - 60	10
		61 - 80	40
		81 - 100	231
		101 - 120	709
		121 - 140	583
		141 - 160	217
		161 - 180	0
		181 - 200	0
		201 +	0
OC	2	TOTAL	1812
OC	ALL	B & S	6
		FTG - 20	0
		21 - 40	22
		41 - 60	180
		61 - 80	86
		81 - 100	1272
		101 - 120	1279
		121 - 140	696
		141 - 160	320
		161 - 180	12
		181 - 200	0
		201 +	0
OC	ALL	TOTAL	3873

WG	SC	AGE CLASS	AREA (HA)
OC	1	B & S	0
		FTG - 20	0
		21 - 40	0
		41 - 60	0
		61 - 80	35
		81 - 100	964
		101 - 120	513
		121 - 140	78
		141 - 160	15
		161 - 180	12
		181 - 200	0
		201 +	0
OC	1	TOTAL	1617
OC	3	B & S	6
		FTG - 20	0
		21 - 40	0
		41 - 60	121
		61 - 80	0
		81 - 100	20
		101 - 120	50
		121 - 140	35
		141 - 160	88
		161 - 180	0
		181 - 200	0
		201 +	0
OC	3	TOTAL	320
OC	ALL	REG 20-22	3867
		PLANT 23	0
		PFR 25-28	0
		B&S 30-33	6
		NSR 2 35	0
		NSR 3 36	0
		NSR 4 37	0
		NSR 5 38	0
		NSR 6 39	0
		TYPE 24	0
		TYPE 29	0
		TYPE 34	0
OC	ALL	TOTAL	3873

TABLE 4.9 Supp
SUMMARY OF CROWN PRODUCTION FOREST AREA BY WORKING GROUP BY AGE CLASS
for the five-year term
from 1993/94 - 1998/99
UPPER SPANISH FOREST MU # 160

10/04/93

WG	SC	AGE CLASS	AREA (HA)
OH	X	B & S	0
		FTG - 20	0
		21 - 40	0
		41 - 60	0
		61 - 80	0
		81 - 100	0
		101 - 120	0
		121 - 140	0
		141 - 160	0
		161 - 180	0
		181 - 200	0
		201 +	0
OH	X	TOTAL	0
OH	2	B & S	0
		FTG - 20	0
		21 - 40	0
		41 - 60	100
		61 - 80	107
		81 - 100	252
		101 - 120	0
		121 - 140	0
		141 - 160	0
		161 - 180	0
		181 - 200	0
		201 +	0
OH	2	TOTAL	459
OH	ALL	B & S	0
		FTG - 20	0
		21 - 40	0
		41 - 60	182
		61 - 80	276
		81 - 100	275
		101 - 120	329
		121 - 140	22
		141 - 160	0
		161 - 180	0
		181 - 200	0
		201 +	0
OH	ALL	TOTAL	1084

WG	SC	AGE CLASS	AREA (HA)
OH	1	B & S	0
		FTG - 20	0
		21 - 40	0
		41 - 60	48
		61 - 80	27
		81 - 100	0
		101 - 120	0
		121 - 140	0
		141 - 160	0
		161 - 180	0
		181 - 200	0
		201 +	0
OH	1	TOTAL	75
OH	3	B & S	0
		FTG - 20	0
		21 - 40	0
		41 - 60	34
		61 - 80	142
		81 - 100	23
		101 - 120	329
		121 - 140	22
		141 - 160	0
		161 - 180	0
		181 - 200	0
		201 +	0
OH	3	TOTAL	550
OH	ALL	REG 20-22	843
		PLANT 23	0
		PFR 25-28	241
		B&S 30-33	0
		NSR 2 35	0
		NSR 3 36	0
		NSR 4 37	0
		NSR 5 38	0
		NSR 6 39	0
		TYPE 24	0
		TYPE 29	0
		TYPE 34	0
OH	ALL	TOTAL	1084

TABLE 4.9 Supp
SUMMARY OF CROWN PRODUCTION FOREST AREA BY WORKING GROUP BY AGE CLASS
for the five-year term
from 1993/94 - 1998/99
UPPER SPANISH FOREST MU # 160

10/04/93

WG	SC	AGE CLASS	AREA (HA)
PO	X	B & S	0
		FTG - 20	0
		21 - 40	0
		41 - 60	0
		61 - 80	0
		81 - 100	0
		101 - 120	0
		121 - 140	0
		141 - 160	0
		161 - 180	0
		181 - 200	0
		201 +	0
PO	X	TOTAL	0
PO	2	B & S	919
		FTG - 20	0
		21 - 40	2735
		41 - 60	1814
		61 - 80	4883
		81 - 100	24151
		101 - 120	4437
		121 - 140	1115
		141 - 160	0
		161 - 180	26
		181 - 200	0
		201 +	0
PO	2	TOTAL	40080
PO	ALL	B & S	1569
		FTG - 20	0
		21 - 40	4583
		41 - 60	4936
		61 - 80	14663
		81 - 100	62661
		101 - 120	17078
		121 - 140	3235
		141 - 160	0
		161 - 180	26
		181 - 200	0
		201 +	0
PO	ALL	TOTAL	108751

WG	SC	AGE CLASS	AREA (HA)
PO	1	B & S	51
		FTG - 20	0
		21 - 40	193
		41 - 60	43
		61 - 80	243
		81 - 100	419
		101 - 120	52
		121 - 140	0
		141 - 160	0
		161 - 180	0
		181 - 200	0
		201 +	0
PO	1	TOTAL	1001
PO	3	B & S	599
		FTG - 20	0
		21 - 40	1655
		41 - 60	3079
		61 - 80	9537
		81 - 100	38091
		101 - 120	12589
		121 - 140	2120
		141 - 160	0
		161 - 180	0
		181 - 200	0
		201 +	0
PO	3	TOTAL	67670
PO	ALL	REG 20-22	89274
		PLANT 23	0
		PFR 25-28	17908
		B&S 30-33	1569
		NSR 2 35	0
		NSR 3 36	0
		NSR 4 37	0
		NSR 5 38	0
		NSR 6 39	0
		TYPE 24	0
		TYPE 29	0
		TYPE 34	0
PO	ALL	TOTAL	108751

TABLE 4.9 Supp
SUMMARY OF CROWN PRODUCTION FOREST AREA BY WORKING GROUP BY AGE CLASS
for the five-year term
from 1993/94 - 1998/99
UPPER SPANISH FOREST MU # 160

10/04/93

WG	SC	AGE CLASS	AREA (HA)
BW	X	B & S	0
		FTG - 20	0
		21 - 40	44
		41 - 60	17
		61 - 80	14
		81 - 100	73
		101 - 120	0
		121 - 140	0
		141 - 160	0
		161 - 180	0
		181 - 200	0
		201 +	0
BW	X	TOTAL	148
BW	2	B & S	952
		FTG - 20	36
		21 - 40	630
		41 - 60	12302
		61 - 80	16859
		81 - 100	25696
		101 - 120	6891
		121 - 140	64
		141 - 160	0
		161 - 180	40
		181 - 200	0
		201 +	0
BW	2	TOTAL	63470
BW ALL		B & S	1245
		FTG - 20	36
		21 - 40	784
		41 - 60	16731
		61 - 80	27126
		81 - 100	37497
		101 - 120	10394
		121 - 140	87
		141 - 160	26
		161 - 180	101
		181 - 200	0
		201 +	0
BW ALL		TOTAL	94027

WG	SC	AGE CLASS	AREA (HA)
BW	1	B & S	0
		FTG - 20	0
		21 - 40	110
		41 - 60	443
		61 - 80	686
		81 - 100	1386
		101 - 120	137
		121 - 140	0
		141 - 160	0
		161 - 180	0
		181 - 200	0
		201 +	0
BW	1	TOTAL	2762
BW	3	B & S	293
		FTG - 20	0
		21 - 40	0
		41 - 60	3969
		61 - 80	9567
		81 - 100	10342
		101 - 120	3366
		121 - 140	23
		141 - 160	26
		161 - 180	61
		181 - 200	0
		201 +	0
BW	3	TOTAL	27647
BW ALL		REG 20-22	76640
		PLANT 23	0
		PFR 25-28	16142
		B&S 30-33	1245
		NSR 2 35	0
		NSR 3 36	0
		NSR 4 37	0
		NSR 5 38	0
		NSR 6 39	0
		TYPE 24	0
		TYPE 29	0
		TYPE 34	0
BW ALL		TOTAL	94027

TABLE 4.9 Supp

SUMMARY OF CROWN PRODUCTION FOREST AREA BY WORKING GROUP BY AGE CLASS

for the five-year term

from 1993/94 - 1998/99

UPPER SPANISH FOREST MU # 160

10/04/93

WG	SC	AGE CLASS	AREA (HA)	WG	SC	AGE CLASS	AREA (HA)
PRODUCTION FOREST TOTAL			523668				

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WC	STAND NO	WG	SPECIES COMPOSITION	AGE	YR OF ORIG	YR UP DATE	HT (M)	STK	SITE CLASS	AREA (HA)	OWN	POLY-GON TYPE	ACT. CODE	ACT. DATE	TOWNSHIP	FMU
MAPSHEET: 000007100																
0	110-0	07	PJ 0	89	904	974	24.1	0.9	X	28	1	20	15	850919	ARDEN	0
0	112-0	07	PJ 0	89	904	974	24.1	0.9	X	30	1	20	15	850919	ARDEN	0
0	114-0	07	PJ 8SB 2	90	903	974	23.8	1.2	X	15	1	20	15	850919	ARDEN	0
0	115-0	07	PJ 8SB 2	90	903	974	23.8	1.2	X	11	1	20	15	850919	ARDEN	0
0	121-0	07	PJ 9SB 1	89	904	974	24.4	1.0	X	11	1	20	15	850919	ARDEN	0
MAPSHEET 000007100 = 95 Hectares																
MAPSHEET: 000014400																
0	474-0	07	PJ 0	84	909	974	22.9	1.0	X	11	1	20	15	850919	BATTERS	0
0	475-0	07	PJ 0	84	909	974	22.9	1.0	X	6	1	20	15	850919	BATTERS	0
MAPSHEET 000014400 = 17 Hectares																
MAPSHEET: 000017100																
0	312-0	07	PJ 7BW 3	95	898	974	24.7	0.9	X	10	5	20	15	850919	BENNEWE	0
0	313-0	07	PJ 7BW 3	95	898	974	24.7	0.9	X	17	5	20	15	850919	BENNEWE	0
0	314-0	07	PJ 7BW 3	95	898	974	24.7	0.9	X	7	5	20	15	850919	BENNEWE	0
MAPSHEET 000017100 = 34 Hectares																
MAPSHEET: 000021100																
0	83-0	07	PJ 0	84	909	974	22.9	1.0	X	26	1	20	15	850919	BLAMEY	0
0	85-0	07	PJ 0	84	909	974	22.9	1.0	X	4	1	20	15	850919	BLAMEY	0
0	86-0	07	PJ 7PO 3	84	909	974	22.9	1.0	X	11	1	20	15	850919	BLAMEY	0
0	87-0	07	PJ 0	84	909	974	22.9	1.0	X	6	1	20	15	850919	BLAMEY	0
0	93-0	07	PJ 0	84	909	974	22.9	1.0	X	34	1	20	15	850919	BLAMEY	0
0	353-0	07	PJ 0	84	909	974	22.9	1.0	X	25	1	20	15	850919	BLAMEY	0
0	356-0	07	PJ 0	84	909	974	22.9	1.0	X	15	1	20	15	850919	BLAMEY	0
MAPSHEET 000021100 = 121 Hectares																

