Tutorial for “Toggle” program

Objective of Toggle

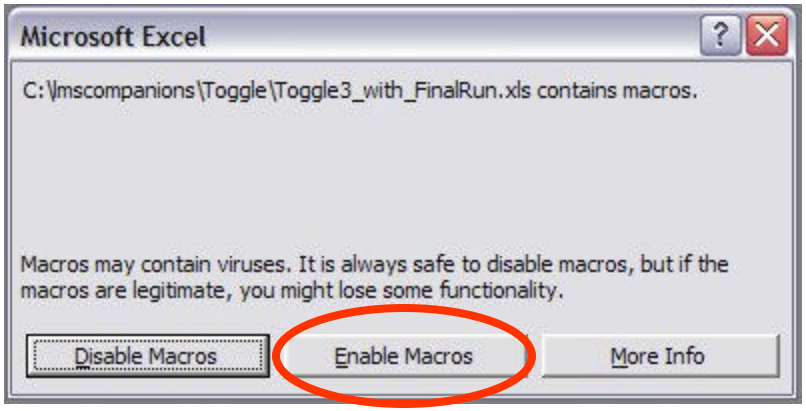
- The Toggle spreadsheet is a simplified implementation of a portion of the rational iterative decision-making process. It requires the pre-running of representative stands for one to 20 groups and up to 50 alternative pathways that are developed for each group.
- The toggle is an interactive area allocation tool which allows the user to see the impact of allocating a given area of the landscape to a particular pathway. The impact can be evaluated using a variety of graphs and tables.

The following slides outline a series of steps that will allow you to use this tool.

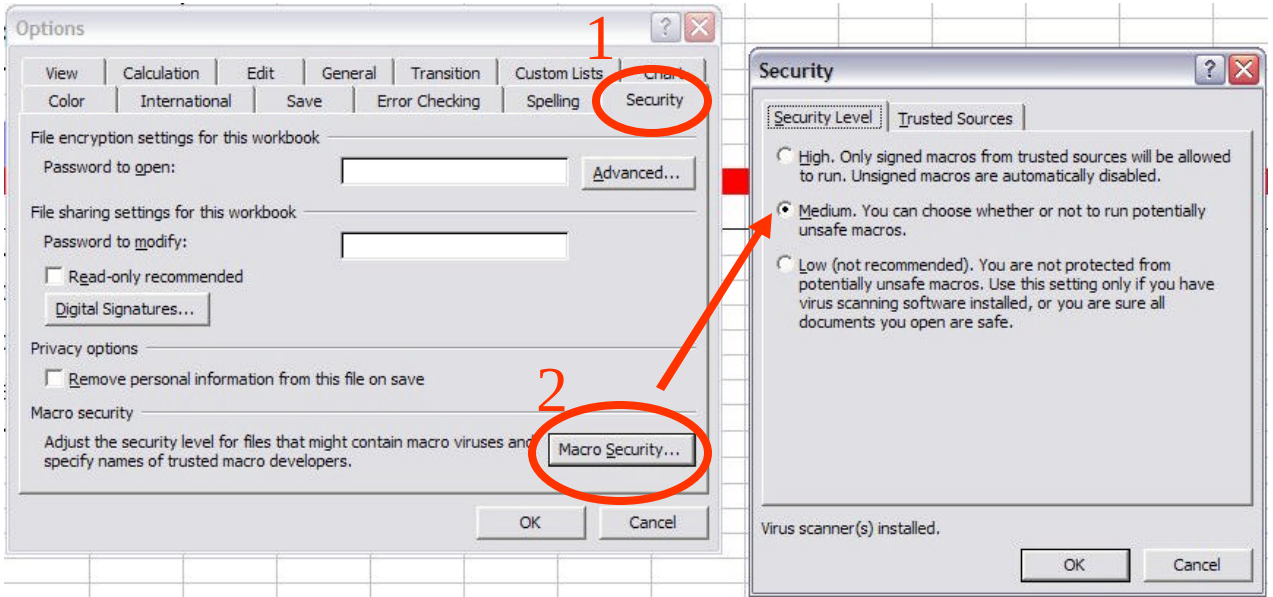
The first steps in using Toggle involve using information from several tables that are generated within LMS.

Toggle runs in Excel and uses information generated in LMS to perform various analyses of management alternatives.

Toggle Start-Up Screen

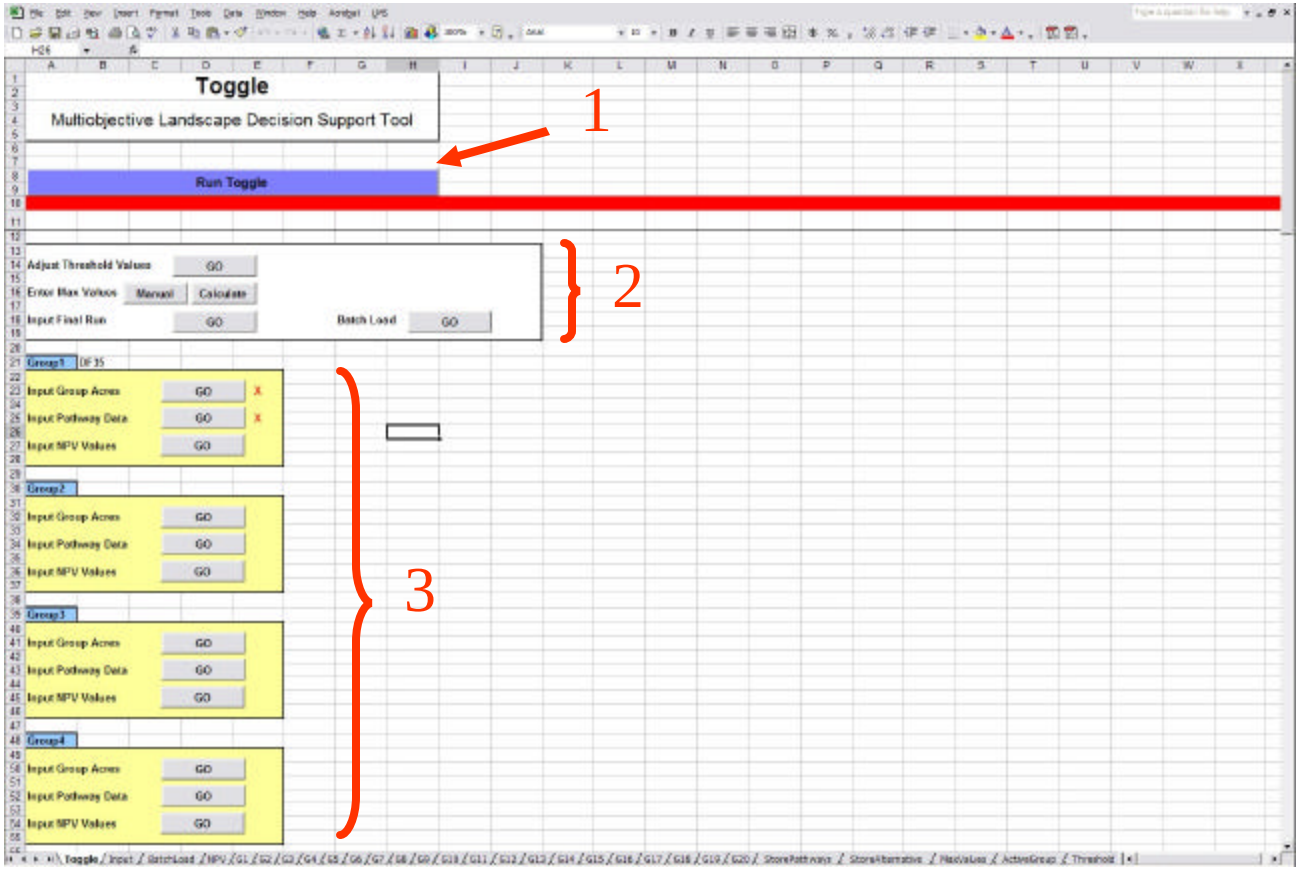


When Toggle opens, Excel will warn the user about macros and provide an option to Disable or Enable them. Toggle requires macros to be enabled to function properly.



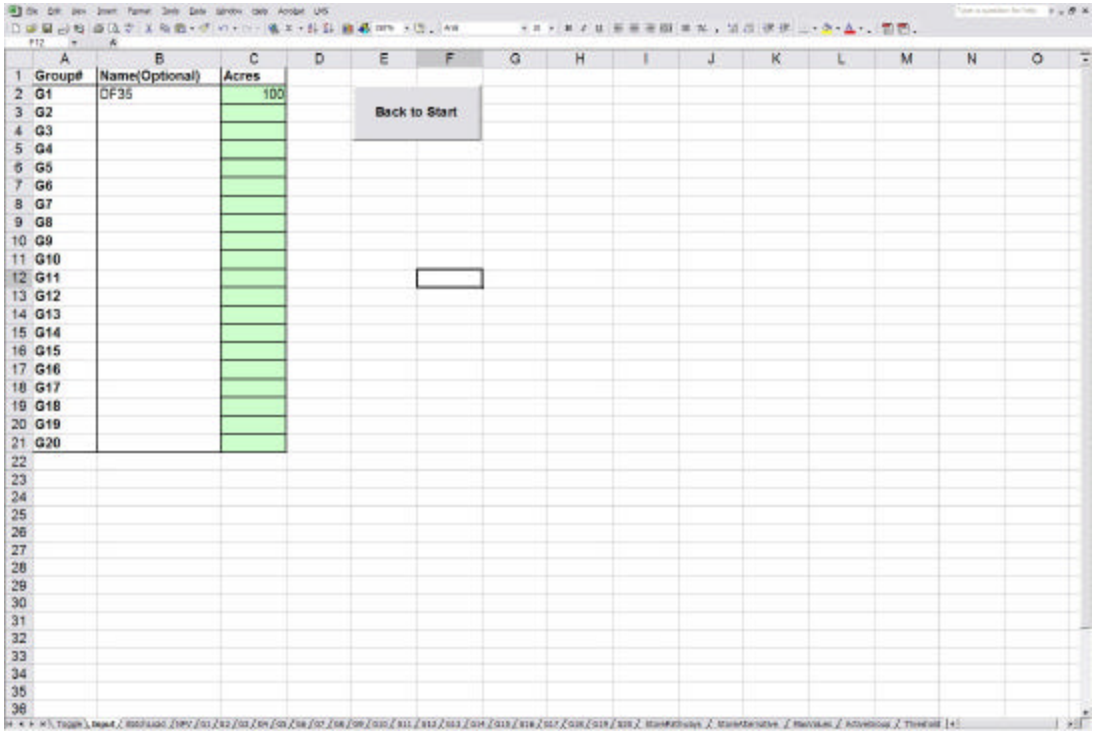
If the above warning and option does not appear, the security level for Excel may be set to High. To change this, go to the Tools menu and select 'Options…'. On the 'Security' tab (1), click the 'Macro Security…' button (2). In the Security window, make sure Medium is selected. Click OK, then reopen Toggle.

Toggle Start-Up Screen



Most functions in Toggle can be accessed from the start-up screen, including entering data, adjusting threshold values, and running Toggle. The blue ‘Run Toggle’ button activates the output sheet from which alternatives can be developed (1). The white area immediately below the red line contains ‘GO’ buttons to sheets where the Toggle program can be adjusted (2). Below the white area is a yellow area for each group, with ‘GO’ buttons to input data sheets (3).

