

Appendix A. Model Runs Workbook - 20 Years

Cherokee NF Ecological Forecasts -- 20 Years

Model Runs - June-August, 2011

Ecological System	Acres (rounded to nearest 100)	Ecological Departure							Ecological ROI (U-B-Gone Mgmt)	Area- Weighted ROI (U-B-Gone Mgmt)	U-B-Gone Mgmt - Ave. Annual Cost
		No Mgmt w Fire Suppression	Maximum Ecological Mgmt	Fire Only Mgmt	Mechanical Only Mgmt	ROI Mgmt	Workshop III Mgmt	U-B-Gone Mgmt			
Cove Forest	103,000	34	31	-	31	30	30	29	1.3	1.4	\$ 22,500
Dry Oak Forest	65,900	60	29	38	36	40	39	37	1.2	0.8	\$ 112,100
Dry-Mesic Oak Forest	40,800	49	28	31	31	37	37	34	2.9	1.2	\$ 32,500
Low-Elevation Pine Forest	23,800	72	28	44	33	50	37	35	3.1	0.7	\$ 93,750
Montane Pine Forest	21,800	80	30	35	25	43	36	35	3.4	0.7	\$ 97,750
Montane Red-Chestnut Oak Forest	71,800	39	25	29	25	25	26	25	1.4	1.0	\$ 62,550
Northern Hardwood Forest	11,600	14	-	-	-	-	-	-	n/a		
Riparian & Floodplain Systems	2,500	39	38	-	-	-	38	38	n/a		\$ -
Spruce-Fir Forest	2,200	40	24	-	24	28	28	24	17.9	0.4	\$ 12,000
Average Annual Cost			\$ 1,383,000	\$ 373,000	\$ 1,225,000	\$ 249,000	\$ 317,000	\$ 433,000			\$ 433,000
Average Annual Acres Prescribed Fire			6,200	9,900	-	4,200	5,000	4,900			
Ave. Annual Acres Commerical Harvest			2,600	-	4,500	1,100	1,400	1,600			

Strategy Worksheet

Cove Forest

102,977 acres

100000

Enter percentages from "Final Conditions" as a whole number

Vegetation Class (describe) <i>type x in left box if high-risk</i>	NRV	Current Condition	No mgmt 20 yrs high fire suppression	Max ecological mgmt	Fire only mgmt (n/a)	Mechanical only mgmt	ROI mgmt	Carryover Workshop III	U-B-Gone mgmt
A - Early	4%	1%	3%	5%		5%	4%	4%	4%
B - Mid Closed	30%	75%	60%	60%		60%	59%	59%	57%
C - Late Open	7%	1%	2%	4%		4%	5%	5%	5%
D - Late Closed	21%	15%	23%	21%		21%	21%	21%	21%
G - Old Growth Closed	38%	6%	10%	10%		10%	10%	10%	11%
x U- White Pine		2%	2%	0%		0%	2%	2%	1%

Ecological Departure

Uncharacteristic Classes

47	34	31	-	31	30	30	29
2	2	0	0	0	2	2	1

Total Cost	\$	-	\$ 1,080,000	\$	-	\$ 1,080,000	\$ 240,000	\$ 240,000	\$ 450,000
ROI (vs. Min. Mgmt)			0.5		-	0.5	1.7	1.7	1.3

Scenarios (enter name below)	Enter Notes	Enter Management Strategies, Number of Acres/Year, Costs & Number of Years					
	Notes	Gap Harvest + Thinning (comm)	Regen Harvest (comm)	Harvest-Restore + Plant (comm)			
No mgmt 20 yrs high fire su							
Max ecological mgmt		200		200			
Fire only mgmt (n/a)							
Mechanical only mgmt		200		200			
ROI mgmt		200					
Carryover Workshop III		200					
U-B-Gone mgmt		200		50			
Cost of Strategy (per acre)		\$ 60	\$ 50	\$ 210			
Number of Years		20	20	20			