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STAND NO	WG	SPECIES COMPOSITION	AGE	YR OF ORIG	YR UP DATE	HT (M)	STK	SITE CLASS	AREA (HA)	OWN	POLY-GON TYPE	ACT. CODE	ACT. DATE	TOWNSHIP	FMU
MAPSHEET: 000041000															
352-0	07	PJ 7BW 3	90	903	974	24.1	0.9	X	26	5	20	15	850919	CHESTER	0
354-0	07	PJ 7BW 3	95	898	974	24.7	0.9	X	23	5	20	15	850919	CHESTER	0
		MAPSHEET 000041000 =			49 Hectares										
MAPSHEET: 000065000															
14-0	07	PJ 8SB 1PO 1	109	884	974	24.4	0.9	X	14	1	20	15	850919	EDINBUR	0
		MAPSHEET 000065000 =			14 Hectares										
MAPSHEET: 000069300															
188-0	07	PJ 5SB 1PO 4	99	894	974	27.4	1.0	X	57	1	20	15	850919	ESTHER	0
		MAPSHEET 000069300 =			57 Hectares										
MAPSHEET: 000072300															
92-0	07	PJ 9PO 1	84	909	974	22.9	1.0	X	29	1	20	15	850919	FAWN	0
		MAPSHEET 000072300 =			29 Hectares										
MAPSHEET: 000080400															
129-0	07	PJ 9BW 1	107	886	974	25.3	1.0	X	64	1	20	15	850919	GARNET	0
		MAPSHEET 000080400 =			64 Hectares										
MAPSHEET: 000100400															
32-0	07	PJ 0	84	909	974	22.9	1.0	X	34	1	20	15	850919	HONGKON	0
33-0	07	PJ 6SB 1PO 3	84	909	974	22.9	1.0	X	14	1	20	15	850919	HONGKON	0
117-0	07	PJ 5PO 3BW 2	84	909	974	22.9	1.0	X	9	1	20	15	850919	HONGKON	0
124-0	07	PJ 7SB 1BW 2	89	904	974	24.4	1.0	X	12	1	20	15	850919	HONGKON	0
265-0	07	PJ 0	84	909	974	22.9	1.0	X	32	1	20	15	850919	HONGKON	0
283-0	07	PJ 0	84	909	974	22.9	1.0	X	11	1	20	15	850919	HONGKON	0
320-0	07	PJ 7SB 3	84	909	974	22.9	1.0	X	27	1	20	15	850919	HONGKON	0
		MAPSHEET 000100400 =			139 Hectares										

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MC	STAND NO	WG	SPECIES COMPOSITION	AGE	YR OF ORIG	YR UP DATE	HT (M)	STK	SITE CLASS	AREA (HA)	OWN	POLY-GON TYPE	ACT. CODE	ACT. DATE	TOWNSHIP	FMU
MAPSHEET: 000105100																
0	420-0	07	PJ 8SB 2	90	903	974	23.8	1.2	X	5	1	20	15	850919	INVERGA	0
0	434-0	07	PJ 8SB 2	90	903	974	23.8	1.2	X	6	1	20	15	850919	INVERGA	0
			MAPSHEET 000105100 = 11 Hectares													
MAPSHEET: 000106000																
0	63-0	07	PJ 7PO 3	104	889	974	24.4	1.0	X	15	1	20	15	850919	IVY	0
0	65-0	07	PJ 8SB 1PO 1	99	894	974	24.4	1.0	X	20	1	20	15	850919	IVY	0
0	71-0	07	PJ 8SB 2	104	889	974	24.4	1.0	X	9	1	20	15	850919	IVY	0
			MAPSHEET 000106000 = 44 Hectares													
MAPSHEET: 000128100																
0	166-0	07	PJ 7PO 1BW 2	84	909	973	22.6	1.0	X	10	1	20	15	850919	MALLARD	0
0	167-0	07	PJ 7PO 1BW 2	84	909	973	22.6	1.0	X	7	1	20	15	850919	MALLARD	0
			MAPSHEET 000128100 = 17 Hectares													
MAPSHEET: 000130300																
0	267-0	07	PJ 9PO 1	89	904	974	25.9	0.9	X	13	1	20	15	850919	MARQUET	0
			MAPSHEET 000130300 = 13 Hectares													
MAPSHEET: 000228000																
0	140-0	07	PJ 5SW 2PO 2BW 1	99	894	974	24.4	1.0	X	26	1	20	15	850919	CAVANA	0
0	162-0	07	PJ 0	99	894	974	25.0	1.1	X	8	1	20	15	850919	CAVANA	0
0	164-0	07	PJ 7SB 2PO 1	99	894	974	24.4	1.0	X	15	1	20	15	850919	CAVANA	0
0	166-0	07	PJ 9SB 1	109	884	974	24.4	0.9	X	9	1	20	15	850919	CAVANA	0
0	254-0	07	PJ 6SB 3PO 1	99	894	974	24.4	0.9	X	16	1	20	15	850919	CAVANA	0
0	255-0	07	PR 2PJ 4SB 1PO 3	100	893	974	24.4	0.9	X	26	1	20	15	850919	CAVANA	0
			MAPSHEET 000228000 = 100 Hectares													

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C	STAND NO	WG	SPECIES COMPOSITION	AGE	YR OF ORIG	YR UP DATE	HT (M)	STK	SITE CLASS	AREA (HA)	OWN	POLY-GON TYPE	ACT. CODE	ACT. DATE	TOWNSHIP	FMU
MAPSHEET: 000233200																
0	188-0	07	PJ 0	89	904	974	24.4	1.0	X	17	1	20	15	850919	SHIPLEY	0
			MAPSHEET 000233200 = 17 Hectares													
MAPSHEET: 000233300																
0	177-0	07	PJ 0	84	909	974	22.9	1.0	X	15	1	20	15	850919	KAPLAN	0
			MAPSHEET 000233300 = 15 Hectares													
			TOTAL AREA = 836 Hectares													

LEDGER1 SORT CRITERIA

LEDGER1 CRITERIA NAME: MANUAL
MANAGEMENT UNIT # 160 WORKING CIRCLE #
MAPSHEET NUMBER: TOWNSHIP NAME:
FORMAN MU # 0
OWNERSHIP 1: 1 OWNERSHIP 2: OWNERSHIP 3:
STAND TYPE: 20 - 23
WG1: PJ WG2: WG3: WG4:
SC1: X SC2: SC3: SC4: SC5:
STANDS: 0 - 9999 AGE: 81 - 120
STOCKING: 0.9 - 1.9 HEIGHT: 15.0 - 40.0
ACTIVITY CODE: - 99 YEAR TO UPDATE TO: 993

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WC	STAND NO	WG	SPECIES COMPOSITION	AGE	YR OF ORIG	YR UP DATE	HT (M)	STK	SITE CLASS	AREA (HA)	OWN	POLY-GON TYPE	ACT. CODE	ACT. DATE	TOWNSHIP	FMU
MAPSHEET: 000000800																
0	268-0	07	PJ 5PO 1BW 4	70	904	974	18.3	1.0	2	10	1	20	15	850919	ABNEY	0
0	269-0	07	PJ 5PO 1BW 4	70	904	974	18.3	1.0	2	2	5	20	15	850919	ABNEY	0
0	313-0	36	PJ 5BW 5	65	909	974	19.8	1.0	1	20	1	20	15	850919	ABNEY	0
0	325-0	07	PJ 5SW 1BW 4	70	904	974	18.3	1.0	2	12	1	20	15	850919	ABNEY	0
MAPSHEET 000000800 = 44 Hectares																
MAPSHEET: 000003300																
0	422-0	07	PJ 5PO 1BW 4	75	899	974	19.8	1.0	2	18	1	20	15	850919	ALCONA	0
MAPSHEET 000003300 = 18 Hectares																
MAPSHEET: 000021100																
0	132-0	36	PJ 5BW 5	70	904	974	18.3	1.0	2	3	1	20	15	850919	BLAKEY	0
0	196-0	07	PJ 6BW 4	75	899	974	18.3	1.0	2	12	1	20	15	850919	BLAKEY	0
0	318-0	07	PJ 6BW 4	60	914	974	18.3	1.0	2	17	1	20	15	850919	BLAKEY	0
MAPSHEET 000021100 = 32 Hectares																
MAPSHEET: 000037400																
0	227-0	07	PJ 6BW 4	65	909	974	18.3	1.0	2	8	1	20	15	850919	CAVELL	0
0	310-0	07	PJ 5SB 1BW 4	70	904	974	18.3	1.0	2	15	1	20	15	850919	CAVELL	0
MAPSHEET 000037400 = 23 Hectares																
MAPSHEET: 000037900																
0	295-0	07	PJ 6BW 4	53	921	974	22.6	1.6	X	17	1	20	15	850919	CHALET	0
MAPSHEET 000037900 = 17 Hectares																
MAPSHEET: 000051400																
0	470-0	36	PJ 5BW 5	70	904	974	18.3	1.0	2	18	1	20	15	850919	CUNNING	0
MAPSHEET 000051400 = 18 Hectares																

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WC	STAND NO	MG	SPECIES COMPOSITION	AGE	YR OF ORIG	YR UP DATE	HT (M)	STK	SITE CLASS	AREA (HA)	OWN	POLY-GON TYPE	ACT. CODE	ACT. DATE	TOWNSHIP	FMU
MAPSHEET: 000065800																
0	340-0	17	PJ 6BW 4	67	907	974	21.0	0.6	1	8	1	20	15	850919	EISENHO	0
0	494-0	17	PJ 5SB 1BW 4	60	914	974	18.3	1.0	2	21	1	20	15	850919	EISENHO	0
			MAPSHEET 000065800 =		29 Hectares											
MAPSHEET: 000072300																
0	106-0	17	PJ 5BW 5	60	914	974	19.8	1.0	1	11	1	20	15	850919	FAWN	0
0	107-0	17	PJ 5BW 5	60	914	974	19.8	1.0	1	8	1	20	15	850919	FAWN	0
			MAPSHEET 000072300 =		19 Hectares											
MAPSHEET: 000090600																
0	307-0	17	PJ 5SB 1BW 4	70	904	974	18.3	1.0	2	7	1	20	15	850919	HALL	0
			MAPSHEET 000090600 =		7 Hectares											
MAPSHEET: 000105100																
0	266-0	17	PJ 5PO 1BW 4	75	899	974	19.8	0.7	2	19	1	20	15	850919	INVERGA	0
			MAPSHEET 000105100 =		19 Hectares											
MAPSHEET: 000105500																
0	185-0	17	PJ 5PO 1BW 4	70	904	974	21.3	1.0	1	15	1	20	15	850919	IRIS	0
			MAPSHEET 000105500 =		15 Hectares											
MAPSHEET: 000107600																
0	9-0	17	PJ 5SB 1BW 4	70	904	974	18.3	1.0	2	2	1	20	15	850919	JOFFRE	0
			MAPSHEET 000107600 =		2 Hectares											

