Kings River Project
Environmental Impact Statement
Fisher Rest Use Probability
Analysis Methods

Prepared by
Ramiro Rojas
July 2006

Purpose

The purpose of the fisher rest site analysis is to compare the effects of the proposed actions treatments, reduction of harvest tree size alternative treatments, and no action alternative on the probability on fisher rest site use across eight management units over a thirty year period. Three phases of modeling are employed in the Kings River Project EIS (KRP). Phase I and II modeling was used to model treatments at the plant aggregation scale across the KRP landscape (Parks and Rojas 2006). Phase III modeled vegetation at the stand level. Phase III modeling assessed treatments at the stand and plot for nine management units. Phase III model results were used to assess the fisher rest site use and other plot based analysis (e.g. insect mortality risk). Modeling efforts described in this paper supplement model efforts described in Parks and Rojas (2006)

This analysis is based on probability equations developed by Zielinski et al 2004. It examines the change in probability of fisher rest site use at the plot level for uneven-aged treatments, thinning from below in California spotted owl protected activity centers (PACs), and underburning that occur at the stand level. That is that stand level prescriptions are disaggregated back to the plot level. Forest structural changes are modeled using the Forest Vegetation Simulator (FVS) and the fire and fuels extension. FVS was used to model the initial eight management units proposed for the Kings River EIS and the South of Shaver management unit that was approved under a separate decision. Harvest treatments, fuels treatments, and wildfire were simulated across these nine management units.

The Fisher rest sites provide areas were fishers are known to stay when moving across home range areas. Rest sites have been found to contain stand structure and geographic characteristics that are preferred by fishers. Rest sites are typically found at a single tree. The single tree is often large (> 40” DBH). However, the rest tree is often found in a group of trees. The characteristics of rest site locations are often less than one acre. However, stands used in this analysis can be as large as 300 acres. Thus stand level data is unable to describe rest site conditions. Rest site conditions occur at the plot level.

Plot information from stand exams was used to calculate fisher rest site probabilities using the Zielinski et al 2004 equations. Fisher rest site structure characteristics include: plot canopy cover, presence of large trees, and large snags. The geographic characteristics are proximity to water (< 100 meters), and steep slopes.

This analysis focuses on the change in probability of use determined by 2 fisher models described by Zielinski et al 2004.

sample	type/size to measure	sample size
Vegetation-Live Brush species	Live Brush Species	83.3 ft radius
Large Live trees	5.0" DBH +	20 BAF or 40 BAF
Saplings	1.0" to 4.9" DBH	11.8 ft radius
Seedlings	6" tall to 1.0" DBH	11.8ft radius
SMALL SNAGS	5" DBH TO 8.9" DBH	20 BAF or 40 BAF
Large Snags	9.0" DBH +	33 ft x 165 ft rectangle
Downed logs	10.0" +	33 ft x 165 ft rectangle
Fuels W record	dead wood less than 9.0"	photo series

1) Sierra probability model=

$$(DBHMax*0.0149+DBHSTD*.0301+.SLOPE*.0194+WATER*.7663)$$

2) Female probability model=

$$(EXP(.0743*CANAVE+.0138*DBHMAX+.0263*SLOPE+.8923*CONSNAG)$$

Where:
DBHMax=DBH of the largest tree on the plot
DBHSTD=Standard deviation of the mean DBH
SLOPE=Percent slope
WATER=< or > 100 meters from perennial or intermittent creek
CANAVE=Non overlapping canopy cover
CONSNAG=presence of >= 1 conifer snag >40” DBH

Each model has a set of variables, which account for the use of any plot by fishers. Resource selection model attributes were developed for each fisher model equation.

STAND DATA

Data used in the analysis was 1564 stand examination plots collected from 1996 to 2004. These plots are representative of the stand structures found with in the initial eight management units proposed for treatment in the Kings River Project EIS and the South of Shaver management unit. Sampled data collected for each plot is displayed in table 1. Figure 1 displays the plot locations across one management unit.

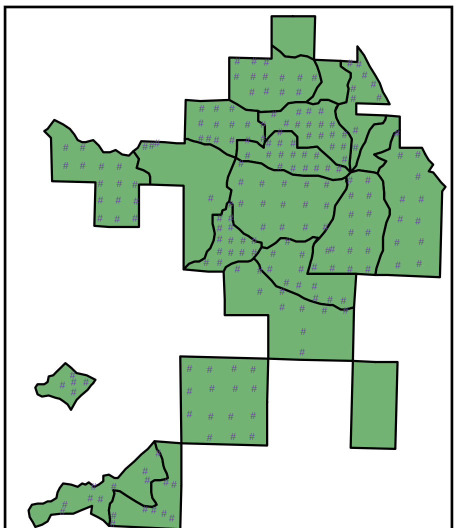


Figure 1Displays the plot locations and stand boundaries for the KREW_prov1 management unit.

TREATMENTS

Treatments for each stand were determined for the proposed action and reduction of harvest tree size alternative. Each stand was assigned a suite of treatments that implemented the uneven-aged J-curve structure, thinning from below up to 20” within spotted owl study PAC’s and fuels treatments for each stand. Treatments within spotted owl study PACs is similar to prescriptions described in the 2001 Sierra Nevada Plan Amendment record of decision PACs inside defense zone. Fuels treatments modeled included underburning, and pile burning. The parameters for the J-curve were determined from the stand prescriptions described in the EIS. No trees greater than 35” were removed with the proposed action simulation and no trees greater than 30" were removed in the reduction of harvest tree size alternative. In addition a simulated wildfire using the 90th percentile fire weather information was processed for each stand for both the proposed action, the reduction of harvest tree size alternative and no action alternative. Stand growth was simulated for a 30-year period. Appendix 1 and 2 contain detailed information about FVS keywords and treatments. Areas with no scheduled treatments such as research controls, red-legged frog no harvest zones, or no harvest stream side management zones are modeled using the no action alternative.

Treatment intensity across the initial eight management units vary based on objectives for restoration of pre-1850 forest conditions, wildland urban interface, research designs and fisher buffer corridors (old forest linkages). Residual basal area used to define the inverse j-curve is applied across a whole stand. Fisher buffer corridors are exceptions. Fisher buffer corridors are areas used to provide linkages across the landscape between fisher home range areas. The buffers occur within in 300 feet of perennial creeks (figure 2). Buffers receive both fuels treatments and tree removal treatments. However, treatment intensity is design to maintain 60 percent canopy cover in mixed conifer stands and 50 percent canopy cover in ponderosa pine stands. FVS treatments with the higher canopy retention was run for the proposed action alternative with and with out fire.

