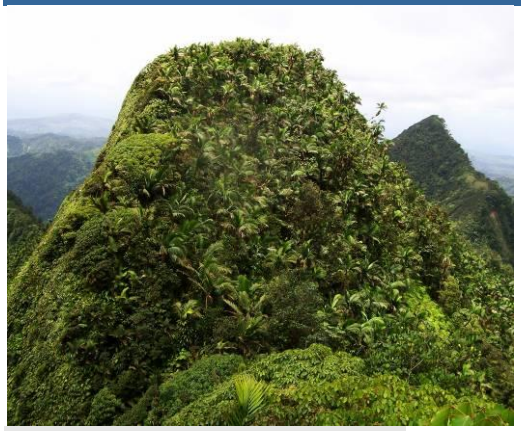
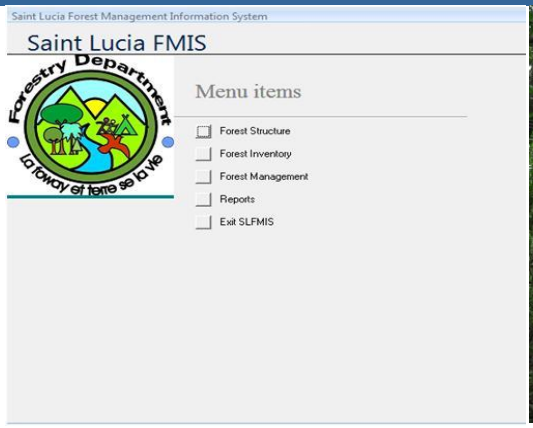
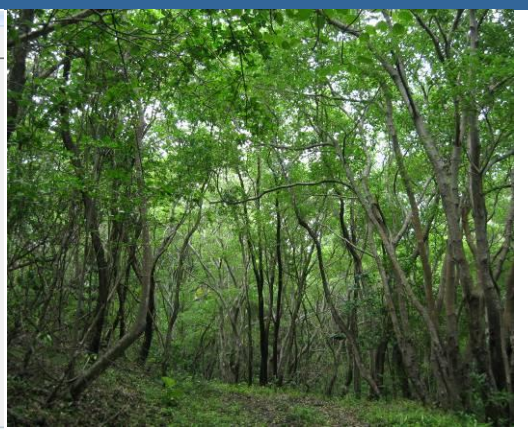
FCG International Ltd
in association with
AFC Consultants International GmbH

TECHNICAL REPORT 11

Presented to the European Commission and
Banana Industry Trust







NATIONAL FOREST DEMARCATION AND BIO-PHYSICAL RESOURCE INVENTORY PROJECT

CARIBBEAN – SAINT LUCIA

SFA 2003/SLU/BIT-04/0711/EMF/LC

THE SAINT LUCIA FOREST MANAGEMENT INFORMATION SYSTEM
User guide

By

ROBERT B. TENNENT

Project Leader/Inventory Specialist

2009

This project is funded by the

European Union

Cover illustrations: Elfin Shrubland on Mount Gimie Range (Roger Graveson, FCG); FMIS Main Menu (Bob Tennent, FCG); Deciduous Seasonal Forest at Grande Anse (Jenny Daltry, FCG-FFI).

PUBLISHED BY

FCG International Ltd

Helsinki, Finland

RECOMMENDED CITATION

Tennent, R.B. (2009) *The Saint Lucia Forest Management Information System – User Guides*. Technical Report No. 11 to the National Forest Demarcation and Bio-Physical Resource Inventory Project, FCG International Ltd, Helsinki, Finland.

The National Forest Demarcation and Bio-Physical Resource Inventory Project was funded by the European Union under the auspices of the Banana Industry Trust, and implemented by the Finnish Consulting Group (FCG) International Ltd in collaboration with the Saint Lucia Forestry Department.

Contents

Introduction

This manual is a user guide to the use of the Saint Lucia Forestry Department Forest Management Information System (SL FMIS). With the use of this user guide and the help system on your computer you will be able to make full use of the system.

The Saint Lucia Forestry Department FMIS is a Microsoft Access application. To gain full use of the system you are advised to learn how to use Access in full. The more you know about Access, the more you will gain from the SL FMIS.

There are many good books on the use of Access, and you are recommended to obtain one, and make a full study of it.

Further information on Access can be gained from the online help menu.

The SL FMIS is based around a forest inventory. The majority of the information stored in the SL FMIS is entered through inventory data sheets. The main focus of the SL FMIS is the presentation of inventory data to show the nature of the forests of Saint Lucia, and how these forests may be most effectively utilized for the benefit of Saint Lucia.

Rationale behind SL FMIS design

The SL FMIS is designed to assist the forest managers of Saint Lucia to manage their forests. A key need of Saint Lucia forest managers has been identified as "*the need to be able to access current information on the state of the growing stock in terms of extent and productivity"*. The SL FMIS was designed to associate with to existing mapping systems, to process information collected in the ongoing inventory, and to use that information to meet the key need identified above.

The key to the SL FMIS is the design of the inventory[1]. If the inventory design is not carefully thought out, the information presented will be of little value.

However the SL FMIS allows you to rapidly redesign the inventory in the event you are not presented with useful information. The key to the inventory design is the forest unit. A ***forest unit*** is defined as *the smallest homogenous piece of land to be considered for forest management*. A forest unit should be occupied by a homogeneous[2] forest cover. An example of a forest unit would be a 10-hectare block of land planted in 1998 in *Casurina equisetifolia,* or a 123-hectare block of natural forest in the centre of Saint Lucia.

You should ensure that all forest units are carefully mapped, and that forest units are truly homogeneous. If a forest unit is not homogeneous, your results will be of less value. You will end up with imprecise estimates.

Groups of forest units are combined to form strata. A ***stratum*** is defined as *a group of forest units that is of managerial importance*. An example of a stratum would be all forest units that were planted with *Casurina equisetifolia* in 1998. Another example of a stratum could be all natural forest units in the Castries waterworks area.

The importance of the stratum is that this is the forest element that the SL FMIS supplies information on.

All information presented in the SL FMIS is derived from forest unit data. The summary data is presented at the stratum level, but all stratum averages are calculated from forest unit values. The forest unit values are derived from inventory sample data, measured in inventory sample plots.

The nature of forest units defines the sampling method use for the forest unit. A forest unit should not be sampled with both strip and diamond plots, as this implies the forest unit is non-homogeneous. Similarly, it is not a good practice to include forest units sampled with diamond plots and forest units sampled with strip plots in the same stratum. If the forest units are different enough to require different sampling methods, they are likely to be different enough to include in different strata.

---

[1] Further details on inventory design and application can be found in *Saint Lucia Inventory Guide*, prepared by R. B. Tennent.

[2] In inventory *homogenous* means of the same statistical nature. i.e. the same kind.

Using the SL FMIS

The SL FMIS allows for different types of forest information to be entered and examined using a simple menu system. The main menu, shown on the cover of this user guide, lets you select one of a number of options for entering and examining data. These are:

- Forest Structure
- Forest Inventory
- Forest Management
- Reports

Each option will be examined in more detail below.

1 Forest Structure

The Forest Structure main menu item leads to the following submenu.

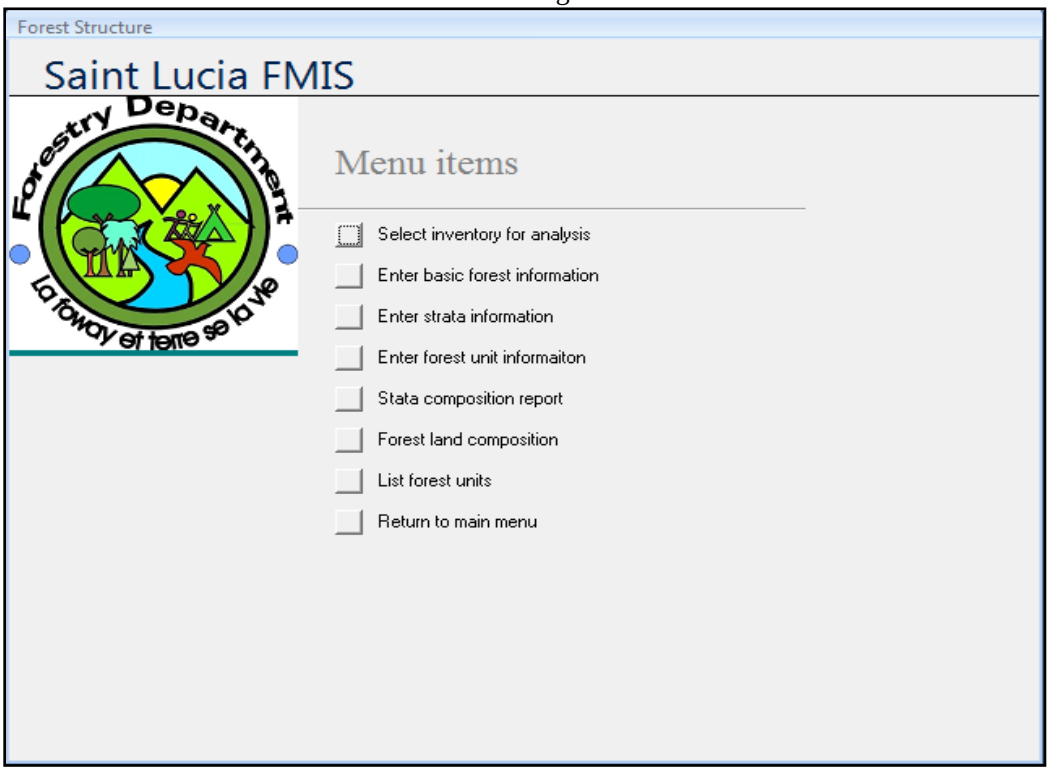


Figure 1 Forest Structure submenu

1.1 Inventory for analysis

The SL FMIS allows you to carry out more than one inventory. This is so that you can at some time carry out a new inventory. Initially you will use the year the inventory started, 2009. Later you may want to change to a new inventory, perhaps in 2012. This menu lets you select the inventory to analyse.