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WC	STAND NO	WG	SPECIES COMPOSITION	AGE	YR OF ORIG	YR UP DATE	HT (M)	STK	SITE CLASS	AREA (HA)	OWN	POLY-CON TYPE	ACT. CODE	ACT. DATE	TOWNSHIP	FMU
	MAPSHEET: 000109200															
0	35-0	07	PJ 6BW 4	70	904	974	19.8	1.0	1	14	1	20	15	850919	KELSO	0
0	58-0	07	PJ 5B 1BW 4	70	904	974	18.3	1.0	2	20	1	20	15	850919	KELSO	0
0	415-0	07	PJ 6BW 4	70	904	974	19.8	1.0	1	6	1	20	15	850919	KELSO	0
			MAPSHEET 000109200 = 40 Hectares													
	MAPSHEET: 000115100															
0	131-0	07	PJ 6BW 4	35	939	974	12.2	0.8	2	6	1	20	15	850919	LAMPMAN	0
0	193-0	07	PJ 5SB 1BW 4	35	939	974	12.2	1.0	2	23	1	20	15	850919	LAMPMAN	0
			MAPSHEET 000115100 = 29 Hectares													
	MAPSHEET: 000128100															
0	383-0	07	PJ 6BW 4	79	894	973	23.5	1.3	1	45	1	20	15	850919	MALLARD	0
			MAPSHEET 000128100 = 45 Hectares													
	MAPSHEET: 000130700															
0	63-0	07	PJ 5SB 1BW 4	60	914	974	19.8	0.8	1	14	1	20	15	850919	MARSHAY	0
			MAPSHEET 000130700 = 14 Hectares													
	MAPSHEET: 000140300															
0	310-0	07	PJ 6BW 4	50	924	974	15.2	1.0	2	9	1	20	15	850919	MCPHAIL	0
			MAPSHEET 000140300 = 9 Hectares													
	MAPSHEET: 000190500															
0	269-0	07	PJ 6BW 4	92	882	974	26.8	0.4	X	6	1	20	15	850919	SMUTS	0
			MAPSHEET 000190500 = 6 Hectares													

ONTARIO MINISTRY OF NATURAL RESOURCES
WILDLIFE HABITAT REPORT

MANAGEMENT UNIT NO. 160

FOREST RESOURCE INVENTORY STAND LISTING AS OF November 04, 93
(Ages, Heights & Site Classes are based on Stand YEAR OF UPDATE)

11/04/93

WC	STAND NO	WG	SPECIES COMPOSITION	AGE	YR OF ORIG	YR UP DATE	HT (M)	STK	SITE CLASS	AREA (HA)	OWN	POLY-GON TYPE	ACT. CODE	ACT. DATE	TOWNSHIP	FMU
MAPSHEET: 000210600																
0	123-0	07	PJ 6BW 4	55	919	974	18.3	0.5	1	9	1	20	15	850919	VROOMAN	0
MAPSHEET 000210600 = 9 Hectares																
MAPSHEET: 000214100																
0	3-0	36	PJ 5BW 5	55	919	974	18.3	0.6	1	56	1	20	15	850919	WESTBRO	0
0	5-0	07	PJ 6BW 4	55	919	974	18.3	0.5	1	5	1	20	15	850919	WESTBRO	0
0	63-0	36	PJ 5BW 5	60	914	974	16.8	0.6	2	18	1	20	15	850919	WESTBRO	0
MAPSHEET 000214100 = 79 Hectares																
TOTAL AREA = 474 Hectares																

WILDLIFE SORT CRITERIA

WILDLIFE CRITERIA NAME: MANUAL
MANAGEMENT UNIT # 160 WORKING CIRCLE #
MAPSHEET NUMBER: TOWNSHIP NAME:
FORMAN MU # 0
OWNERSHIP 1: 1 OWNERSHIP 2: OWNERSHIP 3:
STAND TYPE: 20 - 28
SPECIES 1: PJ COMPOSITION: 5 - 10
SPECIES 2: BW COMPOSITION: 4 - 10
SPECIES 3: COMPOSITION: 0 - 0
SPECIES 4: COMPOSITION: 0 - 0
CONDITION <AND>: Y CONDITION <OR>: CONDITION <SUM>:
SC1: X SC2: 1 SC3: 2 SC4: SC5:
AREA: 0 - 99999 AGE: 51 - 999
STOCKING: 0.3 - 3.0 HEIGHT: 12.0 - 40.0
ACTIVITY CODE: - 99 YEAR TO UPDATE TO: 993

CLASS ID LISTING
FRI SPECIES COMPOSITION SUMMARY

MANAGEMENT UNIT: 868 FOREST CLASS FILE: CLNAGAG.DBF YEAR: 1994 02/16/94

Class	FMU	Age Class	Age	FMU Label	Polygon	SC	Area	Ht	Stk	Sb	Sw	Pj	Bf	Ce	Pw	Pr	Oc	Po	Bw	Oh	SWD	HWD	CLASS
1	2	1- 20	4	MIXHD	20-28	2	404	0.0	0.5	1	1	0	1	0	0	0	0	4	3	0	3	7	1
2	2	21- 40	32	MIXHD	20-28	2	1829	14.4	0.8	0	1	2	0	0	0	0	0	5	1	0	3	7	2
3	2	41- 60	52	MIXHD	20-28	2	31107	16.9	0.8	0	0	1	0	0	0	0	0	3	4	0	3	7	3
4	2	61- 80	66	MIXHD	20-28	2	20046	19.0	0.8	1	1	1	1	0	0	0	0	3	4	0	3	7	4
5	2	81-100	86	MIXHD	20-28	2	3341	20.0	0.6	1	1	0	1	0	0	0	0	3	4	0	3	7	5
6	2	101-120	103	MIXHD	20-28	2	370	22.6	0.7	1	1	0	0	0	0	0	0	3	3	0	3	7	6
7	2	121-140	132	MIXHD	20-28	3	53	23.4	0.4	1	1	0	1	0	0	0	0	5	3	0	2	8	7
8	3	1- 20	15	POPLA	20-28	X	83	9.9	0.8	0	1	0	0	0	0	0	0	9	0	1	1	9	8
9	3	21- 40	33	POPLA	20-28	2	1347	15.4	0.9	0	0	1	0	0	0	0	0	9	0	0	1	9	9
10	3	41- 60	51	POPLA	20-28	2	12671	19.3	0.9	0	0	1	0	0	0	0	0	8	1	0	1	9	10
11	3	61- 80	66	POPLA	20-28	2	3802	22.8	0.9	0	0	0	0	0	0	0	0	8	1	0	1	9	11
12	3	81-100	87	POPLA	20-28	2	583	23.9	0.7	0	1	0	0	0	0	0	0	7	1	0	2	8	12
13	3	101-120	110	POPLA	20-28	2	25	27.1	0.8	1	0	1	1	0	0	0	0	7	0	0	3	7	13
14	4	21- 40	37	BIRCH	20-28	1	29	14.3	0.4	0	0	2	0	0	0	0	0	0	7	0	2	8	14
15	4	41- 60	54	BIRCH	20-28	2	7318	15.7	0.9	0	0	1	0	0	0	0	0	1	8	0	2	8	15
16	4	61- 80	66	BIRCH	20-28	2	3814	16.6	0.8	0	0	0	1	0	0	0	0	1	7	0	2	8	16
17	4	81-100	82	BIRCH	20-28	3	241	18.0	0.6	0	0	0	1	0	0	0	0	0	8	0	2	8	17
18	5	1- 20	14	JPINE	20-28	2	3603	3.8	0.7	1	0	9	0	0	0	0	0	0	0	0	10	1	18
19	5	21- 40	32	JPINE	20-28	1	1755	12.4	0.9	0	0	9	0	0	0	0	0	1	0	0	9	1	19
20	5	41- 60	53	JPINE	20-28	2	25795	16.7	1.0	0	0	8	0	0	0	0	0	1	1	0	9	1	20
21	5	61- 80	66	JPINE	20-28	2	13411	18.6	0.9	1	0	8	0	0	0	0	0	1	1	0	9	1	21
22	5	81-100	85	JPINE	20-28	2	708	20.0	1.0	1	0	9	0	0	0	0	0	0	0	0	9	1	22
23	5	101-120	103	JPINE	20-28	2	103	21.9	0.7	1	0	7	0	0	0	0	0	1	0	0	9	1	23
24	5	121-140	137	JPINE	20-28	1	24	23.4	0.5	2	0	8	0	0	0	0	0	0	1	0	9	1	24
25	5	141-160	144	JPINE	20-28	1	59	24.2	0.6	2	0	7	0	0	0	0	0	0	0	0	10	0	25
26	6	101-120	102	OTHER	20-28	2	47	14.5	0.7	0	1	0	0	0	3	1	0	1	2	2	5	5	26
27	7	1- 20	10	LOWSP	20-28	2	104	0.6	0.6	10	0	0	0	0	0	0	0	0	0	0	10	0	27
28	7	21- 40	32	LOWSP	20-28	2	58	4.9	0.5	10	0	0	0	0	0	0	0	0	0	0	10	0	28
29	7	41- 60	53	LOWSP	20-28	2	518	8.8	0.6	10	0	0	0	0	0	0	0	0	0	0	10	0	29
30	7	61- 80	68	LOWSP	20-28	2	1097	10.2	0.7	9	0	0	0	0	0	0	0	0	0	0	10	0	30
31	7	81-100	90	LOWSP	20-28	2	1271	11.6	0.6	9	0	0	0	0	0	0	0	0	0	0	10	0	31
32	7	101-120	112	LOWSP	20-28	2	1558	13.7	0.6	9	0	0	0	0	0	0	0	0	0	0	10	0	32
33	7	121-140	130	LOWSP	20-28	3	1150	13.3	0.5	8	0	0	0	0	0	0	0	1	0	0	10	0	33
34	7	141-160	148	LOWSP	20-28	3	51	12.0	0.4	8	0	0	0	0	0	0	0	2	0	0	10	0	34
35	7	181-200	192	LOWSP	20-28	3	27	12.7	0.5	6	0	0	1	0	0	0	0	1	0	0	10	0	35
36	8	1- 20	13	SPMIX	20-28	2	2387	3.0	0.7	2	1	4	1	0	0	0	0	0	1	2	7	3	36
37	8	21- 40	34	SPMIX	20-28	X	2259	10.1	0.7	4	1	2	1	0	0	0	0	0	1	1	8	2	37
38	8	41- 60	53	SPMIX	20-28	2	24769	14.3	0.8	3	0	3	0	0	0	0	0	0	1	2	7	3	38
39	8	61- 80	67	SPMIX	20-28	1	23359	15.0	0.7	4	0	2	1	0	0	0	0	0	1	1	8	2	39
40	8	81-100	87	SPMIX	20-28	1	9729	15.2	0.7	6	0	1	1	0	0	0	0	0	1	1	9	1	40
41	8	101-120	110	SPMIX	20-28	1	3413	16.7	0.6	6	0	1	1	0	0	0	0	0	1	0	9	1	41
42	8	121-140	129	SPMIX	20-28	1	1259	18.2	0.6	6	0	1	1	0	0	0	0	0	1	0	9	1	42
43	8	141-160	149	SPMIX	20-28	1	213	19.3	0.4	8	0	0	0	0	0	0	0	0	0	0	9	1	43
44	8	181-200	188	SPMIX	20-28	1	21	16.1	0.4	8	0	0	1	0	0	0	0	0	1	0	9	1	44
45	9	1- 20	16	BPMIX	20-28	1	176	2.6	0.7	1	4	1	4	0	0	0	0	0	1	0	9	1	45