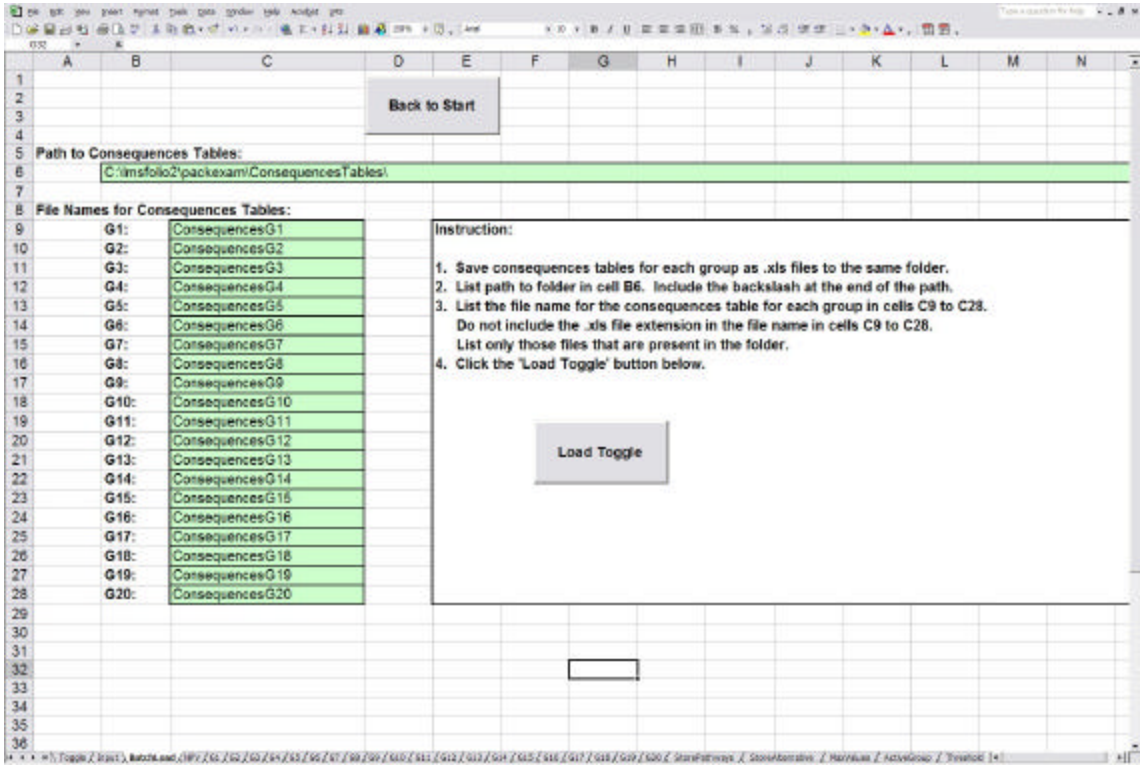
Input Group Acres



	A	B	C
1	Group#	Name(Optional)	Acres
2	G1	DF35	100
3	G2		
4	G3		
5	G4		
6	G5		
7	G6		
8	G7		
9	G8		
10	G9		
11	G10		
12	G11		
13	G12		
14	G13		
15	G14		
16	G15		
17	G16		
18	G17		
19	G18		
20	G19		
21	G20		

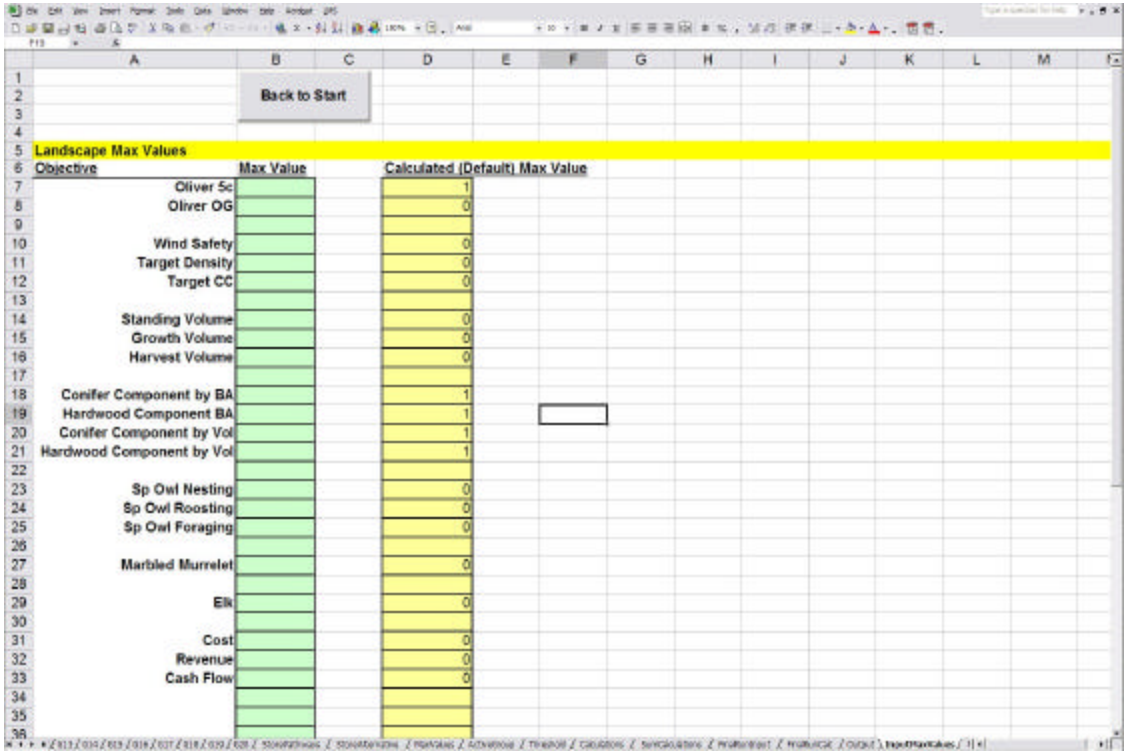
On the Toggle Start-Up screen, the group acres are input by clicking the ‘GO’ button next to ‘Input Group Acres’ for each group (row 23 for Group 1, row 32 for Group 2, etc.). On the Input sheet, the name of each group is entered in column B, and the acres in column C. The acre values are used to multiply by the per acre values provided in the consequences tables to calculate and display landscape total values. To return to the Toggle Start-Up screen, click the ‘Back to Start’ button.

Load Toggle



To load the consequences tables into Toggle, all consequences tables from LMS should be saved as .xls files into a common folder. From the Toggle Start-Up screen, click the ‘GO’ button next to ‘Batch Load’. Follow the instructions provided on the BatchLoad sheet. In cell B6, enter the full path to the folder containing the consequences tables. Include the backslash at the end of the path. In cells C9 to C28, enter the name of the consequences table file for each group. Do not include the .xls extension. If a group is not used leave the corresponding green cell blank. Click the ‘Load Toggle’ button when ready. Data will be pasted into the GX sheets. Click the ‘Back to Start’ button to return to the Toggle Start-Up screen.

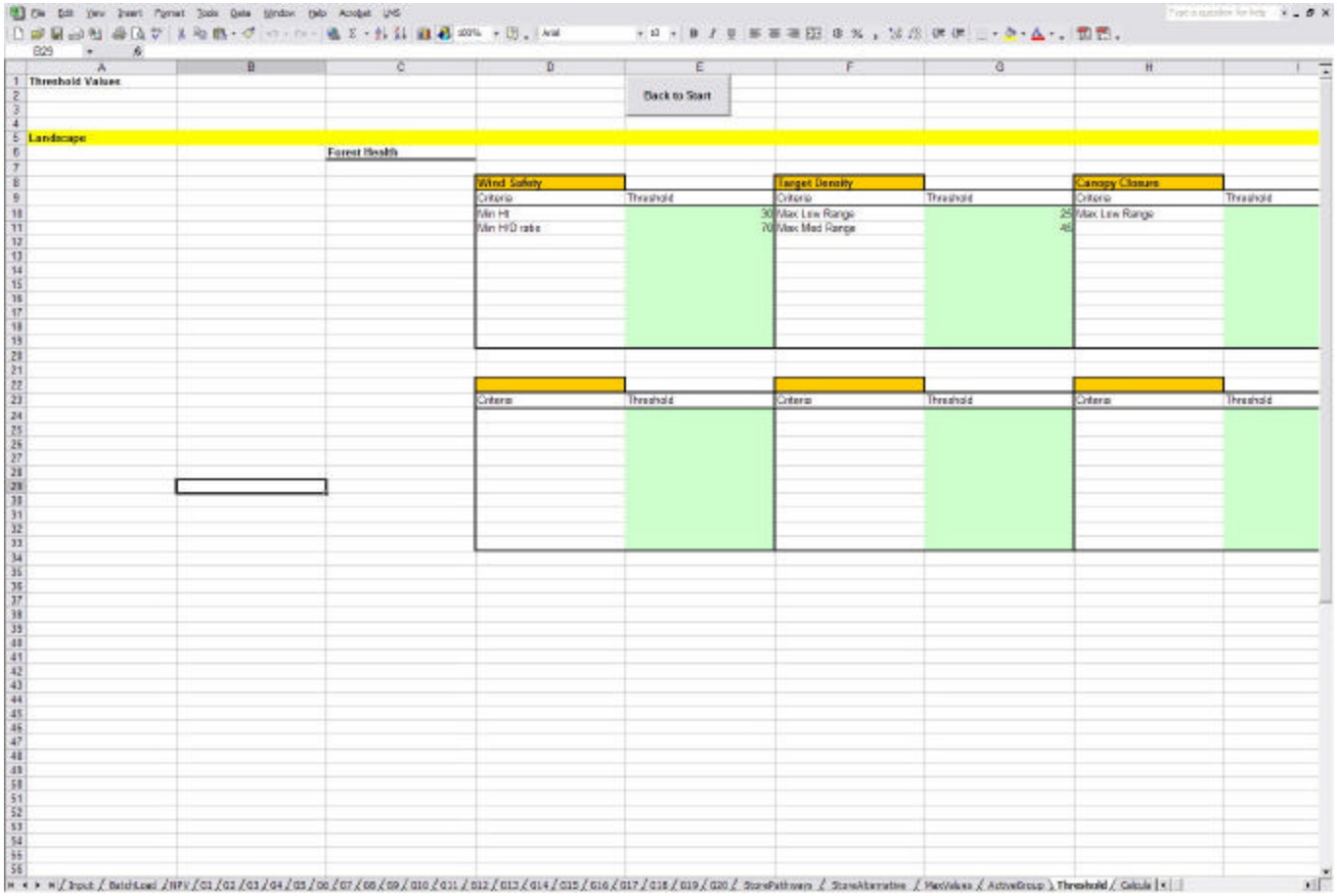
Input Maximum Values



	A	B	C	D	E	F	G	H	I	J	K	L	M
1													
2		Back to Start											
3													
4													
5	Landscape Max Values												
6	Objective	Max Value		Calculated (Default) Max Value									
7	Oliver 5c			1									
8	Oliver OG			0									
9													
10	Wind Safety			0									
11	Target Density			0									
12	Target CC			0									
13													
14	Standing Volume			0									
15	Growth Volume			0									
16	Harvest Volume			0									
17													
18	Conifer Component by BA			1									
19	Hardwood Component BA			1									
20	Conifer Component by Vol			1									
21	Hardwood Component by Vol			1									
22													
23	Sp Owl Nesting			0									
24	Sp Owl Roosting			0									
25	Sp Owl Foraging			0									
26													
27	Marbled Murrelet			0									
28													
29	Elk			0									
30													
31	Cost			0									
32	Revenue			0									
33	Cash Flow			0									
34													
35													
36													

After pathway data and group acres are input, click the ‘Calculate’ button next to ‘Enter Max Values’ on the Toggle Start-Up screen. Toggle will automatically calculate maximum values for each objective from the data provided. Maximum values are used to calculate normalized value scores from 1 to 10 for each objective to compare alternatives. To view these values and/or adjust them manually, click on the ‘Manual’ button to go to the MaxValues sheet. The calculated values in the yellow cells are used only if no values are provided in the green cells. To return to the Toggle Start-Up screen, click the ‘Back to Start’ button.