This inventory year is saved each time you exit the SL FMIS, and so you really don't have to select this option until you decide it is time for a new inventory.

1.2 Basic forest information

This menu option leads to the following data entry screen.

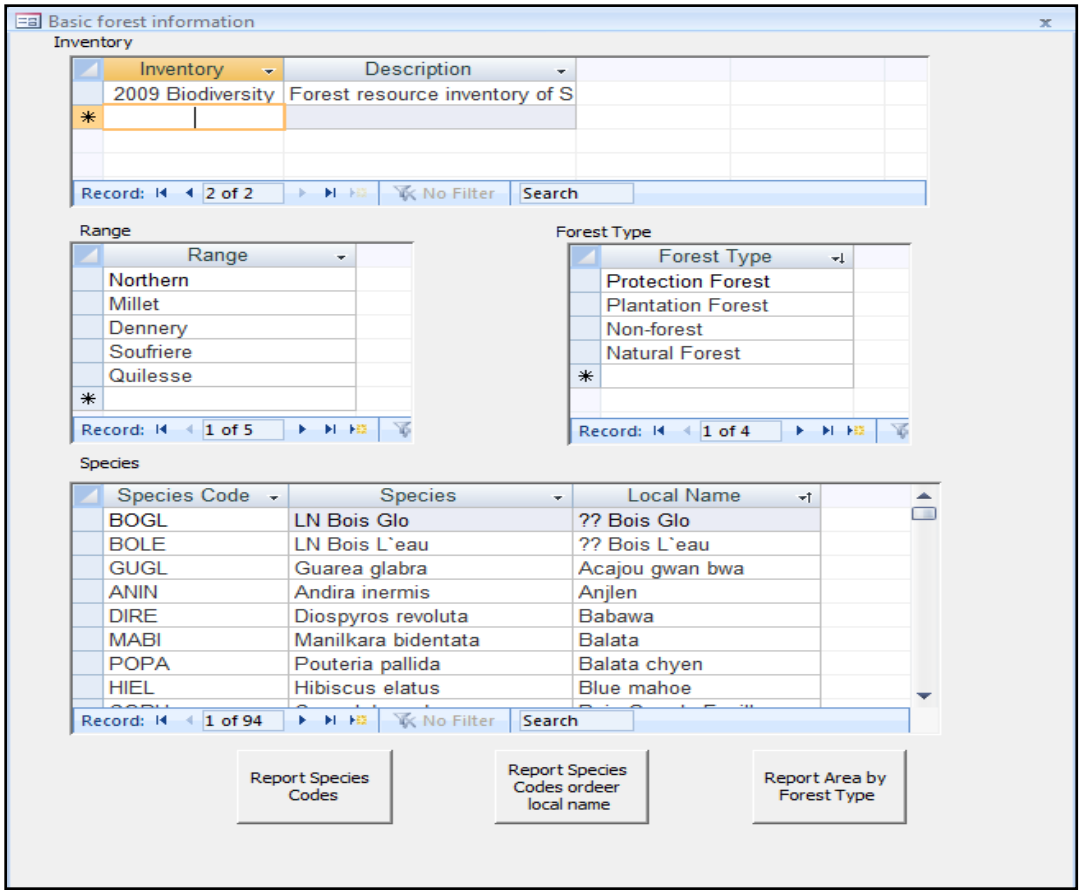


Figure 2 Basic forest information data entry

You can enter basic forest information using this screen. This information does not change very often. You can give a name to the inventory, add ranges, forest types, and species with species codes. You can also print species code reports from this screen.

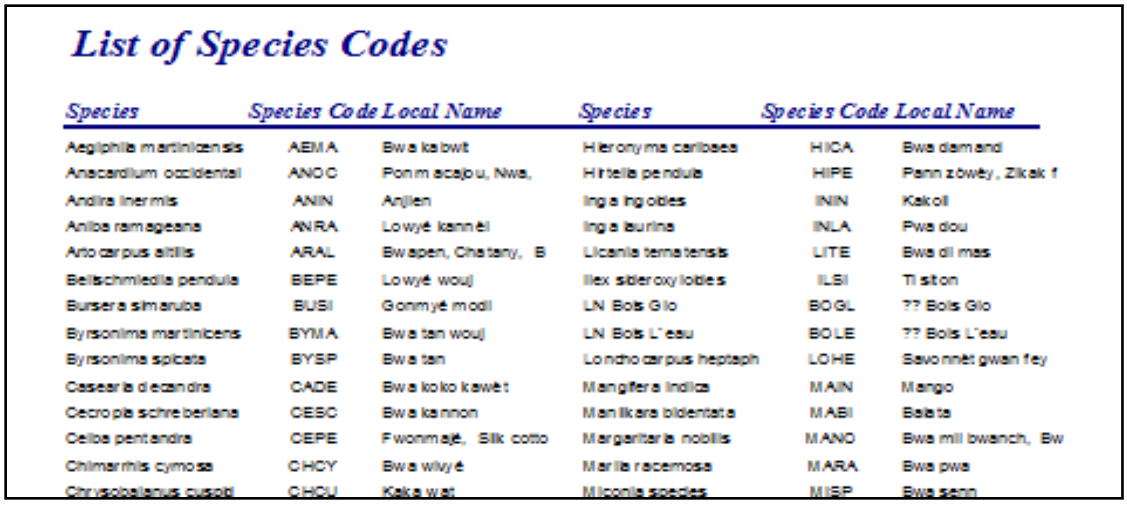
Once you have entered the main information on this screen, you will not need to use this screen very often.

1.3 Species codes reports

The species codes reports allow you to print lists of the species codes, which are needed for the inventory field teams. You can enter new codes in the basic forest detail section. You can also change codes. You should not change the codes often, as this will mean trees already entered may change species.

> ***You should note that you must enter all species measured in the inventory using this data entry screen. If you find a new species on a plot sheet, you will have to add it here before you can use it.***

The species code reports look like the example below. You should print the report out for the inventory teams after you have added new species or corrected any errors.



List of Species Codes

Species	Species Code	Local Name	Species	Species Code	Local Name
Aegiphila martinicensis	AEMA	Bwa kabwit	Hieronyma caribaea	HICA	Bwa damand
Anacardium occidentale	ANOC	Ponm acajou, Nwa,	Hirtella pendula	HIPE	Pann zòwèy, Zikak f
Andira inermis	ANIN	Anjlen	Inga ingoides	ININ	Kakoli
Aniba ramageana	ANRA	Lowyé kannèl	Inga laurina	INLA	Pwa dou
Artocarpus altilis	ARAL	Bwapen, Chatany, B	Licania ternatensis	LITE	Bwa di mas
Beilschmiedia pendula	BEPE	Lowyé wouj	Ilex sideroxyloides	ILSI	Ti siton
Bursera simaruba	BUSI	Gonmyé modi	LN Bois Glo	BOGL	?? Bois Glo
Byrsonima martinicens	BYMA	Bwa tan wouj	LN Bois L'eau	BOLE	?? Bois L'eau
Byrsonima spicata	BYSP	Bwa tan	Lonchocarpus heptaph	LOHE	Savonnèt gwan fey
Casearia decandra	CADE	Bwa koko kawèt	Mangifera indica	MAIN	Mango
Cecropia schreberiana	CESC	Bwa kannon	Manilkara bidentata	MABI	Balata
Ceiba pentandra	CEPE	Fwonmajé, Silk cotto	Margaritaria nobilis	MANO	Bwa mil bwanch, Bw
Chimarrhis cymosa	CHCY	Bwa wivyé	Marila racemosa	MARA	Bwa pwa
Chrysobalanus cuspid	CHCU	Kaka wat	Miconia species	MISP	Bwa senn

Figure 3 Example of species code report

1.4 Strata information

This menu option leads to the following data entry screen.