CLASS ID LISTING
FRI SPECIES COMPOSITION SUMMARY

MANAGEMENT UNIT: 868 FOREST CLASS FILE: CLNAGAG.DBF YEAR: 1994

02/16/94

Class	FMU	Age Class	Age	FMU Label	Polygon	SC	Area	Ht	Stk	Sb	Sw	Pj	Bf	Ce	Pw	Pr	Oc	Po	Bw	Oh	SWD	HWD	CLASS
46	9	21- 40	37	BFMIX	20-28	X	384	11.1	0.7	1	1	1	3	1	0	0	0	2	1	0	7	3	46
47	9	41- 60	51	BFMIX	20-28	X	3127	13.3	0.7	2	1	0	3	1	0	0	0	1	2	0	7	3	47
48	9	61- 80	69	BFMIX	20-28	1	6573	15.0	0.7	2	1	0	3	1	0	0	0	0	2	0	7	3	48
49	9	81-100	89	BFMIX	20-28	2	5359	14.0	0.7	2	1	0	1	3	0	0	1	0	1	0	8	2	49
50	9	101-120	111	BFMIX	20-28	2	2569	14.8	0.6	3	1	0	1	4	0	0	1	0	1	0	9	1	50
51	9	121-140	129	BFMIX	20-28	2	1276	14.3	0.6	3	0	0	0	5	0	0	1	0	0	0	10	0	51
52	9	141-160	147	BFMIX	20-28	2	288	15.9	0.7	2	1	0	1	5	0	0	0	0	1	0	9	1	52
53	9	181-200	186	BFMIX	20-28	3	52	16.1	0.5	1	0	0	1	5	0	0	0	0	0	1	8	2	53
54	9	201-220	207	BFMIX	20-28	3	37	14.2	0.6	1	0	0	1	8	0	0	0	0	0	0	10	0	54
TOT/AVG			62	(Weighted Averages)			225652	16.0	0.8	2	0	3	0	0	0	0	0	2	2	0	6	4	

STAND LISTING BY FOREST CLASS
FOREST CLASS FILE - CLMANUAL.DBF.DBF
FRI STANF FILE - STANF160.DBF.DBF

11/04/93

MAPSHEET	STAND	SUFF	MAPSHEET	STAND	SUFF	MAPSHEET	STAND	SUFF
FOREST CLASS ID # 1								
000000800	178	0	000025300	410	0	000077100	321	0
000228000	143	0						
FOREST CLASS ID # 2								
000077100	277	0	000077100	286	0	000077100	294	0
000077100	324	0	000078700	59	0	000078700	61	0
FOREST CLASS ID # 3								
000065100	160	0	000078700	337	0	000189400	2	0
000227100	447	0	000227100	450	0	000227100	483	0
000233200	363	0						
FOREST CLASS ID # 4								
000025300	405	0	000025300	412	0	000037700	15	0
000048400	292	0	000072000	21	0	000072000	22	0
000072000	48	0	000078700	53	0	000078700	64	0
000078700	248	0	000083100	1	0	000083100	241	0
000083100	310	0	000083100	324	0	000083100	452	0
000083100	500	0	000105500	16	0	000105500	17	0
000105500	316	0	000105500	372	0	000105500	390	0
000106000	204	0	000106000	206	0	000115100	438	0
000117800	47	0	000130300	119	0	000161500	42	0
000164700	139	0	000189400	6	0	000189400	7	0
000189400	10	0	000189400	153	0	000189400	155	0
000189400	158	0	000189400	175	0	000189400	182	0
000189400	264	0	000189400	268	0	000189400	272	0
000189400	288	0	000189400	289	0	000227100	181	0
000227100	373	0	000227100	486	0	000228900	26	0
000228900	27	0	000228900	28	0	000228900	240	0
000229900	38	0	000229900	58	0	000229900	171	0
000229900	280	0	000229900	281	0	000229900	283	0
000229900	285	0	000229900	286	0	000229900	287	0
000230900	64	0	000230900	317	0	000230900	327	0
000230900	338	0						
FOREST CLASS ID # 5								
000007100	444	0	000025300	422	0	000025400	148	0
000041000	96	0	000065100	147	0	000078700	17	0
000078700	40	0	000078700	44	0	000078700	45	0

STAND LISTING BY FOREST CLASS
FOREST CLASS FILE - CLMANUAL.DBF.DBF
FRI STANF FILE - STANF160.DBF.DBF

11/04/93

MAPSHEET	STAND	SUFF	MAPSHEET	STAND	SUFF	MAPSHEET	STAND	SUFF
000078700	143	0	000083100	66	0	000102300	92	0
000102300	93	0	000105500	224	0	000105500	228	0
000105500	229	0	000105500	248	0	000105500	256	0
000105500	328	0	000105500	336	0	000105500	337	0
000105500	352	0	000105500	353	0	000105500	358	0
000105500	359	0	000105500	362	0	000105500	365	0
000105500	382	0	000105500	384	0	000164700	27	0
000164700	142	0	000191200	10	0	000228900	16	0
000228900	18	0	000228900	29	0	000228900	32	0
000228900	34	0	000228900	35	0	000228900	36	0
000228900	39	0	000228900	52	0	000229900	27	0
000229900	30	0	000229900	94	0	000229900	101	0
000229900	103	0	000229900	105	0	000229900	106	0
000229900	179	0	000229900	181	0	000229900	216	0
000229900	293	0	000229900	302	0	000230000	264	0
000230900	24	0	000230900	56	0	000230900	193	0
000230900	219	0	000230900	309	0	000230900	330	0
FOREST CLASS ID # 6								
000021500	244	0	000080400	350	0			
FOREST CLASS ID # 7								
000077100	310	0	000117800	28	0	000183900	302	0
FOREST CLASS ID # 8								
000230900	319	0						
FOREST CLASS ID # 9								
000105100	97	0	000105100	98	0	000105100	99	0
000105100	100	0	000105100	116	0	000105100	134	0

PURE SPECIES YIELD TABLE FOR MANUAL FILE SET

Filename: PURE_MAN.DBF 11/04/93

PURE SPECIES FORECASTING YIELDS (NMV m3/ha)

	WG	SC	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180	190	200
NATURAL	SB	X	0	0	24	68	116	162	184	168	148	120	88	53	33	16	0	0	0	0	0	0
	SB	1	0	0	12	52	84	118	146	168	174	160	141	116	92	68	48	32	0	0	0	0
	SB	2	0	0	0	0	15	40	66	93	116	138	148	152	148	138	127	116	100	78	0	0
	SB	3	0	0	0	0	8	20	28	36	45	55	70	79	86	93	99	100	97	92	89	86
	SW	X	0	0	34	110	181	241	290	330	361	385	400	410	416	371	326	281	236	191	146	100
	SW	1	0	0	26	80	128	176	224	262	300	290	250	215	180	144	108	72	36	0	0	0
	SW	2	0	0	0	0	15	40	66	93	116	138	148	152	148	138	120	100	76	38	0	0
	SW	3	0	0	0	0	8	20	34	52	68	85	100	110	119	126	132	133	130	124	118	112
	PJ	X	0	17	89	155	170	190	210	230	243	244	220	70	30	0	0	0	0	0	0	0
	PJ	1	0	17	89	155	170	190	210	230	243	244	220	70	30	0	0	0	0	0	0	0
	PJ	2	0	2	45	89	129	161	180	193	196	198	180	50	20	0	0	0	0	0	0	0
	PJ	3	0	0	12	42	75	103	125	139	144	147	130	20	8	0	0	0	0	0	0	0
	BF	X	0	0	24	68	114	146	160	151	131	103	72	41	24	0	0	0	0	0	0	0
	BF	1	0	0	24	68	114	146	160	151	131	103	72	41	24	0	0	0	0	0	0	0
	BF	2	0	0	24	68	114	146	160	151	131	103	72	41	24	0	0	0	0	0	0	0
	BF	3	0	0	24	68	114	146	160	151	131	103	72	41	24	0	0	0	0	0	0	0
	CE	X	0	0	20	60	100	140	160	140	130	120	110	50	20	0	0	0	0	0	0	0
	CE	1	0	0	20	60	100	140	160	140	130	120	110	50	20	0	0	0	0	0	0	0
	CE	2	0	0	20	60	100	140	160	140	130	120	110	50	20	0	0	0	0	0	0	0
	CE	3	0	0	20	60	100	140	160	140	130	120	110	50	20	0	0	0	0	0	0	0
	PW	X	0	0	76	157	242	315	372	414	449	479	505	526	544	570	579	585	590	594	594	
	PW	1	0	0	76	157	242	315	372	414	449	479	505	526	544	570	579	585	590	594	594	
	PW	2	0	0	0	77	134	190	238	277	310	338	362	382	398	410	420	427	432	436	439	439
	PW	3	0	0	0	0	38	69	102	133	160	185	205	223	236	247	254	259	261	262	263	263
	PR	X	0	58	145	234	291	333	365	387	406	420	432	442	451	458	464	470	470	470	470	470
	PR	1	0	58	145	234	291	333	365	387	406	420	432	442	451	458	464	470	470	470	470	470
	PR	2	0	0	82	156	209	248	276	299	317	331	342	351	359	365	371	375	375	375	375	375
	PR	3	0	0	29	74	119	156	182	202	216	228	237	245	250	255	259	261	261	261	260	255
	PO	X	0	57	110	190	251	295	322	333	331	318	286	240	192	132	68	0	0	0	0	
	PO	1	0	57	110	190	251	295	322	333	331	318	286	240	192	132	68	0	0	0	0	
	PO	2	0	20	65	135	202	250	275	287	287	265	225	186	117	45	0	0	0	0	0	
	PO	3	0	0	20	57	108	160	194	203	200	172	125	77	22	0	0	0	0	0	0	
	BW	X	0	0	0	25	73	113	142	160	171	176	179	179	178	175	120	59	0	0	0	
	BW	1	0	0	0	25	73	113	142	160	171	176	179	179	178	175	120	59	0	0	0	
	BW	2	0	0	0	20	58	87	107	119	127	130	132	133	132	94	44	0	0	0	0	
	BW	3	0	0	0	16	51	70	85	93	98	101	103	103	72	33	0	0	0	0	0	
	OH	X	0	0	0	0	50	60	90	100	100	100	100	100	80	40	20	0	0	0	0	
	OH	1	0	0	0	0	50	60	90	100	100	100	100	100	80	40	20	0	0	0	0	
	OH	2	0	0	0	0	50	60	90	100	100	100	100	100	80	40	20	0	0	0	0	
	OH	3	0	0	0	0	50	60	90	100	100	100	100	100	80	40	20	0	0	0	0	
	OC	X	0	0	12	52	84	118	146	168	174	160	141	116	92	68	48	32	0	0	0	
	OC	1	0	0	12	52	84	118	146	168	174	160	141	116	92	68	48	32	0	0	0	
	OC	2	0	0	0	0	15	40	66	93	116	138	148	152	148	138	127	116	100	78	0	
	OC	3	0	0	0	0	8	20	28	36	45	55	70	79	86	93	99	100	97	92	89	86

PURE SPECIES YIELD TABLE FOR MANUAL FILE SET

Filename: PURE_MAN.DBF

11/04/93

PURE SPECIES FORECASTING YIELDS (NMV m3/ha)