Adjust Threshold Values

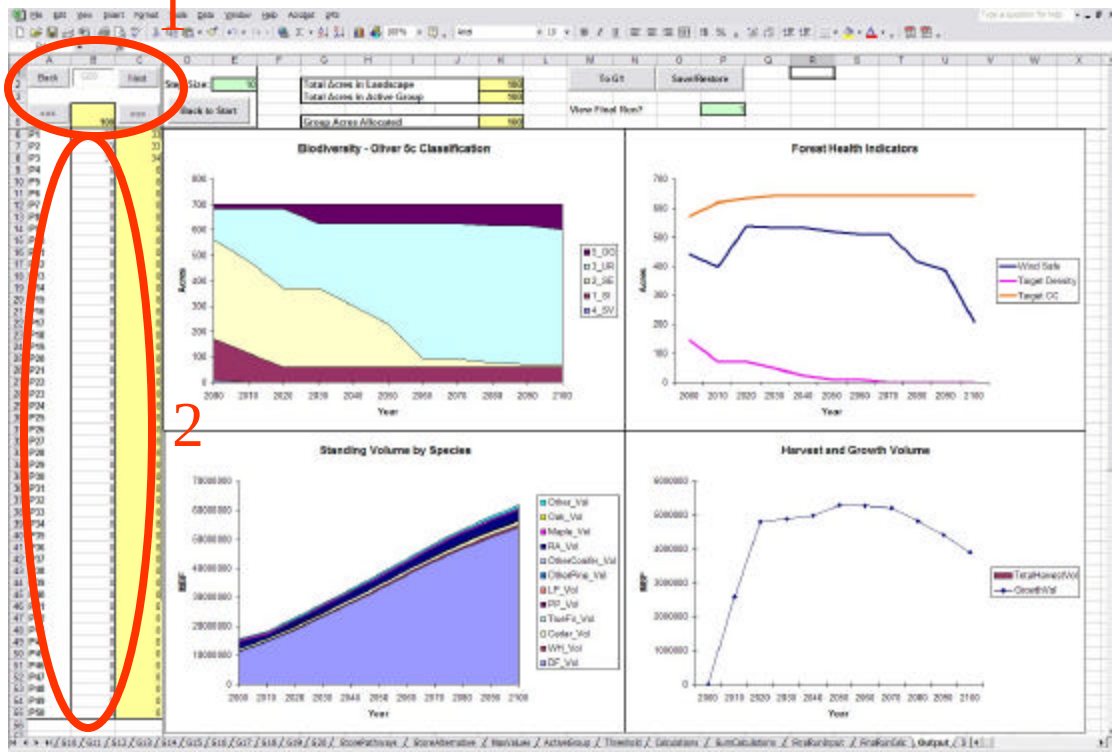


Click on the ‘GO’ button next to ‘Adjust Threshold Values’ on the Toggle Start-Up screen to go to the Threshold Values sheet. Threshold values indicate the measurable criteria limits for each objective, and should be changed as local conditions require. Numbers in green cells can be adjusted. Scroll to the right to view values for other objectives. Click the ‘Back to Start’ button to return to the Toggle Start-Up screen.

With these steps complete you are now ready to Run Toggle.

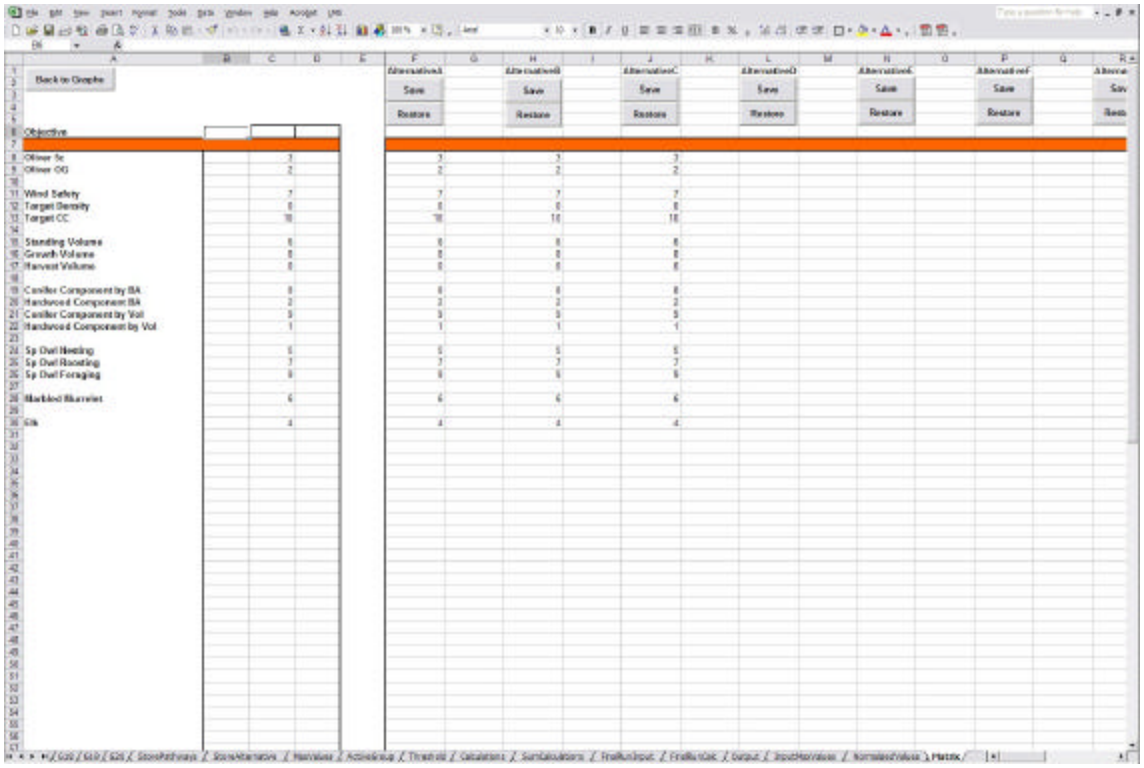
Toggle is run by adjusting the percentage of acres in each group of stands, allocated to each silvicultural pathway.

Develop Alternatives



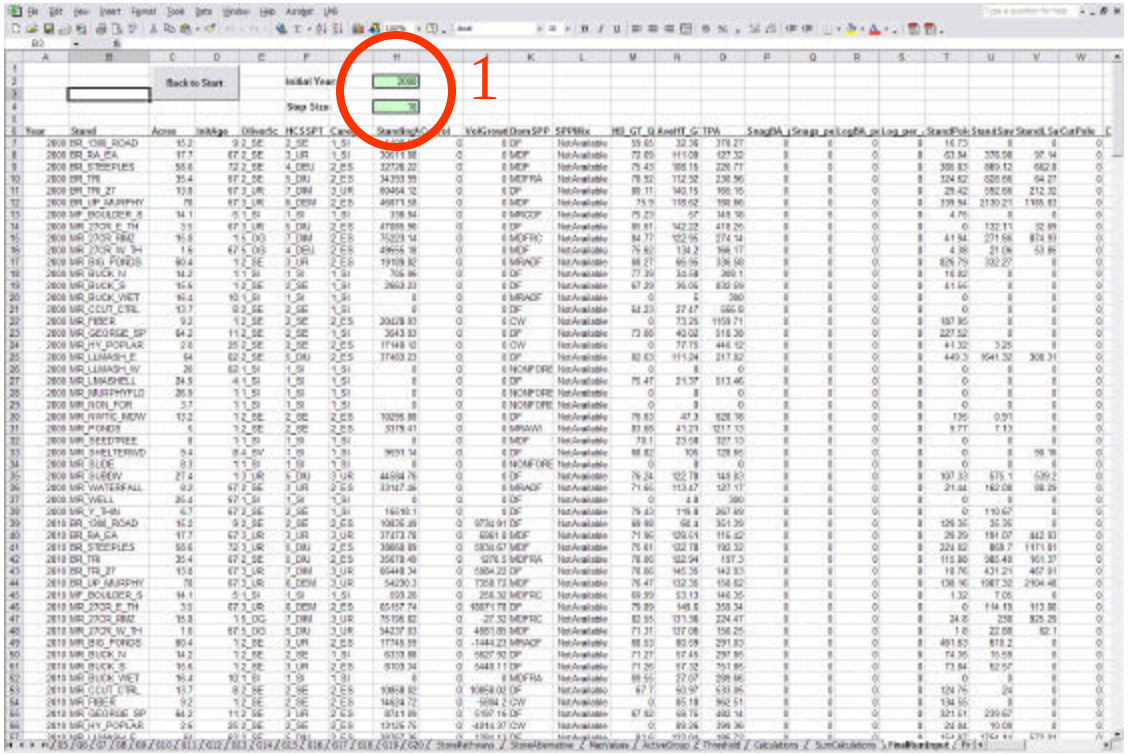
To develop alternatives in Toggle, percentages of each group's area are allocated to the silvicultural pathways developed for that group. From the Toggle Start-Up screen, click the 'Run Toggle' button to go to the Output sheet. To switch between groups, click the 'Back' and 'Next' buttons in the upper left corner of the sheet (1). The text box between these buttons indicates the current group. Area percentages are added to pathways in cells B6 to B55 by entering a whole number from 0 to 100 (2). The yellow cells from C6 to C55 indicate the number of acres applied to a pathway based on the percentage. A landscape alternative is developed when exactly 100% of each group is allocated to the silvicultural pathways. Alternatives can be saved or restored by clicking the 'Save/Restore' button. To return to the Toggle Start-Up page, click the 'Back to Start' button.

