

Excel Functions & Charts

Microsoft Excel® is a powerful companion program for use with LMS. To open Excel, click **Start** on the **Task Bar** then **Programs/ Office/ Microsoft Excel**.

Pivot tables are used in Excel to automate organization and calculation of spread sheet data.

In the following pages, the user will learn to create a Pivot table to summarize stand volumes by species.

Pivot Table using Excel 2000

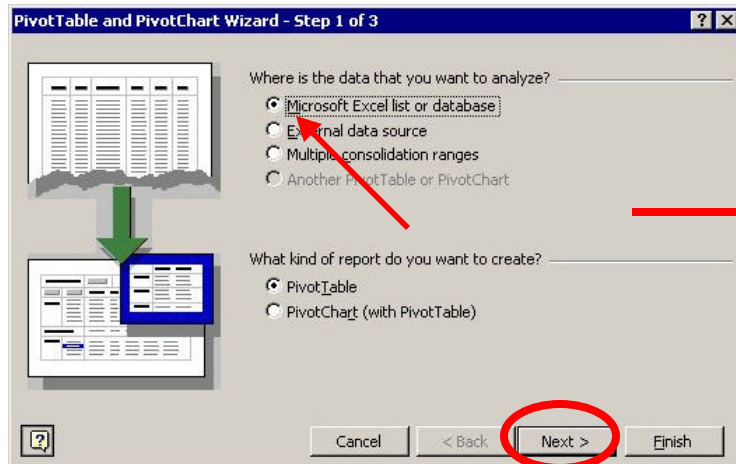
The image shows two windows side-by-side. The left window is 'LMS - D:\lmsfolio2\Packexam.lms' with a menu bar (File, Projection, Analysis, View, Tools, Help). The 'Analysis' menu is open, showing 'Tables...', 'Charts...', and 'Structural Editor'. The 'Tables...' sub-menu is open, showing a list of tables including 'Inventory'. The right window is 'Microsoft Excel - Book1' with a menu bar (File, Edit, View, Insert, Format, Tools, Data, Window, Help). The 'Data' menu is open, showing options like 'Sort...', 'Filter', 'Form...', 'Subtotals...', 'Validation...', 'Table...', 'Text to Columns...', 'Template Wizard...', 'Consolidate...', 'Group and Outline', 'PivotTable Report...', 'Get External Data', and 'Refresh Data'. A red arrow points from the 'PivotTable Report...' option in the Excel 'Data' menu to the 'Inventory' table in the LMS 'Tables...' sub-menu.

Year	Stand	Species	DBH	Height	CR	Exp	VolPerTree	MCW
2000	BR_1300	DF	7.1	32.7	0.76	4.98	0	12.6
2000	BR_1300	DF	5.4	29.6	0.76	4.98	0	10.9
2000	BR_1300	DF	7.3	30.7	0.76	4.98	0	12.8
2000	BR_1300	DF	4.7	27	0.76	4.98	0	10.1
2000	BR_1300	RA	2.1	18.1	0.76	4.95	0	10
2000	BR_1300	RA	2.1	18.8	0.76	4.95	0	10.2
2000	BR_1300	DF	5.2	30.1	0.76	4.98	0	10.7
2000	BR_1300	RA	1.1	11.4	0.76	4.95	0	7.5
2000	BR_1300	DF	5.3	28.8	0.76	4.98	0	10.8
2000	BR_1300	DF	4.9	26.8	0.76	4.98	0	10.4
2000	BR_1300	DF	3.5	21.1	0.76	4.98	0	8.7
2000	BR_1300	DF	3.7	22	0.76	4.98	0	8.9
2000	BR_1300	DF	6.6	30.3	0.76	4.98	0	12.1
2000	BR_1300	DF	8.2	35.3	0.79	4.98	17	13.5
2000	BR_1300	DF	7.2	31.8	0.76	4.98	0	12.7
2000	BR_1300	DF	4.2	26.1	0.76	4.98	0	9.5
2000	BR_1300	DF	5.2	28.8	0.76	4.98	0	10.7
2000	BR_1300	DF	7.1	32.4	0.76	4.98	0	12.5
2000	BR_1300	DF	5.2	29.6	0.76	4.98	0	10.6
2000	BR_1300	DF	5	29.4	0.76	4.98	0	10.5
2000	BR_1300	DF	4.3	25.6	0.76	4.98	0	9.6
2000	BR_1300	DF	4.4	26.8	0.76	4.98	0	9.7
2000	BR_1300	DF	4.5	27.1	0.76	4.98	0	9.9
2000	BR_1300	DF	5.1	30.1	0.76	4.98	0	10.6
2000	BR_1300	DF	4.9	27.6	0.76	4.98	0	10.3
2000	BR_1300	DF	6.8	31.4	0.76	4.98	0	12.3
2000	BR_1300	DF	5.3	27.7	0.76	4.98	0	10.7
2000	BR_1300	DF	7.3	32.2	0.76	4.98	0	12.7
2000	BR_1300	RA	2.4	18.8	0.76	4.95	0	10.8
2000	BR_1300	DF	5.1	28.2	0.76	4.98	0	10.5
2000	BR_1300	DF	7.4	31.8	0.76	4.98	0	12.9
2000	BR_1300	DF	4.8	27.3	0.76	4.98	0	10.3
2000	BR_1300	DF	7.7	34.3	0.76	4.98	17	13.1
2000	BR_1300	DF	5	27.1	0.76	4.98	0	10.4
2000	BR_1300	DF	4.9	26.8	0.76	4.98	0	10.4

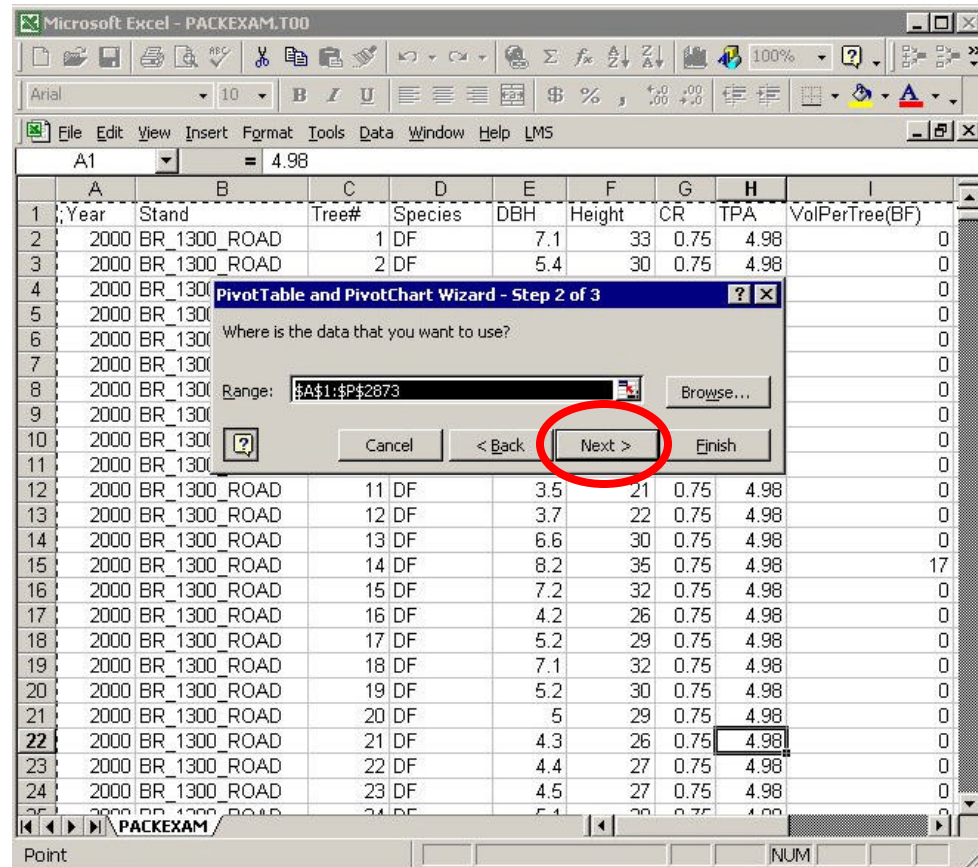
Step 2: With a cell selected within the table area, click on the **Data** drop down menu in Excel. Then click on **Pivot Table Report**.

Step 1: From LMS main window, click **Analysis/Tables/Inventory**, select the year 2000, select all stands, open and delimit Inventory table with macro control key (see Tables section).

Pivot Table using Excel 2000



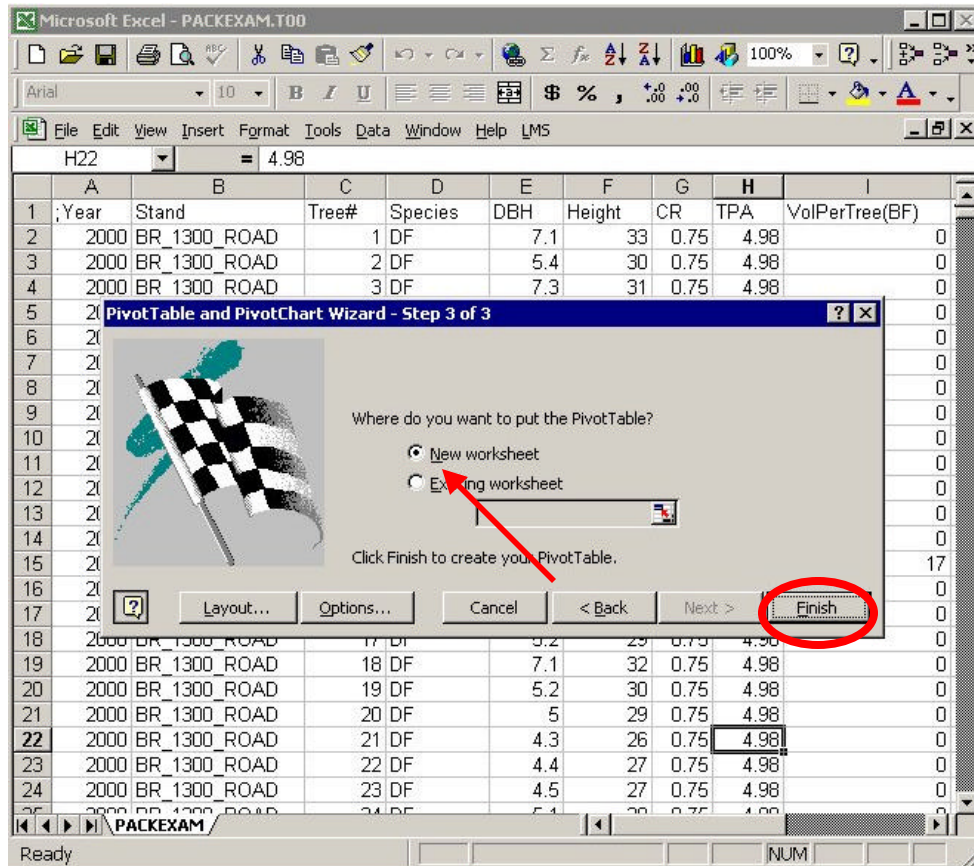
Step 3: Select **Microsoft Excel list or database**. Click **Next**.



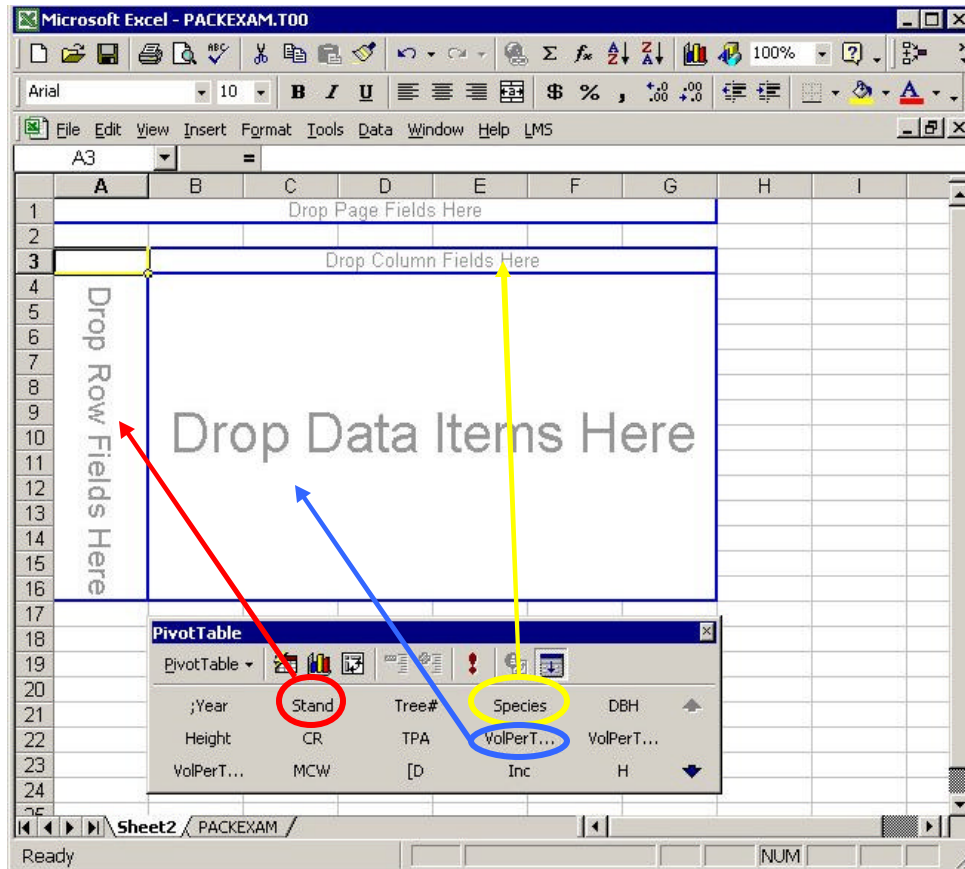
Step 4: The data area should be surrounded by a dashed line, click on **Next**.

Pivot Table using Excel 2000

Step 3: Select **New worksheet**. Click **Finish...**



Pivot Table using Excel 2000



Step 4: Click and drag **Stand** to the Row area, click and drag **Species** to the column area, click and drag **VolPer Tree** to the data area.

Pivot Table using Excel 2000

A Pivot table that displays volume by species by stand is created.

Microsoft Excel - PACKEXAM.T00

File Edit View Insert Format Tools Data Window Help LMS

A3 = Sum of VolPerTree(BF)

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
	Stand	BM	CH	Cw	DF	GC	GF	MH	PY	RA	RC	WH	WI	XX	YC	Grand Total
5	BR_1300_ROAD				221					0						221
6	BR_RA_EA	572	820		3701					1106						6199
7	BR_STEEPLES	279	685		12506		534			4303	1782	3660			166	23915
8	BR_TRI				10771					3176		160				14107
9	BR_TRI_27	92			5980					115		22				6209
10	BR_UP_MURPHY	5519	261		31166			144		2955		56				40101
11	MF_BOULDER_S				0						34	0				34
12	MR_27CR_E_TH	0			4804		0			0		0				4804
13	MR_27CR_RMZ			2113	7253				0	802	5359	90				15617
14	MR_27CR_W_TH	0		106	4026						174	722				5028
15	MR_BIG_PONDS	45			3713					7798						11556
16	MR_BUCK_N				51					0	0	20				71
17	MR_BUCK_S			0	535	0				0						535
18	MR_BUCK_WET				0					0						0
19	MR_CCUT_CTRL				0					0						0
20	MR_FIBER			2108												2108
21	MR_GEORGE_SP	0	0	0	2097					0		0				2097
22	MR_HY_POPLAR			1747												1747
23	MR_LLMASH_E	153			20740					1704						22597
24	MR_LLMASH_W														0	0
25	MR_LMASHELL	0		0	0					0			0		0	0
26	MR_MURPHYFLD														0	0
27	MR_NON_FOR														0	0
28	MR_NwTIC_MDW				10506											10506
29	MR_PONDS	0		45	34	0	0			119			144			342
30	MR_SEEDTREE			0	0	0	0			0						0
31	MR_SHELTERWD			0	962		0			0		0				962
32	MR_SLIDE														0	0
33	MR_SUBDIV	61	704		16264					956	44	183				18212
34	MR_WATERFALL	115			1944					1316						3375
35	MR_WELL				0					0						0
36	MR_Y_THIN			0	1664					0						1664
37	Grand Total	6836	2470	6119	138938	0	534	144	0	24350	7393	4913	144	0	166	192007

Sheet2 / PACKEXAM /

Ready

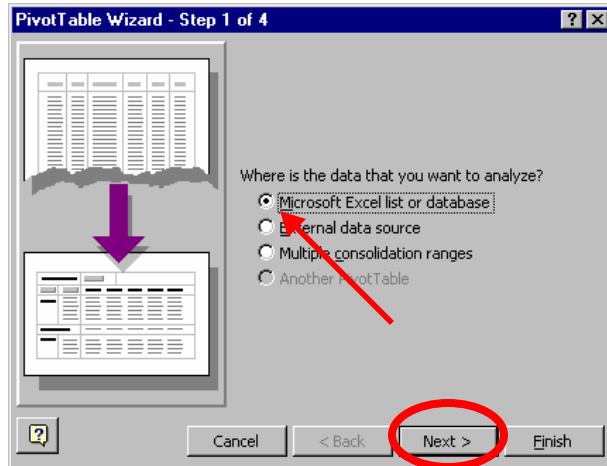
Pivot Table using Excel 2000

To change pivot table field values double-click on upper left cell of pivot table to get **Pivot Table Fields** dialogue box. Select appropriate summary type and click **OK**.