Thus twelve separate FVS model runs were performed:

1. Proposed Action alternative
2. Proposed Action alternative with severe fire in ten years after treatments
3. No action alternative
4. No action alternative with severe fire in ten years after treatment
5. Proposed Action alternative inside fisher buffer
6. Proposed Action alternative with severe fire in ten years after treatment inside fisher buffer
7. No action alternative inside fisher buffer
8. No action alternative with severe fire in ten years after treatment inside fisher buffer
9. Thirty inch limit alternative
10. Thirty inch limit alternative with severe fire in ten years after treatment
11. Thirty inch limit alternative inside fisher buffer
12. Thirty inch limit alternative with severe fire in ten years after treatment inside fisher buffer

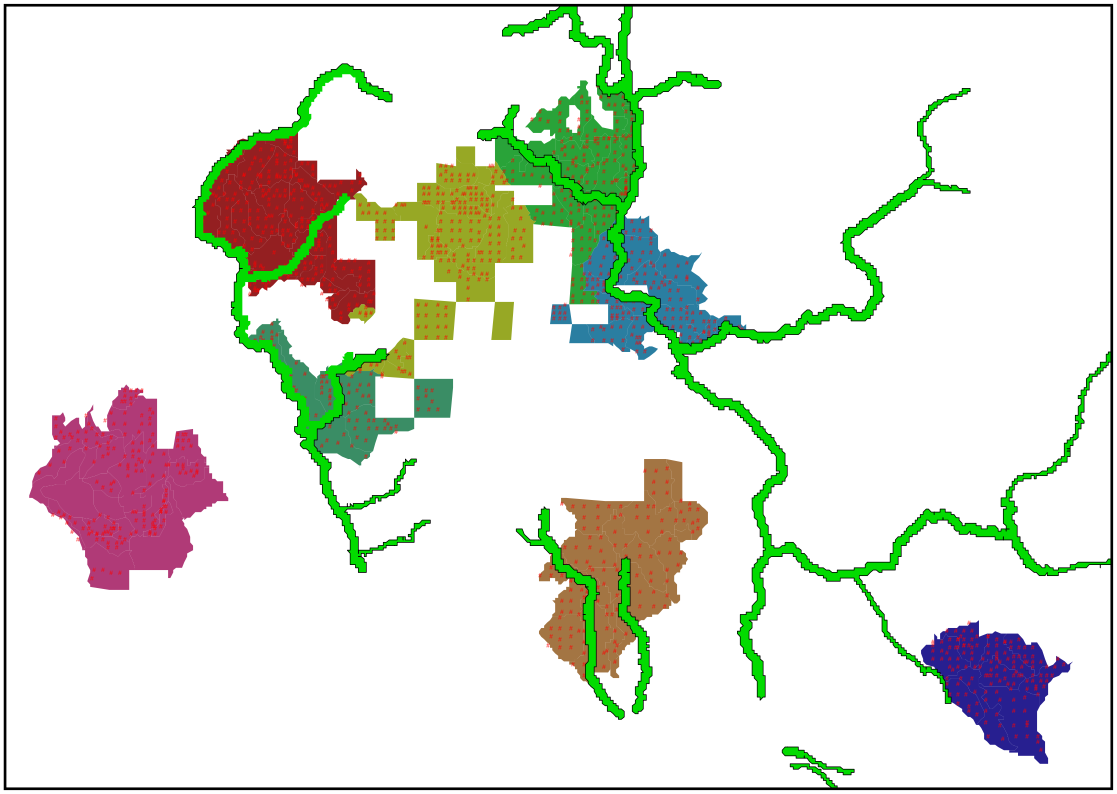


Figure 2 displays the initial eight management units outlined with the fisher corridor buffers. Dots represent plot locations.

Plots locations were identified using global positioning systems (GPS). This GPS data was imported into a geographic information system (GIS). The GIS system was used to locate plots inside and outside buffers. All plots were run by stand for each of the eight model runs. Model runs inside and outside fisher buffers were combined in a database so that the plots falling inside the fisher buffer were combined with those falling outside the fisher buffer. In this way two model runs (inside and outside buffer) were used to create one complete model simulation.

Each stand has a unique identifier. Each plot has a unique number for each stand. To maintain the integrity of the data and ease data manipulation original data labels were kept. This shifted some plots between stands. However, each plot was treated with a stand treatment relative to the stand as a whole. That is trees determined to be excess to the J-curve was based on all plots in a stand. Appendix 2 represents stand identifiers for stands as they appear in the EIS.

POST FVS DATA MANIPULATION

Stand examination data was formatted and processed through the forest vegetation simulator. Output data that described tree information by plot for each stand was summarized in a database. The database extension of FVS was used to export tree information into Microsoft Access databases. Treelist information was used to calculate fisher model components.

Stand prescriptions were modeled for each stand as a whole. The resulting effect of the stand level prescription was then assigned to each plot through tree list information produced at the end of each growth cycle. The tree list information was summarized by plot and each plot was assigned back to its original location by using the GIS data that maintained the location of each plot.

Plot crown variables for CANAVE were determined by applying canopy cover equations developed for FVS to tree list output (Crookston and Stage 1999). The results of each plots non-overlapping canopy were used in fisher functions needing crown canopy data. This non-overlapping canopy data produces lower canopy values than densiometer measurements used in the fisher equations (Landram and Baldwin 2002 unpublished data). However, since each alternative uses the same means of calculating canopy cover comparisons between alternatives are appropriate.

Mean diameter was determined for each plot. This was the simple arithmetic mean. The DBHSTD was determined from this mean DBH. The tree of largest diameter for each plot was determined and used for the MaxDBH variable.

Geographic data used to assign slope and nearness to water was developed from the GIS data found in the Sierra National Forest database and GPS plot locations. Nearness to water was assumed to be associated with streams that carried water for most of the year. These streams are typically the intermittent and perennial streams. Slope data was determined from 10-meter resolution digital elevation models. Slopes were classified in ten percent increments up to 100 percent slope.

Snag numbers were determined from each plots’ tree list information. Snag fall down rates were calculated by FVS.