	WG	SC	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180	190	200
PLANTATION	SBp	X	0	0	48	85	113	148	168	174	160	141	116	92	68	48	32	0	0	0	0	0
	SBp	1	0	0	48	85	113	148	168	174	160	141	116	92	68	48	32	0	0	0	0	0
	SBp	2	0	0	0	6	15	40	66	93	116	138	148	152	148	138	127	116	100	78	0	0
	SBp	3	0	0	0	0	8	20	28	36	45	55	70	79	86	93	99	100	97	92	89	86
	SWp	X	0	4	60	105	150	186	195	200	203	196	147	113	75	48	6	0	0	0	0	0
	SWp	1	0	4	60	105	150	186	195	200	203	196	147	113	75	48	6	0	0	0	0	0
	SWp	2	0	0	6	15	40	66	93	116	138	148	152	148	138	127	116	100	78	10	0	0
	SWp	3	0	0	0	0	8	20	34	52	68	85	100	110	119	126	132	133	130	124	118	112
	PJp	X	0	17	89	155	195	222	235	243	243	244	220	70	30	0	0	0	0	0	0	0
	PJp	1	0	17	89	155	195	222	235	243	243	244	220	70	30	0	0	0	0	0	0	0
	PJp	2	0	2	45	89	129	161	180	193	196	198	180	50	20	0	0	0	0	0	0	0
	PJp	3	0	0	12	42	75	103	125	139	144	130	20	8	0	0	0	0	0	0	0	0
	BFp	X	0	0	24	68	114	146	160	151	131	103	72	41	24	0	0	0	0	0	0	0
	BFp	1	0	0	24	68	114	146	160	151	131	103	72	41	24	0	0	0	0	0	0	0
	BFp	2	0	0	24	68	114	146	160	151	131	103	72	41	24	0	0	0	0	0	0	0
	BFp	3	0	0	24	68	114	146	160	151	131	103	72	41	24	0	0	0	0	0	0	0
	CEp	X	0	0	20	60	100	140	160	140	130	120	110	50	20	0	0	0	0	0	0	0
	CEp	1	0	0	20	60	100	140	160	140	130	120	110	50	20	0	0	0	0	0	0	0
	CEp	2	0	0	20	60	100	140	160	140	130	120	110	50	20	0	0	0	0	0	0	0
	CEp	3	0	0	20	60	100	140	160	140	130	120	110	50	20	0	0	0	0	0	0	0
	PWp	X	0	0	76	157	242	315	372	414	449	479	505	526	544	559	570	579	585	590	594	594
	PWp	1	0	0	76	157	242	315	372	414	449	479	505	526	544	559	570	579	585	590	594	594
	PWp	2	0	0	0	77	134	190	238	277	310	338	362	382	398	410	420	427	432	436	439	439
	PWp	3	0	0	0	0	38	69	102	133	160	185	205	223	236	247	254	259	261	262	263	263
	PRp	X	0	58	145	234	291	333	365	387	406	420	432	442	451	458	464	470	470	470	470	470
	PRp	1	0	58	145	234	291	333	365	387	406	420	432	442	451	458	464	470	470	470	470	470
	PRp	2	0	0	82	156	209	248	276	299	317	331	342	351	359	365	371	375	375	375	375	375
	PRp	3	0	0	29	74	119	156	182	202	216	228	237	245	250	255	259	261	261	261	260	255

PRODUCT PERCENT TABLE FOR MANUAL FILE SET

Filename: PROD_MAN.DBF 11/04/93

PRODUCT PERCENT TABLE - NATURAL & PLANTATIONS

	MG	SC	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180	190	200
NATURAL	SB	X	0	0	10	22	34	46	58	75	88	92	95	95	95	95	95	95	95	95	95	95
	SB	1	0	0	0	12	30	40	50	67	75	87	92	92	92	92	92	92	92	92	92	92
	SB	2	0	0	0	4	25	38	47	59	66	85	90	90	90	90	90	90	90	90	90	90
	SB	3	0	0	0	0	0	12	26	46	62	74	85	88	88	88	88	88	88	88	88	88
	SW	X	0	0	0	0	15	20	33	45	62	77	95	95	95	95	95	95	95	95	95	95
	SW	1	0	0	0	0	0	15	30	45	60	75	90	95	95	95	95	95	95	95	95	95
	SW	2	0	0	0	0	0	13	26	39	52	65	78	90	90	90	90	90	90	90	90	90
	SW	3	0	0	0	0	0	5	20	34	46	59	65	80	80	80	80	80	80	80	80	80
	PJ	X	0	0	10	24	38	46	61	76	90	95	95	95	95	95	95	95	95	95	95	95
	PJ	1	0	0	0	14	28	42	56	70	84	95	95	95	95	95	95	95	95	95	95	95
	PJ	2	0	0	0	0	18	36	54	72	90	90	93	93	93	93	93	93	93	93	93	93
	PJ	3	0	0	0	0	0	12	30	55	72	88	88	88	88	88	88	88	88	88	88	88
	BF	X	0	0	0	20	30	50	70	80	85	85	85	85	85	85	85	85	85	85	85	85
	BF	1	0	0	0	0	25	35	55	75	85	85	85	85	85	85	85	85	85	85	85	85
	BF	2	0	0	0	0	20	30	50	70	80	80	80	80	80	80	80	80	80	80	80	80
	BF	3	0	0	0	0	15	25	45	65	75	75	75	75	75	75	75	75	75	75	75	75
	CE	X	0	0	0	0	5	30	50	65	70	75	80	80	80	80	80	80	80	80	80	80
	CE	1	0	0	0	0	0	25	45	60	65	70	75	75	75	75	75	75	75	75	75	75
	CE	2	0	0	0	0	0	20	40	55	60	65	70	70	70	70	70	70	70	70	70	70
	CE	3	0	0	0	0	0	15	35	50	55	60	65	65	65	65	65	65	65	65	65	65
	PW	X	0	0	0	0	10	19	38	75	79	84	88	92	95	95	95	95	95	95	95	95
	PW	1	0	0	0	0	10	19	38	75	79	84	88	92	95	95	95	95	95	95	95	95
	PW	2	0	0	0	0	0	19	38	57	75	79	83	87	91	95	95	95	95	95	95	95
	PW	3	0	0	0	0	0	0	5	10	20	30	53	75	83	90	90	90	90	90	90	90
	PR	X	0	0	0	10	19	38	75	90	95	95	95	95	95	95	95	95	95	95	95	95
	PR	1	0	0	0	10	19	38	75	90	95	95	95	95	95	95	95	95	95	95	95	95
	PR	2	0	0	0	0	10	19	38	75	90	95	95	95	95	95	95	95	95	95	95	95
	PR	3	0	0	0	0	0	10	19	38	75	90	95	95	95	95	95	95	95	95	95	95
	PO	X	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	PO	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	PO	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	PO	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	BW	X	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	BW	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	BW	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	BW	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	OH	X	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	OH	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	OH	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	OH	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	OC	X	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	OC	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	OC	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	OC	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

PRODUCT PERCENT TABLE FOR MANUAL FILE SET

Filename: PROD_MAN.DBF

11/04/93

PRODUCT PERCENT TABLE - NATURAL & PLANTATIONS

	WG	SC	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180	190	200
PLANTATION	SBp	X	0	0	10	22	34	46	58	75	88	92	95	95	95	95	95	95	95	95	95	95
	SBp	1	0	0	0	12	30	40	50	67	75	87	92	92	92	92	92	92	92	92	92	92
	SBp	2	0	0	0	4	25	38	47	59	66	85	90	90	90	90	90	90	90	90	90	90
	SBp	3	0	0	0	0	0	12	26	46	62	74	85	88	88	88	88	88	88	88	88	88
	SWp	X	0	0	0	0	15	20	33	45	62	77	95	95	95	95	95	95	95	95	95	95
	SWp	1	0	0	0	0	0	15	30	45	60	75	90	95	95	95	95	95	95	95	95	95
	SWp	2	0	0	0	0	0	13	26	39	52	65	78	90	90	90	90	90	90	90	90	90
	SWp	3	0	0	0	0	0	5	20	34	46	59	65	80	80	80	80	80	80	80	80	80
	PJp	X	0	0	10	21	38	46	66	76	90	95	95	95	95	95	95	95	95	95	95	95
	PJp	1	0	0	0	14	28	42	56	70	84	95	95	95	95	95	95	95	95	95	95	95
	PJp	2	0	0	0	0	18	36	54	72	90	90	90	90	90	90	90	90	90	90	90	90
	PJp	3	0	0	0	0	0	12	30	55	72	88	88	88	88	88	88	88	88	88	88	88
	BFp	X	0	0	0	20	30	50	70	80	85	85	85	85	85	85	85	85	85	85	85	85
	BFp	1	0	0	0	0	25	35	55	75	85	85	85	85	85	85	85	85	85	85	85	85
	BFp	2	0	0	0	0	20	30	50	70	80	80	80	80	80	80	80	80	80	80	80	80
	BFp	3	0	0	0	0	15	25	45	65	75	75	75	75	75	75	75	75	75	75	75	75
	CEp	X	0	0	0	0	5	30	50	65	70	75	80	80	80	80	80	80	80	80	80	80
	CEp	1	0	0	0	0	0	25	45	60	65	70	75	75	75	75	75	75	75	75	75	75
	CEp	2	0	0	0	0	0	20	40	55	60	65	70	70	70	70	70	70	70	70	70	70
	CEp	3	0	0	0	0	0	15	35	50	55	60	65	65	65	65	65	65	65	65	65	65
	PWp	X	0	0	0	0	10	19	38	75	79	84	88	92	95	95	95	95	95	95	95	95
	PWp	1	0	0	0	0	10	19	38	75	79	84	88	92	95	95	95	95	95	95	95	95
	PWp	2	0	0	0	0	0	19	38	57	75	79	83	87	91	95	95	95	95	95	95	95
	PWp	3	0	0	0	0	0	0	5	10	20	30	53	75	83	90	90	90	90	90	90	90
	PRp	X	0	0	0	10	19	38	75	90	95	95	95	95	95	95	95	95	95	95	95	95
	PRp	1	0	0	0	10	19	38	75	90	95	95	95	95	95	95	95	95	95	95	95	95
	PRp	2	0	0	0	0	10	19	38	75	90	95	95	95	95	95	95	95	95	95	95	95
	PRp	3	0	0	0	0	0	10	19	38	75	90	95	95	95	95	95	95	95	95	95	95