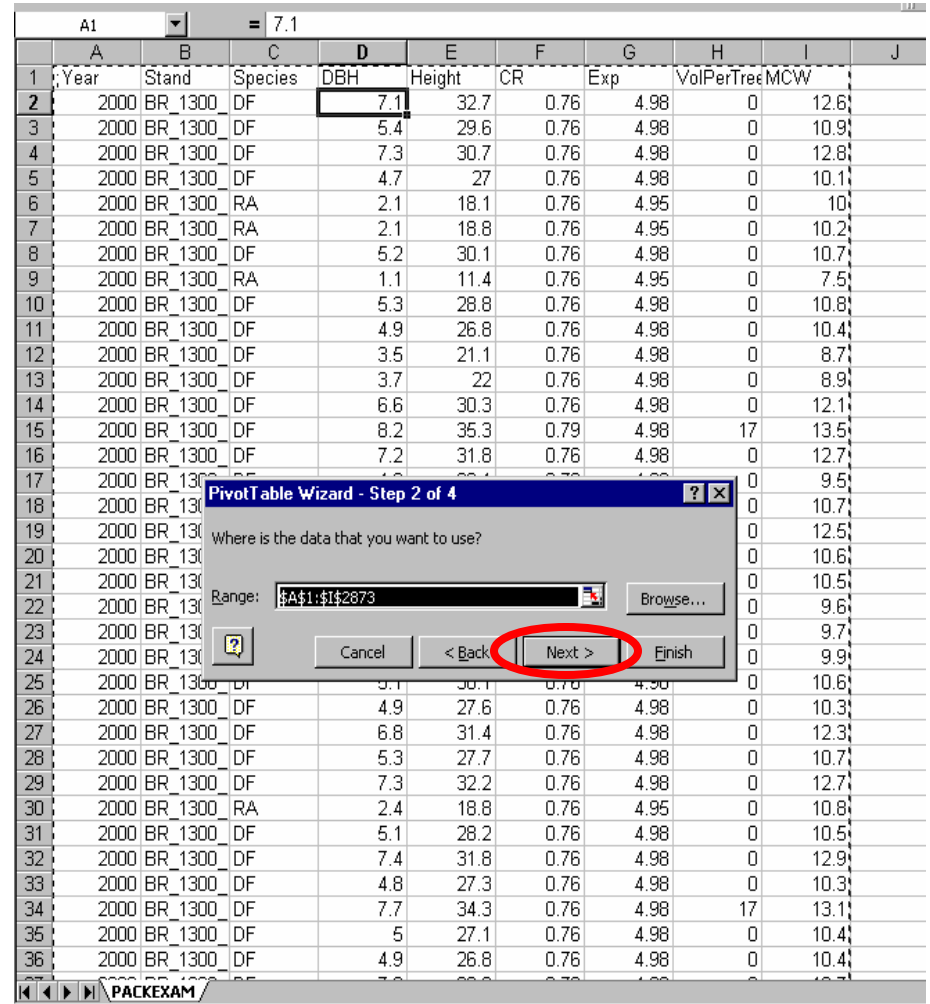
The screenshot shows the Microsoft Excel 2000 interface. A PivotTable is displayed on the 'Sheet2' tab, with the data source 'VolPerTree(BF)'. The PivotTable has 'Stand' in the Row field and 'Species' in the Column field. The 'Sum of VolPerTree(BF)' is the calculated field. The 'PivotTable Field' task box is open, showing the 'Sum' function selected in the 'Summarize by' list. The 'OK' button is highlighted.

Stand	BM	CH	CW	DF	WH	WI	XX	YC	Grand Total
BR_1300_ROAD									221
BR_RA_EA	572	820							6199
BR_STEEPLES	279	685							23915
BR_TRI									
BR_TRI_27	92								14107
BR_UP_MURPHY	5519	261							6209
MF_BOULDER_S									40101
MR_27CR_E_TH	0								34
MR_27CR_RMZ			2113						0
MR_27CR_W_TH	0		106						4804
MR_BIG_PONDS	45								15617
MR_BUCK_N									5028
MR_BUCK_S			0						11556
MR_BUCK_WET									71
MR_CCUT_CTRL									535
MR_FIBER				2108					0
MR_GEORGE_SP	0	0	0	2097					0
MR_HY_POPLAR			1747						2108
MR_LLMASH_E	153			20740					2097
MR_LLMASH_W									1747
MR_LMASHELL	0		0	0					22597
MR_MURPHYFLD									0
MR_NON_FOR									0
MR_NWTIC_MDW				10506					0
MR_PONDS	0		45	34					10506
MR_SEEDTREE			0	0	0				342
MR_SHELTERWD			0	962					0
MR_SLIDE									962
MR_SUBDIV	61	704		16264					0
MR_WATERFALL	115			1944					18212
MR_WELL				0					3375
MR_Y_THIN			0	1664					0
Grand Total	6836	2470	6119	138938	0	534	144	0	1664

Pivot Table using Excel 97

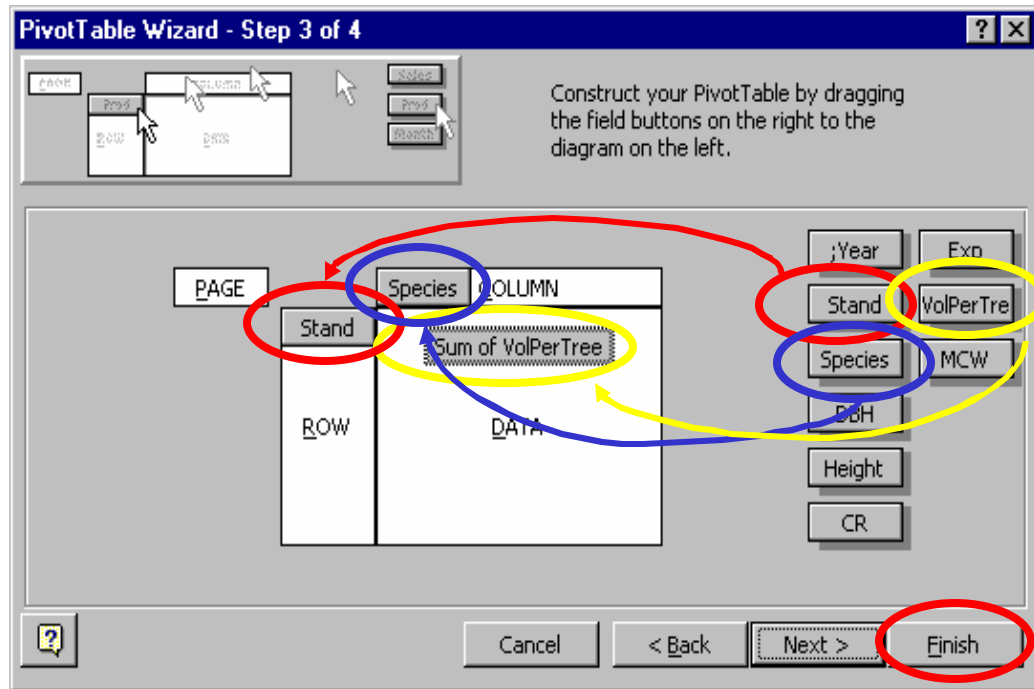


Step 3: Select **Microsoft Excel list or database**. Click **Next**.



Step 4: The data area should be surrounded by a dashed line, click on **Next**.

Pivot Table using Excel 97



Step 5: Click and drag **Stand** to the Row area, click and drag **Species** to the column area, click and drag **VolPer Tree** to the data area. Click **Finish...**

Pivot Table using Excel 97

and a **Pivot table** that displays volume by species by stand is created.

A1		= Sum of VolPerTree																	
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
1	Sum of VolPerTree	Species																	
2	Stand	BC	BM	CO	DF	GC	GF	MH	PY	RA	RC	WH	WI	XX	YC	Grand Total			
3	BR_1300_ROAD				204					0						204			
4	BR_RA_EA	820	572		3701					1078						6171			
5	BR_STEEPLES	685	279		12562		534			4308	1782	3660			166	23976			
6	BR_TRI				10743					3176		160				14079			
7	BR_TRI_27		92		5945					115		22				6174			
8	BR_UP_MURPHY	261	5519		31141			144		2964		56				40085			
9	MF_BOULDER_S				0						34	0				34			
10	MR_27CR_E_TH		0		4804		0			0		0				4804			
11	MR_27CR_RMZ			2137	7253				0	802	5357	90				15639			
12	MR_27CR_W_TH		0	106	4026						174	722				5028			
13	MR_BIG_PONDS		0		3716					7838						11554			
14	MR_BUCK_N				39					0	0	20				59			
15	MR_BUCK_S			0	515	0				0						515			
16	MR_BUCK_WET				0					0						0			
17	MR_CCUT_CTRL				0					0						0			
18	MR_FIBER			2130												2130			
19	MR_GEORGE_SP	0	0	0	2028					0		0				2028			
20	MR_HY_POPLAR			1756												1756			
21	MR_LLMASH_E		153		20600					1704						22457			
22	MR_LLMASH_W													0		0			
23	MR_LMASHELL		0	0	0					0			0			0			
24	MR_MURPHYFLD														0	0			
25	MR_NON_FOR														0	0			
26	MR_NWTIC_MDW				10190											10190			
27	MR_PONDS		0	45	34	0	0			119			144			342			
28	MR_SEEDTREE			0	0	0	0			0						0			
29	MR_SHELTERWD			0	962		0			0		0				962			
30	MR_SLIDE													0		0			
31	MR_SUBDIV	704	61		16414					956	33	183				18351			
32	MR_WATERFALL		115		1896					1316						3327			
33	MR_WELL				0					0						0			
34	MR_Y_THIN			0	1664					0						1664			
35	Grand Total	2470	6791	6174	138437	0	534	144	0	24376	7380	4913	144	0	166	191529			
36																			
37																			
38																			

Column charts are used in Excel to visually display data quantity distributions.

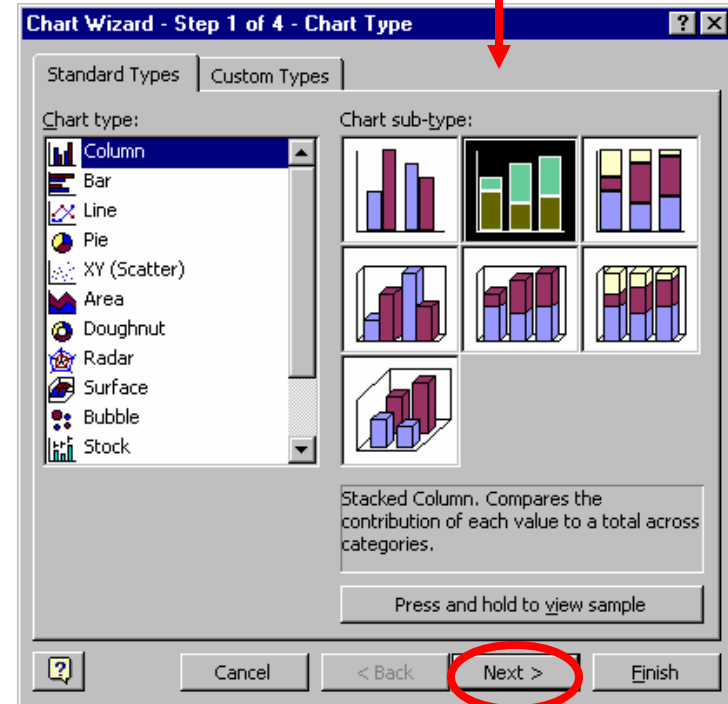
In the next few pages, the user will learn to create a column chart that summarizes timber volumes and grades for the Pack Example landscape.

	B1		= species				
	A	B	C	D	E	F	G
1	year	species	pole(mbf/s	sawtimber	large_saw	timber(mbf/stand)	
2	2000	BC	26	124	47		
3	2000	BM	197	340	79		
4	2000	CO	235	3	162		
5	2000	DF	1122	6721	3275		
6	2000	GC	0	0	0		
7	2000	GF	6	36	0		
8	2000	MH	0	13	0		
9	2000	PY	0	0	0		
10	2000	RA	1552	640	0		
11	2000	RC	60	86	415		
12	2000	WH	41	76	232		
13	2000	WI	0	7	0		
14	2000	XX	0	0	0		
15	2000	YC	13	0	0		
16							
17							
18							
19							
20							

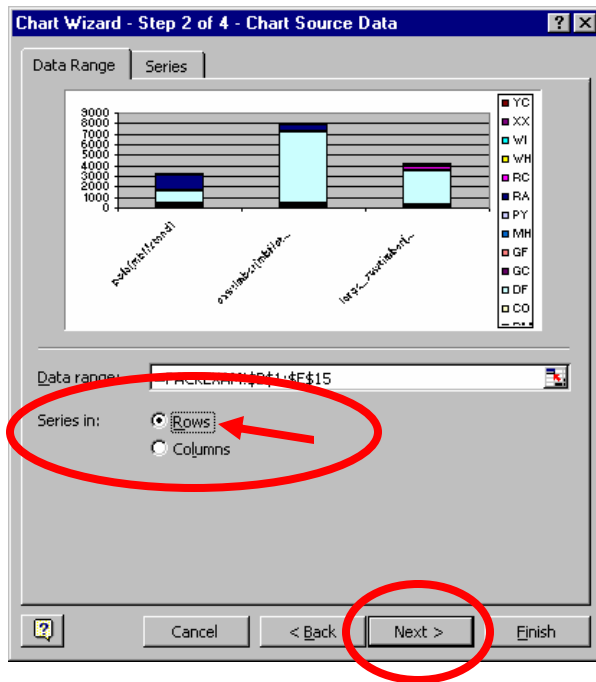
Step 1: In **LMS** main window click **Analysis/Tables/Volume by Species and Size**, open and delimit (use the macro created earlier) Volume by Species and Size table. **Highlight** the species and log size columns.



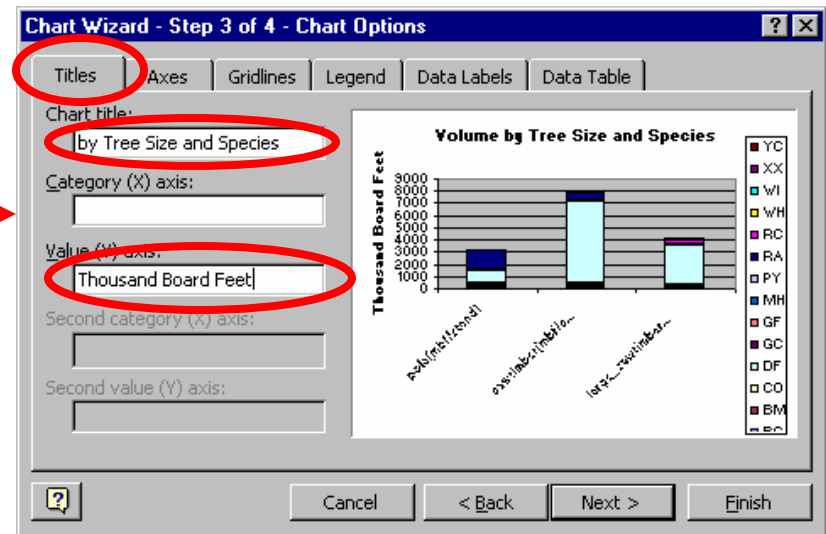
Step 2: From the Excel tool bar **Graphical User Interface (GUI)**, click on the **Chart Wizard** button. This can also be accomplished from the drop down menu by clicking **Insert/Chart**.



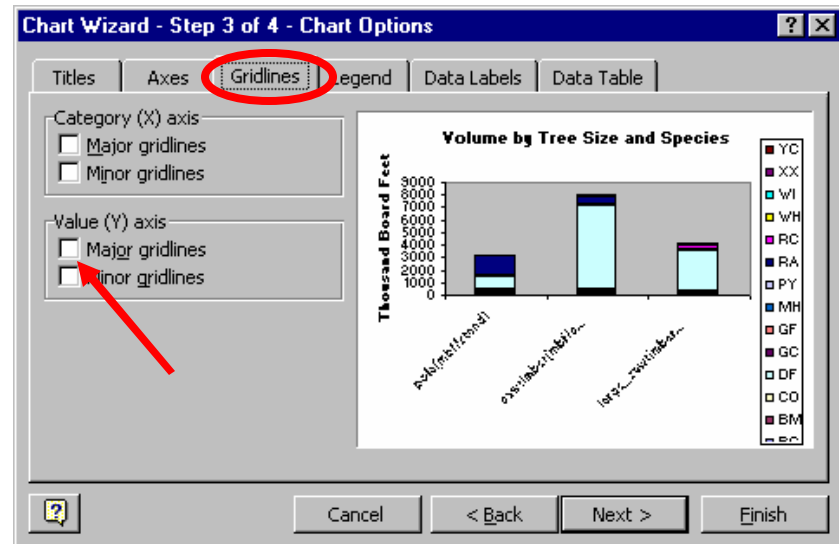
Step 3: Choose the **Column** chart in the top center. Click **Next**.



