Appendix D – Data Tables for Sugar Pine Adaptive Management Project

Sugar Pine Plot Data Summary Table

Existing and Proposed Action Conditions

The Sugar Pine plot data summary table displays plot data collected within the proposed treatment areas displayed on the Sugar Pine EIS map. Variable plots were taken using a 30 Basal Area Factor prism. Trees less than 4 inches dbh were not sampled (4 inches was the smallest diameter being considered for biomass treatments). Due to the wide variability of vegetation present within these proposed treatment areas and the project as a whole, plots representing similar stand conditions were grouped together by proposed treatment area. It would be misleading to display an average for the project area. The column labeled "No. Plots" displays the number of plots within each grouping. Although plots were taken within specific potential treatment areas, similar stand conditions may be present in other areas as well. Plot conditions varied widely from a basal area low of 90 ft^2 to 510 ft^2 per acre. Plot data recorded variations in trees 4 inches dbh and larger per acre from 15 to over 1000. In some plots no small trees were captured in the sample while in others hundreds per acre were. Several plots represent "groupings of conifers with increased BA retention (20 to 30-inch dbh)" similar to those retained in the Cedar Valley project area.

The term "light" which accompanies a number of the proposed treatment areas refers to those areas/plots where the basal area present is generally light and would result in minimal removal of trees 10 inches dbh and larger. Although an area may be designated as "light" due to lighter basal areas present, there may still be a need to treat heavily stocked pockets of smaller diameter trees (less than 4 inches dbh) that may not have been sampled during the sampling process.

The majority of the Sugar Pine project area was heavily railroad logged between 1918 and 1924. Logs were processed at the mill at Sugar Pine. The 1944 aerial photos provide a graphic display of the extent of that activity. In some areas scattered older trees were left following logging. The vast majority of conifers present today were seedlings and saplings present in the understory that survived the logging entry. Except for the 40 year old pine plantation adjacent to Road 6S07, a small pine plantation along Road 5S79, and a couple of others in the Big Sandy area, stands proposed for treatment average 90 to 110 years of age. Overall average site quality sampled is a Dunning 1.

Plot data indicates that the majority of the stands within the area surrounding Sugar Pine are a pine type that is quite heavy to the more shade tolerant, but fire prone, incense cedar. In this area, mixed conifer stands where white fir is a significant component, are found in only a few locations, predominantly near cooler, more moist, draws. White fir stands mixed with red fir and pines comprise a large proportion of the stands in the smaller subwatershed being studied near Big Sandy as a part of the hydrology portion of the project. Crown Closures present were taken from the data sheets with a reduction made for crown overlap. Suppressed trees were not included as part of the existing crown closure.

The plot data and summaries shown provide insight into the variability of the vegetation present within the proposed treatment areas. During collection of the plot data, trees that might be selected for removal under the proposed thinning prescription for that species composition were noted. From that data, potential leave and cut basal area, leave and cut tree sizes and numbers and

existing and post harvest crown closures were determined. On a number of plots, for various reasons, leave basal area exceeds targets for that species composition.

Legend for Sugar Pine Plot Data Summary Tables

Location

Number Corresponds to the Treatment Area Number on Project Map

(MC) represents an area that is considered a Mixed Conifer dominated stand

(plt) represents a pine plantation

(WF) represents an area that is considered a White Fir dominated stand

Remainder are considered pine dominated stands

Species Composition

PP – Ponderosa Pine

SP – Sugar Pine

WF – White Fir

RF – Red Fir

IC – Incense Cedar

OK – Oak

Crown Closure

Given in percent (reduced for crown overlap). CWHR relationship for crown closure designation.

P: 25-39%

M: 40-59%

D: 60% +

Desired leave Basal Area for comparison

Pine dominated stands = 150-180 ft^2 per acre

Mixed Conifer (MC) dominated stands = 210 ft^2 per acre

White Fir (WF) dominated stands = 240 ft^2 per acre

For Alternative 3 and 4 a surrogate of 10 inches dbh was used to display the changes that would occur based on only removing ladder fuels for each alternative. It is anticipated that some trees larger than 10 inches dbh that contribute to fuel ladders will be removed. Since these will be either intermediate or suppressed trees, overall crown closures following treatment will not change.