SITECLASS X-REFERENCE TABLE FOR MANUAL FILE SET

Filename: SCXR_MAN.DBF 11/04/93

SITE CLASS CROSS REFERENCE TABLE BY WORKING GROUP

WG	SC	SB	SW	PJ	BF	CE	PW	PR	PO	BW	OH	OC
SB	X	X	X	2	X	X	3	3	3	2	X	3
SB	1	1	1	3	1	1	3	3	3	3	1	3
SB	2	2	2	3	2	2	3	3	3	3	2	3
SB	3	3	3	3	3	3	3	3	3	3	3	3
SW	X	X	X	2	X	X	3	3	3	2	X	3
SW	1	1	1	3	1	1	3	3	3	3	1	3
SW	2	2	2	3	2	2	3	3	3	3	2	3
SW	3	3	3	3	3	3	3	3	3	3	3	3
PJ	X	X	X	X	X	X	X	X	1	1	X	1
PJ	1	1	1	1	1	1	1	1	2	1	1	2
PJ	2	2	2	2	2	2	2	2	3	2	2	3
PJ	3	3	3	3	3	3	3	3	3	3	3	3
BF	X	X	X	3	X	X	3	3	3	1	X	3
BF	1	1	1	3	1	1	3	3	3	2	1	3
BF	2	2	2	3	2	2	3	3	3	3	2	3
BF	3	3	3	3	3	3	3	3	3	3	3	3
CE	X	X	X	3	X	X	3	3	3	3	X	3
CE	1	1	1	3	1	1	3	3	3	3	1	3
CE	2	2	2	3	2	2	3	3	3	3	2	3
CE	3	3	3	3	3	3	3	3	3	3	3	3
PW	X	X	X	X	X	X	X	X	3	X	X	3
PW	1	1	1	1	1	1	1	1	3	1	1	3
PW	2	2	2	2	2	2	2	2	3	2	2	3
PW	3	3	3	3	3	3	3	3	3	3	3	3
PR	X	X	X	X	X	X	X	X	3	X	X	3
PR	1	1	1	1	1	1	1	1	3	1	1	3
PR	2	2	2	2	2	2	2	2	3	2	2	3
PR	3	3	3	3	3	3	3	3	3	3	3	3
PO	X	X	X	X	X	X	2	2	X	X	X	X
PO	1	1	1	1	1	1	2	2	1	1	1	1
PO	2	2	2	2	2	2	2	2	2	2	2	2
PO	3	3	3	3	3	3	3	3	3	3	3	3
BW	X	X	X	X	X	X	3	3	1	X	X	1
BW	1	1	1	1	1	1	3	3	2	1	1	3
BW	2	2	2	2	2	2	3	3	3	2	2	3
BW	3	3	3	3	3	3	3	3	3	3	3	3
OH	X	X	X	X	X	X	2	2	X	X	X	X
OH	1	1	1	1	1	1	2	2	1	1	1	1
OH	2	2	2	2	2	2	2	2	2	2	2	2
OH	3	3	3	3	3	3	3	3	3	3	3	3
OC	X	X	X	3	X	X	3	3	3	3	X	3
OC	1	1	1	3	1	1	3	3	3	3	1	3
OC	2	2	2	3	2	2	3	3	3	3	2	3
OC	3	3	3	3	3	3	3	3	3	3	3	3

SILVICULTURE CARD LISTING

CRITERIA NAME - MANUAL

FOREST CLASS FILE: CLMANUAL.DBF YIELD FILES: PRMANUAL.DBF, FCMANUAL.DBF COST FILE: CSMANUAL.DBF 11/04/93

CARD # 0001

AGGREGATION CRITERIA — Working Groups: PJ; Site Classes: 3; Stocking Range: 0.0 - 0.2

PRESENT CURVE INFO — Operability Limits (Age): Min - 70 Max - 100 % Available: 85.00 Y-Factor: 100.00

FUTURE CURVE INFO

Future Curve	Species Composition	Stk	Site Class	Plt Crv	COST / HA S/P	Regen	Tend	Priority	Age/Time Reference	Operability Ages Min	Max

PRESENT CURVES ASSIGNED TO FUTURE

CARD # 0002

AGGREGATION CRITERIA — Working Groups: PJ, PJ; Site Classes: 3, 3; Stocking Range: 0.3 - 0.8, 0.9 - 3.0

PRESENT CURVE INFO — Operability Limits (Age): Min - 70 Max - 100 % Available: 85.00 Y-Factor: 100.00

FUTURE CURVE INFO

Future Curve	Species Composition	Stk	Site Class	Plt Crv	COST / HA S/P	Regen	Tend	Priority	Age/Time Reference	Operability Ages Min	Max
INTENSIVE					65						
BASIC	PJ 8PO 1SB 1	0.8	3	Y	225	435		1	60	65	100
NATURAL	PJ 6PO 3SB 1	0.7	3	N					60	65	100
NSR / B&S SPACING											

SILVICULTURE CARD LISTING

CRITERIA NAME - MANUAL

FOREST CLASS FILE: CLMANUAL.DBF YIELD FILES: PRMANUAL.DBF, FCMANUAL.DBF COST FILE: CSMANUAL.DBF 11/04/93

CARD # 0003

AGGREGATION CRITERIA — Working Groups: PJ; Site Classes: X 1 2; Stocking Range: 0.0 - 0.2

PRESENT CURVE INFO — Operability Limits (Age): Min - 70 Max - 100 % Available: 85.00 Y-Factor: 100.00

FUTURE CURVE INFO

Future Curve	Species Composition	Stk	Site Class	Plt Crv	COST / HA S/P	COST / HA Regen	COST / HA Tend	Priority	Age/Time Reference	Operability Ages Min	Operability Ages Max
INTENSIVE											
BASIC											
NATURAL											
NSR / B&S	PJ 7PO 3	0.6	1	Y		350	125		65	65	100
SPACING											

CARD # 0004

AGGREGATION CRITERIA — Working Groups: PJ; Site Classes: X 1 2; Stocking Range: 0.3 - 0.8

Working Groups: PJ; Site Classes: X 1 2; Stocking Range: 0.9 - 3.0

PRESENT CURVE INFO — Operability Limits (Age): Min - 55 Max - 100 % Available: 85.00 Y-Factor: 100.00

FUTURE CURVE INFO

Future Curve	Species Composition	Stk	Site Class	Plt Crv	COST / HA S/P	COST / HA Regen	COST / HA Tend	Priority	Age/Time Reference	Operability Ages Min	Operability Ages Max
INTENSIVE	PJ10	0.9	X	Y	62	350	125	1	55	55	100
BASIC	PJ 9PO 1	0.8	1	N	275	225		2	55	55	100
NATURAL	PJ 7PO 2BW 1	0.8	2	N					60	60	100
NSR / B&S											
SPACING	PJ10	1.1	X	Y			275		50	50	95

SILVICULTURE CARD LISTING

CRITERIA NAME - MANUAL

FOREST CLASS FILE: CLMANUAL.DBF YIELD FILES: PRMANUAL.DBF, FCMANUAL.DBF COST FILE: CSMANUAL.DBF 11/04/93

CARD # 0005

AGGREGATION CRITERIA	Working Groups	Site Classes	Stocking Range
	SP	2 3	0.0 - 0.2
	SP	X 1	0.0 - 0.2

PRESENT CURVE INFO Operability Limits (Age): Min - 90 Max - 120 % Available: 85.00 Y-Factor: 100.00

FUTURE CURVE INFO

Future Curve	Species Composition	Stk	Site Class	Plt Crv	COST / HA S/P	COST / HA Regen	COST / HA Tend	Priority	Age/Time Reference	Operability Ages Min	Operability Ages Max

PRESENT CURVES ASSIGNED TO FUTURE

CARD # 0006

AGGREGATION CRITERIA	Working Groups	Site Classes	Stocking Range
	SP	2 3	0.3 - 0.8
	SP	2 3	0.9 - 3.0

PRESENT CURVE INFO Operability Limits (Age): Min - 90 Max - 120 % Available: 90.00 Y-Factor: 100.00

FUTURE CURVE INFO

Future Curve	Species Composition	Stk	Site Class	Plt Crv	COST / HA S/P	COST / HA Regen	COST / HA Tend	Priority	Age/Time Reference	Operability Ages Min	Operability Ages Max
INTENSIVE					69						
BASIC	SB 9BF 1	0.9	2	Y	125	250		3	80	80	110
NATURAL	SB 8BF 1BW 1	0.8	3	N					80	85	120
NSR / B&S											
SPACING											

SILVICULTURE CARD LISTING

CRITERIA NAME - MANUAL

FOREST CLASS FILE: CLMANUAL.DBF YIELD FILES: PRMANUAL.DBF, FCMANUAL.DBF COST FILE: CSMANUAL.DBF 11/04/93

CARD # 0007

AGGREGATION CRITERIA	Working Groups	Site Classes	Stocking Range
	SP	X 1	0.3 - 0.8
	SP	X 1	0.9 - 3.0

PRESENT CURVE INFO Operability Limits (Age): Min - 80 Max - 110 % Available: 90.00 Y-Factor: 100.00

FUTURE CURVE INFO

Future Curve	Species Composition	Stk	Site Class	Plt Crv	COST / HA S/P	Regen	Tend	Priority	Age/Time Reference	Operability Ages Min	Max
INTENSIVE	SB10	1.2	X	Y	67	350	125	2	80	75	105
BASIC NATURAL NSR / B&S SPACING	SB 6SW 2BW 2	1.0	1	N					80	80	110

ONTARIO MINISTRY OF NATURAL RESOURCES
UPPER SPANISH FOREST MU # 160
Species Volume/Area Summary of All Crown Land by Mapsheet

(Polygon Types 20 - 39 Inclusively)
Minimum Operable Age: 71 years
Maximum Operable Age: 120 years
VOLUME BY SPECIES (000's m3)

11 25/93

Wrk Grp	No. of Stands	Area (ha)	SB	SW	PJ	BF	CE	OC	PW	PR	PO	BW	OH	Total Volume
MAPSHEET:	000000800													
PR	1	5	0.000	0.000	0.000	0.000	0.000	0.000	0.184	0.189	0.120	0.025	0.000	1.518
PJ	84	1410	9.734	1.242	241.597	0.000	0.000	0.000	1.809	0.659	9.281	17.676	0.000	281.398
SP	66	697	56.161	6.425	1.901	0.081	1.038	0.000	0.012	0.000	0.911	7.673	0.609	74.811
OC	3	18	0.152	0.000	0.000	0.000	1.041	0.174	0.000	0.000	0.000	0.000	0.000	1.367
MH	1	11	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.629	0.000	0.871	1.500
PO	48	663	2.609	1.808	5.972	0.558	0.115	0.000	0.386	0.343	76.864	12.542	0.181	111.378
BW	103	1800	15.205	6.261	16.532	0.839	0.499	0.000	0.988	0.000	37.353	108.102	7.484	193.263
	306	4604	83.861	15.736	266.002	1.478	2.693	0.174	3.379	1.191	125.158	146.018	9.145	664.835
	306	4604	84	16	266	1	3	0	3	1	125	146	9	664.835

ONTARIO MINISTRY OF NATURAL RESOURCES
UPPER SPANISH FOREST MU # 160
Species Volume/Area Summary of All Crown Land by Mapsheet & Age Class

(Polygon Types 20 - 39 Inclusively)
Minimum Operable Age: 51 years
Maximum Operable Age: 120 years
VOLUME BY SPECIES (000's m3)