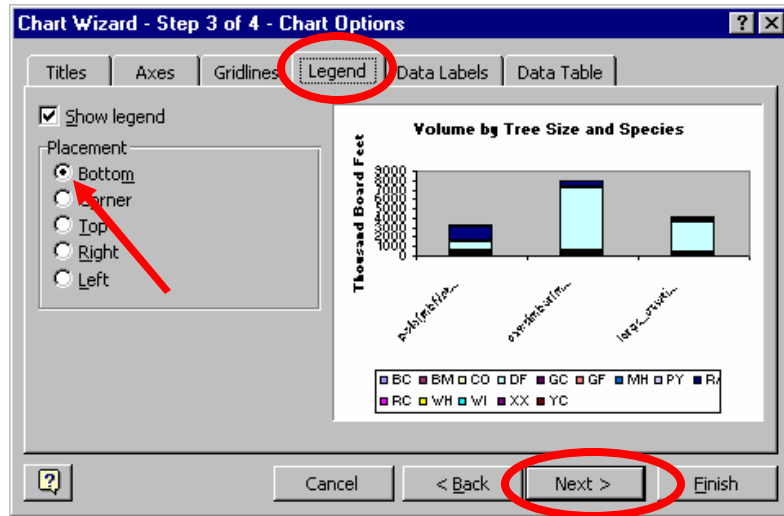
Step 4: Click **Series in Rows**. Click **Next**.



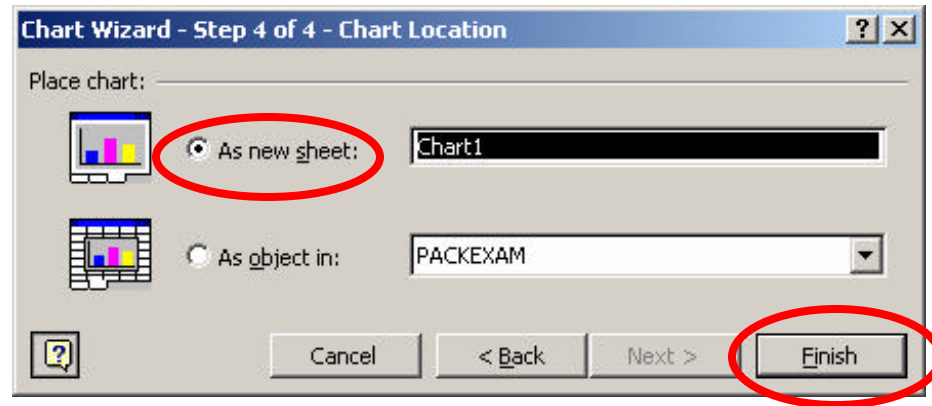
Step 5: Click on the **Titles** tab and **add title**, Volume by Tree Size and Species. **Label Y axis** by typing in Thousand Board Feet.



Step 6: Click on the **Gridlines** tab and uncheck **Major gridlines**.

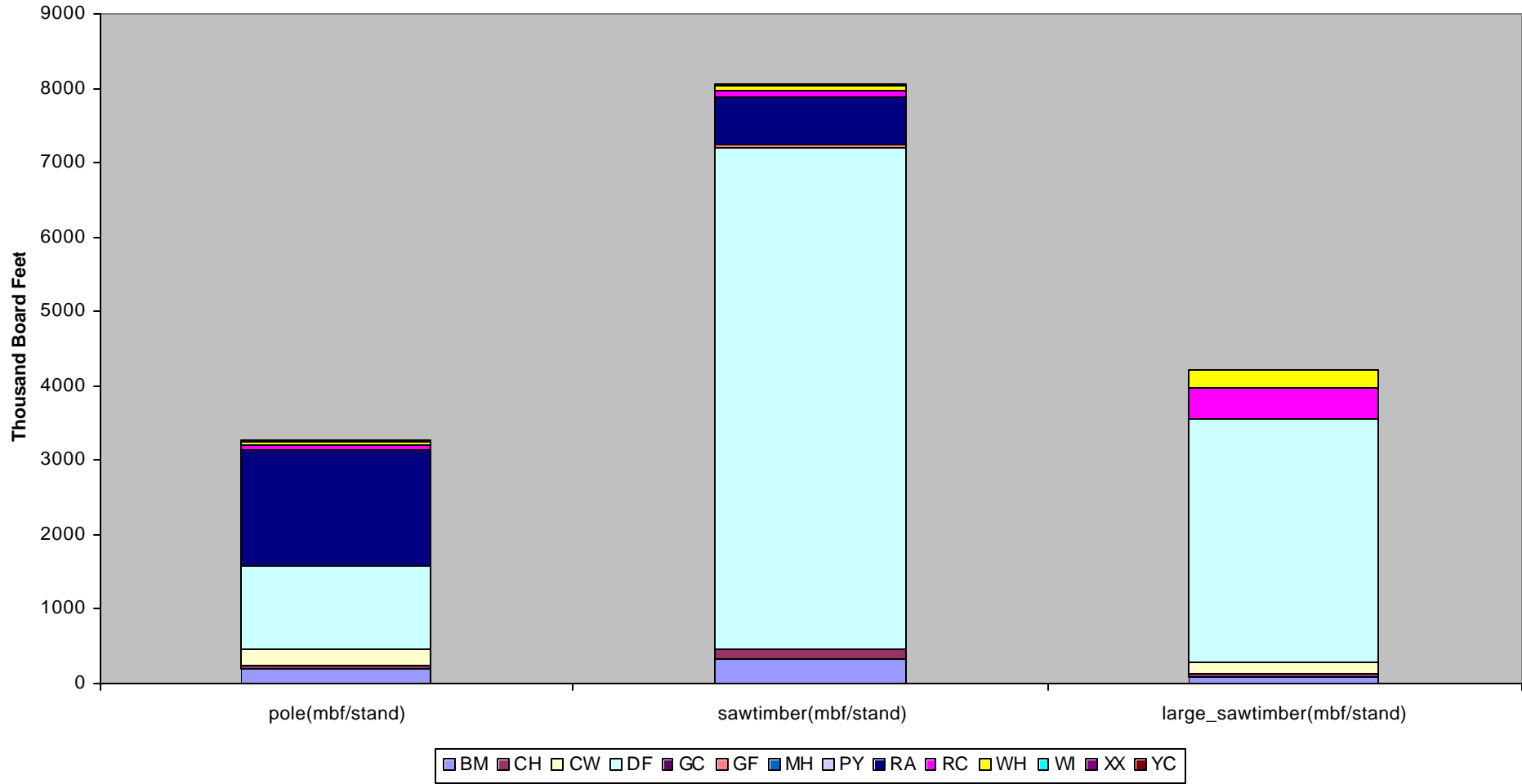


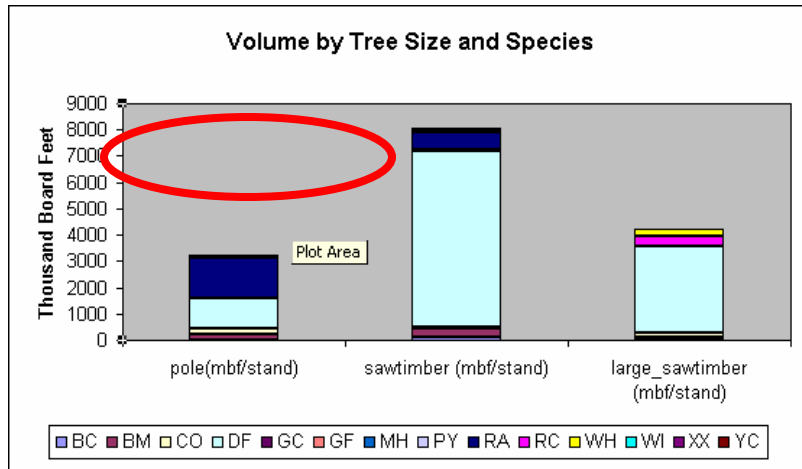
Step 7: Click the **Legend** Tab. Click on **Bottom** to move the legend to the bottom of the chart. Click **Next**.



Step 8: Click **new sheet** as location for this chart. Click **Finish**.

Volume by Tree Size and Species





Step 9: Right click on the **Y axis** and then click **Format Axis**.

Format Axis

Patterns Scale Font Number Alignment

Value (Y) axis scale

Auto

☒ Minimum: 0

☐ Maximum: 10000

☒ Major unit: 5000

☐ Minor unit: 200

☒ Category (X) axis

Crosses at: 0

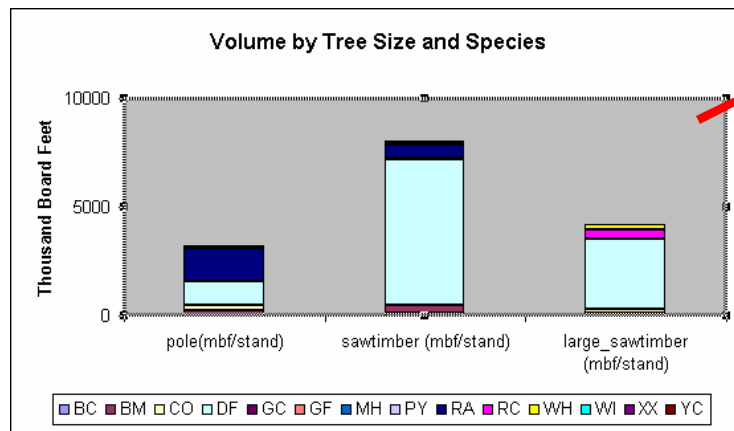
☐ Logarithmic scale

☐ Values in reverse order

☐ Category (X) axis crosses at maximum value

OK Cancel

Step 10: Click on the **Scale** tab. Change the **Maximum** to 10000 and the **Major** unit to 5000. Click **OK**.



Format Plot Area...

Chart Type...

Source Data...

Chart Options...

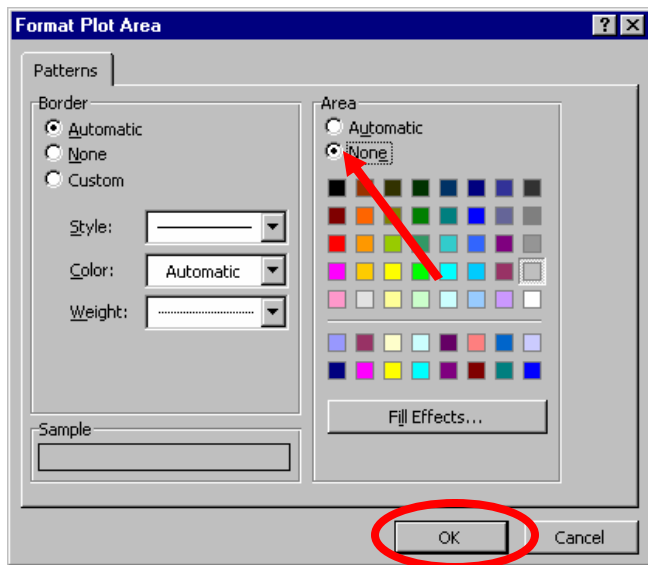
Location...

3-D View...

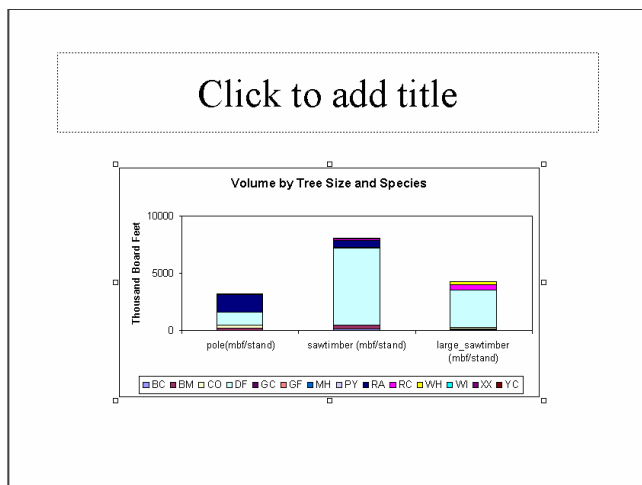
Chart Window

Clear

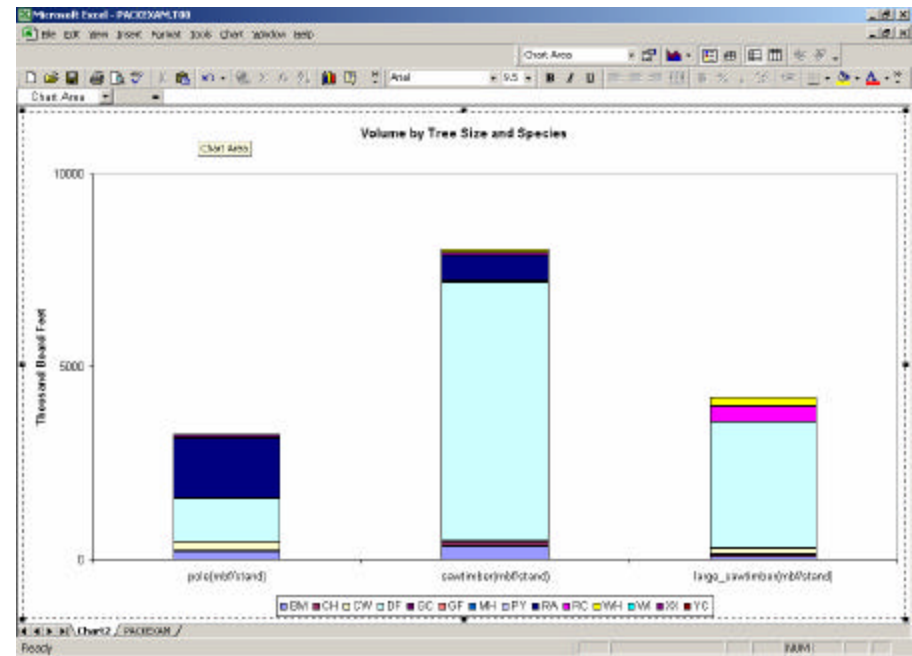
Step 11: Right click in the plot area. Then click **Format Plot Area**.



Step 12: Select **None** for **Area**.
Click **OK**.



font size to 24, and click bold. Type in Title, **Volume by Species and Tree Size Summaries made in Excel from the Volume by Species and Size table**. Size the pasted chart to fit available space by dragging one of the small corner squares. Slide is finished.