Age

Calculated from one sampled tree per plot. The majority of the conifers within the proposed treatment area are 90-110 years old.

Mean Diameter (Dia)

Calculated from trees within plots

Table 1. Sugar Pine Plot Data Summary, Existing and Proposed Action (Alternative 2) Conditions

Location	Species Composition						Age	Site	Trees 5-inch dbh and larger					Basal Area 5 inches and larger				Crown Closure		Mean Dia	No Plots
	PP	SP	WF	RF	IC	OK			Total	Cut 5-10	Cut 11-20	Cut 21-29	Leave	Total	Cut 5-20	Cut 21-29	Leave	Before	After		
3 light	86	0	0	0	14	0	90	1	102	0	38	0	64	210	30	0	180	64 (D)	64 (D)	19	1
3	34	3	14	0	38	10	84	1	111	0	37	14	60	290	60	40	190	89 (D)	66 (D)	22	3
4 light	37	3	11	0	47	3	112	1	109[B]	25	0	0	84	142[B]	7	0	135	42 (M)	42 (M)	15	8
4	34	6	0	0	47	13	98	1	216	74	73	12	57	320	100	30	190	97 (D)	83 (D)	16	3
4 Oak	8	0	0	0	31	62	87	1	66	0	0	0	66	130	0	0	130	88 (D)	88 (D)	12	3
5 light	73	9	18	0	0	0	86	1	62	0	0	0	62	165	0	0	165	39 (P)	39 (P)	22	2
6	62	8	15	0	15	0	134	1	73	0	0	0	73	195	0	0	195	56 (M)	56 (M)	22	2
6 MC	5	18	45	0	32	0	126	1	199	28	77	9	85	330	75	30	225	77 (D)	60 (D)	17	2
7 light	19	0	0	0	81	0	129	1	99[A]	0	30	6	63	225[A]	30	15	180	52 (M)	45 (M)	12	2
7	38	0	0	0	62	0	94	1	251	98	86	19	48	420	150	60	210	100 (D)	70 (D)	17	3
8 MC	6	6	47	0	42	0	107	1	117[A]	12	47	5	53	270[A]	52	15	203	57 (M)	48 (M)	21	4
8	46	17	0	0	25	13	120	1	231	124	38	16	53	360	105	45	210	100 (D)	78 (D)	16	2
8 light	33	17	0	0	50	0	107	1	101	0	0	0	101	180	0	0	180	53 (M)	53 (M)	18	1
10	74	5	0	0	21	0	120	1	136	0	65	3	66	285	75	15	195	88 (D)	60 (D)	20	2
10 light	25	4	14	0	50	7	100	1	240	90	5	0	145	210	30	0	180	68 (D)	61 (D)	12	4

Location	Species Composition						Age	Site	Trees 5-inch dbh and larger					Basal Area 5 inches and larger				Crown Closure		Mean Dia	No Plots
	PP	SP	WF	RF	IC	OK			Total	Cut 5-10	Cut 11-20	Cut 21-29	Leave	Total	Cut 5-20	Cut 21-29	Leave	Before	After		
12	0	50	10	0	40	0	65	1	71	0	0	27	44	300	0	90	210	59 (M)	52 (M)	28	1
14 MC	0	31	50	0	19	0	115	1	116	0	32	32	52	480	30	120	330	92 (D)	73 (D)	28	1
23 MC	31	0	63	0	6	0	83	1	112	0	14	48	50	480	30	150	300	100 (D)	70 (D)	28	1
30 plt	100	0	0	0	0	0	43	1	149	0	67	0	82	240	90	0	150	90 (D)	60 (D)	17	1
33 WF	0	5	50	45	0	0	113	1	138	37	46	5	50	320	65	15	240	53 (M)	45 (M)	20	6
34 light WF	0	0	80	20	0	0	100	1	69	0	0	0	69	240	0	0	240	45 (M)	45 (M)	25	2