Strategy Worksheet

Dry Oak Forest

65,881 acres

100000

Enter percentages from "Final Conditions" as a whole number

Vegetation Class (describe) <i>type x in left box if high-risk</i>	NRV	Current Condition	No mgmt 20 yrs high fire suppression	Max ecological mgmt	Fire only mgmt	Mechanical only mgmt	ROI mgmt	Workshop III mgmt	U-B-Gone mgmt
A - Early	10%	3%	3%	15%	8%	15%	9%	9%	9%
B - Mid Closed	15%	13%	11%	14%	8%	18%	10%	11%	14%
C - Mid Open	31%	0%	1%	6%	5%	2%	3%	3%	3%
D - Late Open	15%	1%	3%	22%	13%	17%	13%	14%	13%
E - Late Closed	8%	61%	32%	11%	24%	15%	22%	22%	23%
F- Old Growth Open	7%	0%	0%	4%	6%	0%	3%	2%	2%
G- Old Growth Closed	14%	14%	40%	27%	28%	32%	31%	32%	32%
x U- White Pine		3%	4%	0%	3%	0%	3%	2%	1%
x U- Yellow Poplar		1%	2%	0%	2%	0%	2%	1%	1%
x U- Pine-Dominated		3%	3%	0%	3%	0%	3%	3%	2%

Ecological Departure

61	60	29	38	36	40	39	37
7	9	0	8	0	8	6	4

Uncharacteristic Classes

Total Cost	\$ -	\$ 4,320,000	\$ 2,400,000	\$ 2,920,000	\$ 1,700,000	\$ 1,780,000	\$ 2,242,000
ROI (vs. Min. Mgmt)		0.9	1.0	1.1	1.2	1.3	1.2

Scenarios (enter name below)	Enter Notes	Enter Management Strategies, Number of Acres/Year, Costs & Number of Years					
		RxFire	Regen Harvest (50-50 comm/non)	Woodland Restoration (50-50 comm/non)	Rx-Fire-WP/YP	Harvest-Restore w oak ovrstry (comm)	Harvest-Restore + Plant (comm)
No mgmt 20 yrs high fire su							
Max ecological mgmt		1600	300	600		80	200
Fire only mgmt		2400					
Mechanical only mgmt			400	600		80	200
ROI mgmt		800	150	300			
Workshop III mgmt		800	150	300	40	40	
U-B-Gone mgmt		800	150	300	40	40	110
Cost of Strategy (per acre)		\$ 50	\$ 100	\$ 100	\$ 50	\$ 50	\$ 210
Number of Years		20	20	20	20	20	20

Strategy Worksheet

Dry-Mesic Oak Forest

40,766 acres

100000

Enter percentages from "Final Conditions" as a whole number

Vegetation Class (describe) <i>type x in left box if high-risk</i>	NRV	Current Condition	No mgmt 20 yrs high fire suppression	Max ecological Mgmt	Fire only mgmt	Mechanical only mgmt	ROI mgmt	Workshop III	U-B-Gone mgmt
A - Early	7%	3%	2%	9%	7%	11%	5%	7%	8%
B - Mid Closed	15%	17%	14%	16%	11%	19%	14%	14%	16%
C - Mid Open	25%	0%	3%	5%	6%	4%	4%	3%	4%
D - Late Open	23%	9%	12%	28%	22%	37%	19%	18%	19%
E - Late Closed	13%	59%	43%	25%	31%	16%	37%	36%	33%
F- Old Growth Open	11%	1%	1%	3%	4%	1%	2%	2%	2%
G- Old Growth Closed	6%	5%	18%	13%	12%	12%	15%	15%	15%
x U- White Pine		3%	4%	0%	3%	0%	3%	3%	2%
x U- Pine-Dominated		3%	3%	0%	3%	0%	2%	2%	1%

Ecological Departure

Uncharacteristic Classes

54	49	28	31	31	37	37	34
6	7	0	6	0	5	5	3

Total Cost

\$ - \$ 1,628,000 \$ 1,250,000 \$ 1,378,000 \$ 365,000 \$ 440,000 \$ 650,000

ROI (vs. Min. Mgmt)