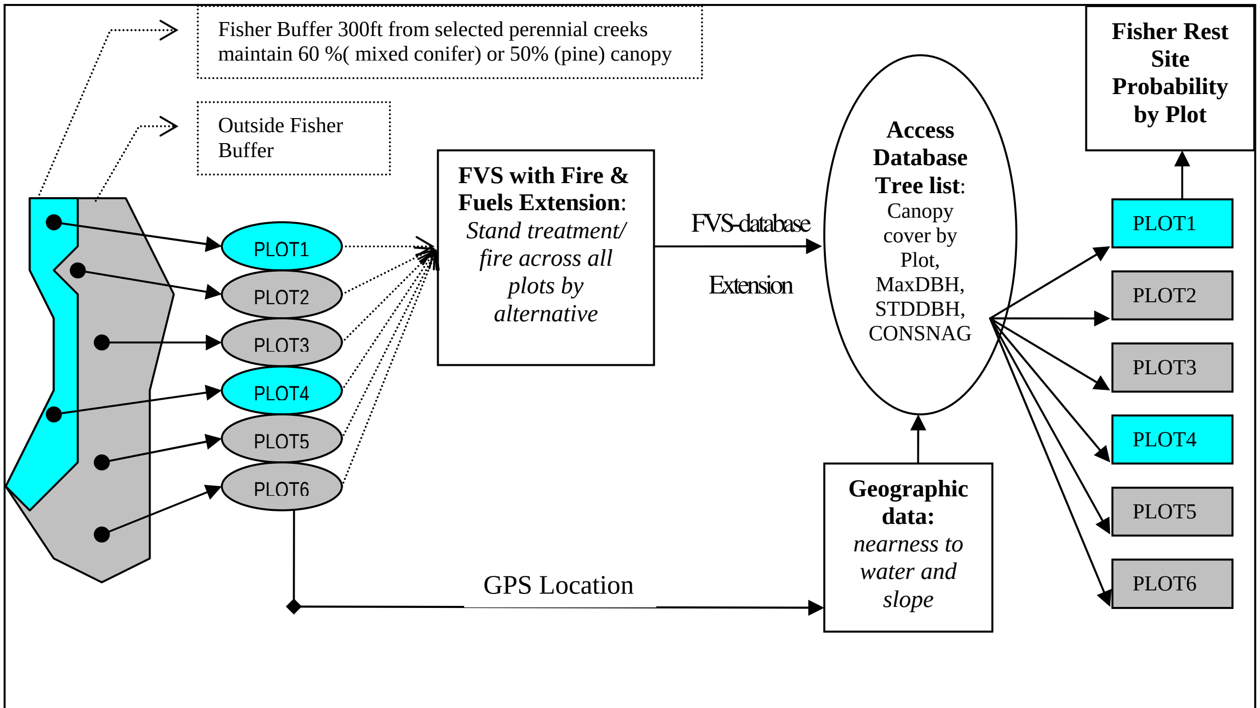


Figure 3: The diagram above displays the process used to calculate fisher rest site probability for each plot. The sampling was based upon the stand. Plot locations were located using GPS. Plots within the fisher corridor buffer (old forest linkage) were model to maintain more than 200 square feet of basal area per acre. The uneven-aged treatment and the thinning from below for California Spotted Owl study PACS were simulated on a stand basis. A severe fire scenario was model across each stand. Tree list information was used to disaggregate stand level information to plots. Tree lists were exported using the FVS database extension into a Microsoft access database. Variables used in the probability equations were developed for each of 1548 plots. Probability equations were used to calculate fisher rest site probability.

PROBABILITY SCALING

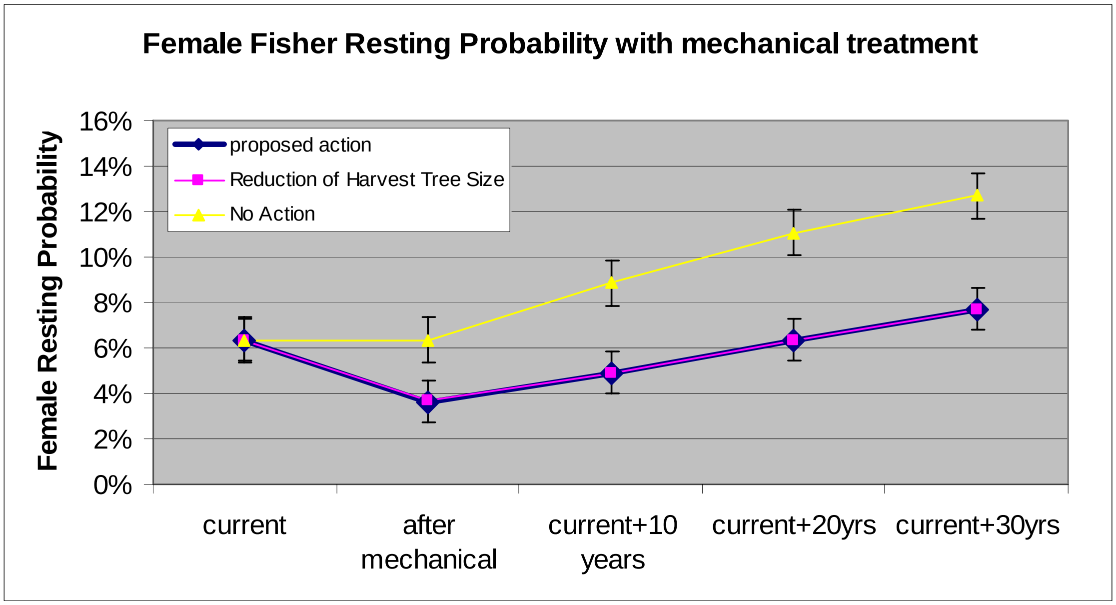
Sierra and female equation data was scaled to produce a probability. Different scale values were used until an appropriate value was determined. Initial scaling was done using the maximum values presented in the data for any growth period. Model data was developed for each 10-year growth period. The use of the maximum in each growth period made comparisons between growth periods impossible. This initial scaling produced almost no probability of fisher rest use across the analysis area in any one-growth period. This was due to several plots that had very large model numbers. Consultation with Dr. Zielinski indicated that scale values should be relevant to all growth cycles and that values need not be the highest values recorded. Final scale values were determined using the natural breaks in the data. This resulted in five plots having probabilities higher than one.

MODEL OUTPUT VS ACTUAL REST SITE DATA

Several studies of fisher rest site use and fisher habitat use have been completed in the Kings River Project Area. Known fisher rest site locations were compared to predicted rest site locations. The comparison examined the plot locations with greater than ten percent probability to known rest sites. Where known rest site locations came with in 300 feet of plot data, the highest probability plots coincided with known sites.

Results

Model results vary for each scenario and probability model. The Graphs below display average resting probability for both the sierra and female resting probability models. The results indicate a decline in average resting probability after treatment for both the sierra and female probability models. However, the sierra model decline is within the standard error for each of the action and no action alternatives. Following fire all alternatives see a drop in resting probability. However, the action alternatives retain a higher average resting probability for both models than in the no action alternative following a severe fire. While an increase in general fisher rest site probability (sierra model) occurs, average resting probability for action alternatives occurs within the standard error of the no action. This indicates that changes may not be significant at the 95% confidence limit (there is only a 5% chance that the alternatives are different from each other). No difference between the effects of action alternatives is observed. Trends show a general increase in probability for each alternative in each scenario with time.