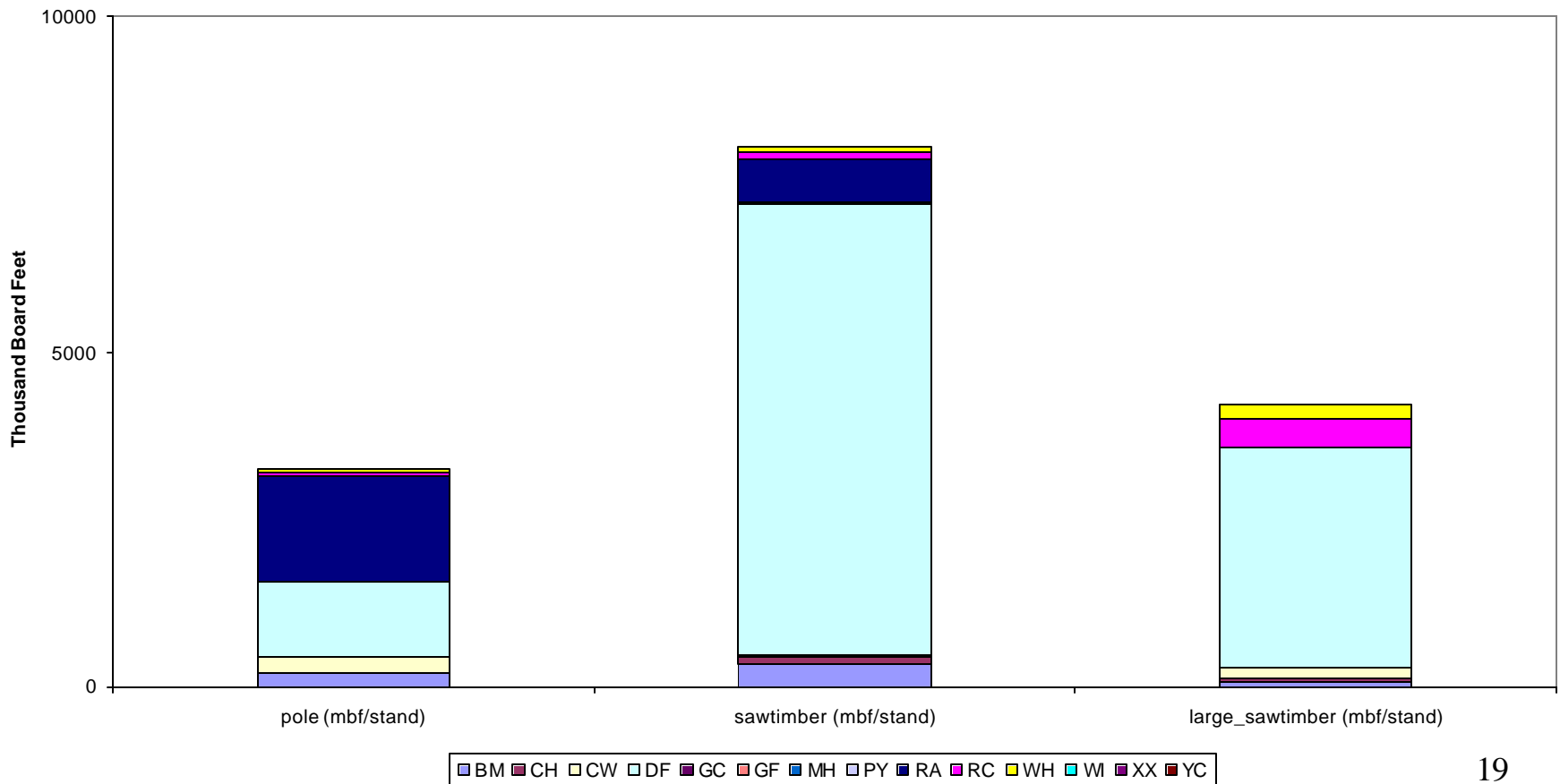


Step 13: To copy and paste the chart into a PowerPoint presentation, click on the chart border to select. The chart is selected when small squares appear on the border. Click on the **Edit** in the Excel drop down menu and click **Copy**. Go to PowerPoint

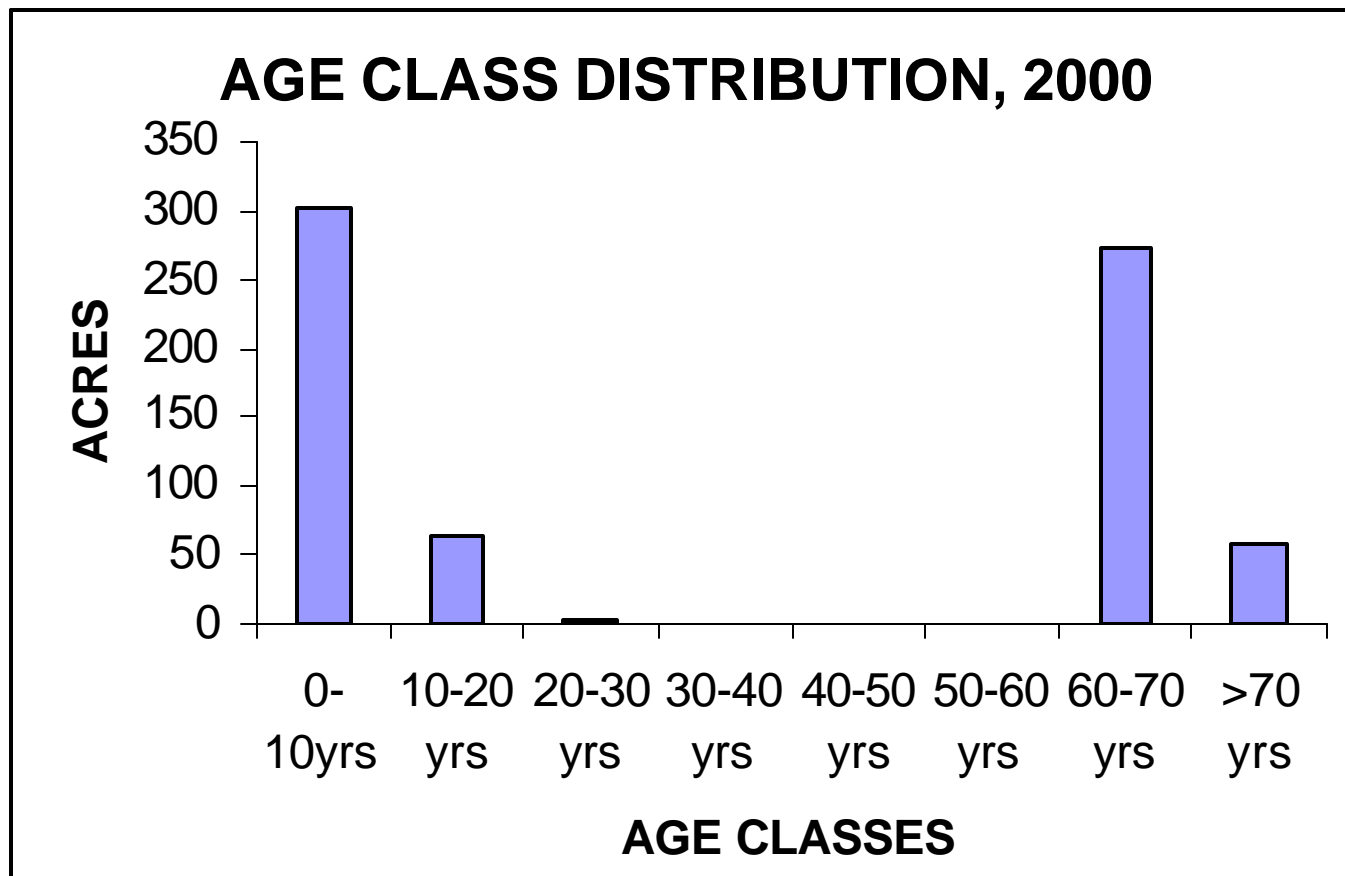
Step 14: With a new slide open in PowerPoint (add title format), click the **Edit** drop down menu and then click **Paste**. Click in the **add title** space provided on slide, adjust

Volume by Species and Tree Size Summaries made in Excel from the Volume by Species and Size table

Volume by Tree Size and Species



Excel column charts can also be used to display Age class distribution. For this exercise the user will learn to use IF statements to group data and then use grouped data to create a chart.



	E	F	G	H	I	J	K	L	M	N
1	HabitatCoc	Age	Slope	Aspect	Elev	Lat	Acres	0-10	11-20	21-30
2	0	9	28.1	249.1	1509.1	0	15.2	=IF(\$F2<11,\$K2,0)		
3	0	67	21.7	262	1367.6	0	17.7			
4	0	72	13.1	187.6	1244.9	0	58.6			
5	0	67	24.5	202.8	1428.3	0	35.4			
6	0	67	33.1	160.6	1493.1	0	13.8			
7	0	67	32.9	174.4	1525.2	0	78			

Step 3: To group the stands into the appropriate age classes, an **IF** statement is used. Click on cell L2, the first cell under the 0-10 age class heading. Type in **IF** formula as shown, =IF(\$F2<11,\$K2,0). The first part of the **IF** statement (\$F2<11) evaluates the stand age. In this case if the stand is less than 11 years old. The second (\$K2) part of the **IF** statement says what to put in that cell if the first part is true, in this case the stand acreage. The third part of the **IF** statement (0) says what to put in the cell if the first part of the statement is false. For this example the first and last columns of age class cell formulas are created in a similar manner. For the last column cell (S2), type in the formula: =IF(\$F2>70,\$K2,0).

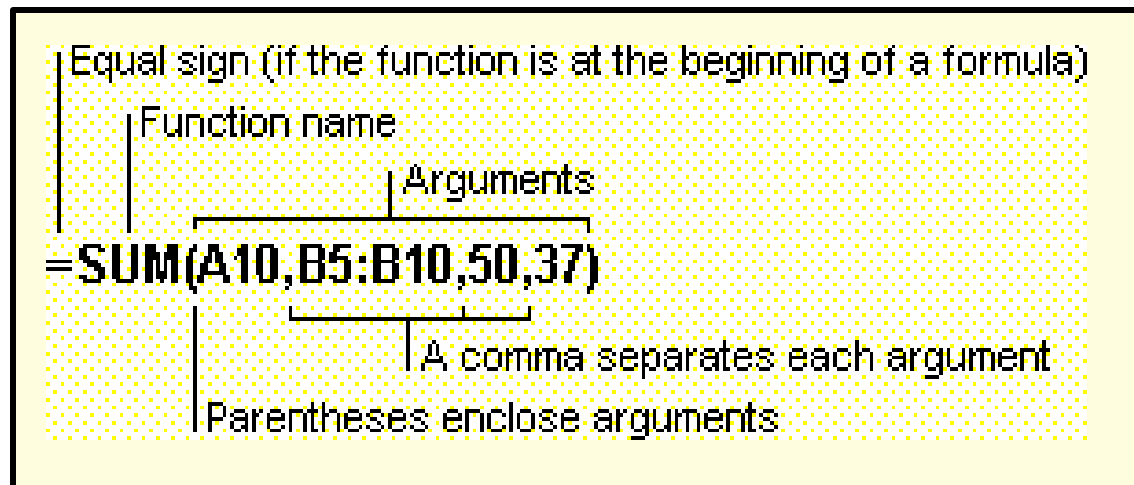
	F	G	H	I	J	K	L	M	N	O
		Slope	Aspect	Elev	Lat	Acres	0-10	11-20	21-30	31-40
9		28.1	249.1	1509.1	0	15.2	15.2	=IF(AND(\$F2>10,\$F2<21),\$K2,0)		
67		21.7	262	1367.6	0	17.7				
72		13.1	187.6	1244.9	0	58.6				
67		24.5	202.8	1428.3	0	35.4				
67		33.1	160.6	1493.1	0	13.8				
67		32.9	174.4	1525.2	0	78				

Step 4: For the middle columns, the stand age class is a more discrete range (11-20, 21-30, etc.). Here the **IF** statement is varied a little by using an **AND** condition to pick up the range. Only the first part of the **IF** statement changes. Now a range is given using the **AND** condition, =IF(AND(\$F2>10,\$F2<21),\$K2,0). Now the first part of the **IF** statement must meet both conditions to be considered true, for example older than 10 and younger than 21. Repeat using appropriate ranges for the rest of the middle columns in this row.

Note: \$ are used in Excel formulas to fix column and/or row designates so that when formulas are copied to other cells the reference remains constant. For our age grouping the column reference must remain the same but the row reference must adjust to accommodate entry in the data table from each of the Pack stands in lower rows.

Subsequently, the column designate is preceded by the \$ while the row designate is not (example: \$F2, \$K2).

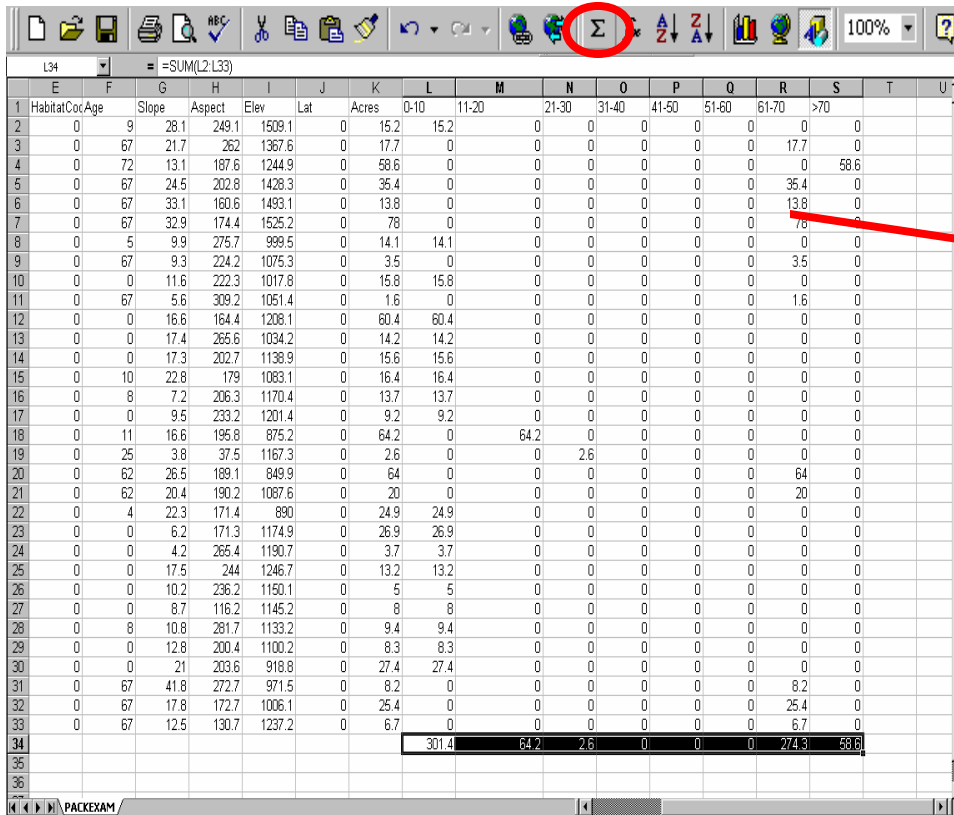
Parentheses are used in Excel to isolate components of formulas called arguments. In the case of the greater or less than formula used in the previous steps, one set of parentheses is used, however, when we isolate discrete ranges for age groups an additional set of parentheses is required to separate the AND portion (range) of the formula from the IF portion. Below see formula schematic from Excel help.



L2		=IF(\$F2<11,\$K2,0)														
	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T
1	Habitat	Coc	Age	Slope	Aspect	Elev	Lat	Acres	0-10	11-20	21-30	31-40	41-50	51-60	61-70	>70
2		0	9	28.1	249.1	1509.1	0	15.2	15.2	0	0	0	0	0	0	0
3		0	67	21.7	262	1367.6	0	17.7								
4		0	72	13.1	187.6	1244.9	0	58.6								
5		0	67	24.5	202.8	1428.3	0	35.4								
6		0	67	33.1	160.6	1493.1	0	13.8								
7		0	67	32.9	174.4	1525.2	0	78								
8		0	5	9.9	275.7	999.5	0	14.1								
9		0	67	9.3	224.2	1075.3	0	3.5								
10		0	0	11.6	222.3	1017.8	0	15.8								

Step 5: Once all of the **IF** statements are entered into the first row, the columns can be **filled** (copied) down. This will put the appropriate **IF** statement into each cell to segregate stand acreage by age class. To **fill**, select all the cells with the **IF** statements entered. A little square will appear on the bottom right-hand corner of the selected cells. Click on this square and drag down. The **IF** statements will then copy to all cells to create the new table. This table will display acreage by age class.