[A] Plus 172 4-inch dbh trees/acre (15 ft^2) to be removed (not included in totals)

[B] Plus 86 4-inch dbh trees/acre (7.5 ft^2) to be removed (not included in totals)

Table 2. Sugar Pine Plot Data Summary, Existing and Alternative 3

Location	Species Composition						Age	Site	Trees 5-inch dbh and larger					Basal Area 5 inches and larger				Crown Closure		Mean Dia	No Plots
	PP	SP	WF	RF	IC	OK			Total	Cut 5-10	Cut 11-20	Cut 21-29	Leave	Total	Cut 5-20	Cut 21-29	Leave	Before	After		
3 light	86	0	0	0	14	0	90	1	102	0	38	0	64	210	30	0	180	64 (D)	64 (D)	19	1
3	34	3	14	0	38	10	84	1	111	0	37	14	60	290	60	40	190	89 (D)	66 (D)	22	3
4 light	37	3	11	0	47	3	112	1	109[B]	25	0	0	84	142[B]	7	0	135	42 (M)	42 (M)	15	8
4	34	6	0	0	47	13	98	1	216	74	0	0	142	320	10	0	310	97 (D)	97 (D)	16	3
4 Oak	8	0	0	0	31	62	87	1	66	0	0	0	66	130	0	0	130	88 (D)	88 (D)	12	3
5 light	73	9	18	0	0	0	86	1	62	0	0	0	62	165	0	0	165	39 (P)	39 (P)	22	2
6	62	8	15	0	15	0	134	1	73	0	0	0	73	195	0	0	195	56 (M)	56 (M)	22	2
6 MC	5	18	45	0	32	0	126	1	199	28	77	9	85	330	75	30	225	77 (D)	60 (D)	17	2
7 light	19	0	0	0	81	0	129	1	99[A]	0	30	6	63	225[A]	30	15	180	52 (M)	45 (M)	12	2
7	38	0	0	0	62	0	94	1	251	98	86	19	48	420	150	60	210	100 (D)	70 (D)	17	3
8 MC	6	6	47	0	42	0	107	1	117[A]	12	47	5	53	270[A]	52	15	203	57 (M)	48 (M)	21	4
8	46	17	0	0	25	13	120	1	231	124	38	16	53	360	105	45	210	100 (D)	78 (D)	16	2
8 light	33	17	0	0	50	0	107	1	101	0	0	0	101	180	0	0	180	53 (M)	53 (M)	18	1
10	74	5	0	0	21	0	120	1	136	0	65	3	66	285	75	15	195	88 (D)	60 (D)	20	2
10 light	25	4	14	0	50	7	100	1	240	90	5	0	145	210	30	0	180	68 (D)	61 (D)	12	4

Location	Species Composition						Age	Site	Trees 5-inch dbh and larger					Basal Area 5 inches and larger				Crown Closure		Mean Dia	No Plots
	PP	SP	WF	RF	IC	OK			Total	Cut 5-10	Cut 11-20	Cut 21-29	Leave	Total	Cut 5-20	Cut 21-29	Leave	Before	After		
12	0	50	10	0	40	0	65	1	71	0	0	27	44	300	0	90	210	59 (M)	52 (M)	28	1
14 MC	0	31	50	0	19	0	115	1	116	0	32	32	52	480	30	120	330	92 (D)	73 (D)	28	1
23 MC	31	0	63	0	6	0	83	1	112	0	14	48	50	480	30	150	300	100 (D)	70 (D)	28	1
30 plt	100	0	0	0	0	0	43	1	149	0	67	0	82	240	90	0	150	90 (D)	60 (D)	17	1
33 WF	0	5	50	45	0	0	113	1	138	37	46	5	50	320	65	15	240	53 (M)	45 (M)	20	6
34 light WF	0	0	80	20	0	0	100	1	69	0	0	0	69	240	0	0	240	45 (M)	45 (M)	25	2

[A] Plus 172 4-inch dbh trees/acre (15 ft^2) to be removed (not included in totals)

[B] Plus 86 4-inch dbh trees/acre (7.5 ft^2) to be removed (not included in totals)

A small portion of Treatment Area 3 would only have fuel ladders removed under this alternative (effects not displayed in table).