Save/Restore Alternatives



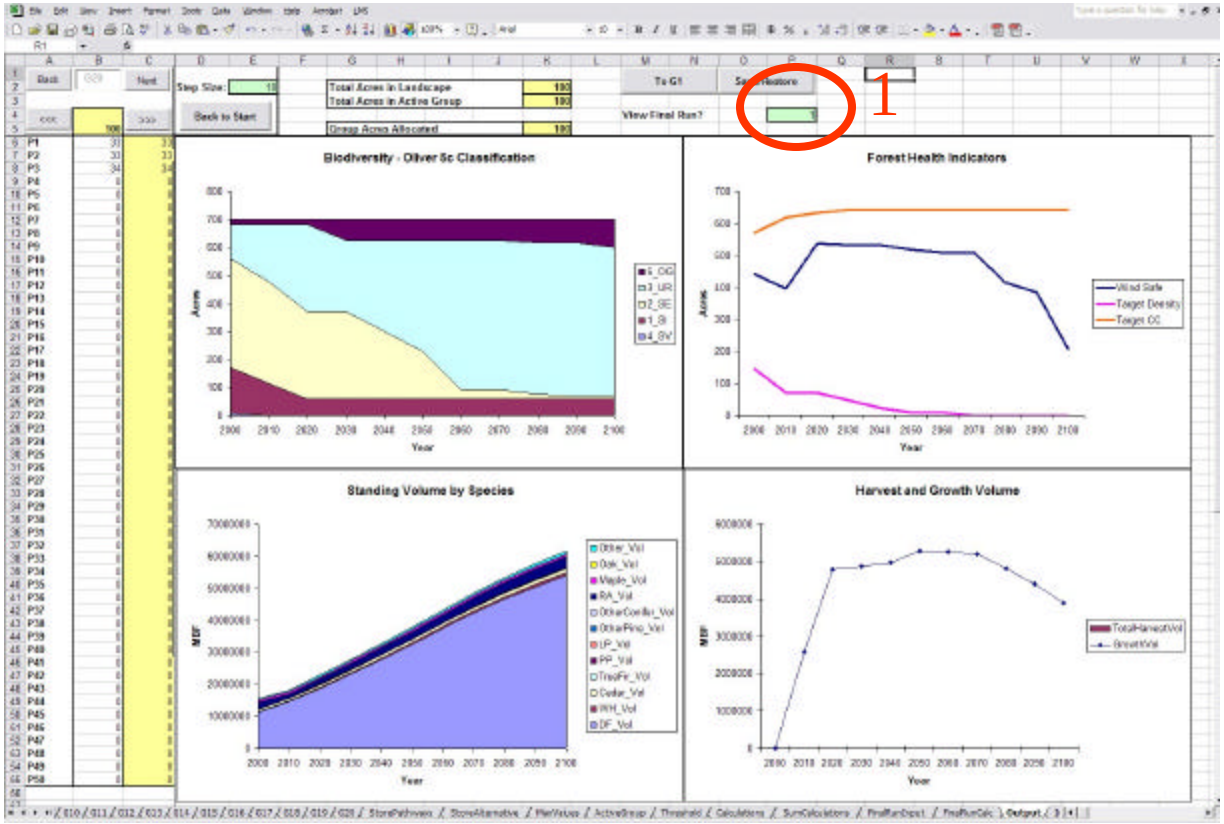
The allocation of group acres to silvicultural pathways which makes up an alternative can be saved, at which point new alternatives can be developed. From the Output page, where alternatives are toggled, click the ‘Save/Restore’ button to go to the Matrix page. From here, alternatives can be saved by clicking on one of 10 ‘Save’ buttons. This also saves the normalized values for each objective, so alternatives can be compared. Alternatives can also be restored at a later point by clicking on the ‘Restore’ button under the corresponding ‘Save’ button. To return to the Output page, click the ‘Back to Graphs’ button in the upper left corner.

Final Run – Input

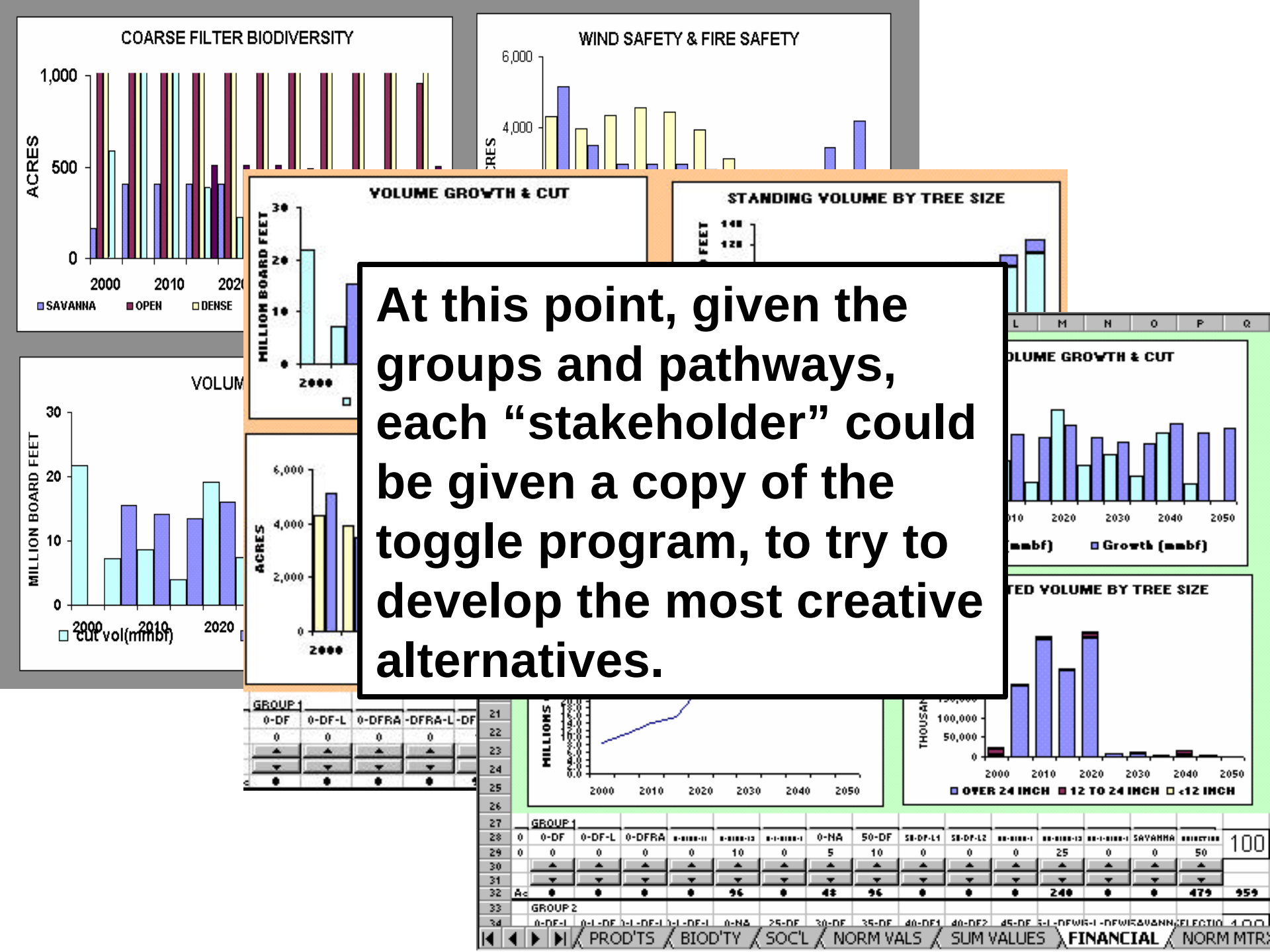


The Final Run option is used to view alternatives developed in LMS using each stand on a landscape. Results can then be compared to alternatives developed using representative stands in Toggle. A consequences table is first generated for all stands in LMS. From the Toggle Start-Up screen, click the ‘GO’ button next to ‘Input Final Run’. The body of the consequences table (no header) is pasted into cell A7. Enter the initial year and step size in the green cells H2 and H4, respectively (1). The Final Run outputs are viewed from the same Output sheet where toggled alternatives are generated. This will be covered next. To return to the Toggle Start-Up screen, click the ‘Back to Start’ button.

Final Run – View Outputs



To view the outputs for a Final Run scenario, click the ‘Run Toggle’ button on the Toggle Start-Up screen. On the Output sheet, if cell P4 is set to 1, the Final Run data will be graphed (1). If cell P4 is 0, the loaded Toggle scenario will be graphed. If the scenario developed in Toggle is loaded and the corresponding Final Run scenario is loaded, differences between using the representative stands and actual stands can be viewed by switching between the Final Run and Toggle mode. To return to the Toggle Start-Up screen, click the ‘Back to Start’ button.



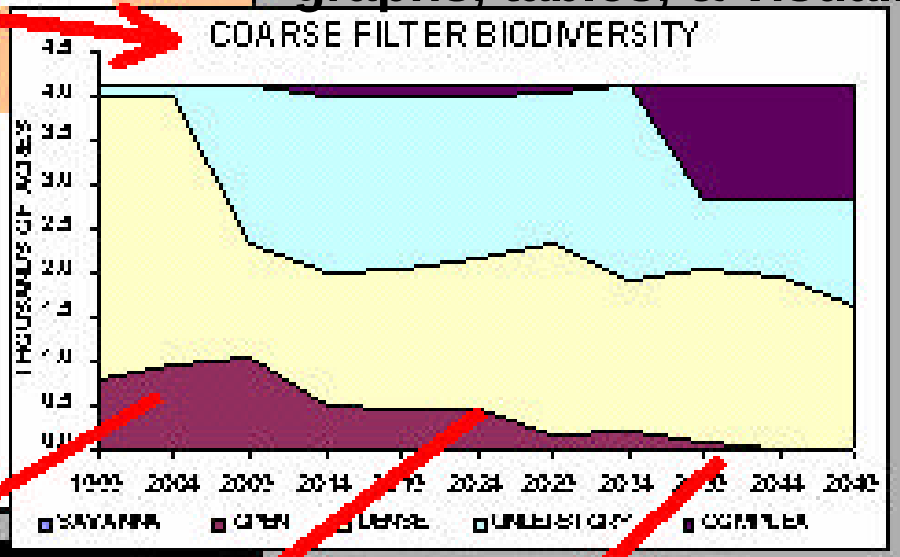
At this point, given the groups and pathways, each "stakeholder" could be given a copy of the toggle program, to try to develop the most creative alternatives.

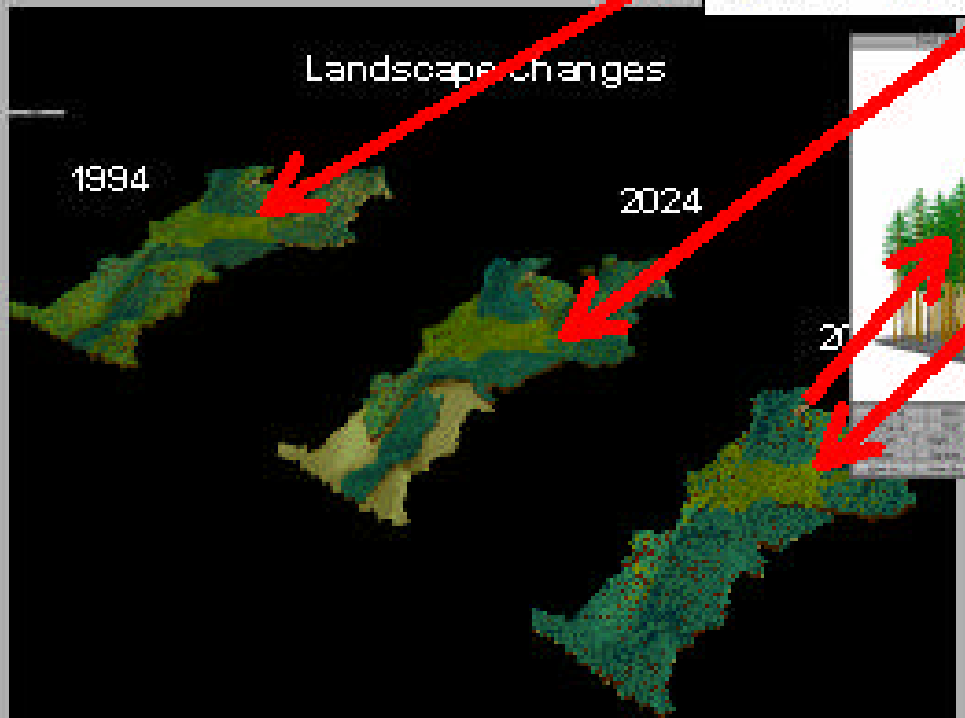
The utility of the this Toggle process is to develop a creative, range of alternatives