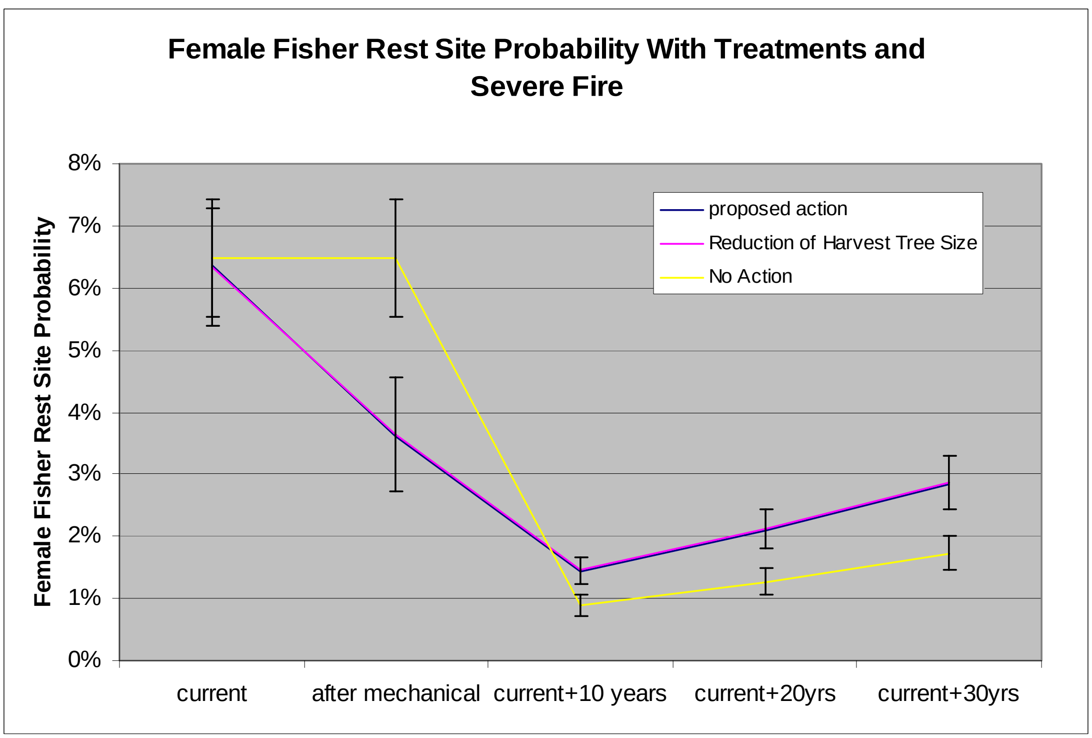
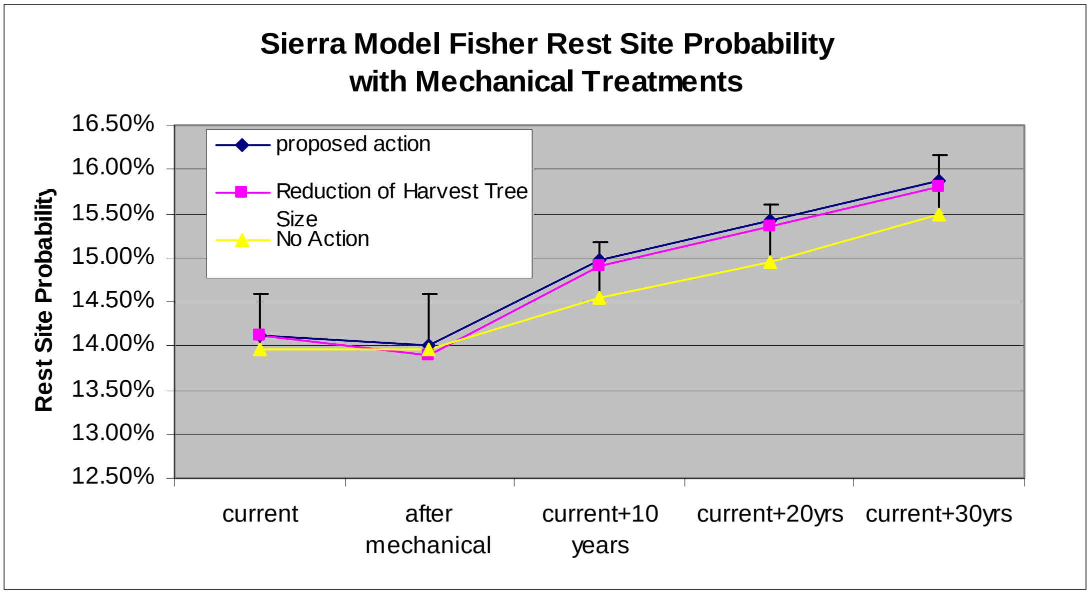


Figure 1a and 1b display the change in fisher rest site potential across the eight initial management units. Figure 1a displays the change with treatments only. Figure 1b displays the change with severe fire. Dark vertical bars indicate the sampling error at the 95% confidence limit. Figure 1a shows a loss in rest site probability after treatments. The treated landscape maintains more fisher rest sites and a higher probability for use after severe fire.



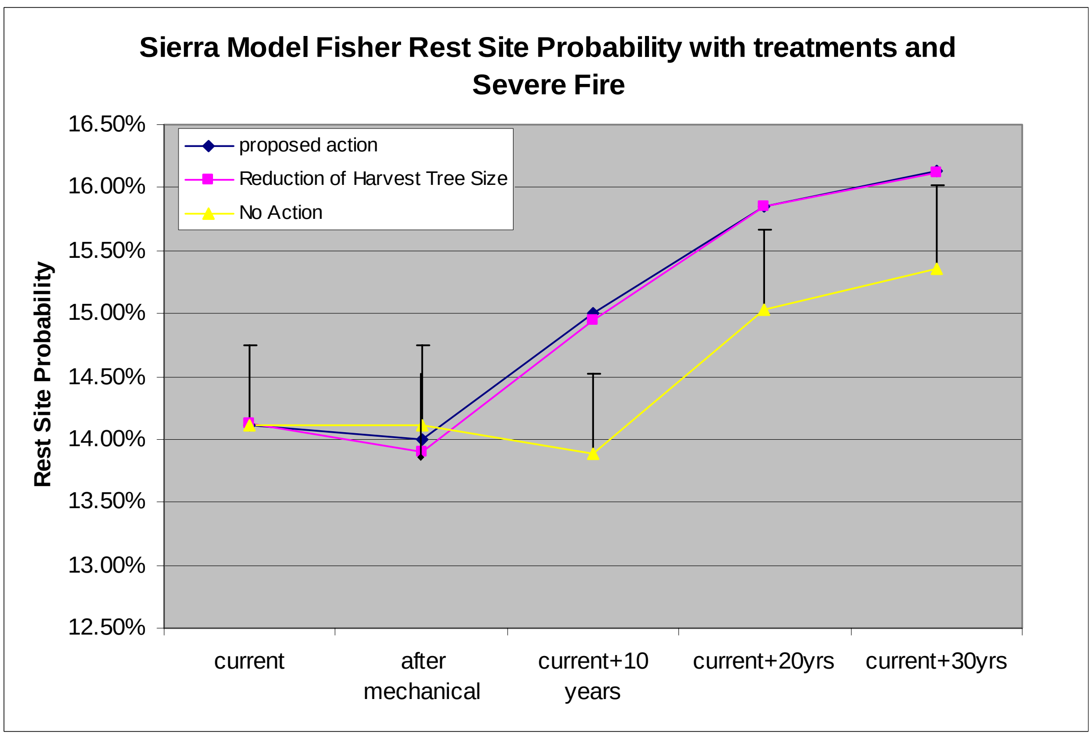


Figure 2a and 2b display the change in general rest site potential across the eight initial management units. Figure2b displays the change with severe fire. Dark vertical bars indicate the sampling error at the 95% confidence limit. While there appears to be a trend toward increasing fisher rest site probability for those without young displayed in figure 2a the difference between treatments is within the confidence limits for the no action. However after severe fire a similar trend of increasing probability occurs, but the treated landscapes are outside the confidence limits for the no action. This would indicate that more fisher rest sites are protected in the treated landscape. The increase in probability for the action alternatives results from the increased diameter growth and maintaining variable stand structures. The no action structures will tend to become less variable over time as the density will kill suppressed and intermediates and diameter growth will be slower than in the action alternatives.