Table 3. Sugar Pine Plot Data Summary, Existing and Alternative 4

Location	Species Composition						Age	Site	Trees 5-inch dbh and larger					Basal Area 5 inches and larger				Crown Closure		Mean Dia	No Plots
	PP	SP	WF	RF	IC	OK			Total	Cut 5-10	Cut 11-20	Cut 21-29	Leave	Total	Cut 5-20	Cut 21-29	Leave	Before	After		
3 light	86	0	0	0	14	0	90	1	102	0	0	0	102	210	0	0	21	64 (D)	64 (D)	19	1
3	34	3	14	0	38	10	84	1	111	0	0	0	111	290	0	0	20	89 (D)	89D)	22	3
4 light	37	3	11	0	47	3	112	1	109[B]	25	0	0	84	142[B]	7	0	135	42 (M)	42 (M)	15	8
4	34	6	0	0	47	13	98	1	216	74	0	0	142	320	10	0	310	97 (D)	97 (D)	16	3
4 Oak	8	0	0	0	31	62	87	1	66	0	0	0	66	130	0	0	130	88 (D)	88 (D)	12	3
5 light	73	9	18	0	0	0	86	1	62	0	0	0	62	165	0	0	165	39 (P)	39 (P)	22	2
6	62	8	15	0	15	0	134	1	73	0	0	0	73	195	0	0	195	56 (M)	56 (M)	22	2
6 MC	5	18	45	0	32	0	126	1	199	28	0	0	171	330	15	0	315	77 (D)	77 (D)	17	2
7 light	19	0	0	0	81	0	129	1	99[A]	0	0	0	99	225[A]	0	0	225	52 (M)	52 (M)	12	2
7	38	0	0	0	62	0	94	1	251	98	0	0	153	420	40	0	380	100 (D)	100 (D)	17	3
8 MC	6	6	47	0	42	0	107	1	117[A]	12	0	0	105	270[A]	8	0	262	57 (M)	57 (M)	21	4
8	46	17	0	0	25	13	120	1	231	124	0	0	107	360	45	0	315	100 (D)	100 (D)	16	2
8 light	33	17	0	0	50	0	107	1	101	0	0	0	101	180	0	0	180	53 (M)	53 (M)	18	1
10	74	5	0	0	21	0	120	1	136	0	0	0	136	285	0	0	285	88 (D)	88 (D)	20	2
10 light	25	4	14	0	50	7	100	1	240	90	0	0	150	210	23	0	187	68 (D)	68 (D)	12	4

Location	Species Composition						Age	Site	Trees 5-inch dbh and larger					Basal Area 5 inches and larger				Crown Closure		Mean Dia	No Plots
	PP	SP	WF	RF	IC	OK			Total	Cut 5-10	Cut 11-20	Cut 21-29	Leave	Total	Cut 5-20	Cut 21-29	Leave	Before	After		
12	0	50	10	0	40	0	65	1	71	0	0	0	71	300	0	0	300	59 (M)	59 (M)	28	1
14 MC	0	31	50	0	19	0	115	1	116	0	0	0	116	480	0	0	480	92 (D)	92 (D)	28	1
23 MC	31	0	63	0	6	0	83	1	112	0	0	0	112	480	0	0	480	100 (D)	100 (D)	28	1
30 plt	100	0	0	0	0	0	43	1	149	0	0	0	149	240	0	0	240	90 (D)	90 (D)	17	1
33 WF	0	5	50	45	0	0	113	1	138	37	0	0	101	320	5	0	315	53 (M)	53 (M)	20	6
34 light WF	0	0	80	20	0	0	100	1	69	0	0	0	69	240	0	0	240	45 (M)	45 (M)	25	2