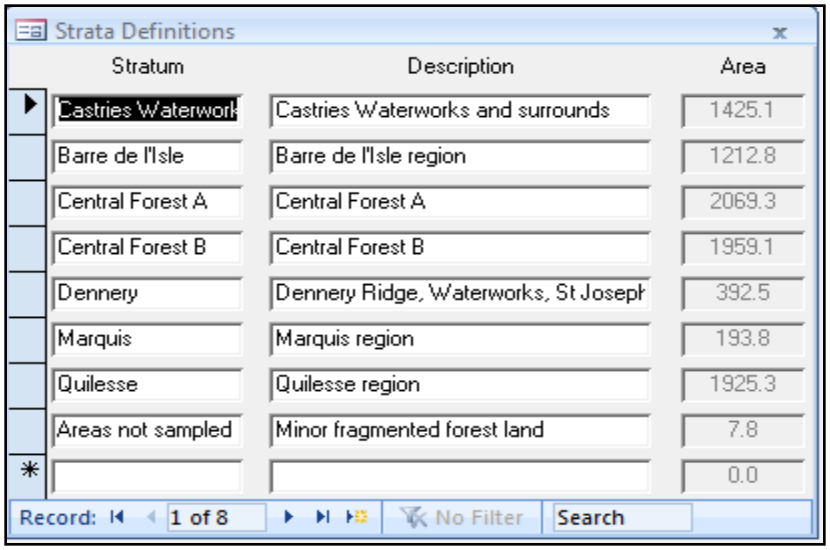


Figure 4 Strata definition data entry screen

Here you can define strata, and change the name and description of a stratum. You will note that the area of each stratum is shown. You cannot change these areas, as they are calculated from the forest unit areas.

1.5 Forest unit information

This menu option leads to the following data entry screen.

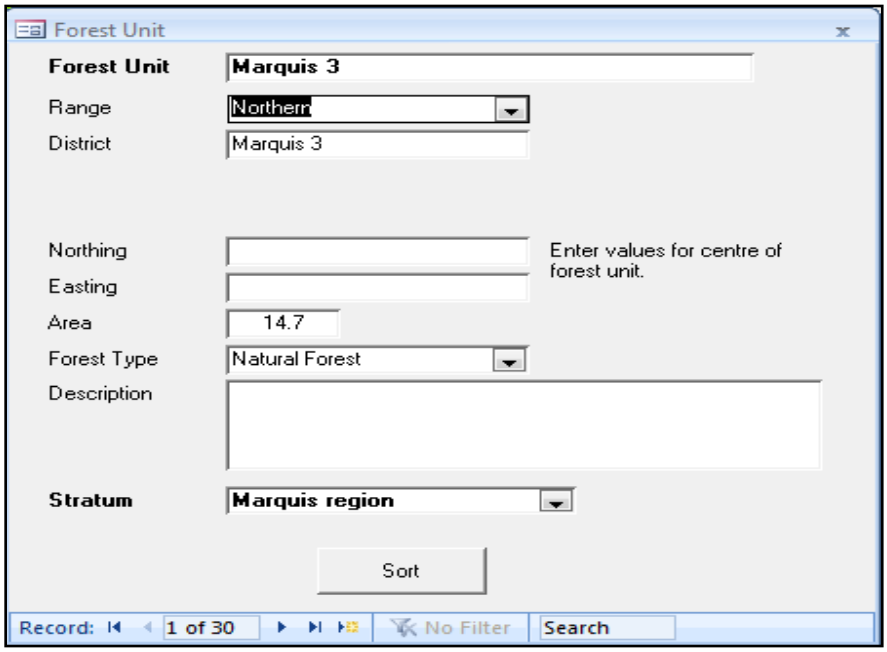


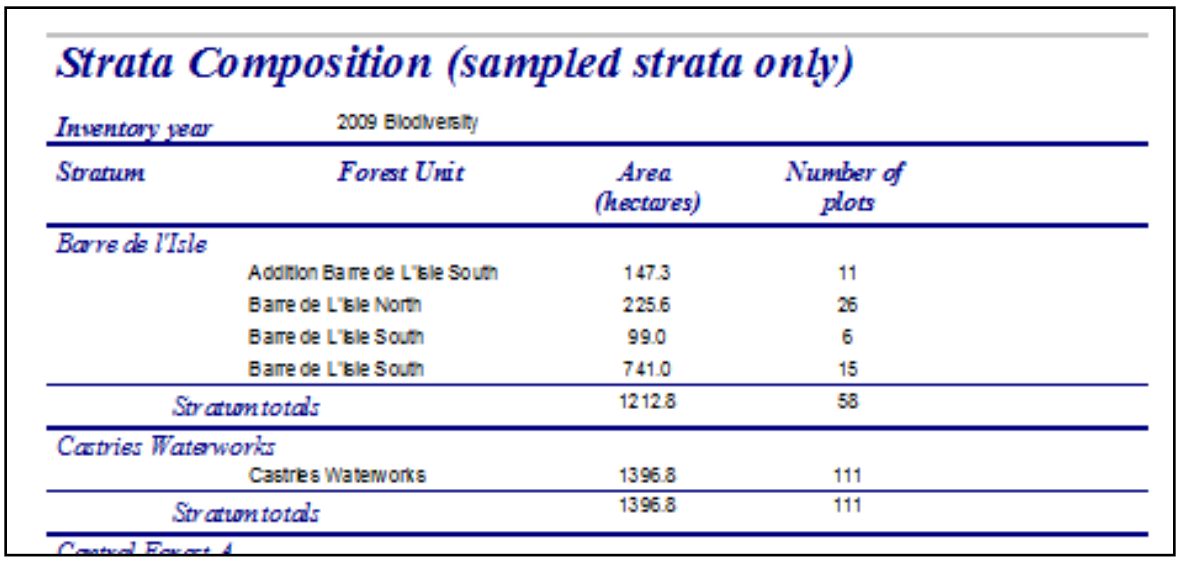
Figure 5 Forest Unit data entry screen

In this data entry screen you can enter the information defining a Forest Unit. You should be as precise as possible when you define the Forest Units, as these are the basic building blocks of your inventory. In the example above in Figure 5, the map sheet and Easting and Northing of the centre of the Forest Unit should have been entered.

1.6 Strata composition

This menu item produces a report that lists all the Forest Units in a stratum, along with other detail such as the total area of the stratum, and the number of sample pots in the stratum.

This report is useful to help you structure your inventory.



Strata Composition (sampled strata only)

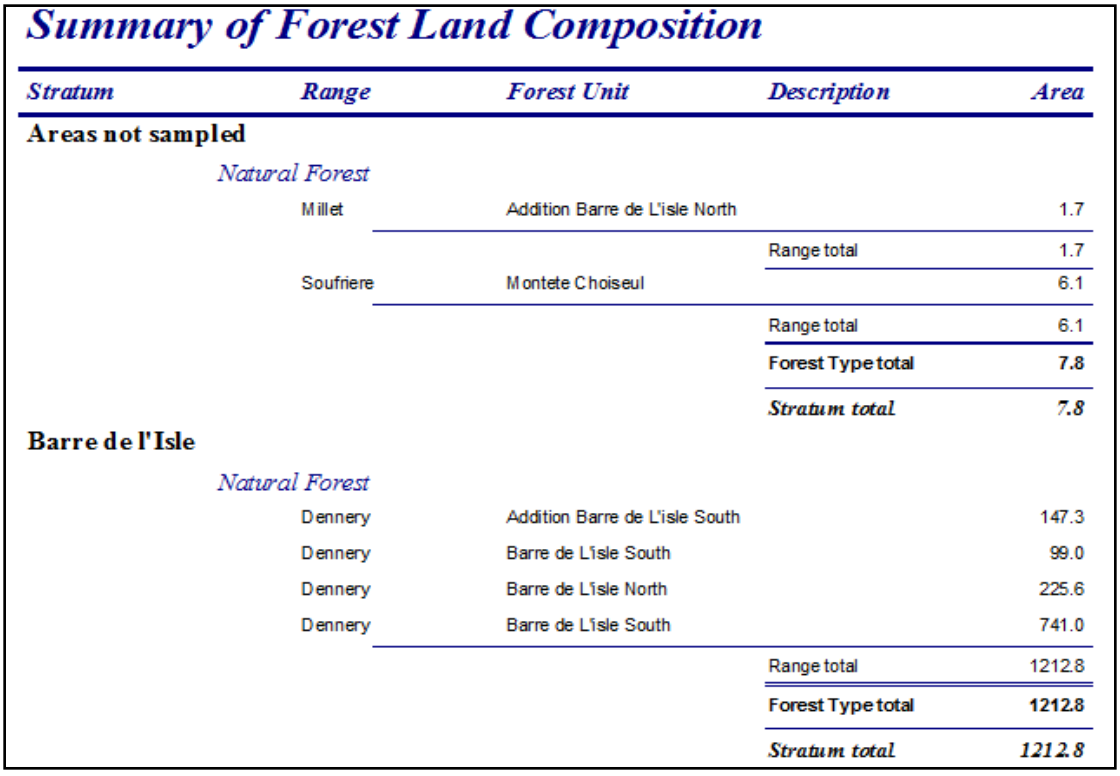
Inventory year: 2009 Biodiversity

Stratum	Forest Unit	Area (hectares)	Number of plots
Barre de l'Isle			
	Addition Barre de L'Isle South	147.3	11
	Barre de L'Isle North	225.6	26
	Barre de L'Isle South	99.0	6
	Barre de L'Isle South	741.0	15
Stratum totals		1212.8	58
Castries Waterworks			
	Castries Waterworks	1396.8	111
Stratum totals		1396.8	111
Central Forest A			

Figure 6 Strata composition report

1.7 Forest land composition

This menu item lists how the forest units are combined to form strata, with additional details, as shown below.