Wrk Grp	Age Class	No. Stds	Area (ha)	SB	SW	PJ	BF	CE	OC	PW	PR	PO	BW	OH	03/03/94 Total Volume
MAPSHEET:	000000800			0.000	0.000	0.000	0.000	0.000	0.000	0.184	0.189	0.120	0.025	0.000	0.518
PR	81-100	1	5	0.139	0.000	0.888	0.000	0.000	0.000	0.000	0.000	0.546	0.066	0.000	1.639
PJ	61- 80	2	14	9.595	1.242	238.992	0.000	0.000	0.000	1.809	0.659	8.735	17.076	0.000	278.108
PJ	81-100	81	1381	0.000	0.000	1.718	0.000	0.000	0.000	0.000	0.000	0.000	0.534	0.000	2.252
PJ	101-120	1	15	12.498	1.648	0.987	0.428	0.709	0.000	0.000	0.000	0.147	2.546	0.000	18.963
SP	61- 80	14	147	35.588	5.048	0.701	0.000	0.755	0.000	0.000	0.000	0.842	4.828	0.119	47.881
SP	81-100	42	418	10.564	1.376	0.509	0.081	0.000	0.000	0.000	0.000	0.069	1.202	0.490	14.303
SP	101-120	15	180	0.970	0.779	0.000	2.469	0.778	0.000	0.012	0.000	0.173	1.010	0.000	6.179
BF	41- 60	4	49	0.676	0.503	0.000	1.497	0.066	0.000	0.000	0.000	0.000	0.384	0.000	3.225
BF	61- 80	3	21	0.152	0.000	0.000	0.000	1.041	0.174	0.099	0.000	0.000	0.000	0.000	1.367
OC	81-100	3	18	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.629	0.000	0.000	1.500
MH	61- 80	1	11	0.070	0.000	0.124	0.000	0.000	0.000	0.000	0.000	2.782	0.683	0.871	3.659
PO	61- 80	3	24	2.578	1.498	5.848	0.416	0.115	0.000	0.193	0.343	73.953	11.805	0.000	96.930
PO	81-100	44	619	0.000	0.311	0.000	0.143	0.000	0.000	0.193	0.000	0.947	0.306	0.181	1.900
PO	101-120	2	26	0.000	0.117	0.000	0.593	0.000	0.000	0.000	0.000	0.603	0.489	0.126	1.928
BW	41- 60	1	39	7.385	1.990	7.203	1.167	0.362	0.000	0.197	0.000	13.367	76.992	3.179	111.842
BW	61- 80	56	1062	11.834	4.035	14.521	0.378	0.000	0.000	0.100	0.000	28.789	67.742	4.499	131.898
BW	81-100	68	1144	0.062	1.394	0.000	0.461	0.371	0.000	0.888	0.000	0.054	2.365	2.277	7.872
BW	101-120	7	171												
		348	5344	92.111	19.941	271.491	7.633	4.197	0.174	3.675	1.191	131.756	188.053	11.742	731.964
		348	5344	92	20	271	8	4	0	4	1	132	188	12	731.964

MANAGEMENT UNIT: 868

FOREST UNIT YIELD CURVE SUMMARY
FOREST CLASS FILE: CLNAGAG.DBF
FOREST CLASS AGE RANGE: 0 - 999
PRIMARY VOLUME CURVE

YEAR: 1994

02/22/94

	Area (Ha)	10	20	30	40	50	60	70	Volume (m3/ha) 80	90	100	110	120	130	140	150	160	170	180	190	200
Own 1 Polygon 20 - 28	FMU Label MIXHD				Stocking																
	57150	0	0	5	10	17	23	28	31	32	33	32	20	17	13	12	11	9	6	1	
Own 1 Polygon 20 - 28	FMU Label POPLA				Stocking																
	18511	0	0	3	5	8	11	12	13	14	14	13	6	4	3	2	2	2	1	0	
Own 1 Polygon 20 - 28	FMU Label BIRCH				Stocking																
	11402	0	0	3	6	11	15	18	20	20	21	19	13	11	8	7	7	6	4	0	
Own 1 Polygon 20 - 28	FMU Label JPINE				Stocking																
	45458	0	2	37	73	104	131	147	159	162	165	151	48	23	7	6	5	5	4	0	
Own 1 Polygon 20 - 28	FMU Label OTHER				Stocking																
	47	0	0	4	13	25	37	45	45	47	48	48	37	31	27	26	25	24	20	18	
Own 1 Polygon 20 - 28	FMU Label LOWSP				Stocking																
	5834	0	0	1	2	11	25	38	51	62	72	78	78	76	72	67	62	55	45	9	
Own 1 Polygon 20 - 28	FMU Label SPMIX				Stocking																
	67409	0	0	10	29	47	65	79	89	93	91	83	54	43	32	26	21	12	9	1	
Own 1 Polygon 20 - 28	FMU Label BFMIX				Stocking																
	19841	0	0	8	26	44	62	73	74	73	68	62	45	35	26	22	19	15	11	5	

FOREST UNIT YIELD CURVE SUMMARY

MANAGEMENT UNIT: 868 FOREST CLASS FILE: CLNAGAG.DBF YEAR: 1994

FOREST CLASS AGE RANGE: 0 - 999

PRIMARY VOLUME CURVE

02/22/94

	Area (Ha)	Volume (m3/ha) 10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180	190	200
MIXHD	57150	0	0	5	10	17	23	28	31	32	33	32	20	17	13	12	11	9	6	1	1
POPLA	18511	0	0	3	5	8	11	12	13	14	14	13	6	4	3	2	2	2	1	0	0
BIRCH	11402	0	0	3	6	11	15	18	20	20	21	19	13	11	8	7	7	6	4	0	0
JPINE	45458	0	2	37	73	104	131	147	159	162	165	151	48	23	7	6	5	5	4	0	0
OTHER	47	0	0	4	13	25	37	45	45	47	48	48	37	31	27	26	25	24	20	18	18
LOWSP	5834	0	0	1	2	11	25	38	51	62	72	78	78	76	72	67	62	55	45	9	9
SPMIX	67409	0	0	10	29	47	65	79	89	93	91	83	54	43	32	26	21	12	9	1	1
BFMIX	19841	0	0	8	26	44	62	73	74	73	68	62	45	35	26	22	19	15	11	5	4

ONTARIO MINISTRY OF NATURAL RESOURCES
UPPER SPANISH FOREST MU # 160
Species Volume/Area Summary of All Crown Land by Mapsheet & Individual Stand

(Polygon Types 20 - 39 Inclusively)
Minimum Operable Age: 91 years
Maximum Operable Age: 120 years
VOLUME BY SPECIES (000's m3)

11/05/93

Wrk Grp	No. of Stands	Area (ha)	SB	SW	PJ	BF	CE	OC	PW	PR	PO	BW	OH	Total Volume
MAPSHEET:	000000800													
PJ	1	5	0.112	0.000	0.531	0.000	0.000	0.000	0.000	0.000	0.000	0.115	0.000	0.758
PJ	1	14	0.185	0.000	0.915	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.000	1.350
PJ	1	38	0.000	0.000	9.249	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	9.249
PJ	1	3	0.000	0.000	0.590	0.000	0.000	0.000	0.000	0.000	0.300	0.000	0.000	0.590
PJ	1	35	0.000	0.000	6.888	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	6.888
PJ	1	38	0.000	1.106	3.707	0.000	0.000	0.000	1.809	0.000	2.031	1.334	0.000	9.987
PJ	1	13	0.282	0.000	1.234	0.000	0.000	0.000	0.000	0.000	0.000	0.270	0.000	1.786
PJ	1	6	0.081	0.000	0.949	0.000	0.000	0.000	0.000	0.000	0.105	0.000	0.000	1.135
PJ	1	4	0.054	0.000	0.633	0.000	0.000	0.000	0.000	0.000	0.070	0.000	0.000	0.757
PJ	1	11	0.000	0.000	2.176	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.176
PJ	1	20	0.000	0.000	3.956	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.956
PJ	1	11	0.149	0.000	1.523	0.000	0.000	0.000	0.000	0.000	0.000	0.285	0.000	1.957
PJ	1	14	0.000	0.000	2.215	0.000	0.000	0.000	0.000	0.000	0.000	0.363	0.000	2.578
PJ	1	10	0.000	0.000	1.187	0.000	0.000	0.000	0.000	0.659	0.000	0.259	0.000	2.105
PJ	1	6	0.039	0.000	0.264	0.000	0.000	0.000	0.000	0.000	0.000	0.109	0.000	0.412
PJ	1	14	0.000	0.000	2.215	0.000	0.000	0.000	0.000	0.000	0.000	0.363	0.000	2.578
PJ	1	29	0.468	0.000	6.366	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	6.834
PJ	1	5	0.145	0.000	0.512	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.657
PJ	1	8	0.116	0.000	1.405	0.000	0.000	0.000	0.000	0.000	0.000	0.126	0.000	1.647
PJ	1	3	0.044	0.000	0.527	0.000	0.000	0.000	0.000	0.000	0.000	0.047	0.000	0.618
PJ	1	15	0.000	0.000	3.659	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.659
PJ	1	6	0.000	0.000	1.317	0.000	0.000	0.000	0.000	0.000	0.000	0.105	0.000	1.422
PJ	1	11	0.000	0.000	1.878	0.000	0.000	0.000	0.000	0.000	0.000	0.579	0.000	2.457
PJ	1	4	0.000	0.000	0.791	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.791
PJ	1	26	0.000	0.000	6.341	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	6.341
PJ	1	55	0.888	0.000	10.732	0.000	0.000	0.000	0.000	0.000	0.000	0.965	0.000	12.585
PJ	1	17	0.000	0.000	4.146	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4.146
PJ	1	33	0.125	0.000	2.372	0.000	0.000	0.000	0.000	0.000	0.000	0.465	0.000	2.962
PJ	1	9	0.196	0.000	0.854	0.000	0.000	0.000	0.000	0.000	0.000	0.187	0.000	1.237
PJ	1	87	0.000	0.000	17.209	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	17.209
PJ	1	10	0.407	0.000	1.385	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.792
PJ	1	31	0.000	0.000	6.132	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	6.132
PJ	1	104	0.000	0.000	22.829	0.000	0.000	0.000	0.000	0.000	0.000	1.825	0.000	24.654
PJ	1	18	0.581	0.000	3.512	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4.093
PJ	1	4	0.000	0.000	0.780	0.000	0.000	0.000	0.000	0.000	0.107	0.070	0.000	0.957
PJ	1	36	0.489	0.000	4.985	0.000	0.000	0.000	0.000	0.000	0.000	0.934	0.000	6.408
PJ	1	11	0.178	0.000	2.415	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.593
PJ	1	19	0.491	0.000	2.966	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.457
PJ	1	15	0.000	0.000	1.718	0.000	0.000	0.000	0.000	0.000	0.000	0.534	0.000	2.252
SP	1	6	0.516	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.516

ONTARIO MINISTRY OF NATURAL RESOURCES
UPPER SPANISH FOREST MU # 160
Species Volume/Area Summary of All Crown Land by Mapsheet & Individual Stand

(Polygon Types 20 - 39 Inclusively)
Minimum Operable Age: 91 years
Maximum Operable Age: 120 years
VOLUME BY SPECIES (000's m3)