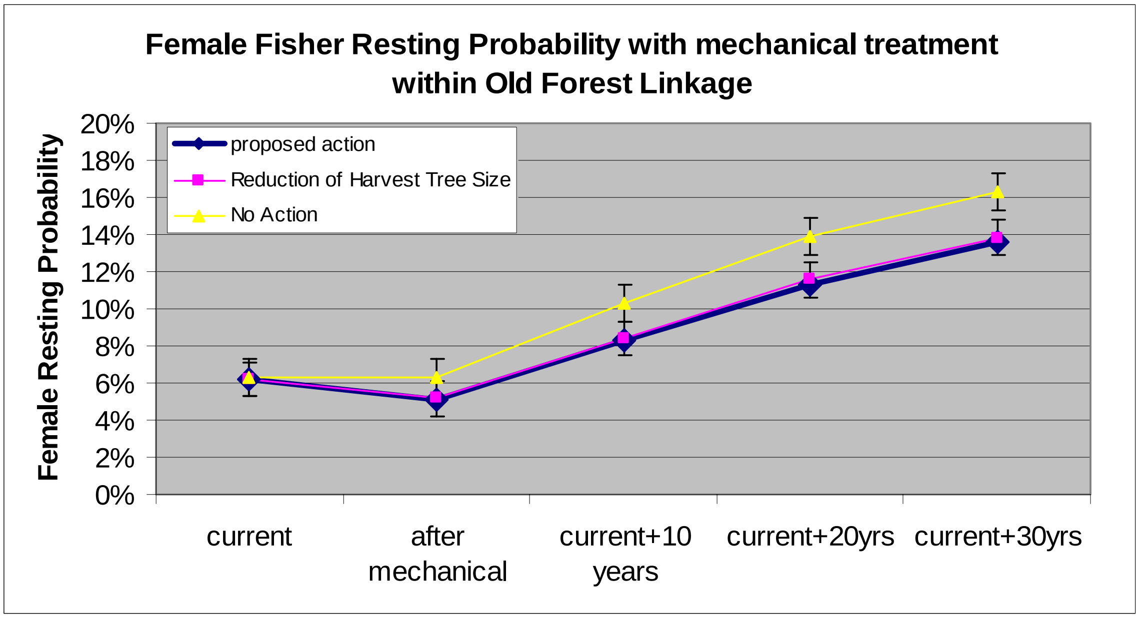


Figure 3 displays female fisher resting probability inside the old forest linkage (fisher buffer). It displays a one percent reduction in female fisher resting probability after treatment.

Literature Cited

Crookston, Nicholas L.; Stage, Albert R. 1999. Percent canopy cover and stand structure statistics from the Forest Vegetation Simulator. Gen. Tech. Rep. RMRS-GTR-24. Ogden, UT: U. S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 11 p.

Zielinski, William J., Richard L. Truex, Gregory A. Schmidt, Fredrick V. Schlexer, Kristin N. Schmidt, Reginal H. Barrett. 2004a. Resting Habitat Selection by Fishers in California. Journal of Wildlife Management 68(3):475-492.

USDA Forest Service (2001). Sierra Nevada Forest Plan Amendment, Final Environmental Impact Statement, Record of Decision. Vallejo, CA.

Parks, Sean; Rojas, Ramiro. 2006. Modeling Existing and Future Vegetation Characteristics, Wildlife Habitat and Fire Behavior Indices in the Kings River Project Area under Three Management Scenarios. USDA Forest Service, Region 5

Landram, M. (2002) Canopy cover study – implications fro the Sierra Nevada forest plan amendment implementation. Vallejo, CA, USDA Forest Service, Region 5:22.

Appendix 1

Uneven-aged Prescription

Each stand is assigned a basal area target (BAT; Appendix 2), which is the desired/expected residual basal area of the stand after treatment. Because we know the distribution of the desired J-shaped curve, we know the BAT for each two-inch diameter class (see table 4). As an example, for a stand with a of BAT of 190 ft^2/acre, we know that the desired BA in the 17.0 – 18.9" diameter class is 10.3 ft^2/acre (190 * 0.054).

For this prescription, the simulation unit BAT is determined by the information in Appendix 2. Figure 7 shows how FVS determines the BAT and cutting efficiency.

Figure 8 shows the actual uneven-aged prescription as implemented within FVS. The purpose of this lengthy FVS statement (figure 8) is to ensure that only diameter classes that have excess trees (as defined by table 4 and the BAT) are harvested. FVS will only cut in the diameter classes where there are excesses. The BAT was determined based on the desired canopy cover of the stand and the dominant tree type (ponderosa pine, Mixed Conifer)

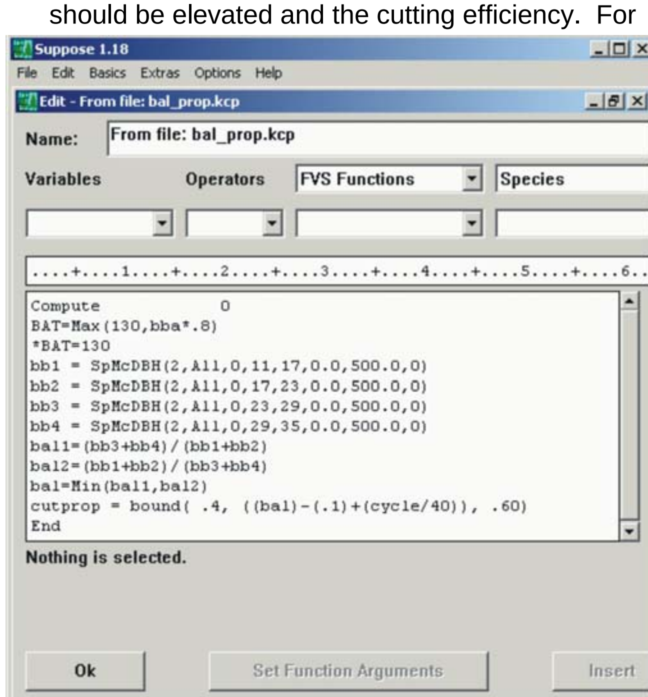
Table 1. Displays the proportion of the basal area target (BAT) in each diameter class. No trees over 35" or 30" were cut in the proposed action or thirty inch limit simulations

Diameter class (dbh; inches)	Proportion of BAT in diameter class
0 - 2.9	0.003
3.0 - 4.9	0.01
5.0 - 6.9	0.018
7.0 - 8.9	0.027
9.0 - 10.9	0.035
11.0 - 12.9	0.042
13.0 - 14.9	0.047
15.0 - 16.9	0.051
17.0 - 18.9	0.054
19.0 - 20.9	0.056
21.0 - 22.9	0.056
23.0 - 24.9	0.056
25.0 - 26.9	0.055
27.0 - 28.9	0.053
29.0 - 30.9	0.050
31.0 - 32.9	0.048
33.0 - 34.9	0.045
35 +	0

Within FVS, the actual treatment type is a thin from below to a BA target (figure 8). As and example BAT of 190, FVS will thin from below in the 0 to 2.9" diameter class to a BA of 0.6 ft^2/acre (190 * 0.003), thin from below in the 3.0 to 4.9" diameter class to a BA of 1.9 ft^2/acre (190 * 0.01), thin from below in the 5.0 to 6.9" (190 * 0.018) diameter class to a BA of 3.4 ft^2/acre, etc.