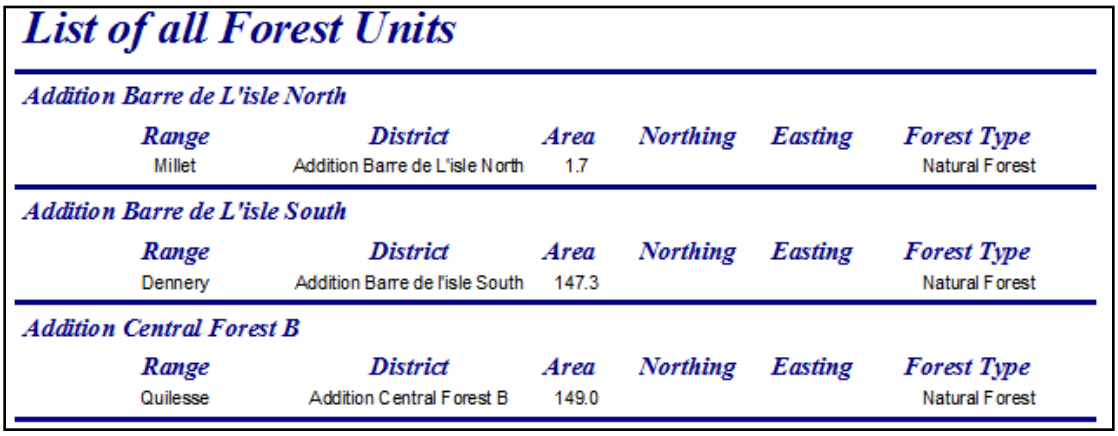
Summary of Forest Land Composition

Stratum	Range	Forest Unit	Description	Area
Areas not sampled				
	Natural Forest			
	Millet	Addition Barre de L'isle North		1.7
			Range total	1.7
	Soufriere	Montete Choiseul		6.1
			Range total	6.1
			Forest Type total	**7.8**
			Stratum total	***7.8***
Barre de l'Isle				
	Natural Forest			
	Dennery	Addition Barre de L'isle South		147.3
	Dennery	Barre de L'isle South		99.0
	Dennery	Barre de L'isle North		225.6
	Dennery	Barre de L'isle South		741.0
			Range total	1212.8
			Forest Type total	**1212.8**
			Stratum total	***1212.8***

Figure 7 Example of forest composition report

1.8 List forest units

This menu item produces a list of forest units, with their details, like the example below.



List of all Forest Units

Addition Barre de L'isle North

Range	District	Area	Northing	Easting	Forest Type
Millet	Addition Barre de L'isle North	1.7			Natural Forest

Addition Barre de L'isle South

Range	District	Area	Northing	Easting	Forest Type
Dennery	Addition Barre de l'isle South	147.3			Natural Forest

Addition Central Forest B

Range	District	Area	Northing	Easting	Forest Type
Quilesse	Addition Central Forest B	149.0			Natural Forest

Figure 8 Example of forest units list

2 Forest Inventory

The Forest Inventory main menu item leads to the following submenu.

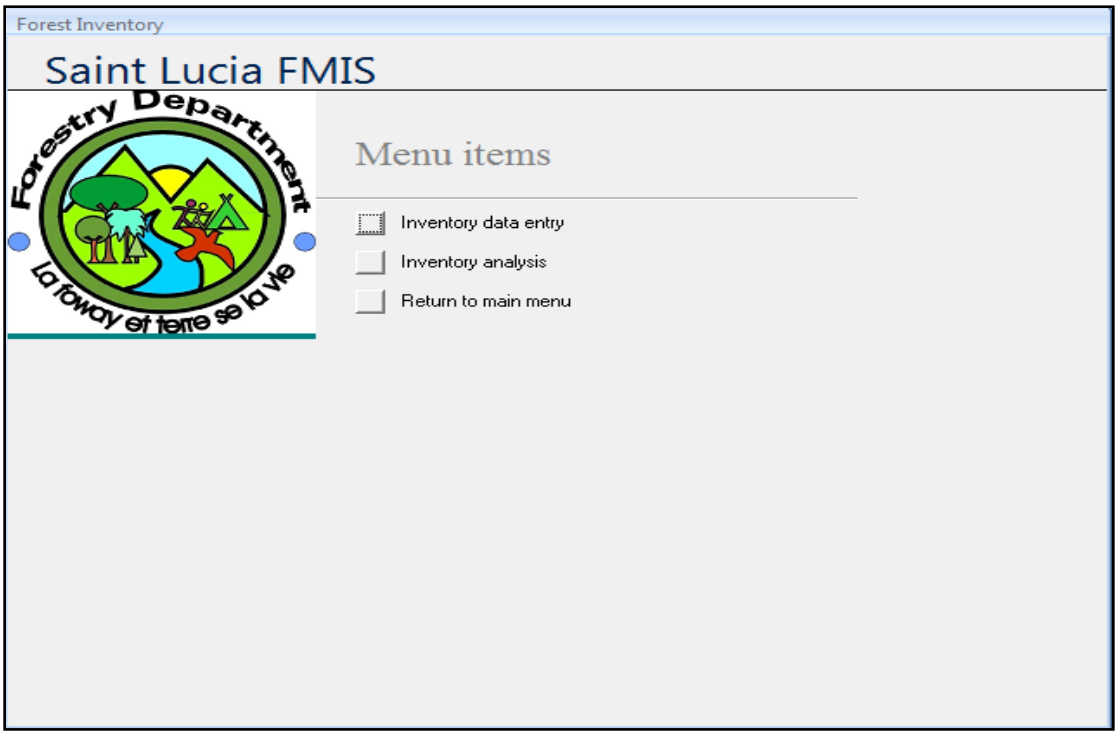


Figure 9 Forest Inventory submenu

Each menu item has a further menu screen.

2.1 Inventory data entry

The Inventory data entry menu items leads to the following menu.

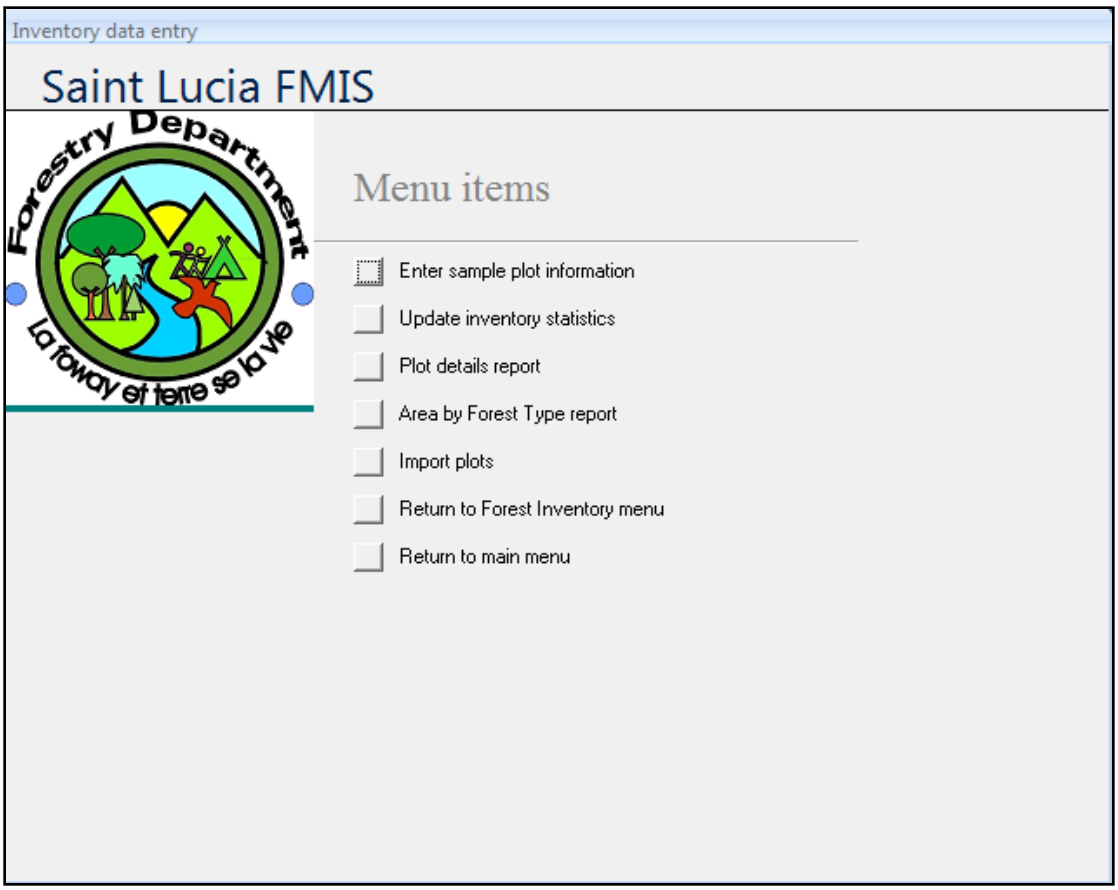


Figure 10 Inventory data entry menu[3]

2.2 Enter sample plot information

This is one of the most important data entry screens in the SL FMIS. Here is where plot data are entered. It is vital that all data entered here has been collected accurately, and recorded correctly.