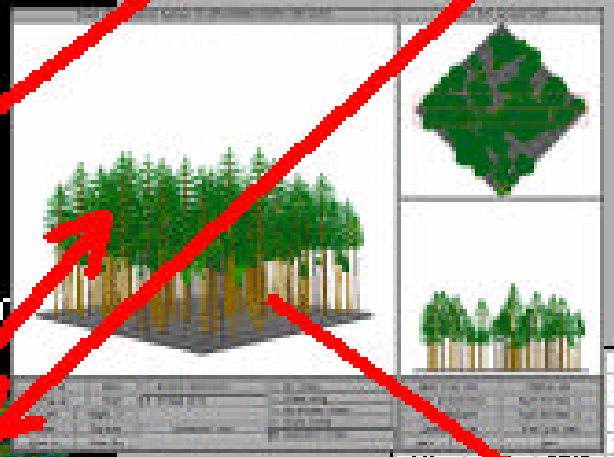
	ALT A	ALT B	ALT C	ALT D	ALT E	ALT F	ALT G	ALT H	ALT I
BIODIVERSITY									
COARSE FILTER (Oliver&C structures)	5	5	6	5	6	4	6	6	5
COARSE FILTER (JH SSPT Structures)	5	4	5	5	5	5	4	6	5
LATE SUCCESSIONAL STRUCTURES	7	10	7	7	7	2	10	3	3
OLD GROWTH STRUCTURES	1	4	1	1	1	0	4	0	1
PRODUCTIVE CAPACITY									
TOTAL GROWTH (million board feet)	8	10	9	9	8	6	9	7	6
TOTAL HARVEST (million board feet)	10	1	10	10	10	7	0	7	7
FINAL/INITIAL STANDING VOLUME	6	1	7	7	6	8	0	8	7
SUSTAINED STANDING QUALITY	4	4	5	5	4	5	3	5	5
SUSTAINED HARVESTED QUALITY	5	0	4	4	5	1	0	1	0
HEALTH, SOIL & WATER									
WIND SAFETY	4	3	4	3	4	4	3	4	4
FIRE SAFETY	10	10	10	10	10	10	10	10	10
FINANCIAL (millions of dollars)									
MINIMUM INCOME STREAM	0	0	0	0	0	0	0	10	10
TOTAL NET CASH FLOW	8	0	10	10	6	7	0	7	7
NET PRESENT VALUE RANK	3	0	4	4	3	10	0	7	7
SOCIAL BENEFITS									
TOTAL EMPLOYMENT (person yrs)	10	1	10	10	10	7	0	7	7
LOCAL ECON. ACTIVITY (million $)	9	0	10	10	9	6	0	6	6
TOTAL RESERVES (acres)	7	10	7	7	7	7	10	7	7
OLD FOREST RESERVES (acres)	6	9	8	8	6	8	9	8	6

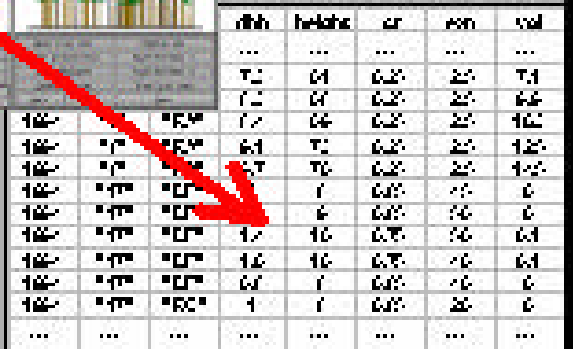
Each alternative can be explained by normalized values, graphs, tables, & visualizations

	NO ACTION	ALTER. NATIVE A	ALTER. NATIVE B	ALTER. NATIVE C	ALTER. NATIVE D
COARSE FILTER BIODIVERSITY	4	5	5	5	6
OPTIMUM OWL HABITAT	0	2	2		
SUITABLE OWL HABITAT	6	6	6		
COMMODITY FAIR SHARE	0	8	8		
WIND SAFETY	9	7	7		
FIRE SAFETY	7	9	9		
NET PRESENT VALUE	0	2	2		
CASH FLOW STABILITY	3	9	9		
TOTAL EMPLOYMENT	0	7	7		
STABLE EMPLOYMENT	0	1	1		





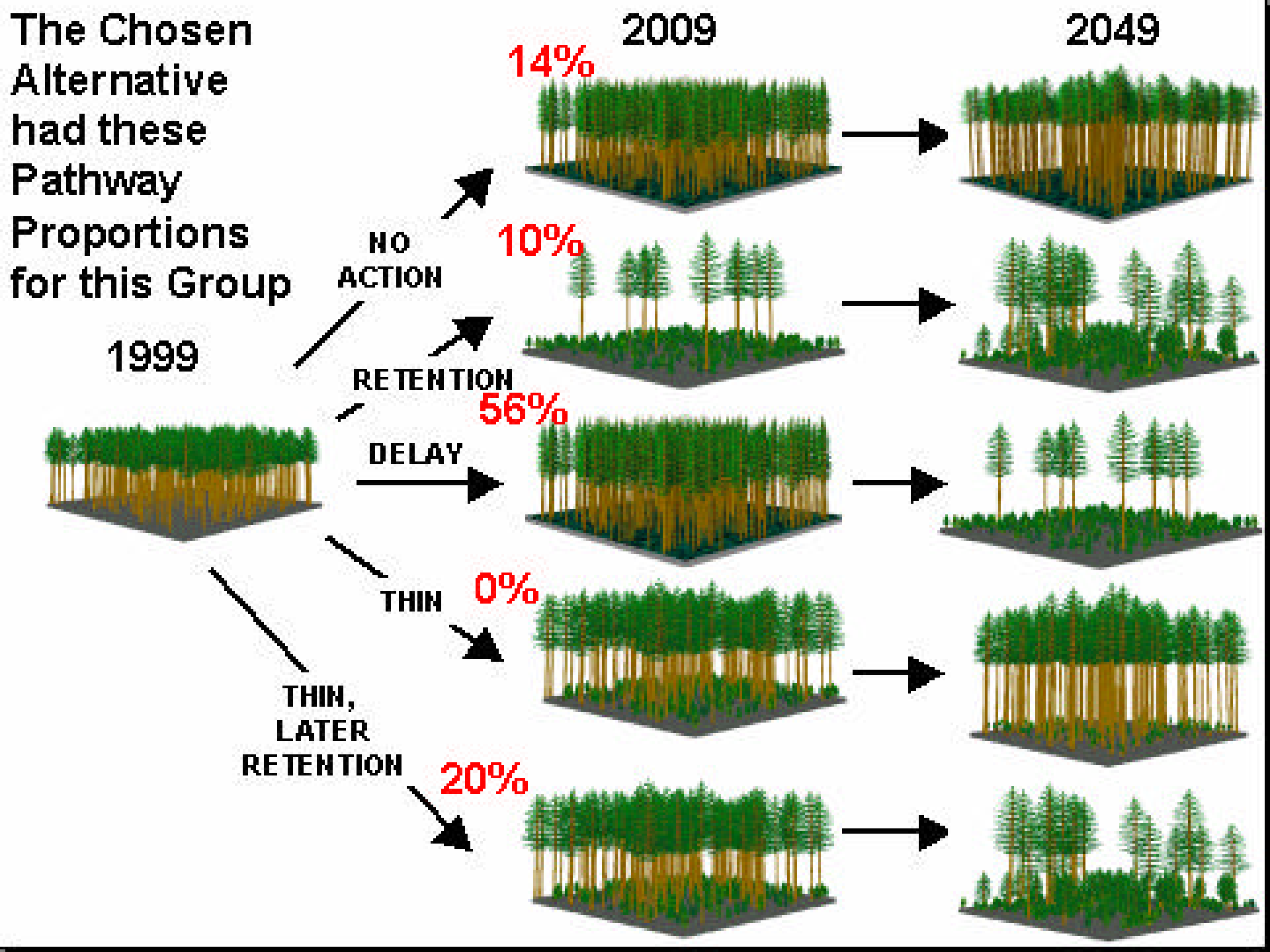




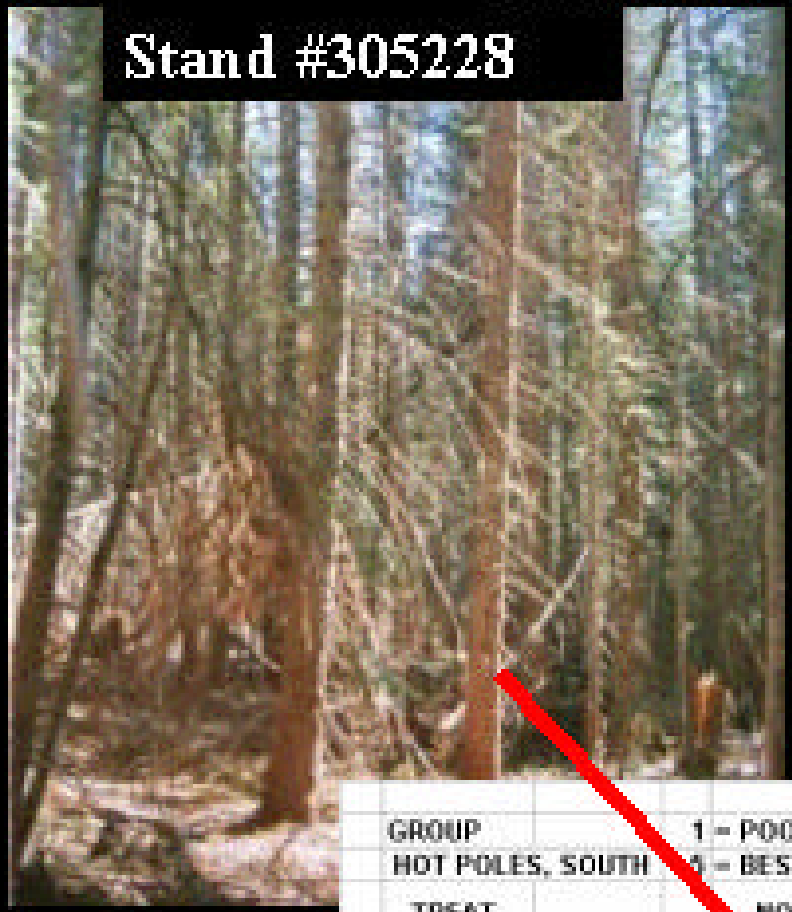
The Decision-maker(s) chooses the best alternative to meet the management goals