Other parameters for the uneven-aged prescription are as follow. Black oak sprouting was set to 0.25. Mistletoe preferences we set to 0 for DMR = 0,

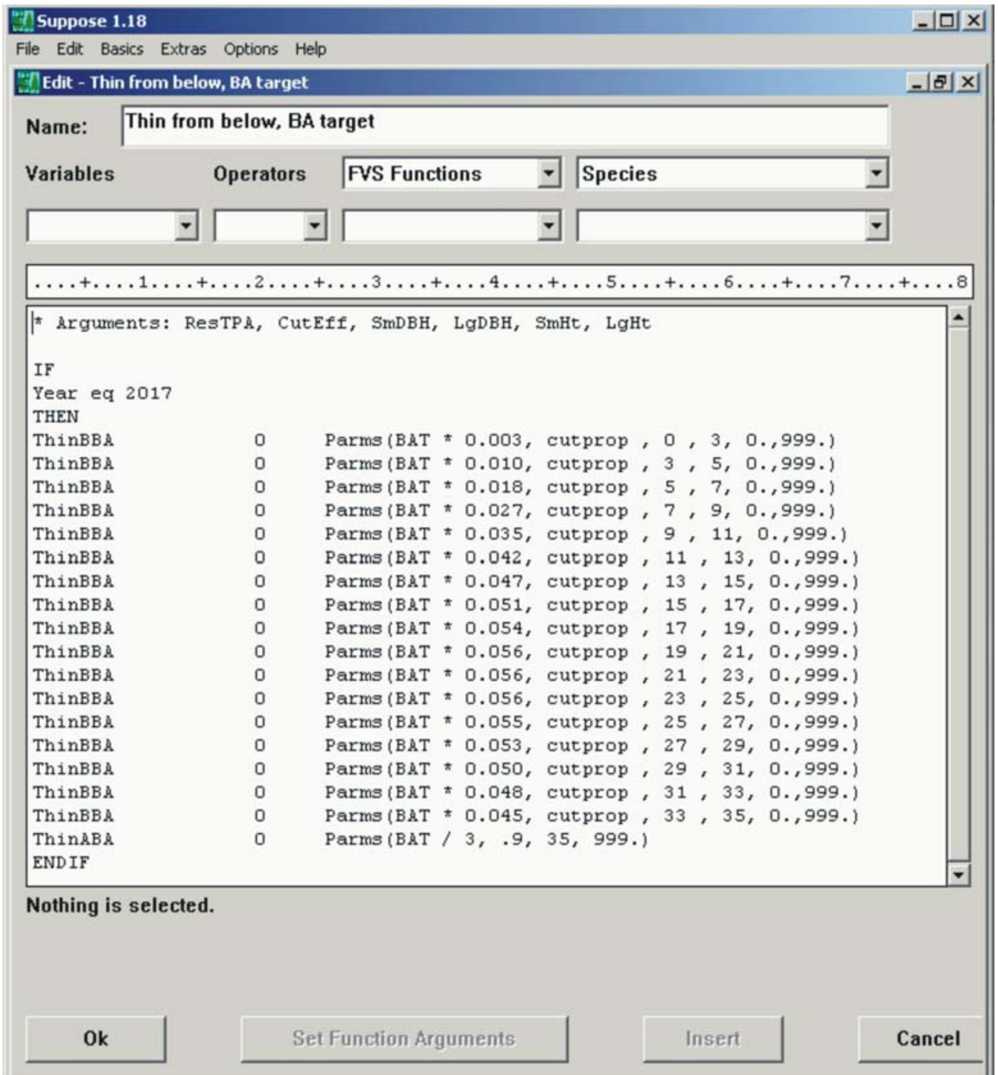
Figure 7. For a simulation unit with a BAT of 130, this shows the FVS statements for determining if the BAT should be elevated and the cutting efficiency. For



n

2000 for DMR = 2, 3000 for DMR = 3, 4000 for DMR = 4, 5000 for DMR = 5 and 6000 for DMR = 6. Black oak has a removal preference of –200. Incense cedar has a removal preference of 100. If the simulation unit was below 6000 feet elevation and 20% of the basal has been removed, regeneration is as follows: 20 ponderosa pine per acre, 10 sugar pine per acre, 20 white fir per acre and 20 incense cedar per acre. If the simulation unit is above 6000 feet, no regeneration is modeled.

Figure 8. Shows uneven-aged prescription for Phase II within FVS program. "BAT" refers to the basal area target (Appendix 2) and "cutprop" refers to the cutting efficiency (figure 7).



<u>2001 Framework Prescription</u>

This prescription mimics the prescription described in the 2001 framework record of decision (USDA Forest Service 2001) for the wildland urban interface defense inside a spotted owl PAC.

This prescription treats stands that have a canopy cover greater than 50% different than stands with a canopy cover less than 50%. If the average canopy cover of the stand has a canopy cover greater than 50%, then simulation units in the stand are thinned from below (only trees less than 20" dbh) to a residual canopy cover of 40%. The residual canopy cover may be less than 40% if the original initial canopy cover is less than 40%, in which case no thinning will occur on that simulation unit. The residual canopy cover of a simulation unit may be more than 40% if the canopy cover of trees greater than 20" dbh is greater than 40%, as no trees over 20" dbh are cut.

For stands with less than 50% canopy cover, the simulation units are thinned from below (only trees less than 6" dbh) to a residual of 250 trees per acres (TPA) in the 0 – 6" dbh range.

There are four basic treatments that were modeled in FVS in an attempt to closely mimic the fuels treatments that are proposed to be implemented on the ground: pile burn, underburn, grossyard and no fuels treatment. More types of fuel treatments are proposed, but they are lumped into these four categories for modeling purposes.

Pile Burn

The pile burn fuels treatment takes place in 94 stands in the Phase I modeling. Within these 94 stands, only simulation units that undergo any silviculture treatments receive the pile burn fuels treatment.

For this project, we used the default values for the pile burn fuels treatment: 70% of the area is affected by treatment, 10% is the affected area where fuel is concentrated, 80% is the proportion of fuel that is collected in the affected area and 0% is the mortality.

Underburn

The underburn fuels treatment gets modeled in 49 of the phase I stands. The underburn fuels treatment consists of three separate underburns after the initial silvicultural treatment. The underburns are modeled three, seven and fifteen years after the initial treatment. For each underburn, the model parameters are as follow: wind speed is 10 mph, moisture level for all fuels is "dry" and the temperature is 70 degrees Fahrenheit.

Gross Yard

The gross yard fuels treatment is very similar to the pile burn fuels treatment and is modeled on 12 stands. Only simulation units that undergo silvicultural treatments receive the gross yard fuels treatment.

The gross yard fuels treatment simply has different values for the parameters used in the pile burn treatment. The area affected by the gross yard treatment is 100%, the affected area where fuel is concentrated is 1%, the proportion of fuel that is collected in the affected area is 90% and the mortality is 0%.

No Fuels Treatment

Fuels are not treated in stands designated as controls.