If the data are not entered correctly, the inventory results will not be accurate.

[3] For details on how to use the Import Plots menu item please see the appendix where the use of the stand alone data entry module is described.

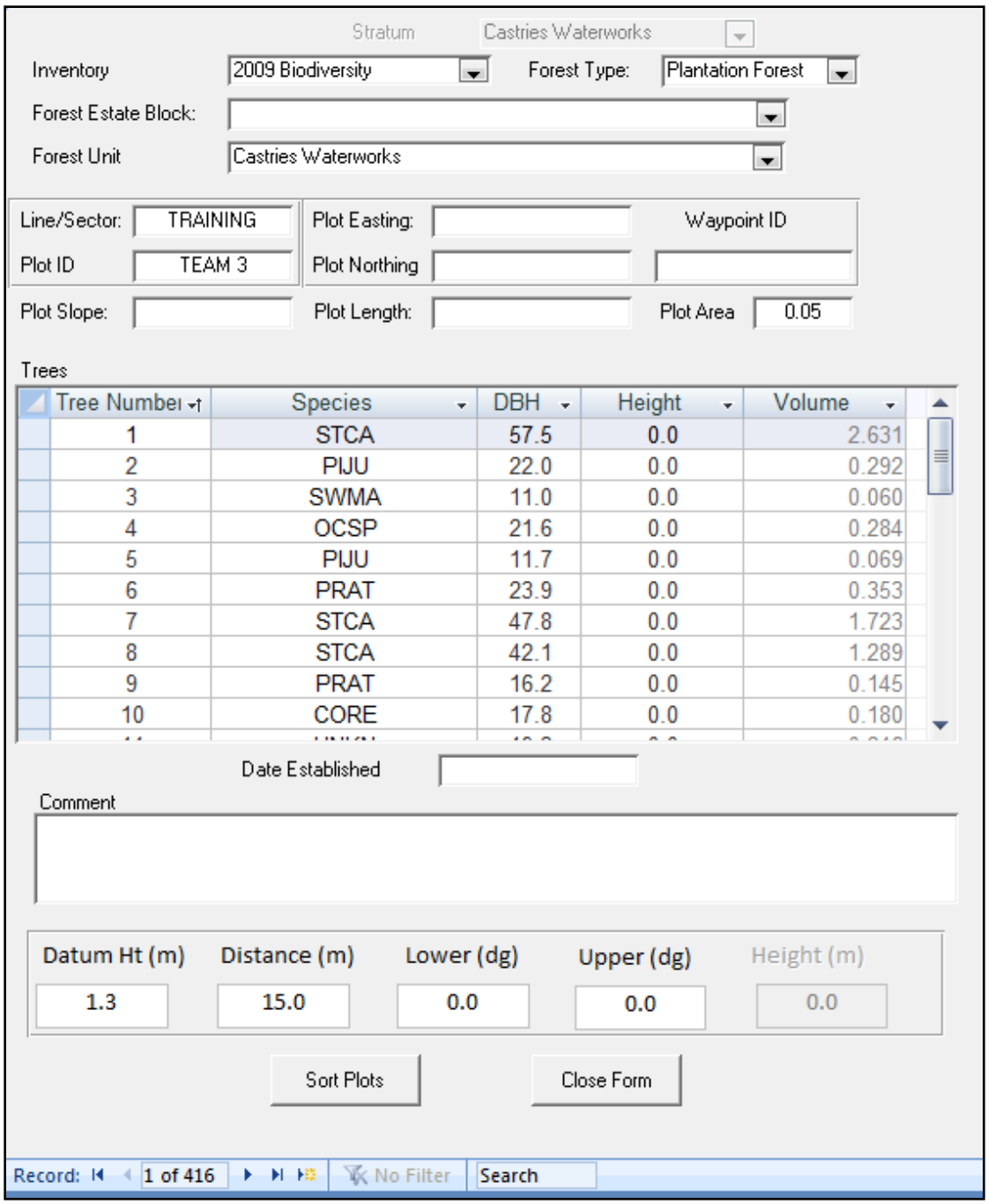


Figure 11 Plot data entry screen

All the information is entered from the top of the screen down. You must put in the plot area, or you will get an error message. The Forest Unit has to have already been entered in the SL FMIS, as does the Inventory year. Similarly, you can only put in species codes that have already been entered into the species code table.

The Inventory year is the year the inventory was started, which was 2009 at the time the system was set up. At some point in the future this may change, but until then, you should enter 2009.

As you enter trees, you should use the Tab key to move across, from Tree Number, to Species, to DBH, to Height, and then use the Tab key to go to the next record.

If you use the Tab key like this, the SL FMIS will add new trees for you, with the next number, and the same species as the previous tree. You can change the number if you need, or the species, but often this will speed up the data entry process.

When SL FMIS adds a new tree, it sets the dbh to -1. This is so that the system can remove any unwanted extra tree records. When you have finished with this plot, you can go to the next one, or exit, and the system will tidy up the last tree it added.

There is a height calculator at the bottom of the screen, to let you calculate heights, if needed. You should enter the height calculation data into the calculator, and the height will be calculated. You will have to then enter the height against the appropriate tree.

2.3 Update inventory statistics

SL FMIS is designed to recalculate the inventory statistics on demand, rather than automatically. As the number of plots in an inventory grows, the time taken to update the database increases. If the database was automatically recalculated, you would sometimes have to wait for 5 to 10 minutes while the update proceeded.

When the inventory statistics need to be updated, a warning shows on the main screen, as below.

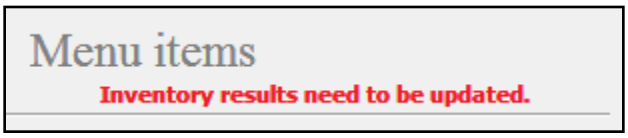


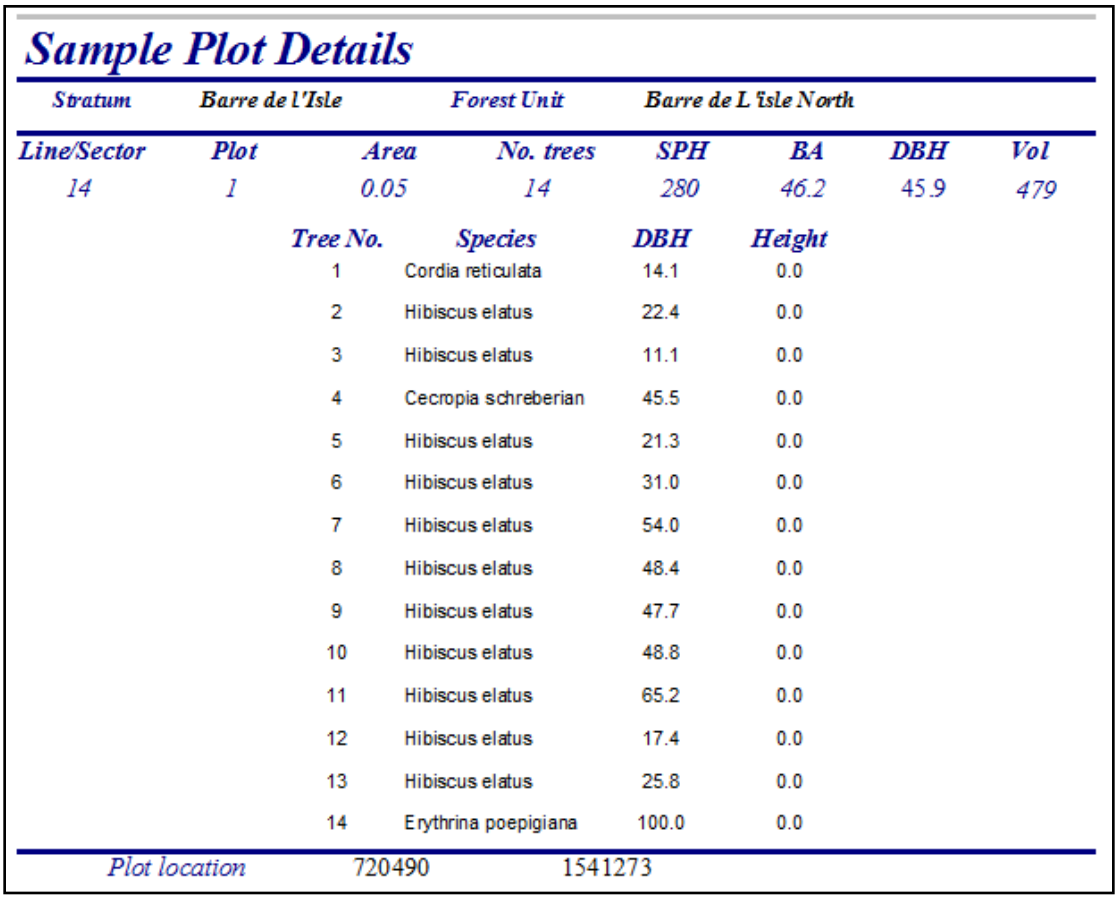
Figure 12 Need to run update warning

When you see this warning, you should run the update option before you inspect any results.