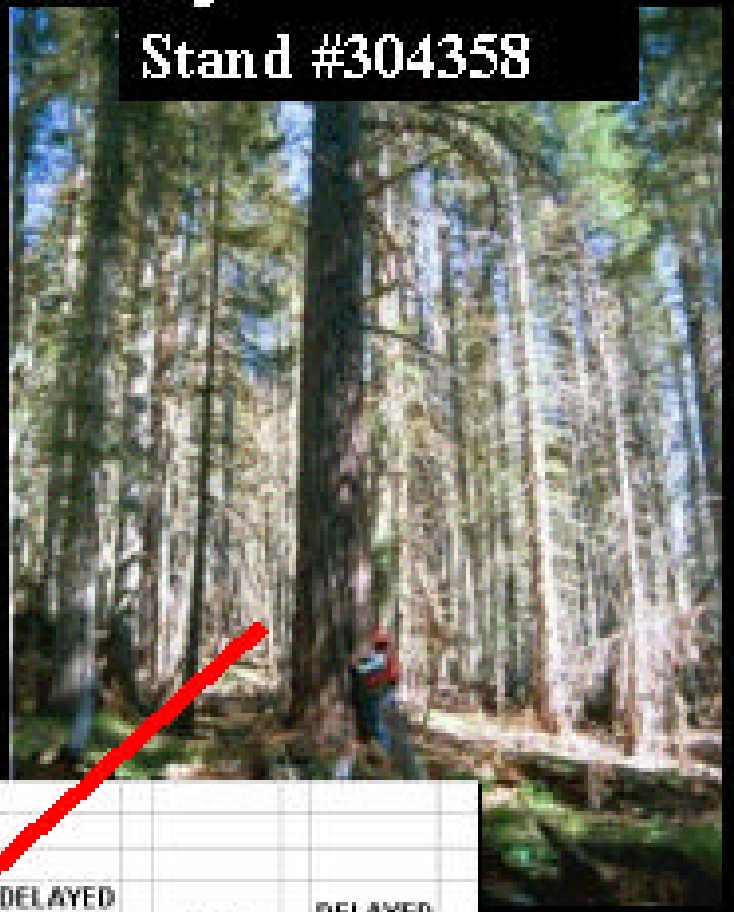
	NO ACTION	ALTER-NATIVE A	ALTER-NATIVE B	ALTER-NATIVE C	ALTER-NATIVE D
COARSE FILTER BIODIVERSITY	4	5	5	5	6
OPTIMUM OWL HABITAT	0	2	2	2	2
SUITABLE OWL HABITAT	6	6	6	7	6
COMMODITY FAIR SHARE	0	8	8	7	5
WIND SAFETY	9	7	7	7	8
FIRE SAFETY	7	9	9	9	9
NET PRESENT VALUE	0	2	2	2	0
CASH FLOW STABILITY	3	9	9	9	10
TOTAL EMPLOYMENT	0	7	7	7	5
STABLE EMPLOYMENT	0	1	1	1	0

Post- ”toggle” management planning procedures


The Chosen Alternative had these Pathway Proportions for this Group
1999
2009
2049
NO ACTION
14%
RETENTION
10%
DELAY
56%
THIN
0%
THIN, LATER RETENTION
20%

Then, the Field Forester Determines which Stands Follows Each Pathway





GROUP HOT POLES, SOUTH		1 = POOR CHOICE 5 = BEST CHOICE				
TREAT-MENT		NO ACTION	RETENTION	DELAYED RETEN-TION	THIN	DELAYED THIN
TOTAL ACR STAND	1,685 ACRES					
305,228	4	5	3	3	1	1
304,358	21	1	4	3	2	5
304,343	24	4	3	5	1	2

Given the allocation of stands within a group to various pathways, based on chosen alternative, the field forester assesses how appropriate each pathway is for each given stand.

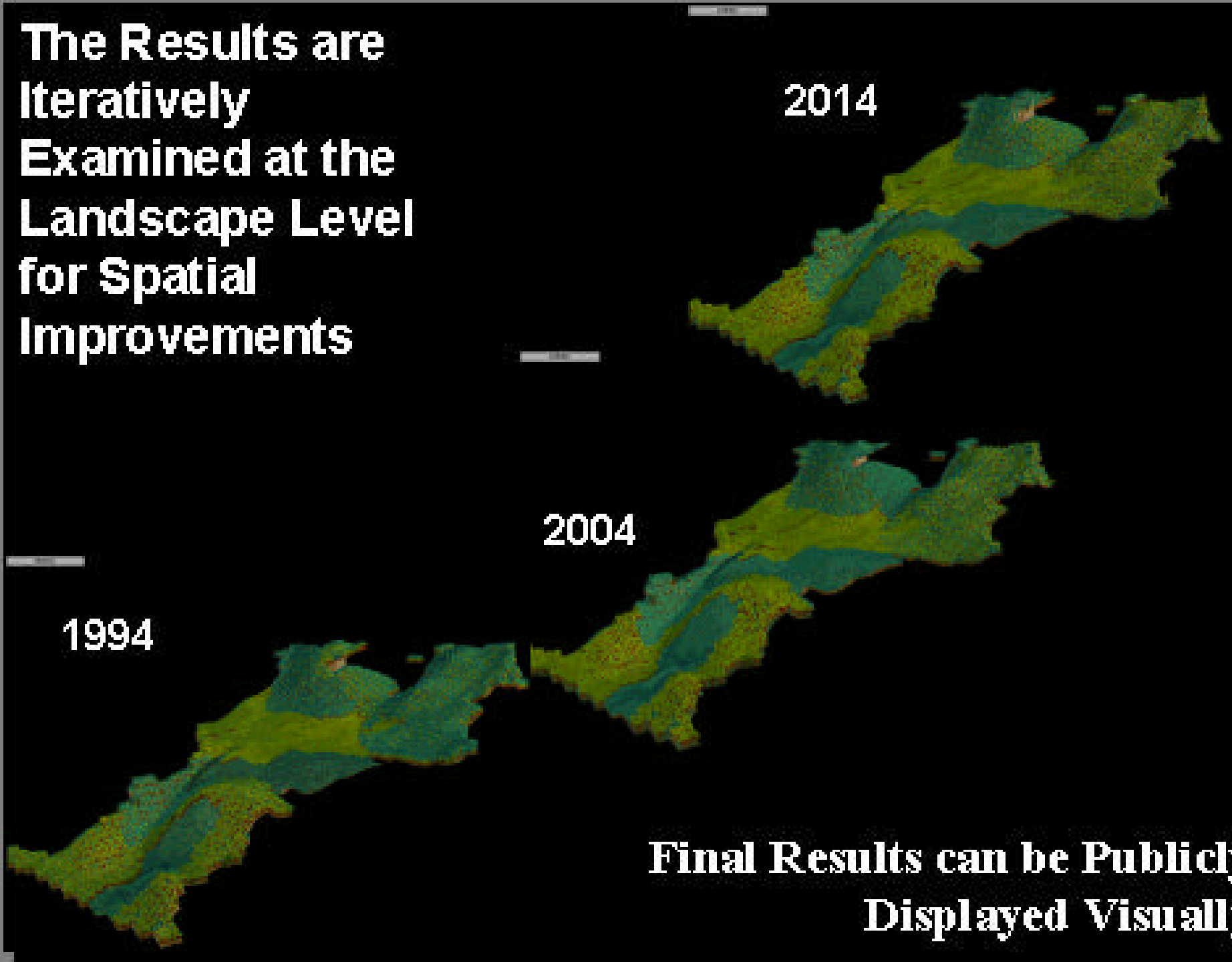
A “STAND SUITABILITY TABLE” Is the result of this process

GROUP	3	DATE			PEOPLE											
	GROUP>>	no_actioon	thin_now	intense	df250	dflong1	dflong2	underplt2	SV1	underplt	prog_thin1	prog_thin2	prop_thin	dfrcintense	dfrc_long	wh
	ACRES>>	34	169	0	135	0	0	0	0	0	101	0	68	68	101	0
	PERCENT>>	5	25	0	20	0	0	0	0	0	15	0	10	10	15	0
STAND	ACRES															
BR_B&T_NORTH	34	1	4	3	4	3	2	4	2	4	3	3	2	3	3	3
BR_LJ_MAC	6.8	1	3	3	4	3	3	2	2	2	3	3	2	3	3	3
BR_LONECEDAR	14.7	1	4	3	4	3	3	3	3	3	4	4	2	3	3	3
BR_PEEWEE_RA	3	1	4	2	3	2	2	4	3	4	3	3	2	2	2	2
HC_1400-01	9.2	2	2	2	3	2	4	3	3	3	4	3	2	2	2	2
HC_1400-02	12.5	3	2	1	4	2	3	3	4	3	3	4	2	2	2	2
HC_CL_FWOOD	28.1	2	2	1	4	2	3	4	2	4	2	4	3	2	2	2
HC_COVINGTON	13.4	4	2	2	2	2	2	4	3	4	1	3	3	1	1	1
HC_DOE_BRIDG	3.4	4	2	2	2	2	2	4	3	4	1	2	4	1	1	1
HC_EHUGO_RID	24.2	1	4	4	4	4	2	3	3	3	4	4	2	3	3	3
HC_ENEWT_CR	50.8	3	2	1	4	1	4	2	2	2	3	2	2	2	2	2
HC_G&H	1.9	1	4	2	4	2	2	2	2	2	3	2	2	2	2	2
HC_NEWT_DIV	31	1	4	3	4	3	2	2	2	2	3	3	2	3	2	2
HC_NISQ_SLVG	9.8	1	4	2	4	3	2	2	2	2	3	3	2	2	2	2
HC_PWEE_CL	12.6	3	2	1	3	1	2	4	4	4	1	2	2	1	1	1
MF_DOE_DFH	8.6	1	4	3	3	4	3	2	2	2	4	3	2	3	3	2
MF_DOE_DFL	2.2	1	4	3	3	4	3	2	2	2	4	3	2	3	3	2
MF_HWY_7_REV	13	2	2	3	3	4	3	2	2	2	4	3	2	2	2	2
MF_JAMERSON	9.8	2	2	2	3	2	2	2	3	2	2	4	2	2	2	2
MF_MASH_FLAT	25.6	3	2	1	3	1	2	4	4	4	2	4	2	2	2	2
MF_VALENTINE	15	2	3	2	3	2	2	4	4	4	2	4	2	3	3	2
MF_VAN_ISLND	5.7	2	4	2	3	2	3	2	2	2	4	4	2	2	2	2
MR_BIG_PONDS	60.4	2	4	2	3	2	3	2	2	2	4	4	2	2	2	2
MR_FIBER	9.2	1	4	2	4	4	2	2	2	2	3	3	2	2	2	2
MR_GEORGE_SP	64.2	1	4	3	4	3	2	2	2	2	3	3	2	2	2	2
MR_GRO	33.3	1	4	3	4	3	2	2	2	2	3	3	2	2	2	2
MR_HY_POPLAR	2.6	4	3	4	3	3	2	2	2	2	2	2	2	2	2	2
MR_NWTIC_MDW	13.2	2	3	2	4	3	3	2	2	2	3	3	2	3	3	2
SE_B&T	10.8	1	4	3	4	4	3	3	3	3	3	3	2	3	3	3
SE_B&T_SOUTH	5.7	1	5	4	4	4	3	3	3	3	3	3	2	3	3	3
SE_KELLY	33.2	2	3	1	4	1	2	4	4	4	2	4	3	1	1	1
SE_NOVELLI	96.1	4	2	1	3	1	1	2	4	2	1	3	3	1	1	1
SE_TALMADGE	12	2	3	3	3	3	3	2	2	2	3	3	2	2	2	2