Severe Fire

In order for FVS to simulate prescribed burns and the severe fire ten years after treatments (for two of the modeled scenarios), the Fire and Fuels Extension (Reinhardt and Crookston 2003) was utilized, which simulates fuel dynamics and potential fire behavior over time. Additionally, fire-related variables related to potential fires, such as torching index, crowning index and fuel model, are generated using the potential fire report of the FFE (See Appendix 11 for details).

For the potential fire report, the following parameters are used for severe fire: for one-hour fuels (0 – 0.25”), percent moisture equals 3%, for 10-hour fuels (0.25” – 1”), percent moisture equals 4%, for 100-hour fuels (1” – 3”), percent moisture equals 5%, for fuels greater than 3”, percent moisture equals 7%, for duff, the percent moisture equals 10%, for live vegetation, the percent moisture equals 80%, the temperature equals 95 degrees F and the 20-foot wind speed is 20 mph. For moderate fire, the percent moisture values are the same, but the temperature is 82 degrees F and the 20-foot wind speed is 10 mph.

For the severe fire that is simulated ten years after treatments for two of the “alternatives”, the following parameters were used: for 1-hour fuels, percent moisture equals 3%, for 10-hour fuels percent moisture equals 4%, for 100-hour fuels, percent moisture equals 5%, for 3”+ fuels, percent moisture equals 15%, for duff, percent moisture equals 75% and for live fuels, percent moisture equals 80%.

Appendix 2

Treatments by plan id (stand) for Kings River –eight management units plus south of shaver

Plan ID	Silviculture Treatment	Fuels Treatment	Project Area	Implementation Year	Max of Residual BA for Model	Acres
0	2001_frame_w	pile_burn	bear_fen_6	2007	0	75
125	uneven_aged	pile_burn	glen_mdw_1	2007	133	82
129	uneven_aged	pile_burn	glen_mdw_1	2007	200	76
150	no_treatment	none	glen_mdw_1	2007	0	116
154	uneven_aged	pile_burn	glen_mdw_1	2007	200	44
170	2001_frame_w	pile_burn	glen_mdw_1	2007	0	68
184	uneven_aged	grossyard	providen_1	2006	128	58
188	no_treatment	none	glen_mdw_1	2007	0	68
189	no_treatment	none	glen_mdw_1	2007	0	62
190	uneven_aged	pile_burn	glen_mdw_1	2007	200	87
192	uneven_aged	pile_burn	providen_1	2006	128	151
195	uneven_aged	grossyard	sos_1	2004	128	44
196	uneven_aged	pile_burn	sos_1	2004	128	163
197	2001_frame_w	pile_burn	glen_mdw_1	2007	0	76
205	uneven_aged	pile_burn	providen_1	2006	154	163
208	uneven_aged	pile_burn	krew_prv_1	2006	200	37
212	uneven_aged	grossyard	providen_1	2006	128	101
217	uneven_aged	pile_burn	glen_mdw_1	2007	200	18
220	uneven_aged	pile_burn	sos_1	2004	133	44
224	uneven_aged	pile_burn	sos_1	2004	128	40
225	uneven_aged	pile_burn	glen_mdw_1	2007	200	137
226	uneven_aged	pile_burn	sos_1	2004	128	20
227	2001_frame_w	pile_burn	glen_mdw_1	2007	0	69
228	uneven_aged	underburn	sos_1	2004	200	27
232	uneven_aged	pile_burn	sos_1	2004	128	32
235	uneven_aged	underburn	krew_prv_1	2006	133	97
236	uneven_aged	pile_burn	krew_prv_1	2006	100	59
237	uneven_aged	pile_burn	glen_mdw_1	2007	167	96
244	uneven_aged	pile_burn	providen_1	2006	128	23
245	uneven_aged	pile_burn	glen_mdw_1	2007	200	123
250	uneven_aged	pile_burn	krew_prv_1	2006	200	28
253	uneven_aged	grossyard	providen_1	2006	128	100
254	uneven_aged	pile_burn	sos_1	2004	128	47
257	uneven_aged	pile_burn	providen_1	2006	154	71
259	uneven_aged	pile_burn	glen_mdw_1	2007	200	46
262	uneven_aged	pile_burn	providen_1	2006	154	134
264	uneven_aged	pile_burn	sos_1	2004	128	35
267	2001_frame_w	underburn	sos_1	2004	0	76

Plan ID	Silviculture Treatment	Fuels Treatment	Project Area	Implementation Year	Max of Residual BA for Model	Acres
268	2001_frame_w	underburn	sos_1	2004	0	108
271	2001_frame_w	pile_burn	sos_1	2004	0	118
273	2001_frame_w	pile_burn	providen_1	2006	0	95
275	2001_frame_w	pile_burn	glen_mdw_1	2007	0	84
276	2001_frame_w	pile_burn	providen_1	2006	0	97
280	uneven_aged	pile_burn	krew_prv_1	2006	133	75
281	uneven_aged	underburn	krew_prv_1	2006	133	71
283	2001_frame_w	pile_burn	providen_1	2006	0	99
285	uneven_aged	pile_burn	sos_1	2004	128	33
288	uneven_aged	pile_burn	glen_mdw_1	2007	200	89
292	uneven_aged	pile_burn	krew_prv_1	2006	200	29
293	uneven_aged	pile_burn	sos_1	2004	128	23
295	uneven_aged	pile_burn	krew_prv_1	2006	133	125
296	uneven_aged	pile_burn	glen_mdw_1	2007	200	103
299	uneven_aged	pile_burn	krew_prv_1	2006	133	160
301	uneven_aged	underburn	krew_prv_1	2006	200	65
303	uneven_aged	pile_burn	providen_1	2006	128	95
306	uneven_aged	underburn	krew_prv_1	2006	133	138
316	uneven_aged	underburn	krew_prv_1	2006	200	158
319	2001_frame_w	pile_burn	providen_1	2006	0	47
320	uneven_aged	grossyard	providen_1	2006	128	126
323	uneven_aged	pile_burn	sos_1	2004	128	32
324	uneven_aged	grossyard	sos_1	2004	128	40
325	uneven_aged	grossyard	sos_1	2004	128	91
327	2001_frame_w	grossyard	providen_1	2006	0	30
328	uneven_aged	pile_burn	sos_1	2004	133	73
329	uneven_aged	pile_burn	el_o_win_1	2006	200	35
330	uneven_aged	pile_burn	el_o_win_1	2006	200	76
331	uneven_aged	underburn	krew_prv_1	2006	133	124
333	uneven_aged	underburn	sos_1	2004	133	46
345	uneven_aged	none	providen_1	2006	128	39
346	uneven_aged	underburn	krew_prv_1	2006	200	48
347	uneven_aged	grossyard	providen_1	2006	128	42
350	uneven_aged	pile_burn	providen_1	2006	154	147
352	uneven_aged	pile_burn	sos_1	2004	128	148
353	uneven_aged	pile_burn	el_o_win_1	2006	200	149
361	2001_frame_w	underburn	sos_1	2004	0	28
365	no_treatment	none	krew_prv_1	2006	0	85
371	2001_frame_w	underburn	el_o_win_1	2006	0	142
373	uneven_aged	pile_burn	providen_1	2006	154	46
375	uneven_aged	underburn	providen_1	2006	154	11
379	uneven_aged	pile_burn	providen_1	2006	128	51
380	no_treatment	none	krew_prv_1	2006	0	165
384	uneven_aged	pile_burn	providen_1	2006	128	101