If you do not run the update when the warning is showing, any results you display or print be wrong!

2.4 Plot details report

This menu item produces a report for each plot in the SL FMIS. You can inspect the reports on the screen, or print all or any of them that you wish. An example of part of a report is shown below.



Sample Plot Details

Stratum	Barre de l'Isle	Forest Unit	Barre de L'isle North

Line/Sector	Plot	Area	No. trees	SPH	BA	DBH	Vol
14	1	0.05	14	280	46.2	45.9	479

Tree No.	Species	DBH	Height
1	Cordia reticulata	14.1	0.0
2	Hibiscus elatus	22.4	0.0
3	Hibiscus elatus	11.1	0.0
4	Cecropia schreberian	45.5	0.0
5	Hibiscus elatus	21.3	0.0
6	Hibiscus elatus	31.0	0.0
7	Hibiscus elatus	54.0	0.0
8	Hibiscus elatus	48.4	0.0
9	Hibiscus elatus	47.7	0.0
10	Hibiscus elatus	48.8	0.0
11	Hibiscus elatus	65.2	0.0
12	Hibiscus elatus	17.4	0.0
13	Hibiscus elatus	25.8	0.0
14	Erythrina poepigiana	100.0	0.0

Plot location 720490 1541273

Figure 13 Example of part of a plot report

The plot report lists any errors that can be found, such as zero dbhs, suspect heights, and zero plot areas. You should use the plot report to check against the sample data, so that any data entry mistakes can be corrected.

If you have any bad heights in the plot, you should remove the height measurement. Only do this if you are sure that the height measurement is bad, not if it is actually a very tall or very short tree.

2.5 Inventory data analysis

The Inventory data analysis menu item leads to the following menu.

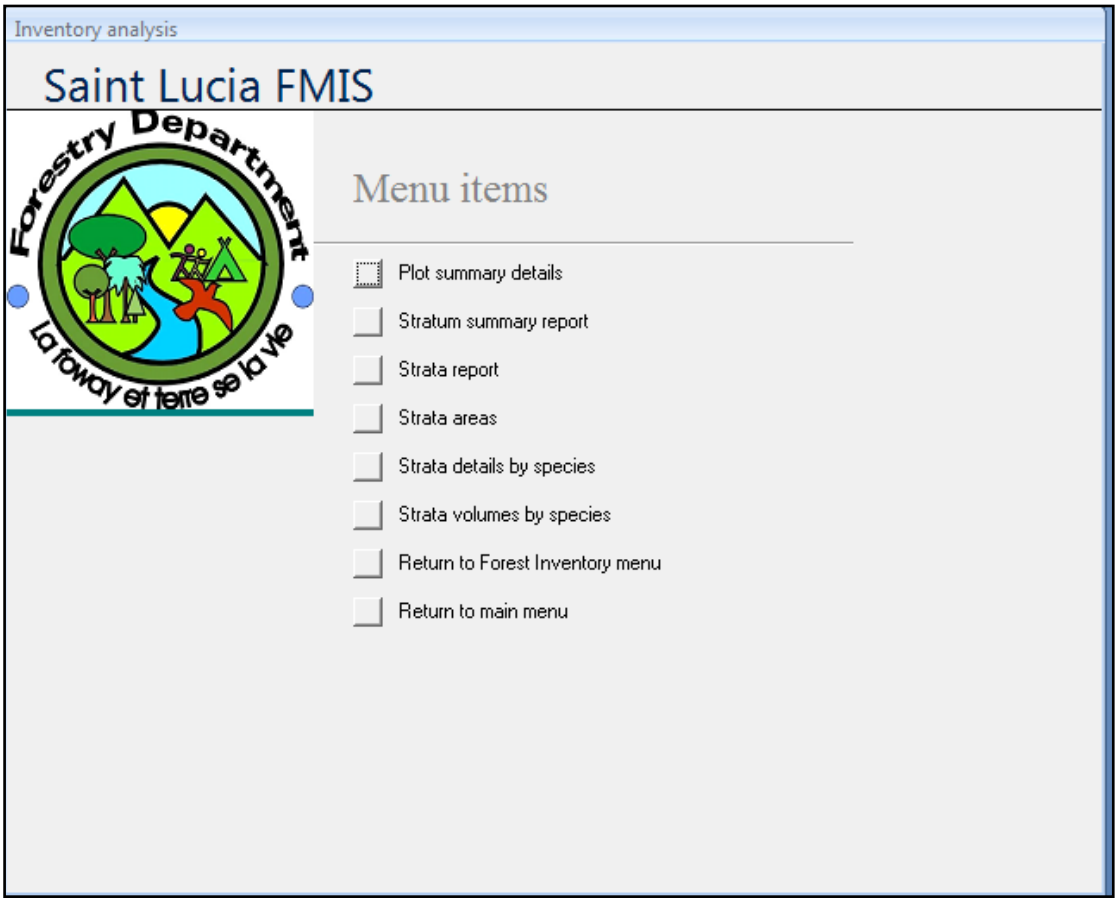


Figure 14 Inventory data analysis menu

This menu lets you examine your inventory in detail. The inventory examined is the one selected above, if you have more than one inventory in the system.

The inventory analysis consists of a series of reports. The reports present the inventory summary details for your examination. These reports let you see how accurate the inventory is, so that you can decide whether to carry out more sampling. They also show the detail in the inventory, so that you can decide whether to redefine your forest units to get more detail.

A key report is the Strata report, which provides details of the estimate of the main strata variables. This is shown below in Figure 15. This report shows the stratum basal area, stocking, mean top height, and volume estimates, with the PLE[4] for basal area and stocking. The PLE can only be calculated for basal area and volume, as these are direct estimates, while mean top height and volume are derived estimates.

[4] Probable Limit of Error, 95% confidence interval of the estimate of the mean, expressed as a percentage.

Stratum Estimates

Inventory 2009 Biodiversity

Name Barre de l'Isle — Barre de l'Isle region — **No. plots** 58 0.24% sampled

	Stratum Area		Basal Area	SPH	DBH	Volume
			Stratum Averages per hectare			
Total	1212.8	Estimate	39.1	566	29.6	360
Sampled	1212.8	St. Err.	2.0	34		
		PLE	10.1%	12.2%		

Estimated Total Stratum Volume (m3) 436,616

Name Castries Waterworks — Castries Waterworks and surround — **No. plots** 111 0.52% sampled

	Stratum Area		Basal Area	SPH	DBH	Volume
			Stratum Averages per hectare			
Total	1425.1	Estimate	40.3	546	30.6	381
Sampled	1396.8	St. Err.	1.7	19		
		PLE	8.1%	6.8%		

Estimated Total Stratum Volume (m3) 542,971

Figure 15 Strata report, showing stratum estimates

An example of the Strata details by species report is shown below in Figure 16.

Stratum Summary by Species and Diameter Class

Stocking and basal area per hectare — Inventory 2009 Biodiversity

Stratum	Diameter Class								
Barre de l'Isle	<15	25	35	45	55	65	75	>75	Total
Aegiphila martinicensis	0	0	0	0	0	0	0	0	0
Bwa kabwit	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Andira inermis	0	2	1	0	0	1	0	0	4
Anjlen	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.3
Artocarpus altilis	0	0	0	0	0	0	0	0	0
Bwapen, Chatany, Brea	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Byrsonima martinicensi	1	1	2	0	0	0	0	0	4
Bwa tan wouj	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.2
Byrsonima spicata	3	3	1	0	0	0	0	0	8
Bwa tan	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.3

Figure 16 Example of inventory analysis report

3 Forest Management

The Forest Management main menu item contains the following menu items.

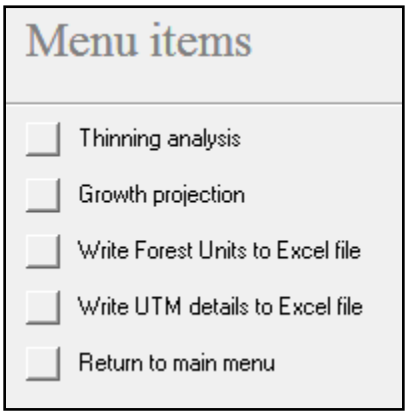


Figure 17 Forest Management menu items

3.1 Thinning analysis

A major forest management function is the controlled thinning of a forest. Thinning can be used to vary the structure of a forest, to reach a more desired forest type. A forest may be thinned in many different manners, such as removal of particular species, or particular parts of the crop. The SL FMIS allows you to simulate thinning for each stratum in the forest.

The Thinning analysis menu item leads to the following submenu items.

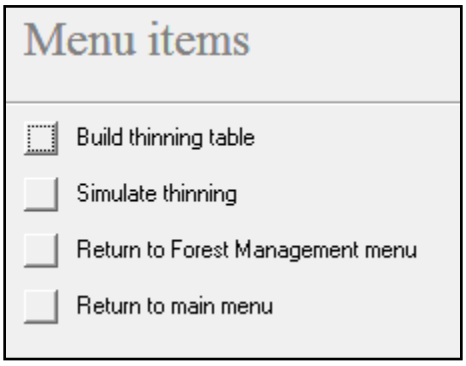


Figure 18 Thinning simulator submenu items

3.2 Build thinning table

The first step in simulating a thinning is to build a temporary table for you to use to simulate thinning. It is important not to use the actual inventory data, so by clicking on this option, you make the SL FMIS build a fresh thinning table for you.