1.7 1.5 1.8 3.8 3.2 2.9

Scenarios (enter name below)	Enter Notes	Enter Management Strategies, Number of Acres/Year, Costs & Number of Years						
		RxFire		Thinning (comm)	Regen Harvest (comm)		Harvest-Restore w oak ovrstry (comm)	Harvest-Restore + Plant (comm)
No mgmt 20 yrs high fire su								
Max ecological Mgmt		650		250	100		40	140
Fire only mgmt		1250						
Mechanical only mgmt				550	200		40	140
ROI mgmt		200		100	25		40	
Workshop III		200		100	100		40	
U-B-Gone mgmt		200		100	100		40	50
Cost of Strategy (per acre)		\$ 50		\$ 50	\$ 50		\$ 50	\$ 210
Number of Years		20		20	20		20	20

Strategy Worksheet

Low-Elevation Pine Forest

23,812 acres

100000

Enter percentages from "Final Conditions" as a whole number

Vegetation Class (describe) <i>type x in left box if high-risk</i>	NRV	Current Condition	No mgmt 20 yrs high fire suppression	Max ecological mgmt	Fire only mgmt	Mechanical only mgmt	ROI mgmt	Workshop III	"U-B-Gone" mgmt
A - Early	32%	2%	14%	31%	33%	26%	25%	31%	35%
B - Mid Closed	2%	5%	22%	30%	11%	27%	19%	15%	17%
C - Mid Open	32%	0%	8%	14%	12%	11%	12%	14%	18%
D - Late Open	33%	5%	3%	24%	9%	27%	10%	15%	12%
E - Late Closed	1%	56%	21%	2%	3%	8%	15%	7%	5%
x U- Oak Dominated		32%	33%	0%	33%	1%	19%	18%	12%

Ecological Departure

Uncharacteristic Classes

90	72	28	44	33	50	37	35
32	33	0	33	1	19	18	12

Total Cost	\$ -	\$ 10,525,000	\$ 1,000,000	\$ 7,575,000	\$ 625,000	\$ 1,515,000	\$ 1,875,000
ROI (vs. Min. Mgmt)		0.7	2.8	0.9	5.8	3.3	3.1

Scenarios (enter name below)	Enter Notes	Enter Management Strategies, Number of Acres/Year, Costs & Number of Years					
	Notes	RxFire - Years 1-5 & 16-20	Thinning	Woodland Restoration [50% seed source] (comm)	Restoration Harvest + Pine Planting (no seed source)	Fire Breaks	
No mgmt 20 yrs high fire suppression							
Max ecological mgmt		500	225	225	225	250	
Fire only mgmt		2000					
Mechanical only mgmt			250	225	225	125	
ROI mgmt		800		225			
Workshop III	5 acres break for 1000 Rx	1500	25	225		10	
"U-B-Gone" mgmt		1500	25	225	60	10	
Cost of Strategy (per acre)		\$ 50	\$ 600	\$ 50	\$ 300	\$ 1,200	
Number of Years		10	20	20	20	20	

Strategy Worksheet

Montane Pine Forest

21,837 acres

100000

Vegetation Class (describe) <i>type x in left box if high-risk</i>	NRV	Current Condition	No mgmt 20 yrs high fire suppression	Max ecological mgmt	Fire only mgmt	Mechanical only mgmt	ROI mgmt	Workshop III	U-B-Gone mgmt
A - Early	12%	6%	3%	32%	25%	15%	14%	14%	23%
B - Mid Closed	3%	13%	12%	12%	9%	15%	16%	13%	15%
C - Mid Open	25%	1%	3%	8%	9%	4%	7%	13%	14%
D - Late Open	55%	3%	6%	47%	36%	59%	30%	31%	31%
E - Late Closed	5%	57%	53%	0%	8%	1%	18%	17%	17%
x U- Oak Dominated		20%	23%	1%	14%	6%	14%	13%	1%

Ecological Departure

Uncharacteristic Classes

82	80	30	35	25	43	36	35
20	23	1	14	6	14	13	1

Total Cost

\$ - \$ 7,510,000 \$ 1,500,000 \$ 9,100,000 \$ 850,000 \$ 1,075,000 \$ 1,955,000

ROI (vs. Min. Mgmt)