Plan ID	Silviculture Treatment	Fuels Treatment	Project Area	Implementation Year	Max of Residual BA for Model	Acres
386	2001_frame_w	underburn	el_o_win_1	2006	0	176
387	2001_frame_w	pile_burn	sos_1	2004	0	89
388	uneven_aged	pile_burn	glen_mdw_1	2007	200	75
389	2001_frame_w	underburn	sos_1	2004	0	111
391	uneven_aged	pile_burn	sos_1	2004	128	21
397	uneven_aged	pile_burn	providen_1	2006	154	52
400	2001_frame_w	pile_burn	sos_1	2004	0	10
401	2001_frame_w	pile_burn	sos_1	2004	0	39
405	uneven_aged	grossyard	providen_1	2006	128	23
425	uneven_aged	grossyard	providen_1	2006	128	23
426	uneven_aged	pile_burn	providen_1	2006	128	88
427	2001_frame_w	pile_burn	sos_1	2004	0	13
431	uneven_aged	pile_burn	el_o_win_1	2006	200	83
432	2001_frame_w	pile burn	sos_1	2004	0	62
449	2001_frame_w	pile_burn	krew_prv_1	2006	0	166
450	uneven_aged	none	krew_prv_1	2006	133	83
454	uneven_aged	grossyard	krew_prv_1	2006	128	29
455	uneven_aged	pile_burn	el_o_win_1	2006	200	43
457	uneven_aged	underburn	el_o_win_1	2006	200	32
458	uneven_aged	underburn	el_o_win_1	2006	167	100
461	uneven_aged	underburn	el_o_win_1	2006	133	51
472	uneven_aged	underburn	el_o_win_1	2006	100	19
474	uneven_aged	underburn	el_o_win_1	2006	167	84
477	uneven_aged	underburn	el_o_win_1	2006	167	88
478	uneven_aged	underburn	providen_4	2006	154	89
480	uneven_aged	underburn	el_o_win_1	2006	200	96
484	uneven_aged	pile_burn	el_o_win_1	2006	200	42
499	2001_frame_w	pile_burn	krew_prv_1	2006	0	72
530	uneven_aged	none	providen_4	2006	154	7
533	uneven_aged	pile_burn	providen_4	2006	128	92
535	uneven_aged	none	providen_4	2006	128	188
544	uneven_aged	pile_burn	providen_4	2006	133	156
553	uneven_aged	pile_burn	n_soapro_2	2008	128	44
568	uneven_aged	pile_burn	n_soapro_2	2008	128	184
579	no_treatment	none	n_soapro_2	2008	0	23
591	uneven_aged	pile_burn	n_soapro_2	2008	128	123
598	2001_frame_w	pile_burn	n_soapro_2	2008	0	150
602	2001_frame_w	underburn	n_soapro_2	2008	0	90
610	no_treatment	none	n_soapro_2	2008	0	95
615	no_treatment	none	n_soapro_2	2008	0	83
616	2001_frame_w	pile_burn	n_soapro_2	2008	0	89
622	no_treatment	none	n_soapro_2	2008	0	34
626	no_treatment	none	n_soapro_2	2008	0	101
632	uneven_aged	underburn	n_soapro_2	2008	128	87

Plan ID	Silviculture Treatment	Fuels Treatment	Project Area	Implementation Year	Max of Residual BA for Model	Acres
633	uneven_aged	underburn	bear_fen_6	2007	200	125
634	uneven_aged	pile_burn	bear_fen_6	2007	200	47
639	uneven_aged	underburn	n_soapro_2	2008	101	163
643	uneven_aged	pile_burn	n_soapro_2	2008	128	112
644	no_treatment	none	n_soapro_2	2008	0	158
645	no_treatment	none	n_soapro_2	2008	0	57
652	uneven_aged	pile_burn	n_soapro_2	2008	101	275
654	uneven_aged	pile_burn	n_soapro_2	2008	181	13
658	uneven_aged	pile_burn	n_soapro_2	2008	133	66
659	2001_frame_w	underburn	bear_fen_6	2007	0	189
662	no_treatment	none	n_soapro_2	2008	0	51
671	2001_frame_w	pile_burn	bear_fen_6	2007	0	160
672	uneven_aged	pile_burn	n_soapro_2	2008	128	111
675	uneven_aged	underburn	bear_fen_6	2007	267	95
678	uneven_aged	underburn	n_soapro_2	2008	128	32
681	uneven_aged	pile_burn	n_soapro_2	2008	128	13
686	uneven_aged	pile_burn	bear_fen_6	2007	267	132
691	uneven_aged	pile_burn	n_soapro_2	2008	133	51
698	uneven_aged	pile_burn	n_soapro_2	2008	128	41
705	uneven_aged	pile_burn	bear_fen_6	2007	267	19
710	2001_frame_w	underburn	bear_fen_6	2007	0	171
712	2001_frame_w	underburn	bear_fen_6	2007	0	133
721	uneven_aged	pile_burn	n_soapro_2	2008	101	175
725	uneven_aged	underburn	bear_fen_6	2007	267	135
733	uneven_aged	underburn	bear_fen_6	2007	200	75
742	uneven_aged	underburn	bear_fen_6	2007	181	185
765	uneven_aged	underburn	bear_fen_6	2007	133	99
777	2001_frame_w	pile_burn	bear_fen_6	2007	0	105
787	2001_frame_w	underburn	bear_fen_6	2007	0	130
792	2001_frame_w	underburn	bear_fen_6	2007	0	73
796	uneven_aged	underburn	krew_bul_1	2007	267	110
809	uneven_aged	underburn	bear_fen_6	2007	200	159
811	uneven_aged	pile_burn	krew_bul_1	2007	267	134
838	uneven_aged	underburn	krew_bul_1	2007	267	152
956	uneven_aged	none	providen_4	2006	128	160
957	uneven_aged	underburn	providen_4	2006	181	162
961	uneven_aged	underburn	krew_bul_1	2007	267	98
962	uneven_aged	pile_burn	krew_bul_1	2007	267	101
964	uneven_aged	pile_burn	krew_bul_1	2007	267	116
965	uneven_aged	underburn	krew_bul_1	2007	267	93
1037	uneven_aged	pile_burn	glen_mdw_1	2007	200	98
1041	uneven_aged	pile_burn	el_o_win_1	2006	200	145
1042	uneven_aged	underburn	providen_4	2006	128	193
1043	2001_frame_w	pile_burn	krew_prv_1	2006	0	87

Plan ID	Silviculture Treatment	Fuels Treatment	Project Area	Implementation Year	Max of Residual BA for Model	Acres
1049	uneven_aged	underburn	bear_fen_6	2007	200	97
1056	uneven_aged	underburn	krew_bul_1	2007	267	67
1057	uneven_aged	underburn	krew_bul_1	2007	267	280