L2	=IF(\$F2<11,\$K2,0)																
	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
1	Habitat	Coc	Age	Slope	Aspect	Elev	Lat	Acres	0-10	11-20	21-30	31-40	41-50	51-60	61-70	>70	
2	0	9	28.1	249.1	1509.1	0	15.2	15.2	0	0	0	0	0	0	0	0	0
3	0	67	21.7	262	1367.6	0	17.7	0	0	0	0	0	0	0	17.7	0	0
4	0	72	13.1	187.6	1244.9	0	58.6	0	0	0	0	0	0	0	0	58.6	0
5	0	67	24.5	202.8	1428.3	0	35.4	0	0	0	0	0	0	0	35.4	0	0
6	0	67	33.1	160.6	1493.1	0	13.8	0	0	0	0	0	0	0	13.8	0	0
7	0	67	32.9	174.4	1525.2	0	78	0	0	0	0	0	0	0	78	0	0
8	0	5	9.9	275.7	999.5	0	14.1	14.1	0	0	0	0	0	0	0	0	0
9	0	67	9.3	224.2	1075.3	0	3.5	0	0	0	0	0	0	0	3.5	0	0
10	0	0	11.6	222.3	1017.8	0	15.8	15.8	0	0	0	0	0	0	0	0	0
11	0	67	5.6	309.2	1051.4	0	1.6	0	0	0	0	0	0	0	1.6	0	0
12	0	0	16.6	164.4	1208.1	0	60.4	60.4	0	0	0	0	0	0	0	0	0
13	0	0	17.4	265.6	1034.2	0	14.2	14.2	0	0	0	0	0	0	0	0	0
14	0	0	17.3	202.7	1138.9	0	15.6	15.6	0	0	0	0	0	0	0	0	0
15	0	10	22.8	179	1083.1	0	16.4	16.4	0	0	0	0	0	0	0	0	0
16	0	8	7.2	206.3	1170.4	0	13.7	13.7	0	0	0	0	0	0	0	0	0
17	0	0	9.5	233.2	1201.4	0	9.2	9.2	0	0	0	0	0	0	0	0	0
18	0	11	16.6	195.8	875.2	0	64.2	0	64.2	0	0	0	0	0	0	0	0
19	0	25	3.8	37.5	1167.3	0	2.6	0	0	2.6	0	0	0	0	0	0	0
20	0	62	26.5	189.1	849.9	0	64	0	0	0	0	0	0	0	64	0	0
21	0	62	20.4	190.2	1087.6	0	20	0	0	0	0	0	0	0	20	0	0
22	0	4	22.3	171.4	890	0	24.9	24.9	0	0	0	0	0	0	0	0	0
23	0	0	6.2	171.3	1174.9	0	26.9	26.9	0	0	0	0	0	0	0	0	0
24	0	0	4.2	265.4	1190.7	0	3.7	3.7	0	0	0	0	0	0	0	0	0
25	0	0	17.5	244	1246.7	0	13.2	13.2	0	0	0	0	0	0	0	0	0
26	0	0	10.2	236.2	1150.1	0	5	5	0	0	0	0	0	0	0	0	0
27	0	0	8.7	116.2	1145.2	0	8	8	0	0	0	0	0	0	0	0	0
28	0	8	10.8	281.7	1133.2	0	9.4	9.4	0	0	0	0	0	0	0	0	0
29	0	0	12.8	200.4	1100.2	0	8.3	8.3	0	0	0	0	0	0	0	0	0
30	0	0	21	203.6	918.8	0	27.4	27.4	0	0	0	0	0	0	0	0	0
31	0	67	41.8	272.7	971.5	0	8.2	0	0	0	0	0	0	0	8.2	0	0
32	0	67	17.8	172.7	1006.1	0	25.4	0	0	0	0	0	0	0	25.4	0	0
33	0	67	12.5	130.7	1237.2	0	6.7	0	0	0	0	0	0	0	6.7	0	0
34																	
35																	
36																	
PACKEXAM																	

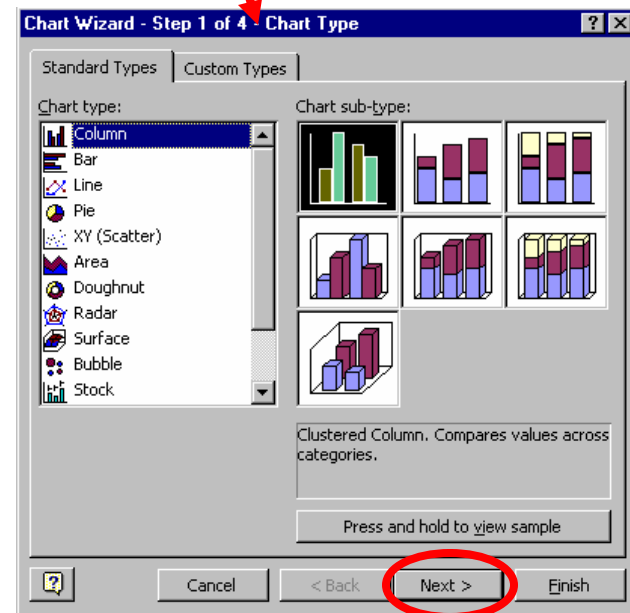


	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
1	Habitat	CocAge	Slope	Aspect	Elev	Lat	Acres	0-10	11-20	21-30	31-40	41-50	51-60	61-70	>70		
2	0	9	28.1	249.1	1509.1	0	15.2	15.2	0	0	0	0	0	0	0		
3	0	67	21.7	262	1367.6	0	17.7	0	0	0	0	0	0	0	17.7	0	
4	0	72	13.1	187.6	1244.9	0	58.6	0	0	0	0	0	0	0	0	58.6	
5	0	67	24.5	202.8	1428.3	0	35.4	0	0	0	0	0	0	0	35.4	0	
6	0	67	33.1	160.6	1493.1	0	13.8	0	0	0	0	0	0	0	13.8	0	
7	0	67	32.9	174.4	1525.2	0	7.8	0	0	0	0	0	0	0	7.8	0	
8	0	5	9.9	275.7	999.5	0	14.1	14.1	0	0	0	0	0	0	0	0	
9	0	67	9.3	224.2	1075.3	0	3.5	0	0	0	0	0	0	0	3.5	0	
10	0	0	11.6	222.3	1017.8	0	15.8	15.8	0	0	0	0	0	0	0	0	
11	0	67	5.6	309.2	1051.4	0	1.6	0	0	0	0	0	0	0	1.6	0	
12	0	0	16.6	164.4	1208.1	0	60.4	60.4	0	0	0	0	0	0	0	0	
13	0	0	17.4	265.6	1034.2	0	14.2	14.2	0	0	0	0	0	0	0	0	
14	0	0	17.3	202.7	1138.9	0	15.6	15.6	0	0	0	0	0	0	0	0	
15	0	10	22.8	179	1083.1	0	16.4	16.4	0	0	0	0	0	0	0	0	
16	0	8	7.2	206.3	1170.4	0	13.7	13.7	0	0	0	0	0	0	0	0	
17	0	0	9.5	233.2	1201.4	0	9.2	9.2	0	0	0	0	0	0	0	0	
18	0	11	16.6	195.8	875.2	0	64.2	0	64.2	0	0	0	0	0	0	0	
19	0	25	3.8	37.5	1167.3	0	2.6	0	0	2.6	0	0	0	0	0	0	
20	0	62	26.5	189.1	849.9	0	64	0	0	0	0	0	0	0	64	0	
21	0	62	20.4	190.2	1087.6	0	20	0	0	0	0	0	0	0	20	0	
22	0	4	22.3	171.4	890	0	24.9	24.9	0	0	0	0	0	0	0	0	
23	0	0	6.2	171.3	1174.9	0	26.9	26.9	0	0	0	0	0	0	0	0	
24	0	0	4.2	265.4	1190.7	0	3.7	3.7	0	0	0	0	0	0	0	0	
25	0	0	17.5	244	1246.7	0	13.2	13.2	0	0	0	0	0	0	0	0	
26	0	0	10.2	236.2	1150.1	0	5	5	0	0	0	0	0	0	0	0	
27	0	0	8.7	116.2	1145.2	0	8	8	0	0	0	0	0	0	0	0	
28	0	8	10.8	281.7	1133.2	0	9.4	9.4	0	0	0	0	0	0	0	0	
29	0	0	12.8	200.4	1100.2	0	8.3	8.3	0	0	0	0	0	0	0	0	
30	0	0	21	203.6	918.8	0	27.4	27.4	0	0	0	0	0	0	0	0	
31	0	67	41.8	272.7	971.5	0	8.2	0	0	0	0	0	0	0	8.2	0	
32	0	67	17.8	172.7	1006.1	0	25.4	0	0	0	0	0	0	0	25.4	0	
33	0	67	12.5	130.7	1237.2	0	6.7	0	0	0	0	0	0	0	6.7	0	
34							301.4	64.2	2.6	0	0	0	0	274.3	58.6		

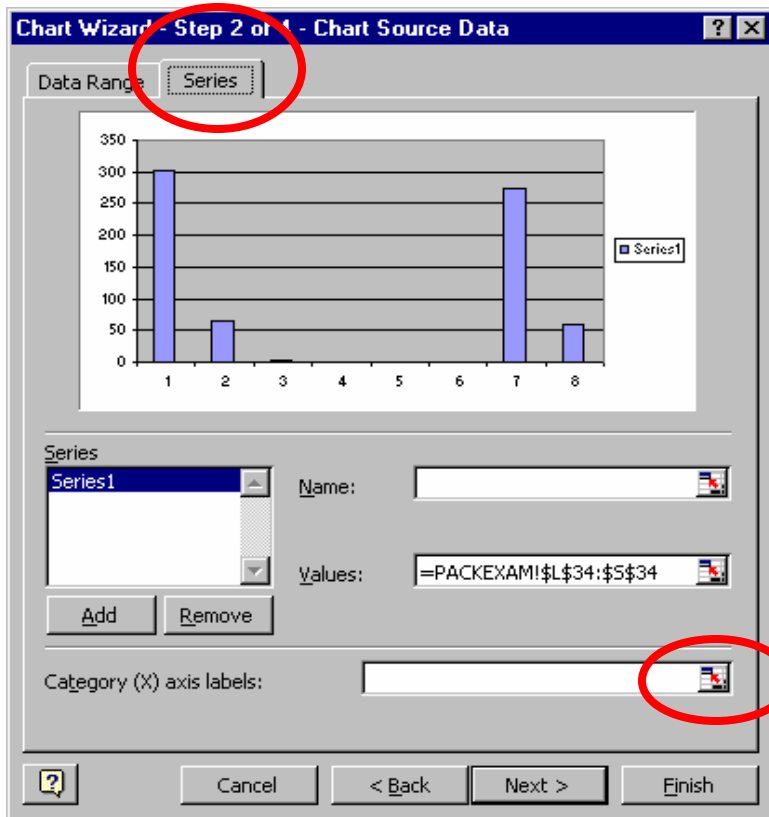
Step 6: To sum up the acres in each age class, highlight the cells across the bottom of the age class columns. Next click the **sum button (S)** from the GUI (Graphical User Interface or speed bar).



Step 7: With the summed cells still highlighted, click on the **Chart Wizard** button from the GUI or click **Insert/Chart** from the drop down menu.



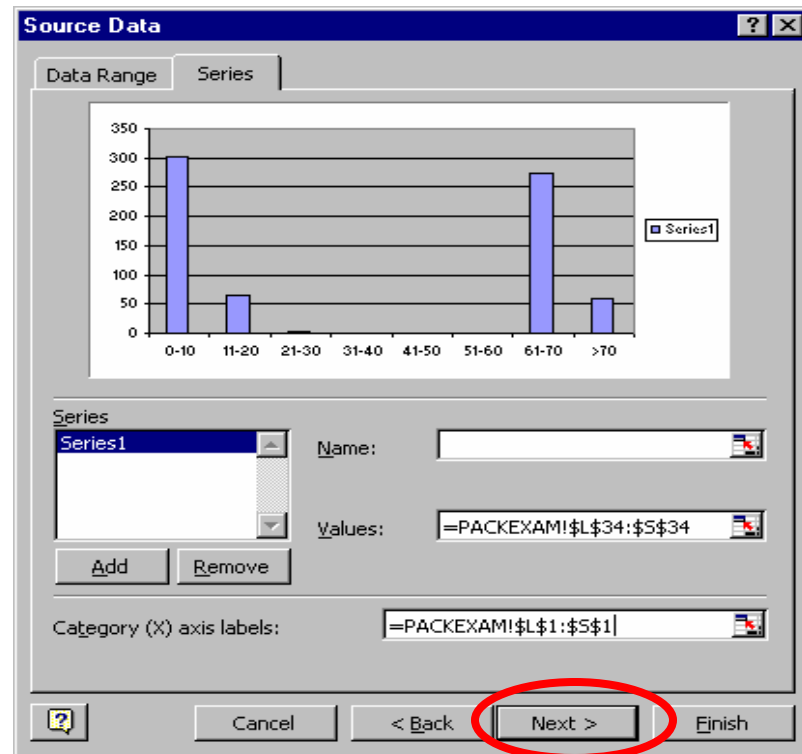
Step 8: Choose the column chart in the upper left corner and click **Next**. 25



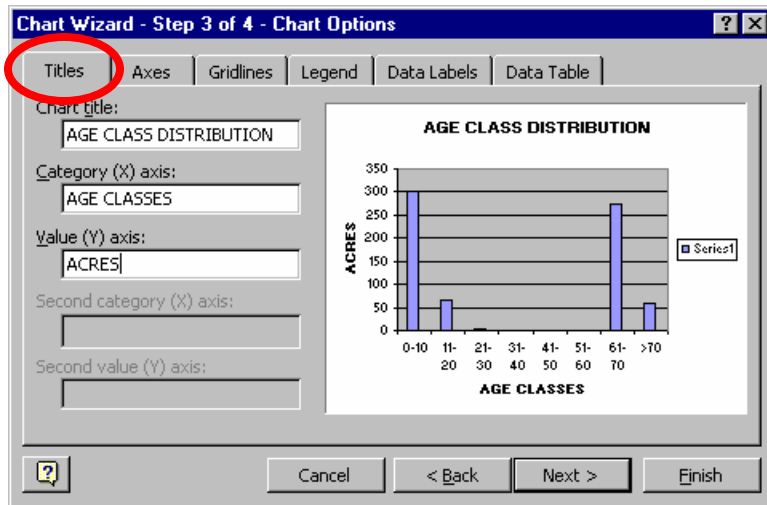
Step 9: Click on the **Series** tab.
To get the proper labels (diameter classes) on the x axis, click on the **Category (X) axis labels** box.

	J	K	L	M	N	O	P	Q	R	S	T	U
	Lat	Acres	0-10	11-20	21-30	31-40	41-50	51-60	61-70	>70		
1	0	15.2	15.2	0	0	0	0	0	0	0		
6	0	17.7	0	0	0	0	0	0	17.7	0		
9	0	58.6	0	0	0	0	0	0	0	58.6		
3	0	35.4	0	0	0	0	0	0	35.4	0		
1	0	13.8	0	0	0	0	0	0	13.8	0		
2	0	78	0	0	0	0	0	0	78	0		
5	0	14.1	14.1	0	0	0	0	0	0	0		
3	0	3.5	0	0	0	0	0	0	0	0		
8	0	15.8	15.8	0	0	0	0	0	0	0		
4	0	1.6	0	0	0	0	0	0	1.6	0		
1	0	60.4	60.4	0	0	0	0	0	0	0		
2	0	14.2	14.2	0	0	0	0	0	0	0		
9	0	15.6	15.6	0	0	0	0	0	0	0		

Step 10: Highlight the age classes and click on the box again. Age classes will appear on the x axis.



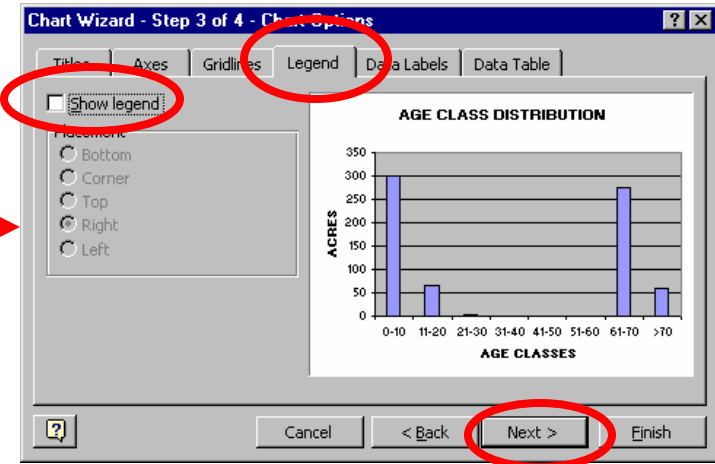
Step 11: Click on **Next**.



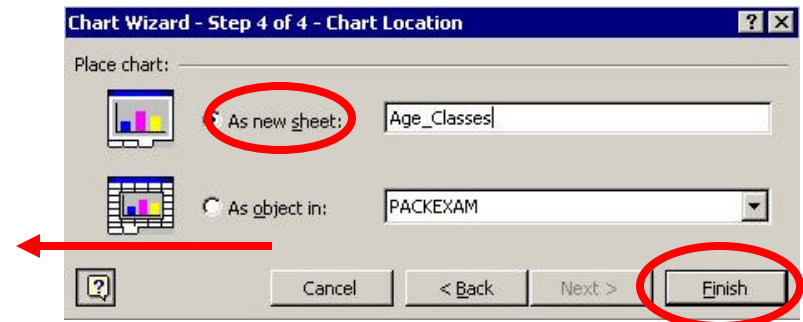
Step 12: Click on the **Titles** tab and enter the appropriate titles as shown.