3.3 Simulate thinning

Once you have built the thinning table, you select the Simulate thinning menu option, which leads to the following thinning simulator.

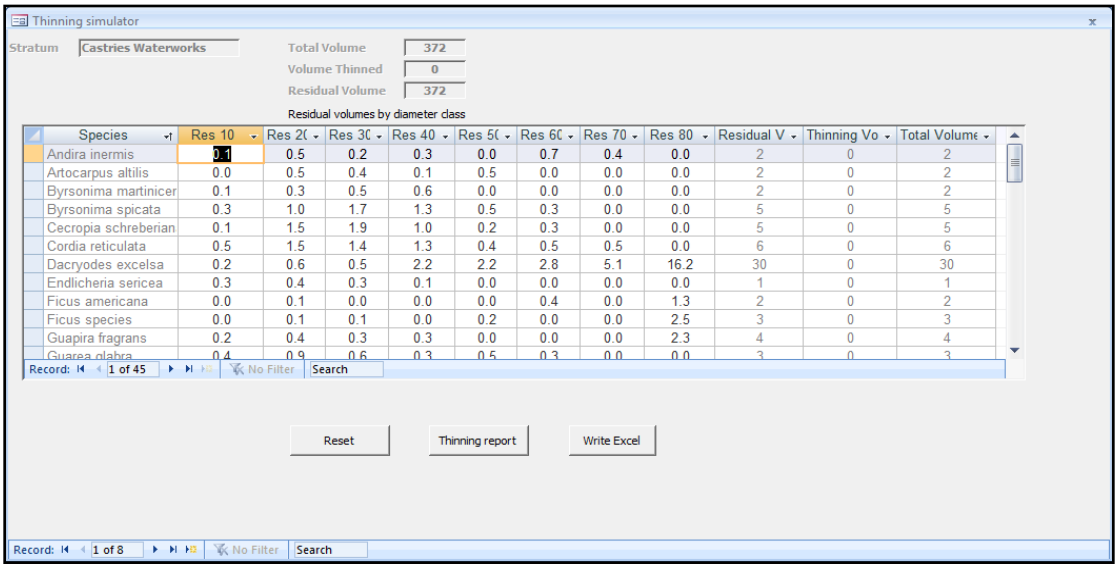


Figure 19 Thinning simulator showing stratum before thinning

The simulator uses the thinning table built from your inventory data. The simulator shows the estimated volume in each 10 cm diameter class for all species in each stratum. You can simulate a thinning by setting the residual volume to a lower figure than is shown in the table.

For example, the table above shows that the stratum shown, Castries Waterworks, has a total volume of 372 m^3 per hectare. The stratum is mostly composed of small trees, but has 30 m^3 per hectare of *Dacryodes excelsa* with 16.2 m^3 per hectare in trees over 75 cm. You decide to thin the larger trees, resulting in the following stand structure after thinning.

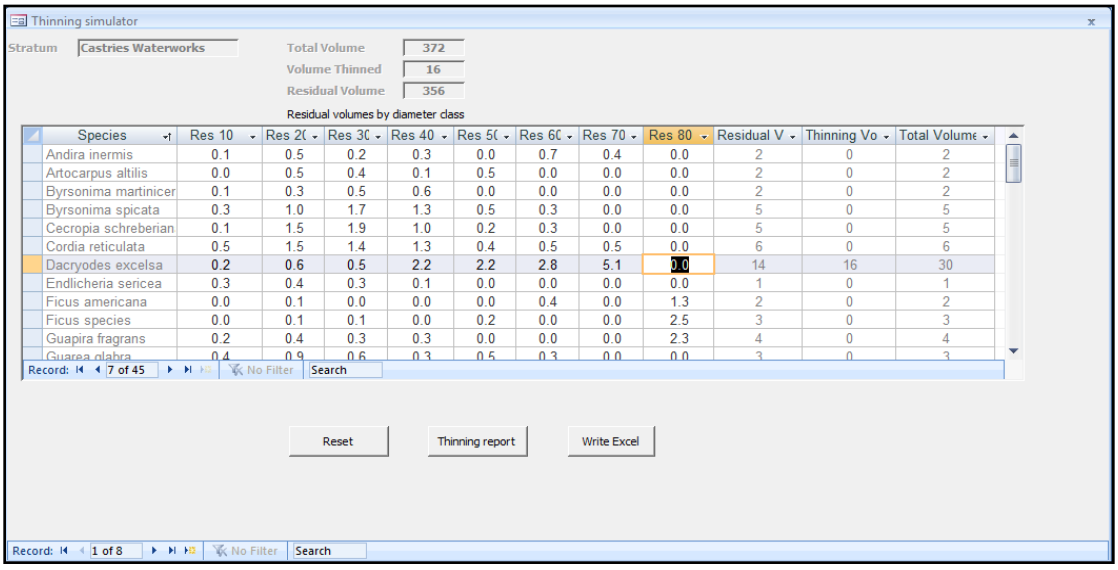


Figure 20 Thinning simulator showing stratum after thinning

You can see that removing these large trees is expected to produce 16 m^3 per hectare, and to leave a stratum with a more even structure.

You can return the thinning simulator to the starting values by clicking the Reset button.

By clicking on the Thinning report button, you will receive a report like the example below in Figure 21. Here you can see the stand after thinning and the expected volume from thinning.

Of course you should be aware that this is a simulation and that you may actually get more or less volume from the thinning, depending on how accurate your inventory figures are. You should also be aware that the thinning simulator assumes there is no loss through logging damage, where as if you fell a 70 cm diameter tree, you are likely to damage smaller trees.

The thinning simulator allows you to examine these options.

Thinning simulation report

Stratum *Castries Waterworks*

	Diameter class								Volumes (m3/ha)		
Species	***10***	***20***	***30***	***40***	***50***	***60***	***70***	***80***	***Thinned***	***Residual***	***Total***
Andira inermis	0	0	0	0	0	0	0	0	0	2	2
Artocarpus altilis	0	0	0	0	0	0	0	0	0	2	2
Byrsonima martin	0	0	0	0	0	0	0	0	0	2	2
Byrsonima spicat	0	0	0	0	0	0	0	0	0	5	5
Cecropia schreb	0	0	0	0	0	0	0	0	0	5	5
Cordia reticulata	0	0	0	0	0	0	0	0	0	6	6
Dacryodes excel	0	0	0	0	0	0	0	16	16	14	30
Swietenia macro	0	0	0	0	0	0	0	0	0	22	22
Symplocos marti	0	0	0	0	0	0	0	0	0	2	2
Tabebuia heterop	0	0	0	0	0	0	0	0	0	2	2
Tapura antillana	0	0	0	0	0	0	0	0	0	2	2
Tovomita plumieri	0	0	0	0	0	0	0	0	0	2	2
Unknown	0	0	0	0	0	0	0	0	0	6	6
Totals	0	0	0	0	0	0	0	16	16	356	372

Figure 21 Example of thinning simulation report

3.4 Write to Excel

The SL FMIS is designed mainly to focus on the processing of inventory results. It includes the ability to simulate thinning, and to project strata forward through a growth projector. However managers may wish to carry out further analysis. The SL FMIS includes the facility to write the thinning table to an Excel spreadsheet file.

If you click on the Write Excel button (see Figure 20), the SL FMIS will write an Excel file that contains a copy of the Thinning table. You can use this for your own analysis, for example, to add a cost per species, to give the expected value of the thinning.

3.5 Growth projection

A major aspect of Forest Management is taking into account the growth of the forest. There is little data available that can be used to predict the growth of the forest. The SL FMIS includes a rudimentary growth projection system, which projects growth forward based on a growth rate of between 0 and 2 % per year.

This is a simplistic growth projection system, but can be used to examine the effects of delaying a thinning.[5]

The Growth simulator is very similar to the thinning simulator, and is accessed through the following menu.

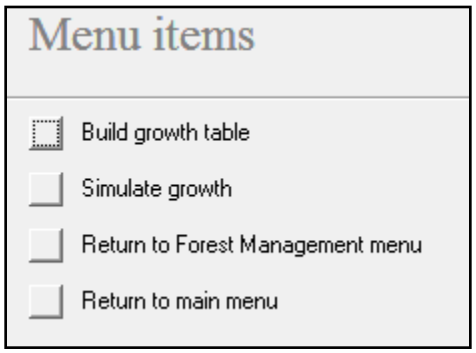


Figure 22 Growth simulator submenu

3.6 Build growth table

First you must build a Growth table, similar to building a thinning table, by clicking on the Build growth table button.

3.7 Simulate growth

When you click on the Simulate growth button, you will go to the Growth simulator, shown below.

[5] A more realistic growth projection system would use a growth model or yield table to grow the different forest species on. There are no suitable growth models or yield tables available at this stage. At some future point, growth models and yield tables may be included in the SL FMIS.