Wrk Grp	No. of Stands	Area (ha)	SB	SW	PJ	BF	CE	OC	PW	PR	PO	BW	OH	11/05/93 Total Volume
SP	1	17	1.098	0.000	0.200	0.000	0.000	0.000	0.000	0.000	0.238	0.411	0.000	1.947
SP	1	8	0.000	1.959	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.166	0.000	2.125
SP	1	6	0.775	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.775
SP	1	2	0.194	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.194
SP	1	6	0.581	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.581
SP	1	9	0.367	0.000	0.000	0.000	0.218	0.000	0.000	0.000	0.000	0.000	0.000	0.585
SP	1	13	1.006	0.000	0.180	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.186
SP	1	2	0.076	0.000	0.000	0.000	0.029	0.000	0.000	0.000	0.000	0.000	0.000	0.105
SP	1	11	1.065	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.065
SP	1	13	1.117	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.117
SP	1	6	0.678	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.678
SP	1	3	0.484	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.484
SP	1	15	2.421	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.421
SP	1	25	0.000	1.233	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.300	1.533
SP	1	2	0.200	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.200
SP	1	23	1.315	0.000	0.485	0.000	0.000	0.000	0.000	0.000	0.000	0.378	0.184	2.362
SP	1	5	0.192	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.039	0.079	0.000	0.310
SP	1	23	2.301	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.301
SP	1	6	0.274	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.049	0.000	0.323
SP	1	27	1.379	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.498	0.000	1.877
SP	1	2	0.000	0.143	0.000	0.000	0.000	0.000	0.012	0.000	0.000	0.016	0.006	0.177
SP	1	4	0.457	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.457
SP	1	21	1.341	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.341
SP	1	9	0.386	0.000	0.000	0.381	0.000	0.000	0.000	0.000	0.000	0.167	0.000	0.634
SP	1	7	0.447	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.447
SP	1	11	1.258	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.258
SP	1	2	0.092	0.000	0.024	0.000	0.000	0.000	0.000	0.000	0.030	0.014	0.000	0.160
SP	1	13	0.924	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.924
OC	1	4	0.152	0.000	0.000	0.000	0.203	0.000	0.000	0.000	0.000	0.000	0.000	0.355
OC	1	6	0.000	0.000	0.000	0.000	0.218	0.000	0.000	0.000	0.000	0.000	0.000	0.218
OC	1	8	0.000	0.000	0.000	0.000	0.620	0.174	0.000	0.000	0.000	0.000	0.000	0.794
PO	1	11	0.000	0.149	0.000	0.058	0.000	0.000	0.000	0.000	0.735	0.143	0.000	1.085
PO	1	25	0.000	0.208	0.000	0.265	0.000	0.000	0.000	0.000	0.656	0.252	0.125	1.506
PO	1	11	0.000	0.000	0.484	0.000	0.000	0.000	0.000	0.000	0.961	0.222	0.000	1.667
PO	1	19	0.000	0.187	0.000	0.143	0.000	0.000	0.193	0.000	0.370	0.195	0.000	1.088
PO	1	7	0.000	0.123	0.000	0.000	0.000	0.000	0.000	0.000	0.577	0.111	0.000	0.811
BW	1	30	0.000	0.269	0.000	0.144	0.000	0.000	0.000	0.000	0.453	0.476	0.000	1.342
BW	1	11	0.000	0.149	0.000	0.000	0.000	0.000	0.100	0.000	0.192	0.285	0.055	0.781
BW	1	17	0.129	0.000	0.349	0.000	0.000	0.000	0.000	0.000	0.416	0.479	0.000	1.373
BW	1	21	0.091	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.587	1.184	0.000	1.862
BW	1	4	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.168	0.226	0.000	0.394

ONTARIO MINISTRY OF NATURAL RESOURCES
UPPER SPANISH FOREST MU # 160
Species Volume/Area Summary of All Crown Land by Mapsheet & Individual Stand

(Polygon Types 20 - 39 Inclusively)
Minimum Operable Age: 91 years
Maximum Operable Age: 120 years
VOLUME BY SPECIES (000's m3)

11/05/93

Wrk Grp	No. of Stands	Area (ha)	SB	SW	PJ	BF	CE	OC	PW	PR	PO	BW	OH	Total Volume
BW	1	27	0.102	0.000	0.555	0.000	0.000	0.000	0.000	0.000	0.000	0.952	0.378	1.987
BW	1	5	0.136	0.000	0.198	0.000	0.000	0.000	0.000	0.000	0.000	0.389	0.000	0.723
BW	1	18	0.587	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.755	0.747	0.000	2.089
BW	1	20	0.000	0.255	0.000	0.000	0.000	0.000	0.270	0.000	0.000	0.570	0.420	1.515
BW	1	8	0.000	0.058	0.000	0.029	0.000	0.000	0.000	0.000	0.000	0.130	0.096	0.313
BW	1	20	0.000	0.109	0.000	0.054	0.000	0.000	0.000	0.000	0.000	0.244	0.180	0.587
BW	1	64	0.000	0.582	0.000	0.290	0.371	0.000	0.618	0.000	0.000	0.652	0.960	3.473
BW	1	2	0.062	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.054	0.074	0.000	0.190
BW	1	39	0.000	0.230	0.000	0.088	0.000	0.000	0.000	0.000	0.000	0.481	0.351	1.150
BW	1	18	0.000	0.159	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.214	0.270	0.643
	91	1490	27.233	6.919	145.538	1.152	1.659	0.174	3.002	1.659	8.544	18.989	3.325	217.194
	91	1490	27	7	146	1	2	0	3	1	9	19	3	217.194

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FMU # 2 MIXHD Part A
STAND_TYPE>=20.AND.STAND_TYPE<=28
OWNERSHIP>="1".AND.OWNERSHIP<="1"
PO+BW>= 6.AND.PO+BW<=10

FMU # 3 POPLA Part A
OWNERSHIP>="1".AND.OWNERSHIP<="1"
STAND_TYPE>=20.AND.STAND_TYPE<=28
PO>= 7.AND.PO<=10

FMU # 4 BIRCH Part A
OWNERSHIP>="1".AND.OWNERSHIP<="1"
STAND_TYPE>=20.AND.STAND_TYPE<=28
BW>= 7.AND.BW<=10

FMU # 5 JPINE Part A
STAND_TYPE>=20.AND.STAND_TYPE<=28
OWNERSHIP>="1".AND.OWNERSHIP<="1"
PJ>= 7.AND.PJ<=10

FMU # 6 OTHER Part A
WG>="17".AND.WG<="19"
STAND_TYPE>=20.AND.STAND_TYPE<=28
OWNERSHIP>="1".AND.OWNERSHIP<="1"

FMU # 7 LOWSP Part A
FORMANMU>=20.AND.FORMANMU<=21

FMU # 8 SPMIX Part A
STAND_TYPE>=20.AND.STAND_TYPE<=28
OWNERSHIP>="1".AND.OWNERSHIP<="1"
PJ+SB+SW+BW+PO>= 7.AND.PJ+SB+SW+BW+PO<=10
PJ+SB+SW>= 4.AND.PJ+SB+SW<=10
PO+BW>= 0.AND.PO+BW<= 5

FMU # 9 BFMIX Part A
STAND_TYPE>=20.AND.STAND_TYPE<=28
OWNERSHIP>="1".AND.OWNERSHIP<="1"
PJ+SB+SW+BF+CE+OC>= 5.AND.PJ+SB+SW+BF+CE+OC<=10

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```
FMU # 20                Part A
        STAND_TYPE>=20.AND.STAND_TYPE<=28
        OWNERSHIP>="1".AND.OWNERSHIP<="1"
        WG>="10".AND.WG<="12"
        SITE_CLASS="3"

FMU # 20                Part B
        OWNERSHIP>="1".AND.OWNERSHIP<="1"
        STAND_TYPE>=20.AND.STAND_TYPE<=28
        SB>=10.AND.SB<=10
        SITE_CLASS="2"

FMU # 20                Part C
        OWNERSHIP>="1".AND.OWNERSHIP<="1"
        STAND_TYPE>=20.AND.STAND_TYPE<=28
        SB>= 9.AND.SB<= 9
        OC>= 1.AND.OC<= 1
        SITE_CLASS="2"

FMU # 21                Part A
        STAND_TYPE>=20.AND.STAND_TYPE<=28
        OWNERSHIP>="1".AND.OWNERSHIP<="1"
        SITE_CLASS="2"
        SB>= 9.AND.SB<= 9
        CE>= 1.AND.CE<= 1
```

APPENDIX III

NORMAN, FORMAN CP& FORMAN 2.1 FILE STRUCTURES

CLASS FILES

NORMAN

FIELD	dBASE TYPE	WIDTH
CLASS_ID	Character	4
AREA	Character	8
AGE	Numeric	3
PRESENT	Numeric	4
NATURAL	Numeric	4
INTENSIVE	Numeric	4
BASIC	Numeric	4
NSR	Numeric	4
INT_PRIOR	Numeric	3
BAS_PRIOR	Numeric	3
AVAILABLE	Numeric	3
MU	Numeric	3
COMMENTS	Character	60

FORMAN 2.1

FIELD	dBASE TYPE	WIDTH
CLASS_ID	Character	3
AREA	Character	8
AGE	Numeric	3
PR_CURVE	Numeric	3
FUTURE	Numeric	3
PLANTING	Numeric	3
PLT_PRIOR	Numeric	3
CROWN	Numeric	3
MU	Numeric	3
COMMENTS	Character	60

APPENDIX III (continued)

CLASS FILES

FORMAN CP

FIELD	dBASE TYPE	WIDTH
CLASS_ID	Character	3
AREA	Character	8
AGE	Numeric	4
PR_CURVE	Numeric	4
FUTURE	Numeric	4
PLANTING	Numeric	4
PLT_PRIOR	Numeric	4
CROWN	Numeric	4
MU	Numeric	4
COMMENTS	Character	60

COST FILES

NORMAN

FIELD	dBASE TYPE	WIDTH
CURVE_ID	Numeric	3
FC_ID	Numeric	3
COST	Numeric	5
COMMENTS	Character	65

FORMAN 2.1

FIELD	dBASE TYPE	WIDTH
CURVE_ID	Numeric	3
FC_ID	Numeric	3
COST	Numeric	5
COMMENTS	Character	65

FORMAN CP

FIELD	dBASE TYPE	WIDTH
CURVE_ID	Numeric	4
FC_ID	Numeric	4
COST	Numeric	5
COMMENTS	Character	65

APPENDIX III (continued)

YIELD FILES

FIELD NAME	FIELD WIDTH NORMAN	FORMAN 2.1	FORMAN CP
ID	4	3	4
SPACEATRIB	4	3	4
OPERABLEF	3	3	4
OPERABLEL	3	3	4
YFACTOR	4	4	4
VERTICES	3	3	4
X1	3	3	4
Y1	3	3	4
X2	3	3	4
Y2	3	3	4
X3	3	3	4
Y3	3	3	4
.	.	.	.
.	.	.	.
.	.	.	.
X18	3	3	4
Y18	3	3	4
X19	3	3	4
Y19	3	3	4
X20	3	3	4
Y20	3	3	4

APPENDIX IV

VALID WORKING GROUP AND SPECIES CODES FOR STANF FILE CHECK

WORKING GROUPS

01	PW
04	PR
07	PJ
08	PS
10	S, SW, SB, SR, SP
11	SB
12	SW, SR
13	B, BF
16	HE
17	CE, CER
18	L
19	C, OC, CE, L, CER
20	A, AB, AW
21	SL, MH, MS, BY, HI, BW, OR, BE, AB, AW, E, BD, IW, CHB
22	M, MH, MS
23	MH
24	MS
26	BY
28	O, OR, OW
29	H, OH, BE, E, BD, HI, WB, BN, IW, CHB
33	PO
34	PB
36	BW

SPECIES

PW
PR
PJ
PS
SW
SB
SR
S
HE
B
CER
CE

L
MH
MS
SL
BY
BW
OW
OR
BE
AB
AW

E
BD
HI
WB
BN
IW
CHB
H
PB
PO