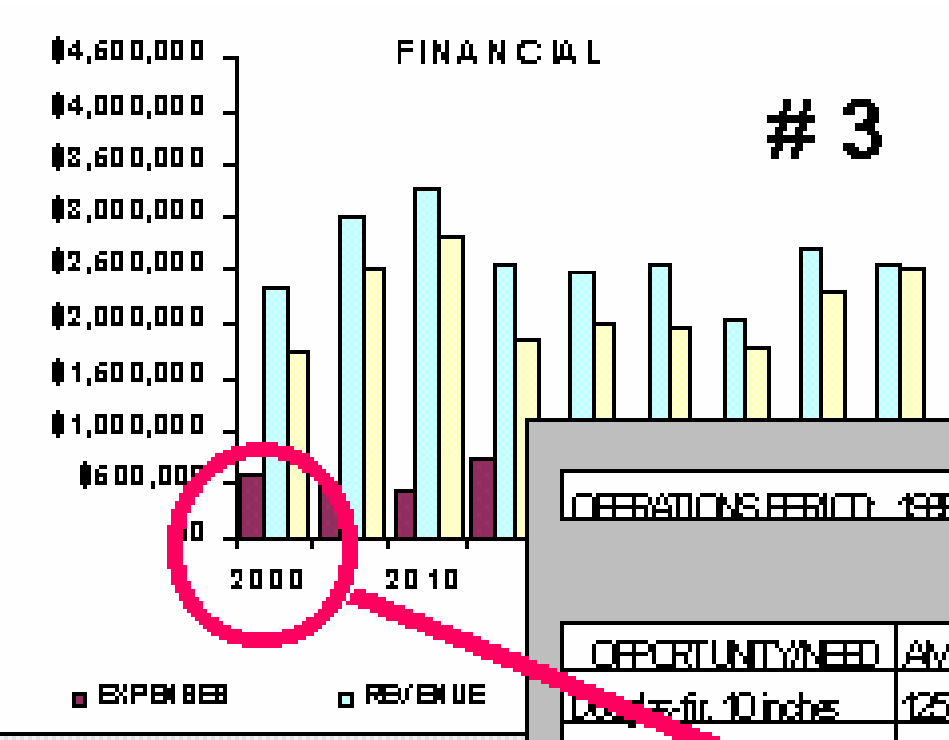
The Stand Suitability table is used to match the target landscape allocations with suitable stands

GROUP	3	DATE			PEOPLE											
	GROUP>>	no_actioon	thin_now	intense	df250	dflong1	dflong2	underplt2	SV1	underplt	prog_thin1	prog_thin2	prop_thin	dfrcintense	dfrc_long	wh
	ACRES>>	34	169	0	135	0	0	0	0	0	101	0	68	68	101	0
	PERCENT>>	5	25	0	20	0	0	0	0	0	15	0	10	10	15	0
STAND	ACRES	29	175		137						102		65	67	101	
BR_B&T_NORTH	34	1	4	3	4	3	2	4	2	4	3	3	2	3	3	3
BR_LJ_MAC	6.8	1	3	3	4	3	3	2	2	2	3	3	2	3	3	3
BR_LONECEDAR	14.7	1	4	3	4	3	3	3	3	3	4	4	2	3	3	3
BR_PEEWEE_RA	3	1	4	2	3	2	2	4	3	4	3	3	2	2	2	2
HC_1400-01	9.2	2	2	2	3	2	4	3	3	3	4	3	2	2	2	2
HC_1400-02	12.5	3	2	1	4	2	3	3	4	3	3	4	2	2	2	2
HC_CL_FWOOD	28.1	2	2	1	4	2	3	4	2	4	2	4	3	2	2	2
HC_COVINGTON	13.4	4	2	2	2	2	2	4	3	4	1	3	3	1	1	1
HC_DOE_BRIDG	3.4	4	2	2	2	2	2	4	3	4	1	2	4	1	1	1
HC_EHUGO_RID	24.2	1	4	4	4	4	2	3	3	3	4	4	2	3	3	3
HC_ENEWT_CR	50.8	3	2	1	4	1	4	2	2	2	3	2	2	2	2	2
HC_G&H	1.9	1	4	2	4	2	2	2	2	2	3	2	2	2	2	2
HC_NEWT_DIV	31	1	4	3	4	3	2	2	2	2	3	3	2	3	2	2
HC_NISQ_SLVG	9.8	1	4	2	4	3	2	2	2	2	3	3	2	2	2	2
HC_PWEE_CL	12.6	3	2	1	3	1	2	4	4	4	1	2	2	1	1	1
MF_DOE_DFH	8.6	1	4	3	3	4	3	2	2	2	4	3	2	3	3	2
MF_DOE_DFL	2.2	1	4	3	3	4	3	2	2	2	4	3	2	3	3	2
MF_HWY_7_REV	13	2	2	3	3	4	3	2	2	2	4	3	2	2	2	2
MF_JAMERSON	9.8	2	2	2	3	2	2	2	3	2	2	4	2	2	2	2
MF_MASH_FLAT	25.6	3	2	1	3	1	2	4	4	4	2	4	2	2	2	2
MF_VALENTINE	15	2	3	2	3	2	2	4	4	4	2	4	2	3	3	2
MF_VAN_ISLND	5.7	2	4	2	3	2	3	2	2	2	4	4	2	2	2	2
MR_BIG_PONDS	60.4	2	4	2	3	2	3	2	2	2	4	4	2	2	2	2
MR_FIBER	9.2	1	4	2	4	4	2	2	2	2	3	3	2	2	2	2
MR_GEORGE_SP	64.2	1	4	3	4	3	2	2	2	2	3	3	2	2	2	2
MR_GRO	33.3	1	4	3	4	3	2	2	2	2	3	3	2	2	2	2
MR_HY_POPLAR	2.6	4	3	4	3	3	2	2	2	2	2	2	2	2	2	2
MR_NWTIC_MDW	13.2	2	3	2	4	3	3	2	2	2	3	3	2	3	3	2
SE_B&T	10.8	1	4	3	4	4	3	3	3	3	3	3	2	3	3	3
SE_B&T_SOUTH	5.7	1	5	4	4	4	3	3	3	3	3	3	2	3	3	3
SE_KELLY	33.2	2	3	1	4	1	2	4	4	4	2	4	3	1	1	1
SE_NOVELLI	96.1	4	2	1	3	1	1	2	4	2	1	3	3	1	1	1
SE_TALMADGE	12	2	3	3	3	3	3	2	2	2	3	3	2	2	2	2

The Results are Iteratively Examined at the Landscape Level for Spatial Improvements



Final Results can be Publicly Displayed Visually



3

The Manager knows what Activities & Opportunities to do for the next (and subsequent) 5- or 10-year Planning Period

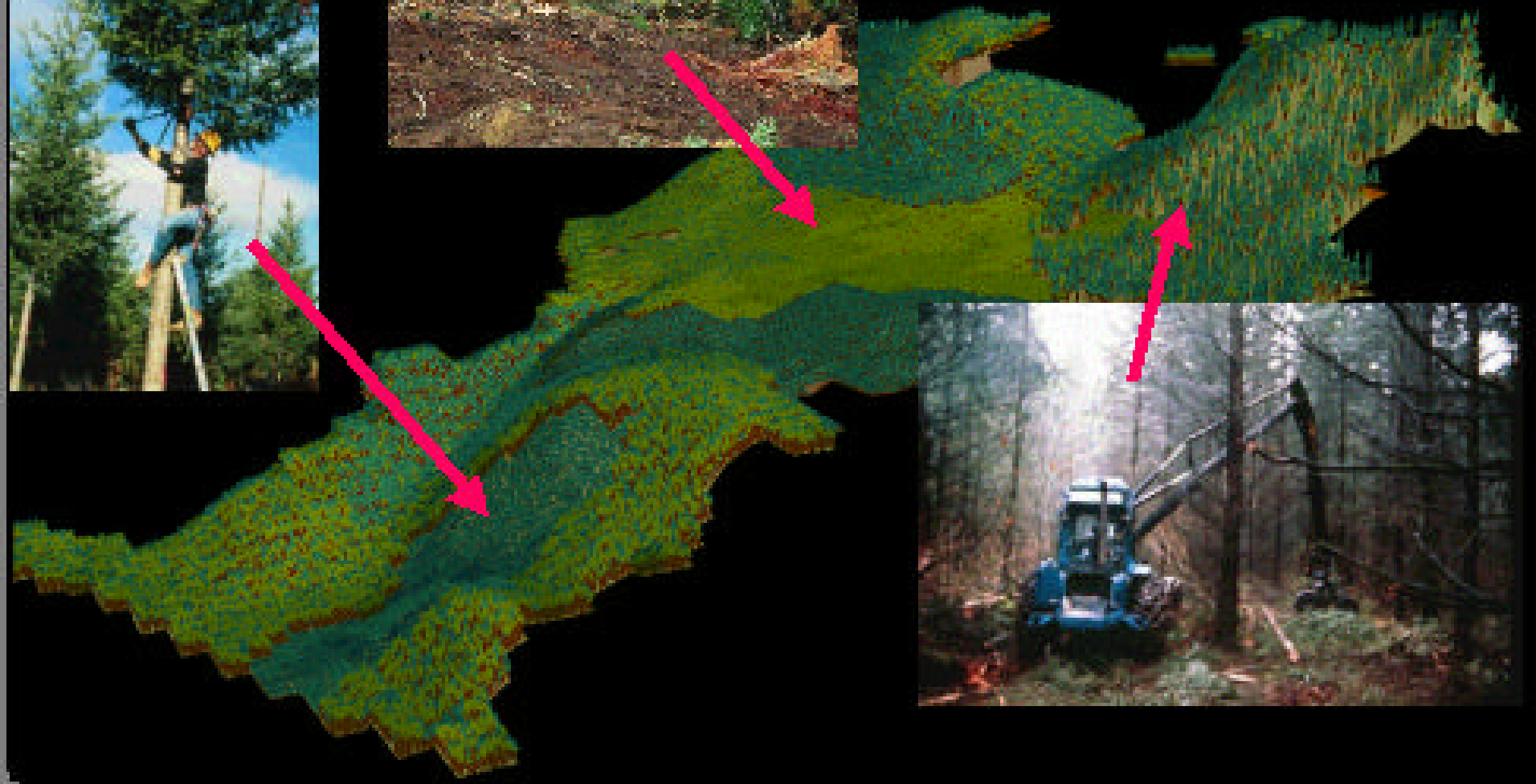
OPERATIONS PERIOD: 1998-2008

OPPORTUNITY/NEED	AMOUNT	STANDS	OPERATIONS	EXPECTED COSTS	EXPECTED RETURNS
Douglas-fir, 10 inches	125 MBF	#22, #41	thinning, ground	110	
Western Redcedar	50 MBF	#22, #36	thinning, cable	140	
Hemlock, 16 inches	500 MBF	#14	clearcut, cable	110	
Red Alder	360 MBF	#8, #64	clearcut, ground	85	
Douglas-fir, 30 inches	250 mbf	#4	selective cut	130	
. . .					
Salal greens	25 acres	#22, #41, #36			
Old growth	25 acres	#42			
Open areas	35 acres	#8, #14, #64, #33			
. . .					
REPLANT	25 acres	#8, #14, #64			
PRUNE	5 acres	#16			
WEED CONTROL	14 acres	#33			
. . .					