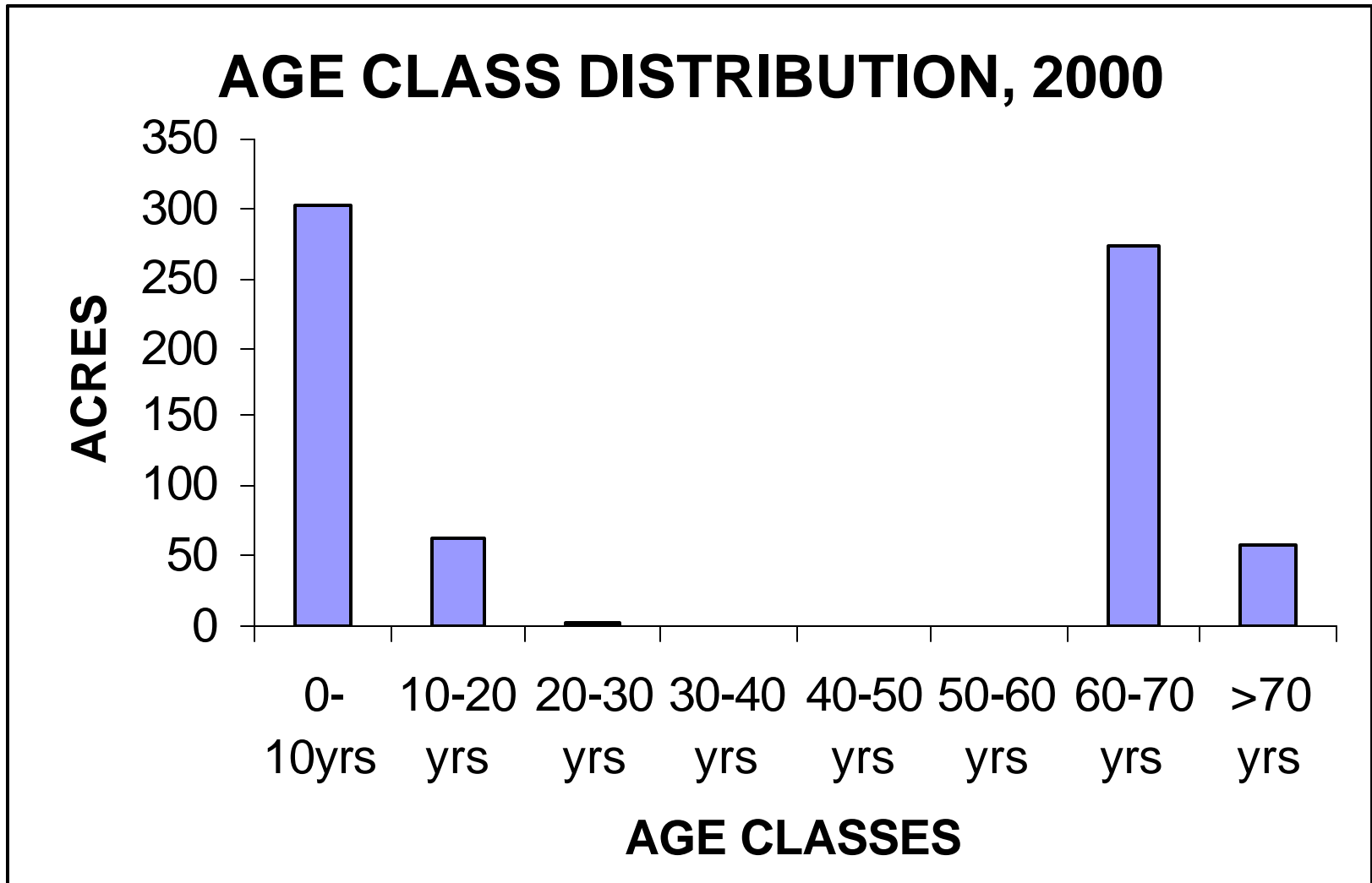
Step 14: Make other chart format changes as desired and then **Copy and Paste** the chart into PowerPoint (see previous chart paste).



Step 13: Click on the **Legend** tab and uncheck **Show legend**. Click **Next**, then **As new sheet**, replace **Chart1** with **Age_Classes**, and then click **Finish**.

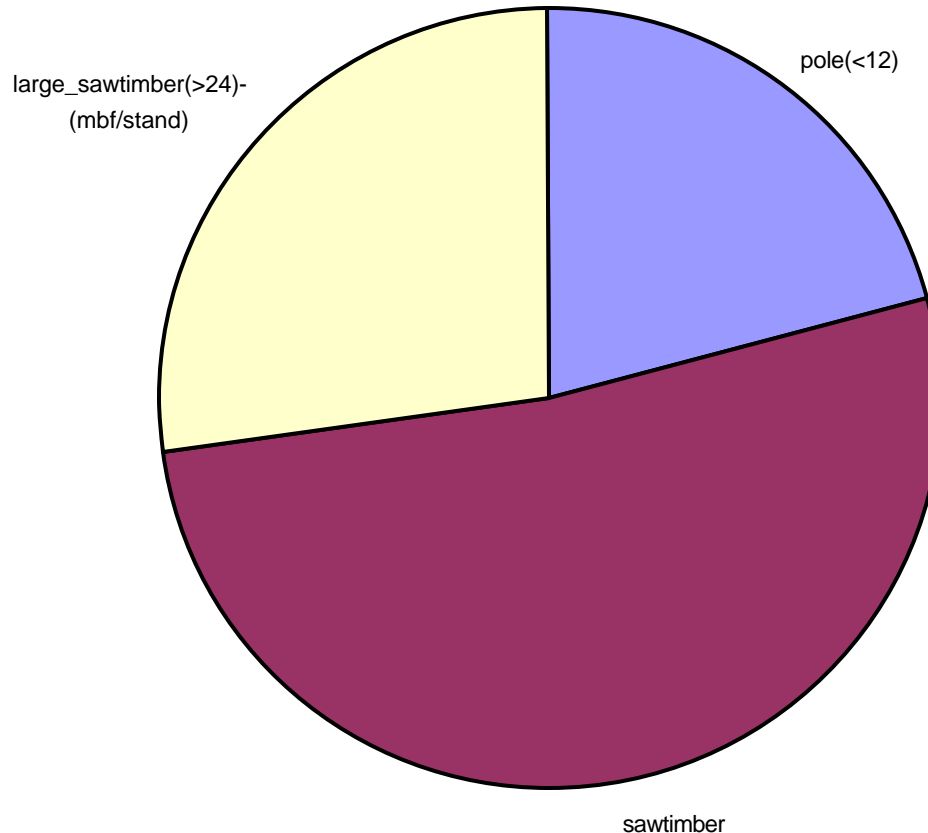


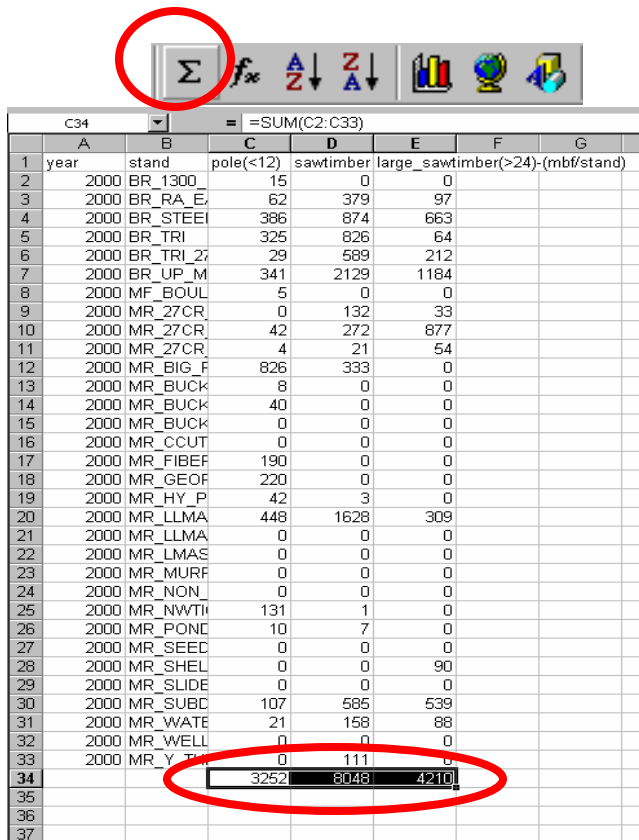
Made in Excel from the Stand Attributes table



A number of chart types are available for creation within Excel. Next, the user will learn to create a pie chart that displays volume by tree size for the landscape.

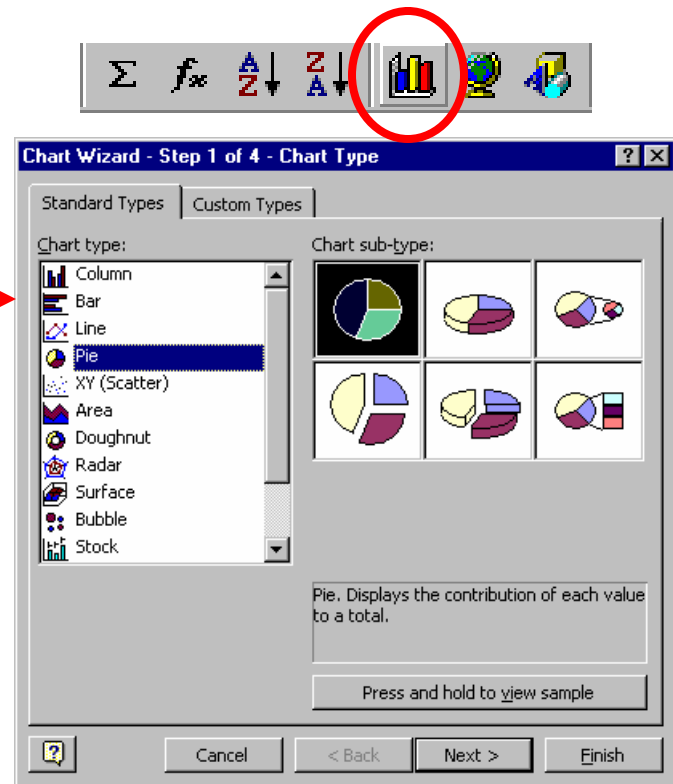
Volume by Tree Size for Landscape



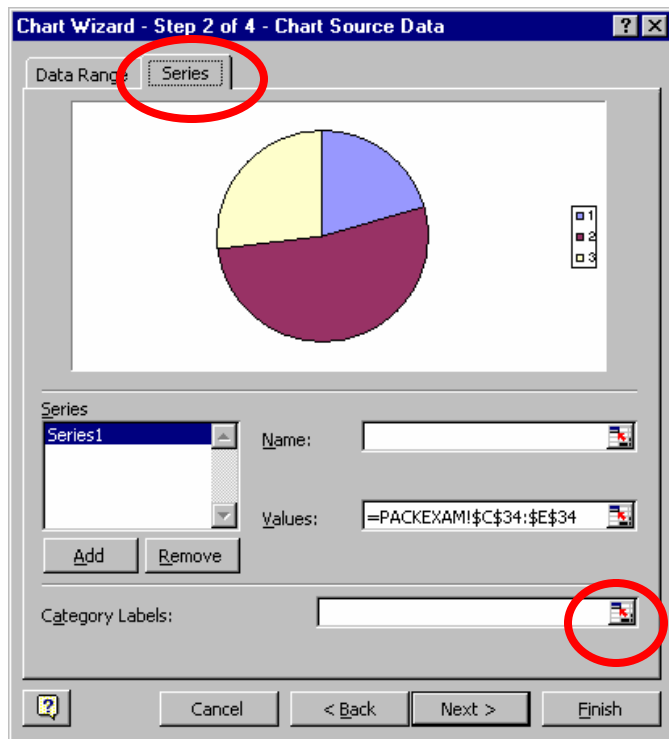


	A	B	C	D	E	F	G
1	year	stand	pole(<12)	sawtimber	large_sawtimber(>24)	(mbf/stand)	
2	2000	BR_1300	15	0	0		
3	2000	BR_RA_E	62	379	97		
4	2000	BR_STEE	386	874	663		
5	2000	BR_TRI	325	826	64		
6	2000	BR_TRI_2	29	589	212		
7	2000	BR_UP_M	341	2129	1184		
8	2000	MR_BOUL	5	0	0		
9	2000	MR_27CR	0	132	33		
10	2000	MR_27CR	42	272	877		
11	2000	MR_27CR	4	21	54		
12	2000	MR_BIG_F	826	333	0		
13	2000	MR_BUCK	8	0	0		
14	2000	MR_BUCK	40	0	0		
15	2000	MR_BUCK	0	0	0		
16	2000	MR_CCUT	0	0	0		
17	2000	MR_FIBER	190	0	0		
18	2000	MR_GEOF	220	0	0		
19	2000	MR_HY_P	42	3	0		
20	2000	MR_LLMA	448	1628	309		
21	2000	MR_LLMA	0	0	0		
22	2000	MR_LMAS	0	0	0		
23	2000	MR_MURF	0	0	0		
24	2000	MR_NON	0	0	0		
25	2000	MR_NWTI	131	1	0		
26	2000	MR_POND	10	7	0		
27	2000	MR_SEED	0	0	0		
28	2000	MR_SHEL	0	0	90		
29	2000	MR_SLIDE	0	0	0		
30	2000	MR_SUBC	107	585	539		
31	2000	MR_WATE	21	158	88		
32	2000	MR_WELL	0	0	0		
33	2000	MR_Y_TH	0	111	0		
34			3252	8048	4210		
35							
36							
37							

Step 1: In LMS main window click **Analysis/Tables/Volume by Size Class**. Open and delimit (your macro) the Volume by Size Class table. Highlight the cells on the bottom of the size class columns. Click the Sum (S) button from the GUI. This will add up the volumes in each size class.



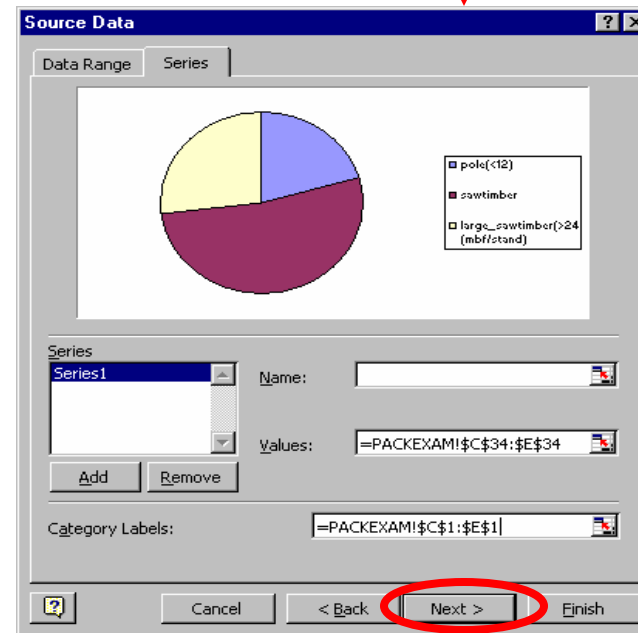
Step 2: With the Sums still selected, click the **Chart Wizard** button. Select Chart type: Pie and then chose the **Pie** chart in the upper left corner.



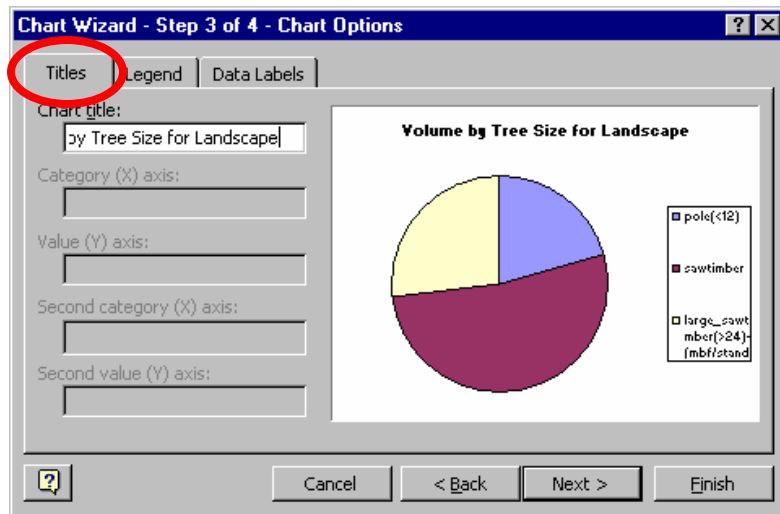
Step 3: Click on the **Series** tab then click on the **Category Labels** box.

	A	B	C	D	E	F	G	H
1	year	stand	pole(<12)	sawtimber	large	sawtimber(>24)-(mbf/stand)		
2	2000	BR_1300	15	0	0			
3	2000	BR_RA_E	62	379	97			
4	2000	BR_STEE	386	874	663			
5	2000	BR_TRI	325	826	64			
6	2000	BR_TRI_27	29	589	212			
7	2000	BR_LIP_M	341	2129	1184			
8	2000	MF						
9	2000	MR						
10	2000	MR_27CR	42	272	877			
11	2000	MR_27CR	4	21	54			
12	2000	MR_BIG_F	826	333	0			
13	2000	MR_BUCK	8	0	0			
14	2000	MR_BUCK	40	0	0			

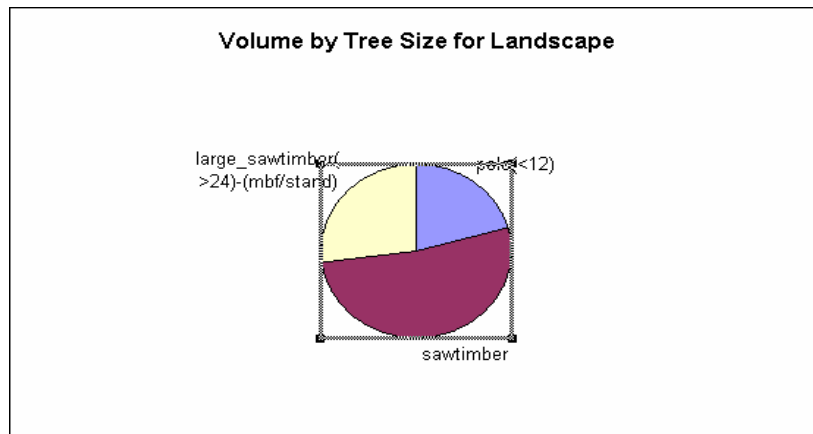
Step 4: Highlight the size classes in the table and click the **Category Labels** box again.