1.0 3.6 0.8 5.4 5.0 3.4

Scenarios (enter name below)	Enter Notes	Enter Management Strategies, Number of Acres/Year, Costs & Number of Years						
	Notes	RxFire - Years 1-5 & 16-20	Maintenance Fire (10 "off" years)	RxFire-Oak (30% seed source)	Thin B to C for first 10 yrs	Thinning - 5 years	Restoration Treatmt w Seed Source (30% of OD)	Restoration Harvest + Pine Planting
No mgmt 20 yrs high fire suppr								
Max ecological mgmt	Burn & thin 1st & last 5 years	2200	220			1500		300
Fire only mgmt	Burn 2500 1st & last 5 years; must limit Oak to 100 vs 350	2500	300	100				
Mechanical only mgmt	Thin 2500 last 5 yrs					2500	100	200
ROI mgmt	Burn 2500 1st & 500 last 5 yrs	1500		100				
Workshop III	Burn 2500 1st & 500 last 5 yrs; add thin B to C	1500		100	250			
U-B-Gone mgmt		1500		100	250		100	80
Cost of Strategy (per acre)		\$ 50	\$ 50	\$ 50	\$ 90	\$ 600	\$ 200	\$ 300
Number of Years		10	10	20	10	5	20	20

Strategy Worksheet

Montane Red-Chestnut Oak Forest

71,847 acres

100000

Enter percentages from "Final Conditions" as a whole number

Vegetation Class (describe) <i>type x in left box if high-risk</i>	NRV	Current Condition	No mgmt 20 yrs - fire suppression	Max ecological mgmt	Fire only mgmt	Mechanical only mgmt	ROI mgmt	Workshop III (corrected)	U-B-Gone mgmt
A - Early	7%	3%	3%	12%	7%	19%	7%	8%	8%
B - Mid Closed	26%	21%	19%	16%	15%	14%	17%	16%	17%
C - Mid Open	20%	0%	3%	6%	5%	9%	6%	6%	6%
D - Late Open	12%	3%	4%	15%	10%	22%	13%	13%	13%
E - Late Closed	18%	61%	44%	30%	35%	18%	33%	33%	33%
F- Old Growth Open	2%	0%	0%	2%	2%	1%	1%	1%	1%
G- Old Growth Closed	14%	8%	22%	19%	21%	18%	21%	20%	19%
x U- White Pine		1%	2%	0%	2%	0%	1%	1%	1%
x U- Yellow Poplar		2%	2%	0%	2%	0%	1%	1%	1%
x U- Pine-Dominated		1%	1%	0%	1%	0%	0%	0%	0%

Ecological Departure

47	39	25	29	25	25	26	25
4	5	0	5	0	2	2	2

Uncharacteristic Classes

Total Cost	\$ -	\$ 2,365,000	\$ 1,300,000	\$ 2,450,000	\$ 1,102,500	\$ 1,208,800	\$ 1,250,800
ROI (vs. Min. Mgmt)		0.8	0.8	0.8	1.5	1.3	1.4

Scenarios (enter name below)	Enter Notes	Enter Management Strategies, Number of Acres/Year, Costs & Number of Years						
	Notes	RxFire	Thinning - Late Closed (commercial)	Thinning- Mid Closed Older (commercial)	Gap Harvest + Thin (small commercial)	Regen Harvest (commercial)	Restoration Harvest w Oak Overstory (25%) (comm)	Restoration Harvest + Plant (comm)
No mgmt 20 yrs - fire suppressi								
Max ecological mgmt	Thin Mid Closed in last 5 yrs	1000	100	100	100	100	75	225
Fire only mgmt		1300						
Mechanical only mgmt	Thin Mid Closed in last 5 yrs		400	600	400	400	75	225
ROI mgmt	Thin Mid Closed in last 5 yrs	800	75	50	75	50	75	
Workshop III (corrected)		800	125	75	75	100	75	
U-B-Gone mgmt		800	125	75	75	100	75	10
Cost of Strategy (per acre)		\$ 50	\$ 50	\$ 50	\$ 60	\$ 50	\$ 50	\$ 210
Number of Years		20	20	5	20	20	20	20