A 5- or 10- year portfolio

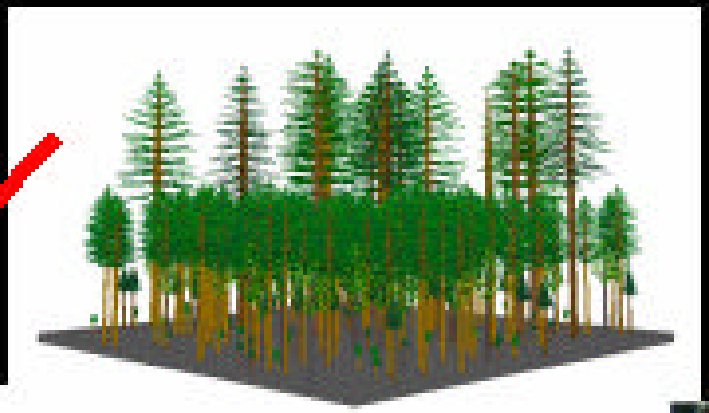
Stand	Action	Products Expected
BR_[illegible]TH_1366	Clearcut	Saw-log
BR_[illegible]AF_WLDCOR	Thin	Saw-log
[illegible]_PEEWEE_R6	PCT	None
[illegible]R_PWT	Thin	Saw-log
BR_R6_E6	Clearcut	Saw-log
BR_SILV_CTRL	Clearcut	Saw-log
BR_SILV_WEST	Clearcut	[illegible]
BR_STEEPLES	Thin	[illegible]
BR_TRI	Thin	pulp/small saw-log
BR_UP_MURPHY	Thin	Saw-log
HC_1766_RD	Clearcut	Saw-log
HC_CAN_POLE	Clearcut	Saw-log
HC_CL_EAST	Thin	pulp/small saw-log
HC_CL_THN	Clearcut	Saw-log
HC_HUGO_WP	PCT	None
HC_L_PWDR_TH	Clearcut	Saw-log
HC_LGTH_DR_B	Clearcut	Saw-log
HC_PORCUPINE	Thin	pulp/small saw-log
HC_PWEE_YUH	PCT	None
HC_SCRUB_OG	Th[illegible]	pulp/small saw-log
HC_STOCKPILE	PCT	None
HC_SWITCHBK	Thin	[illegible]
HC_TPU	PCT	None
HC_WHUGO_RID	Thin	Saw-log
HF_COMP_BUFF	Clearcut	Saw-log
HF_DECADES	Clearcut	
HF_DOE_DFH	PCT	
HF_DOE_R6H	PCT	
HF_OATE_THN	Thin	
HF_ACT_THN	Thin	
HF_LGTH_DR_N	[illegible]	
HF_HLL_POND	[illegible]	
HF_RR_WETLND	Thin	
HR_JTCR_E_TH	Clearcut	
HR_JTCR_RHI	PCT	
HR_BIG_PONDS	PCT	
HR_GEORGE_SP	PCT	
HR_GRO	PCT	
HR_LLH6SH_W	PCT	
HR_SUBDIV	Thin	
SF_BGT_SOUTH	Thin	
[illegible]_COUGAR	Clearcut	
[illegible]_COW_EAST	Thin	
SF_[illegible]ECCARDO	Clearcut	
SF_[illegible]HG_PLY	PCT	
SF_F[illegible]_FRS	Thin	
SF_LOG_[illegible]HP	Clearcut	

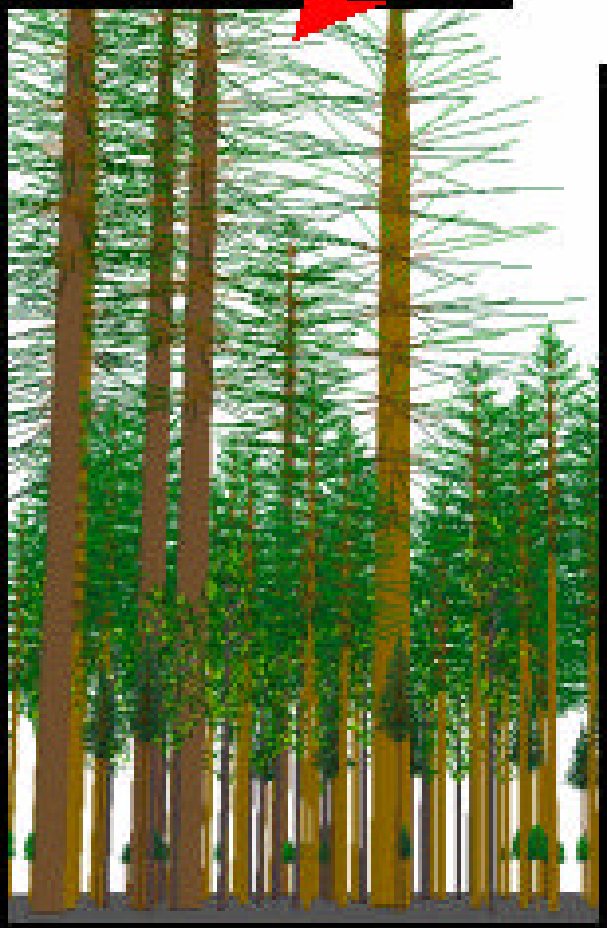
The Manager Knows What Stand-Specific Operation to Do When & Where to Achieve the Objectives



Visualization Tools can aid in Operation Layout & Implementation

The Results are Monitored, as Described Earlier



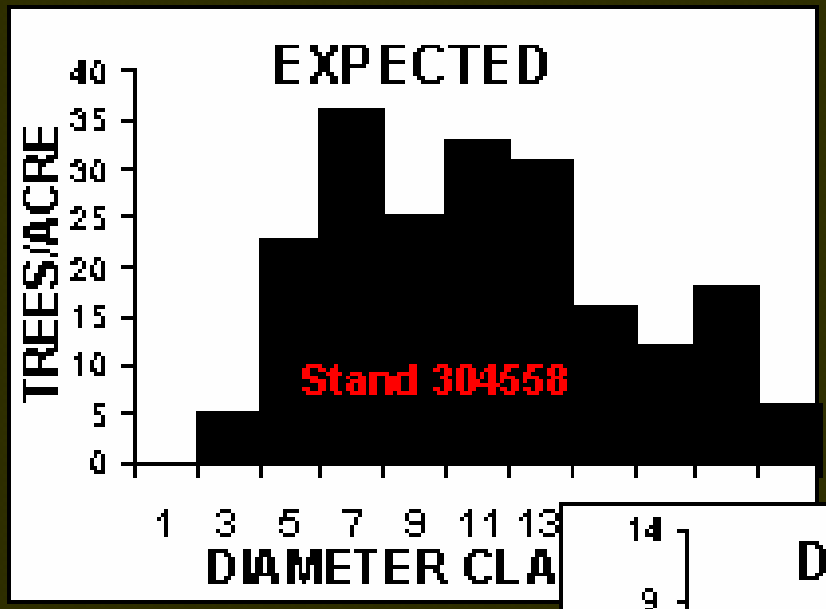


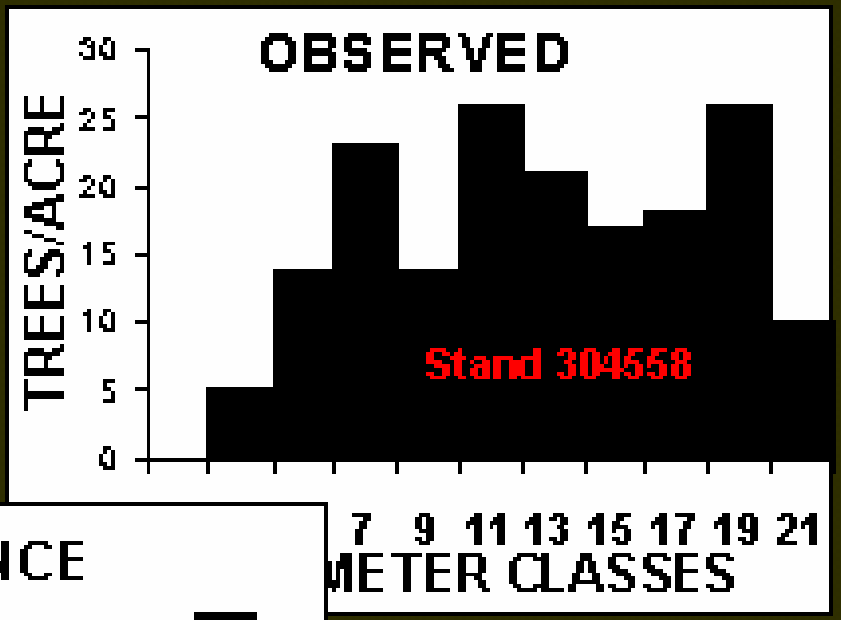
Stand 304528

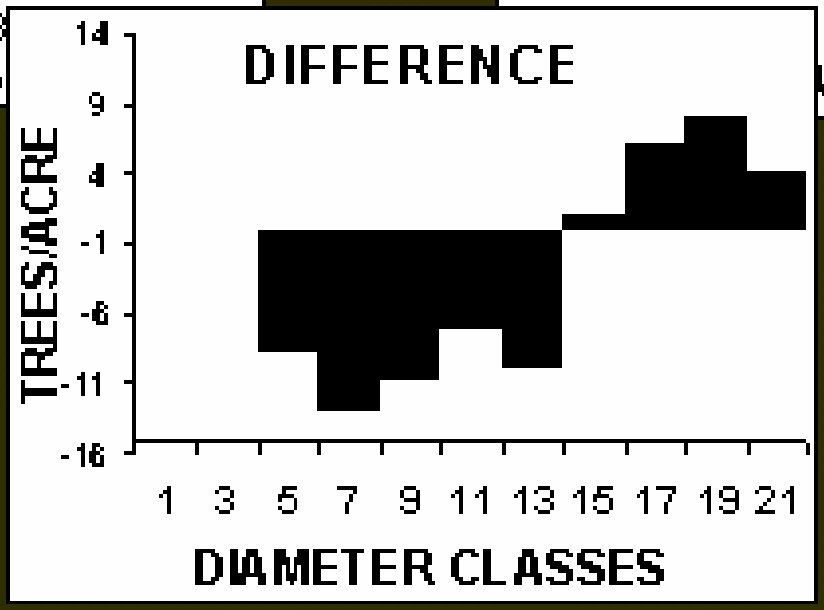
<<<EXPECTED

ACTUAL>>>

Monitoring--More Intensive Measurements in a Subsample of Stands of Each Stratification







FOR MORE INFORMATION ON THE DECISION ANALYSIS PROCESS, ECOSYSTEM MANAGEMENT, AND PROGRESS ON THE PACK FOREST AND SATSOP MANAGEMENT PLANS, SEE

“ECOSYSTEM MANAGEMENT”

IN:

http://lms.cfr.washington.edu

Computer needs for LMS2.0+

- IBM Pentium PC running Windows 98 is required as a minimum, a Pentium II (or higher) 400Mhz (or higher) running Windows 98/NT/2000 is recommended.
- SVGA video required, 8MB minimum recommended, 32MB or more preferred. 2D hardware acceleration useful for stand visualization. 3D OpenGL hardware acceleration useful for landscape visualization.
- 64MB RAM required, 128MB or greater recommended.
- 60MB of hard drive space is required. The data and intermediate files can use considerably more space.

http://lms.cfr.washington.edu