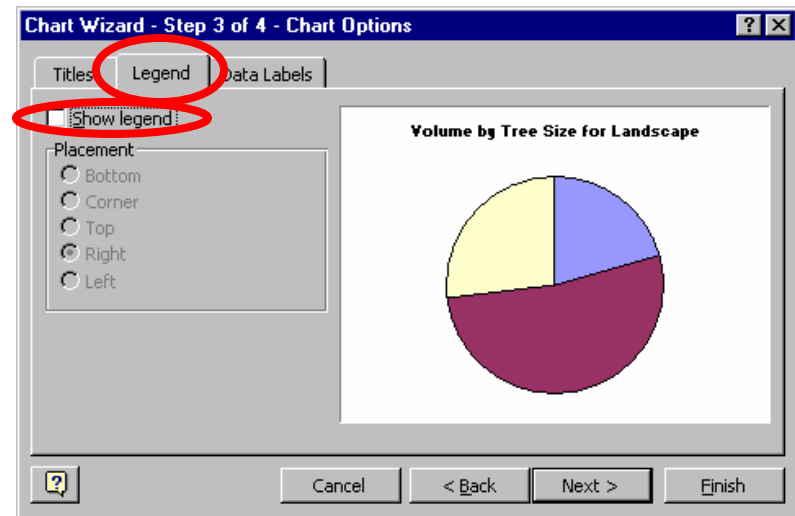
Step 5: Click **Next**.



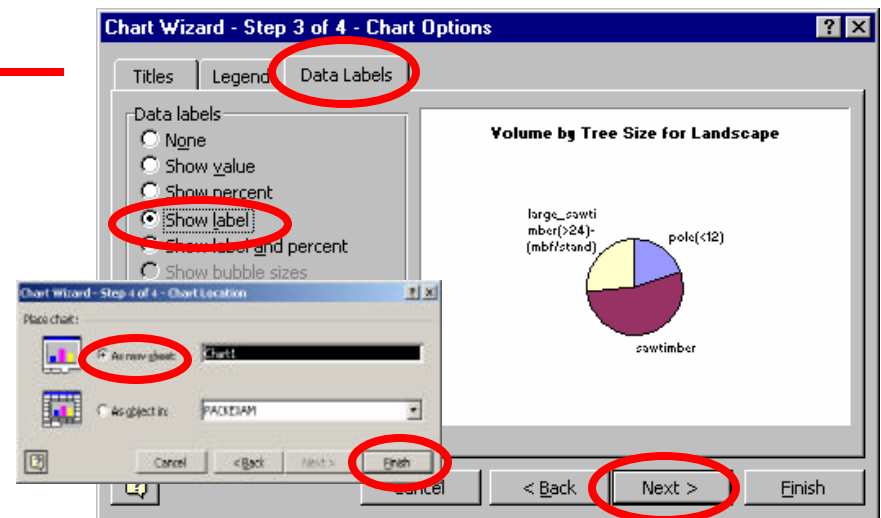
Step 6: Click on the **Titles** tab and add the title, Volume by Tree Size for Landscape.



Step 9: To adjust the size of the Pie chart, click near the Pie chart until a square appears around the chart. Click on one of the corners of the square and drag to adjust to desired size.

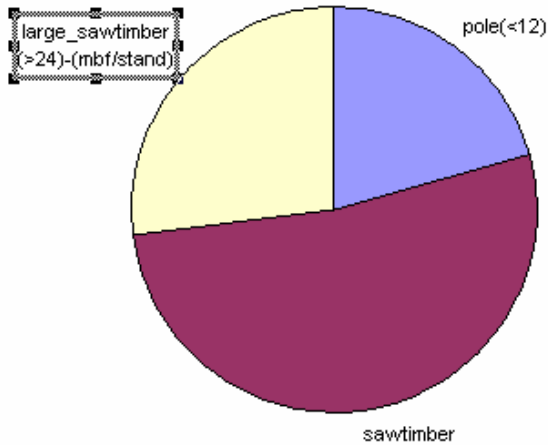


Step 7: Click on the **Legend** tab and unselect **Show Legend**.



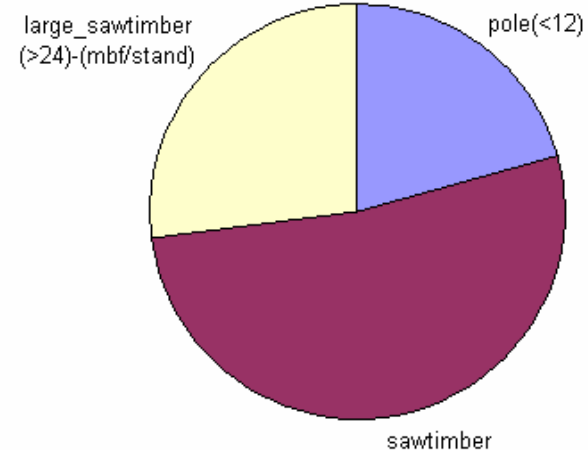
Step 8: Click on the **Data Labels** tab and select **Show label**. Click Next. Click **As new sheet**, name the sheet **Vol_by_tree_size** and click **Finish**.

Volume by Tree Size for Landscape



Step 10: Data labels may be edited for spacing, content, and font size by clicking on the data label so that a box around text appears.

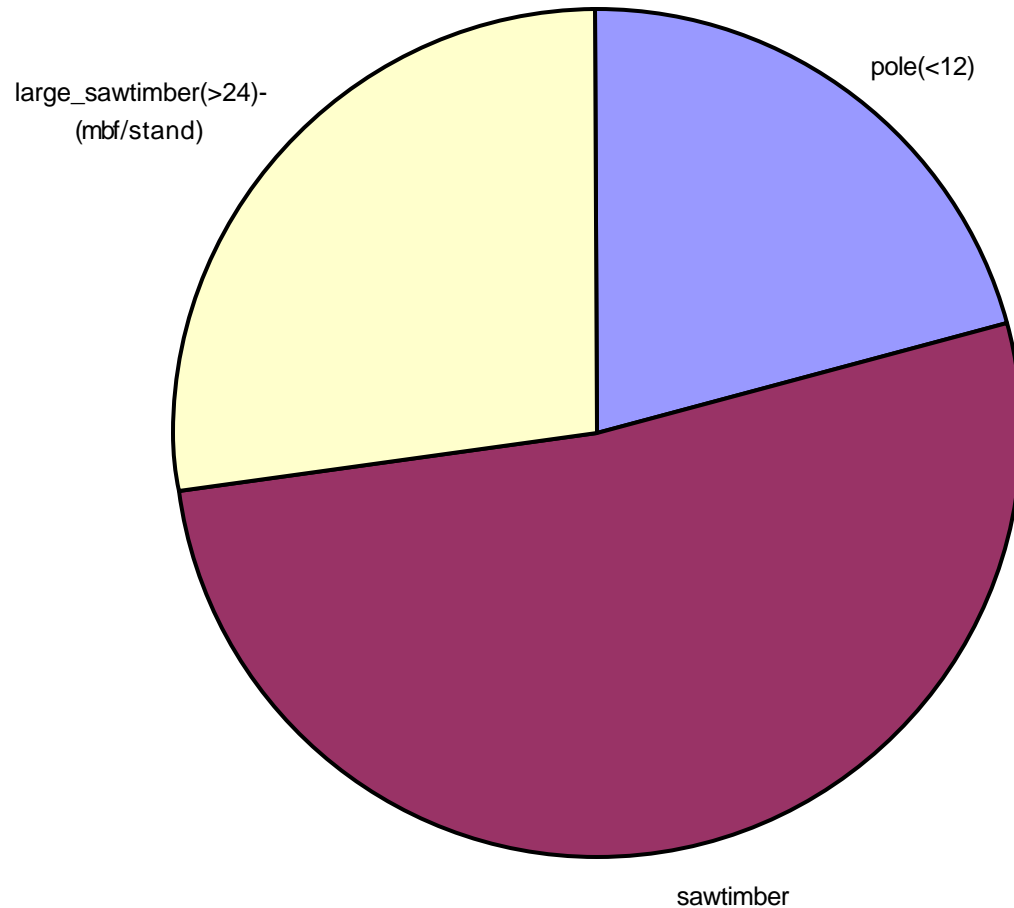
Volume by Tree Size for Landscape



Step 11: Copy and Paste chart into PowerPoint.

Pie Chart made in Excel from Volume by Size Class table

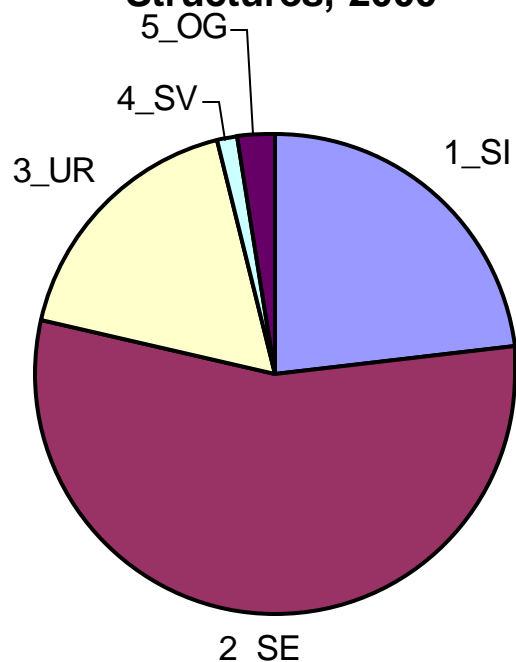
Volume by Tree Size for Landscape



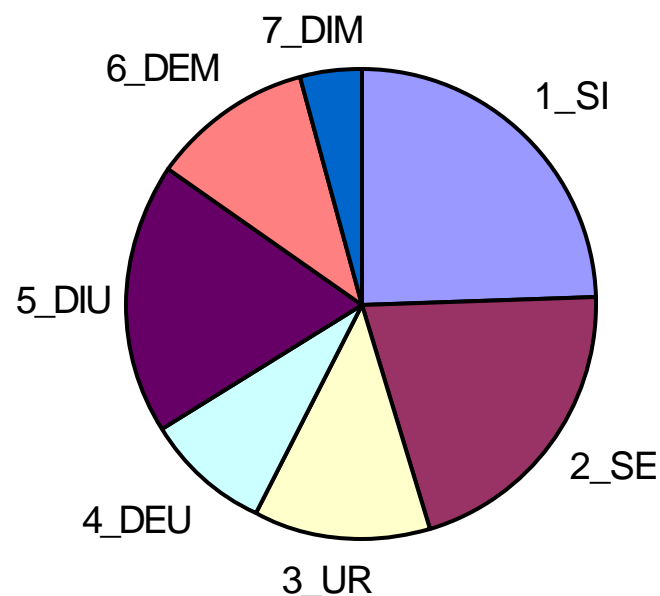
Other Pie charts can easily be made from LMS Analysis data.

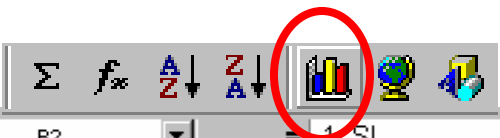
Shown below are pie charts displaying structural stages. The structural stage options in LMS reflect different approaches to categorize forest successional stages. To open these tables from the LMS main window click **Analysis/Structural Stages** (see tables section). When the Select Structure classes window opens, click by Structure and then choose desired structure classification. For this example, Oliver 5c was chosen for the first Pie chart creation and HCSSPT was chosen for the second Pie chart.

**Distribution of Oliver 5c Stand
Structures, 2000**



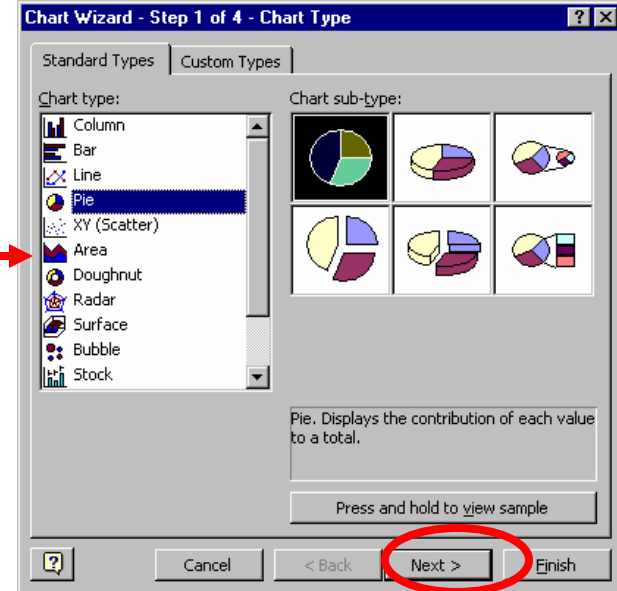
**Distribution of HCSSPT Stand
Structures, 2000**



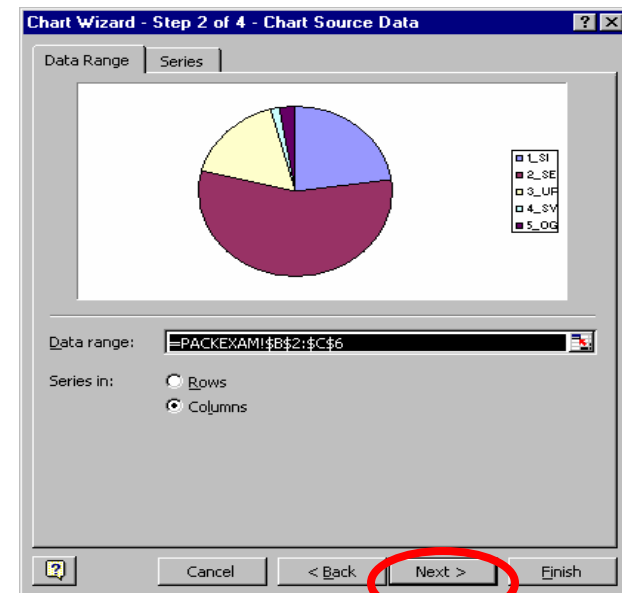


	A	B	C	D
1	year	struct.	prop	
2	2000	1 SI	0.230923	
3	2000	2 SE	0.555841	
4	2000	3 UR	0.175011	
5	2000	4 SV	0.013408	
6	2000	5 OG	0.024818	
7				
8				
9				
10				
11				

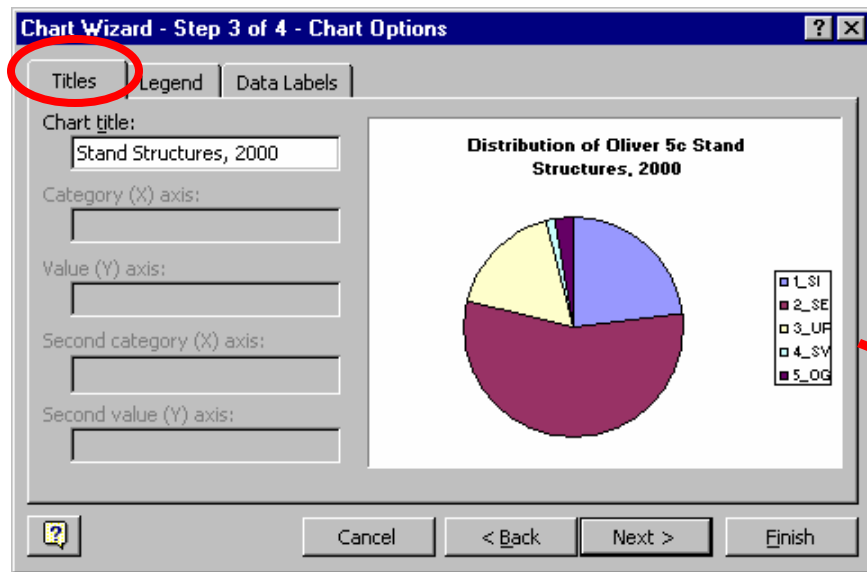
Step 1: Open and delimit **Oliver 5c** from the **Select Structure Classes** window. Highlight the structures and proportions of structure and click on the **Chart Wizard**.