Strategy Worksheet

Northern Hardwood Forest

11,639 acres

100000

Enter percentages from "Final Conditions" as a whole number

Vegetation Class (describe) <i>type x in left box if high-risk</i>	NRV	Current Condition	No Mgmt 20 Yrs - fire suppression	-	-	-	-	-
A - Early	9%	2%	6%					
B - Mid Closed	18%	13%	9%					
C - Late Closed	69%	81%	82%					
D - Late Open	4%	4%	2%					

Ecological Departure

12	14	-	-	-	-	-
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Total Cost

\$ -	\$ -	\$ -	\$ -	\$ -
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ROI (vs. Min. Mgmt)

-	-	-	-	-
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	Enter Notes	Enter Management Strategies, Number of Acres/Year, Costs & Number of Years						
Scenarios (enter name below)								
<i>No Mgmt 20 Yrs - fire suppr</i>								
Cost of Strategy (per acre)								
Number of Years								

Strategy Worksheet

Riparian & Floodplain Systems

2,548 acres

100000

Enter percentages from "Final Conditions" as a whole number

Vegetation Class (describe) <i>type x in left box if high-risk</i>	NRV	Current Condition	No mgmt 20 yrs high fire suppression	Max ecological mgmt	Fire only mgmt	Mechanical only mgmt	ROI mgmt	U-B-Gone mgmt
A - Early	15%	4%	14%	16%				16%
B - Mid Closed	23%	14%	9%	10%				10%
C - Mid Open	13%	2%	3%	3%				3%
D - Late Open	40%	17%	26%	25%				25%
E - Late Closed	9%	60%	45%	44%				44%
x U- White Pine		2%	2%	2%				2%

Ecological Departure

Uncharacteristic Classes

54	39	38	-	-	-	38
2	2	2	0	0	0	2

Total Cost

\$ - \$ - \$ - \$ - \$ - \$ -

ROI (vs. Min. Mgmt)

- - - - -

Scenarios (enter name below)	Enter Notes	Enter Management Strategies, Number of Acres/Year, Costs & Number of Years					
		RxFire					
No mgmt 20 yrs high fire su							
Max ecological mgmt	33 acres/yr carryover from other systems	33					
Fire only mgmt	50 acres/yr carryover from other systems	50					
Mechanical only mgmt							
ROI mgmt	25 acres/yr carryover from other systems	25					
U-B-Gone mgmt	33 acres/yr carryover from other systems	33					
Cost of Strategy (per acre)		\$ -					
Number of Years		20					

Strategy Worksheet

Spruce-Fir Forest

2,236 acres

100000

Enter percentages from "Final Conditions" as a whole number

Vegetation Class (describe) <i>type x in left box if high-risk</i>	NRV	Current Condition	No mgmt 20 yrs high fire suppression	Max ecological mgmt	Fire only mgmt	Mechanical only mgmt	ROI mgmt	Carryover Workshop III	U-B-Gone mgmt
A - Early	18%	1%	7%	8%		8%	8%	8%	8%
B - Mid Closed	13%	5%	2%	2%		2%	2%	2%	2%
C - Mid Open	11%	0%	6%	8%		8%	7%	7%	8%
D - Late Closed	58%	54%	45%	69%		69%	55%	55%	69%
x U- Brush-Shrub		12%	12%	12%		12%	12%	12%	12%
x U- NOT Spruce or Fir		27%	27%	0%		0%	16%	16%	0%

Ecological Departure

Uncharacteristic Classes

40	40	24	-	24	28	28	24
39	39	12	0	12	28	28	12

Total Cost

\$ - \$ 240,000 \$ - \$ 240,000 \$ 90,000 \$ 90,000 \$ 240,000

ROI (vs. Min. Mgmt)

17.9 - 17.9 25.6 25.6 17.9

Enter Notes

Enter Management Strategies, Number of Acres/Year, Costs & Number of Years

Scenarios (enter name below)	Enter Notes	Spruce Restoration (50% commercial)						
No mgmt 20 yrs high fire su								
Max ecological mgmt		40						
Fire only mgmt								
Mechanical only mgmt		40						
ROI mgmt		15						
Carryover Workshop III		15						
U-B-Gone mgmt		40						
Cost of Strategy (per acre)		\$ 300						
Number of Years		20						