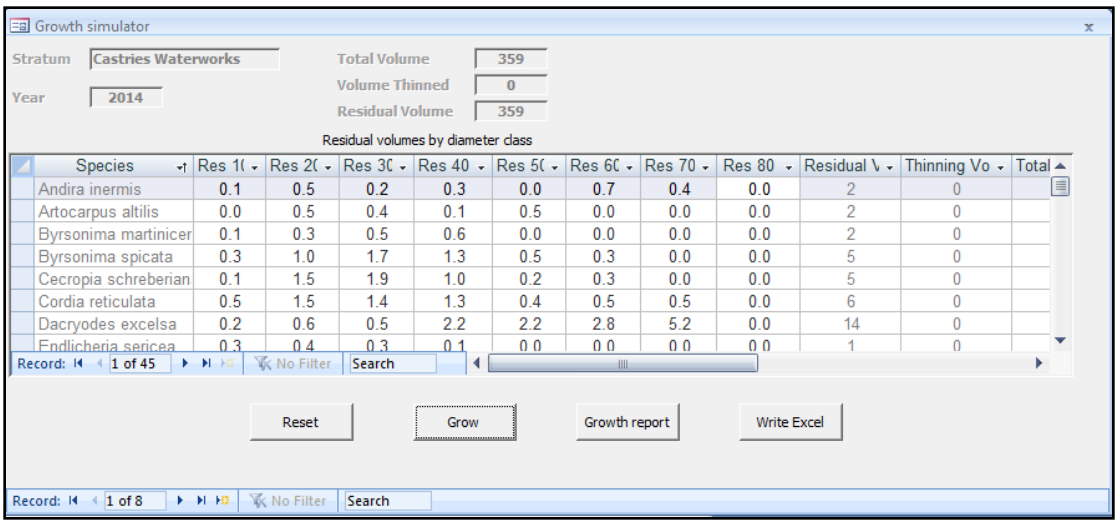


Figure 23 Growth simulator

This operates exactly the same as the Thinning simulator, with the exception of the Grow button. The Grow button simulates growing the stratum forward one year.

In the example in Figure 23 the same stratum shown in Figure 19 has been grown forward to 2014. The Growth simulator shows a predicted volume of 359 m^3 per hectare.

Again you can write the Growth table to an Excel file with the Write Excel button.

The Reset button resets the stratum to the before thinning position in the year you have grown it to. If you want to start all over, you will need to exit the Growth simulator, and build a new Growth table.

Repeated Inventories

The SL FMIS is designed to process one inventory carried out at one time. The relatively slow growth rate of the forests of Saint Lucia means that the SL FMIS will be able to provide information for several years using inventory data collected over different years. However, at some point forest growth and management will mean that a separate inventory will need to be defined. You do this by entering a new inventory year and description, as described above on page 3. After selecting a new inventory you can enter new sample plot measurements for the new inventory, and recalculate the new inventory results.

However should the value of the SL FMIS be realised over time, the SL FMIS should be enhanced to allow for the comparison of separate inventories together. This aspect of inventory design has been allowed for in the SL FMIS, with the ability to provide a name and description of more than one inventory

Further improvement of the SL FMIS can be carried out when there is a large enough collection of inventory data.

Independent Data Analysis

All the data in the SL FMIS can be examined and analysed with Microsoft Access 2007. Microsoft Access 2007 is a powerful development tool, but can also be used for simple examination of data, and to extract the data to Excel files, or files for use with other software.

As described below in the Appendix, the SL FMIS consists of two files, SLFMIS_be.ACCDB, which stores the data, and SLFMIS.ACCDB, which one stores the program details. These two files can be copied to another directory or computer and used for data analysis.

You should not do such data analysis on the computer which is used as the main SL FMIS computer, as this might lead to corruption of the database. Instead, you should copy the two files onto your work computer. You will need to have a copy of Microsoft Access 2007 to open the files, but when you do, you will be able to access all the data. Of course, you will need to know how Microsoft Access 2007 works to be able to do the more powerful things, but you can easily export the data tables to Excel files for examination.

Make sure that you only experiment with copies of the data files, to avoid corruption the database!

Appendix. Maintenance of the SL FMIS

The SL FMIS is a medium complexity computer system. There will need to be some elements of regular maintenance carried out, and the future upkeep of the system will need to be maintained. This appendix contains technical details to assist with this maintenance.

Hardware and software requirements

The SL FMIS is a Microsoft Access 2007 application. The SL FMIS requires a copy of Microsoft Access 2007 to run. This is usually purchased as part of Microsoft Office 2007. Any later version of Microsoft Access should be suitable to run the SL FMIS.

The SL FMIS can be run without a copy of Microsoft Access 2007, through the runtime software option, but modifications and ad hoc queries will not be able to be made.

The SL FMIS is not a demanding application, and most modern computers should be able to run it. Any computer, which meets the specifications necessary to run Microsoft Access 2007 or a later version, will be suitable to run the SL FMIS.

The SL FMIS does not require a large amount of disk space. It is unlikely that the application will need more than 100 Mb of disk space.

Any computer built after 2007 should be capable of running the SL FMIS.

Upkeep of the system

The SL FMIS is self-maintaining, and needs little upkeep. The regular support of the computer hosting the system should ensure the system is up kept.

The computer the SL FMIS is hosted on should be maintained at least monthly, with a disk check and disk defragmentation carried out.

The main element of up keeping is the regular backing up of the files, as discussed below.

SL FMIS Computer files

The SL FMIS is a Microsoft Access computer system. It is designed to be kept in a computer directory called C:\SLFMIS\.

The system consists of two computer files, a *program file* and a *data file*. The *program file* is called SLFMIS.ACCDB. This file stores the program details along with data entry screens, reports, and other program features.

The *data file* is called SLFMIS_be.ACCDB. This stores the actual inventory data.

The program file, SLFMIS.ACCDB, does not change regularly. However the data file changes every time more inventory data is entered or changed.

Both files should be backed up regularly.

If you want to move the SLFMIS to another computer, or if you want to take a copy to use on another computer, make sure that the files are copied into a directory with the same name on the same drive e.g. C:\SLFMIS\

If you copy them into a different directory, the program will not run, and you will need to get an Access expert in to help you.[6]

If there is a problem with the SL FMIS, you may be sent a new version of SLFMIS.ACCDB. If this happens, to update the SL FMIS, you should copy the new SLFMIS.ACCDB to replace the old SLFMIS.ACCDB. You will be given careful instructions if you need to do this.

Backups

The information entered into the SL FMIS is extremely valuable. The inventory will cost a considerable amount of time and money to carry out, and the results are of great value to the Forestry Department.

You should make regular backups of your data. These backups should be kept in a safe place, with old copies of the backups stored in another building. If the main office building was destroyed in a fire or disaster, you could restore the SL FMIS from a backup kept in another office.

You should backup all the files in the SLFMIS directory by copying them to a CD or other backup device.

Future development

The SL FMIS is a Microsoft Access 2007 application. Future development should be possible by any competent Access 2007 developer. Some knowledge of forest practises may be required.

All software code is imbedded in the application. The Microsoft Access 2007 development environment includes Visual Basic, which was the language used to develop the subroutines and functions called by the application. The Visual Basic development system renders all code visible to the developer.

Further development should be possible with a backed up copy of the application by any competent Access 2007 developer. No specialised development tools were used in the development of this software.

Stand alone Inventory data entry

The stand alone inventory data module is called SLFMISData. It uses a data file called SLFMIS_Import.

To use the stand alone system, both of these files should be copied into a directory called C:\SLFMIS\. The stand alone data entry is run by running the SLFMISData program. This will open the same data entry screen as is in the main SLFMIS program. All the data entered will go into the SLFMIS_Import file.

To enter the data into the main SLFMIS, the SLFMIS_Import file should be sent to the main computer that the SLMIS system is installed on, and then the SLFMIS system can import the data from the SLFMIS_Import file. The SLFMIS_Import file can either be copied into the SLFMIS directory, overwriting any old version of the file, or the SLFMIS system can be given the location of the file e.g. C:\TEMP\.

[6] SL FMIS makes use of the Access split database feature. This requires configuration of the different front and back ends of the system.

If the computer which is being used for standalone data entry does not have a copy of Microsoft Office 2007, you will need to download and install the free Microsoft Access 2007 runtime system. This can be found at http://www.microsoft.com/downloads/ or by searching on 'Microsoft Access 2007 runtime'.

Automatic backup of FMIS data

An automatic backup system has been installed on the FMIS computer. The system uses software from a company called DriveHQ, whose website is at www.drivehq.com

The automatic backup software is called **DriveHQ Online Backup**. An account has been set up and the files in the SLFMIS directory are backed up automatically when they are changed. There is no need to start or stop the software. The backup will keep up to 10 copies of the SLFMIS files.

The account created is in the name 'invproject' and is a free account, with 1 Gb of space allocated. The password was set at the password applied to all projects after the project leader left Saint Lucia.

An email account has been set up for use with this backup system. The email address is invproject@qfservices.com, with the same password as above. Email can be checked at mail.qfservices.com or via start.qfservices.com . This email may disappear at some stage, and so the email address should be changed to an email address owned by the Forestry Department.