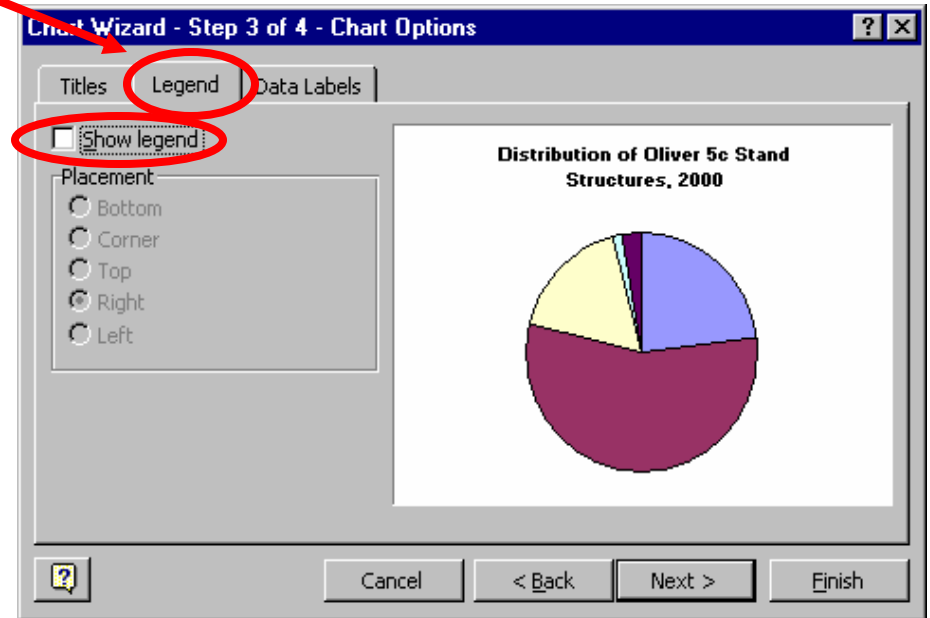
Step 2: Select the **Pie** Chart in the upper left corner. Click **Next**.



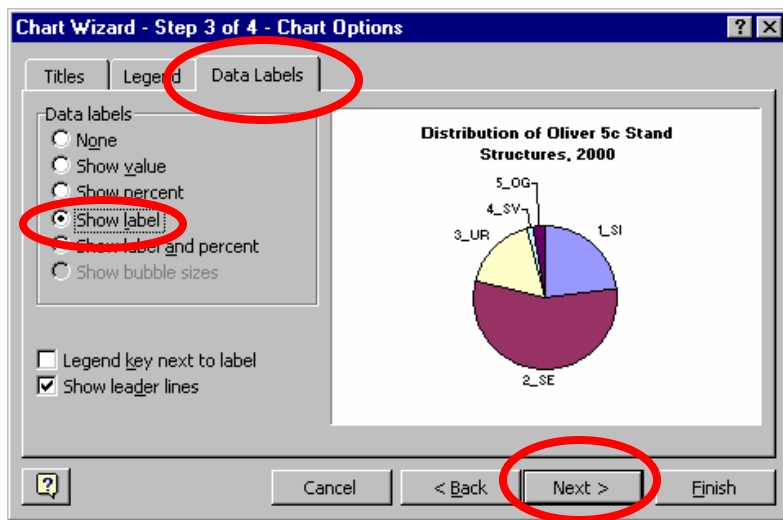
Step 3: Click on **Next** again.



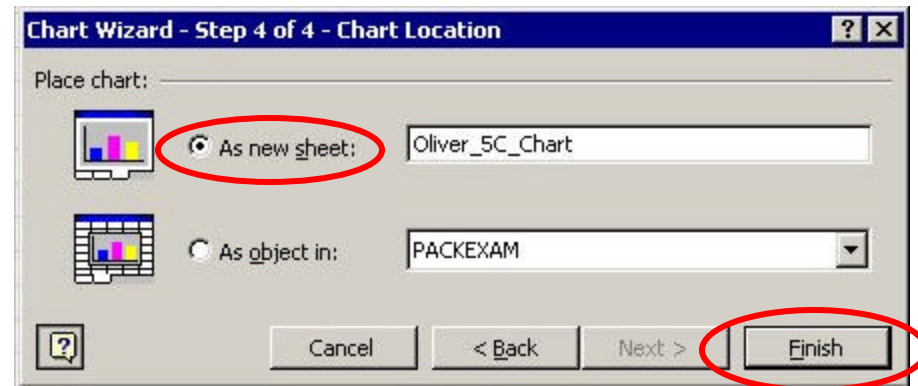
Step 4: Click on the **Titles** tab and enter the title.



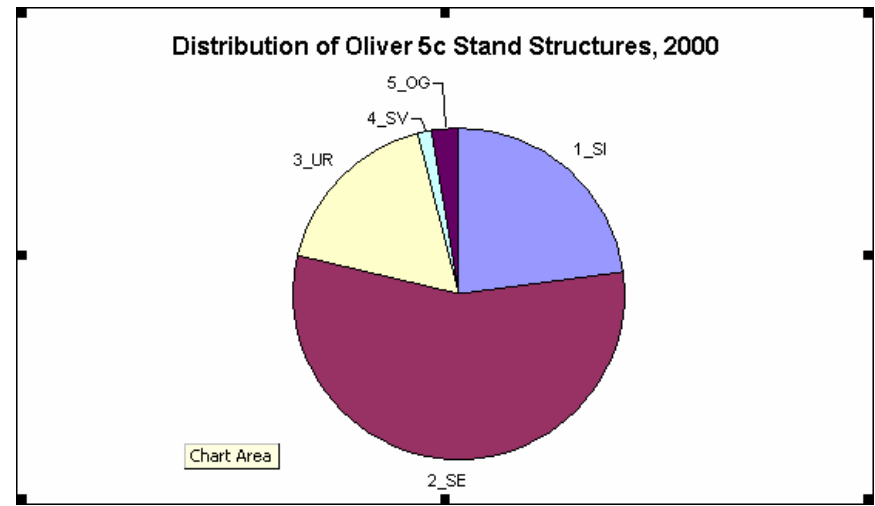
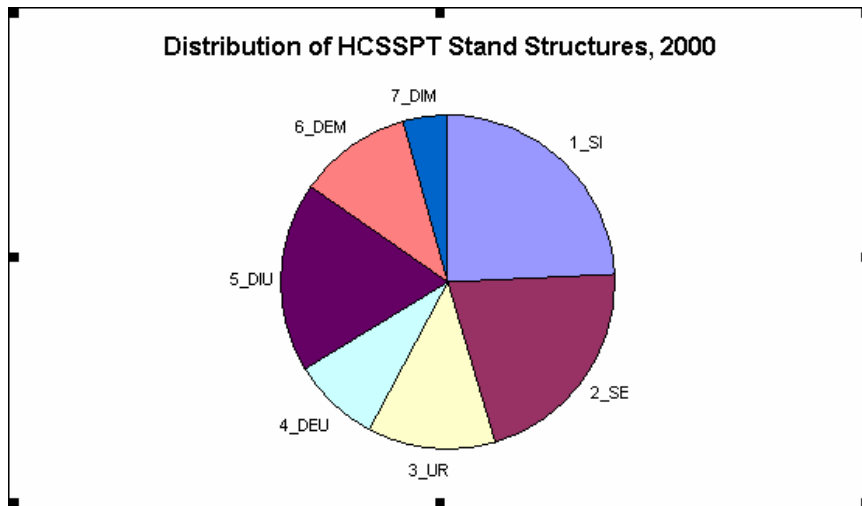
Step 5: Click on the **Legend** tab and unselect **Show legend**.



Step 6: Click on the **Data Labels** tab and select **Show label**. Click **Next**.



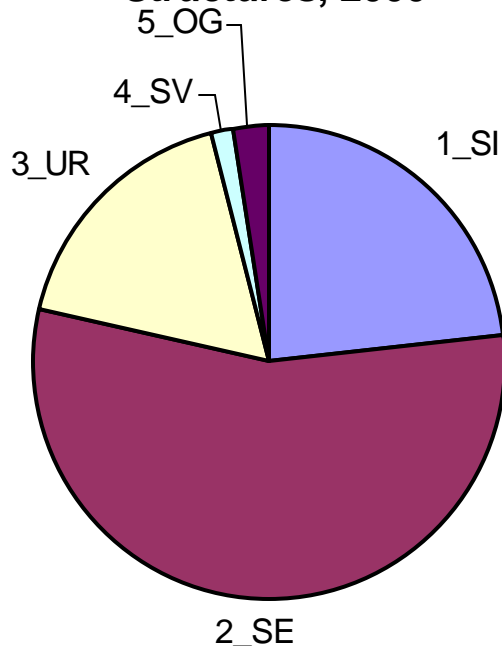
Step 7: Click **As new sheet**, name the sheet Oliver_5C_Chart and click **Finish**. Repeat Steps 1 - 6 with the HCSSPT structural instead of Oliver 5c.



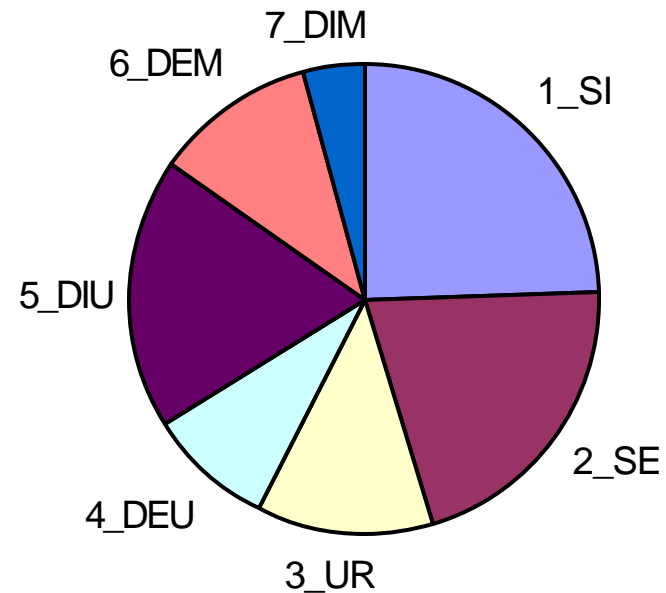
Step 7: Copy and paste each chart into one PowerPoint slide for side by side comparison. Type in title.

Pie Chart comparisons of Stand Structure distributions made in Excel from Stand Structure Analyses tables

Distribution of Oliver 5c Stand Structures, 2000

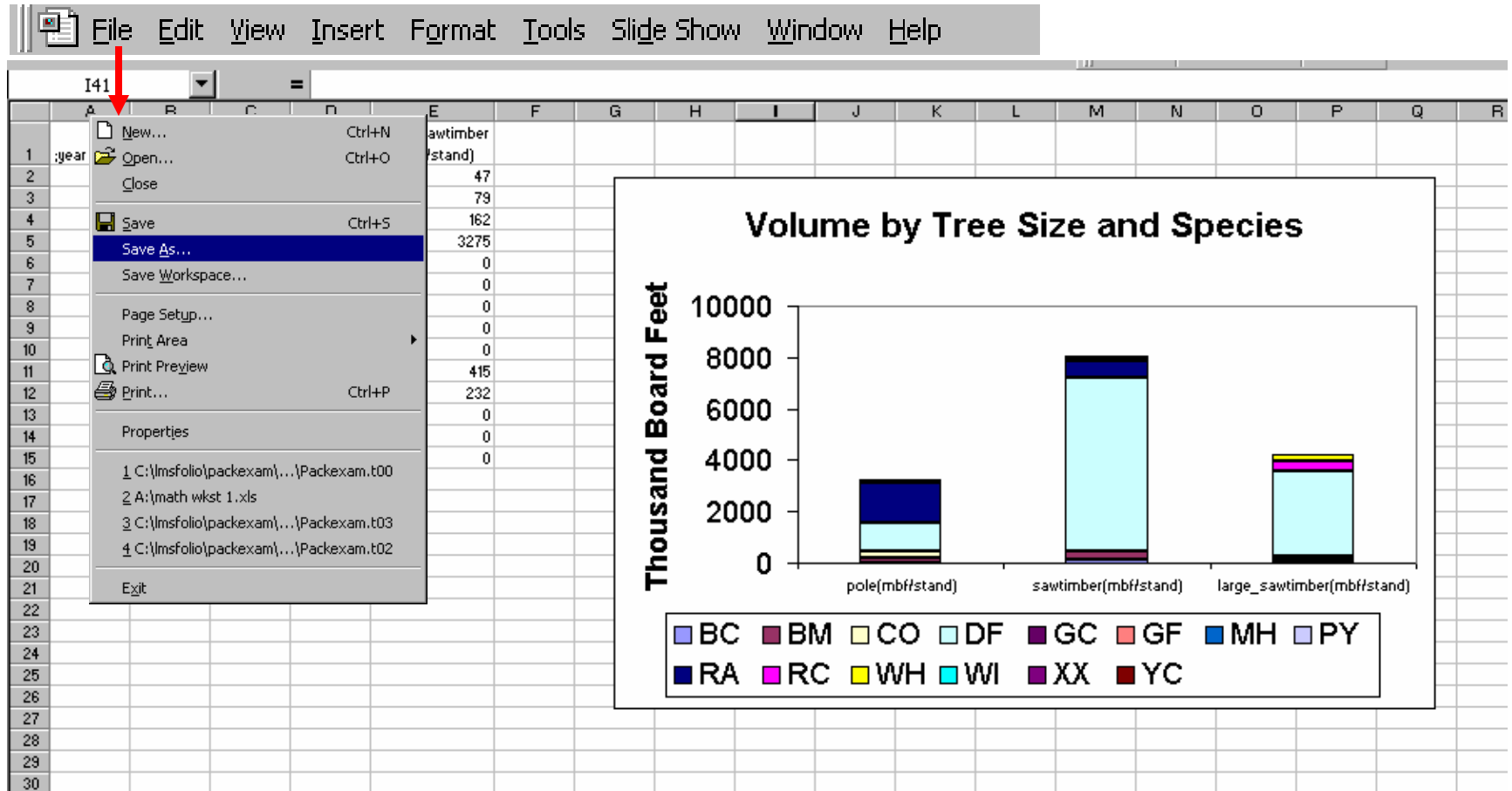


Distribution of HCSSPT Stand Structures, 2000

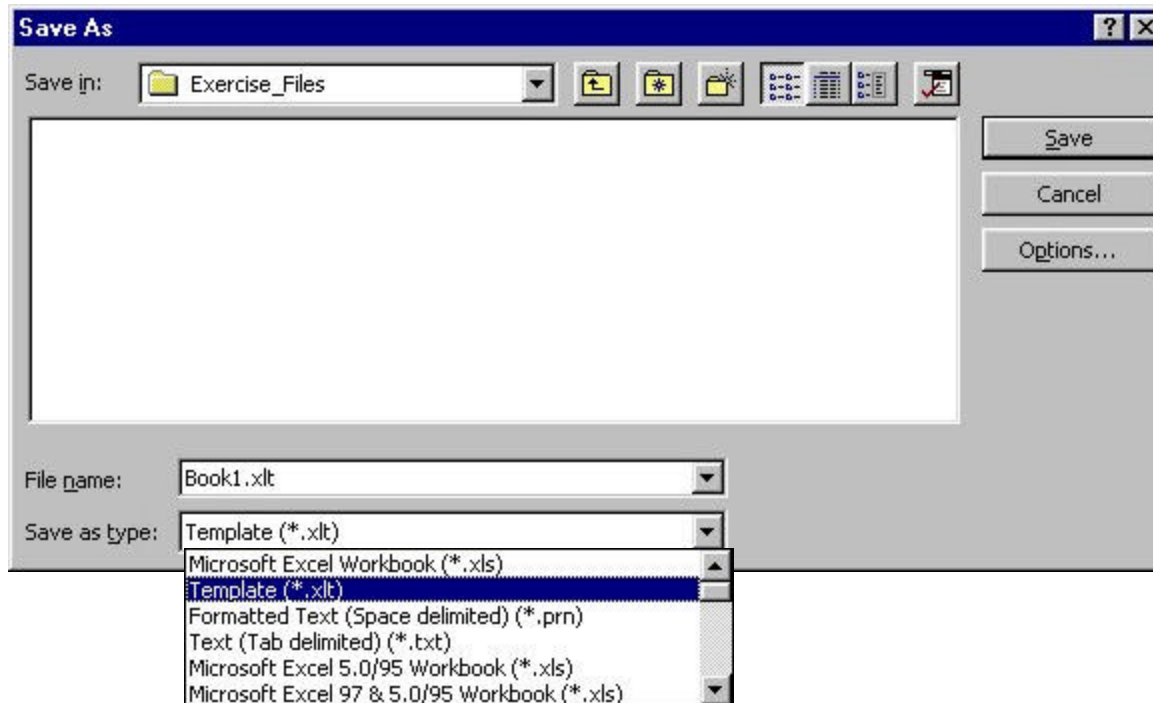


Any of the charts that have just been created may be saved as Templates in Excel. By saving tables and charts as templates, in the future when the user wants to view the same chart only with different data, all the user must do is to paste the appropriate data into the template table. Then the charts will change automatically to reflect the new data.

The following pages show the user how to save an Excel workbook and accompanying chart as a template.



Step 1: When a chart is completed, click on the **File** drop down menu then click on **Save As**.



Step 2: Save in **C:/lmsfolio2/ packexam/Exercise_Files** with your other saved files. Click on the **Save as type:** and chose **Template (*.xlt)**. Give the file an appropriate name such as Vol_Size_Spp.xlt and click **Save**.

Exercise

- Create each of the previous tables and graphs for other data sets available from LMS Analysis drop down.
- Save workbooks as templates *.xlt with appropriate names that you will remember in C:/lmsfolio2/packexam/Exercise_Files/.