[A] Plus 172 4-inch dbh trees/acre (15 ft^2) to be removed (not included in totals)

[B] Plus 86 4-inch dbh trees/acre (7.5 ft^2) to be removed (not included in totals)

California Wildlife Habitat Relationships (CWHR)

Table 4. Sugar Pine CWHR Data, Main Project Area; Present Compared to Proposed Action (Alternative 2)

CWHR	Total Project Acres	Treatment Analysis Area Acres	Acres Before Treatments			Acres After Treatments			Total Project Acres After Treatments
			Tractor	Mastication[1]	Rx[2]	Tractor	Mastication[1]	Rx[2]	
MCH	6	1	0	0	0	0	0	0	6
MCP	38	24	0	19	0	0	19	0	38
MRI	1	0	0	0	0	0	0	0	1
MHW3M	5	1	0	0	0	0	0	0	5
MHW3D	27	15	0	0	0	0	0	0	27
MHW4M	81	15	3	7	0	3	7	0	81
MHW4D	**26**	**17**	**1**	**14**	**0**	**1**	**14**	**0**	**26**
MHC4P	23	23	13	5	0	13	5	0	23
MHC4M	62	50	15	26	0	15	26	2	64
MHC4D	**605**	**325**	**115**	**66**	**31**	**115**	**66**	**29**	**603**
MHC5D	**21**	**4**	**0**	**4**	**0**	**0**	**4**	**0**	**21**
PGS	3	3	0	3	0	0	3	0	3
PPN3P	6	6	1	5	0	1	5	0	6
PPN3M	16	14	5	8	1	42	8	1	53
PPN3D	186	186	167	19	0	130	19	0	149
PPN4S	8	6	0	0	0	0	0	0	8
PPN4P	56	40	40	0	0	40	0	0	56
PPN4M	312	261	136	93	0	136	93	1	313
PPN4D	**1429**	**762**	**314**	**210**	**11**	**314**	**210**	**10**	**1428**

CWHR	Total Project Acres	Treatment Analysis Area Acres	Acres Before Treatments			Acres After Treatments			Total Project Acres After Treatments
			Tractor	Mastication[1]	Rx[2]	Tractor	Mastication[1]	Rx[2]	
PPN5M	88	80	22	56	0	22	56	0	88
PPN5D	**17**	**7**	**5**	**0**	**0**	**5**	**0**	**0**	**17**
SMC3S	5	5	0	0	5	0	0	5	5
SMC3M	16	16	9	2	0	12	2	0	19
SMC3D	35	21	7	14	0	4	14	0	32
SMC4S	4	4	0	0	4	0	0	4	4
SMC4P	54	36	8	21	7	8	21	7	54
SMC4M	149	120	12	55	50	12	55	55	154
SMC4D	**1016**	**410**	**98**	**132**	**71**	**98**	**132**	**66**	**1011**
SMC5M	8	0	0	0	0	0	0	0	8
SMC5D	**30**	**6**	**0**	**4**	**2**	**0**	**4**	**2**	**30**
WFR4D	**9**	**7**	**1**	**0**	**6**	**1**	**0**	**6**	**9**
Total	**4342**	**2465**	**972**	**763**	**188**	**972**	**763**	**188**	**4342**

[1]Note: Acres Before and After Treatment for Mastication and Rx are gross acres

[2]Approximately only 65% of mastication acreage will be treated. Rx burning acreage % may be substantially less than shown

Table 5. Sugar Pine CWHR Data, Hydrology Study Area; Present Compared to Proposed Action (Alternative 2)

CWHR	Total Project Acres	Treatment Analysis Area Acres	Acres Before Treatments			Acres After Treatments			Total Project Acres After Treatments
			Tractor	Mastication	Rx	Tractor	Mastication	Rx	
MCP	27	2	0	0	2	0	0	2	27
BAR	16	2	0	0	0	0	0	0	16
JPN2S	34	32	0	32	0	0	32	0	34
JPN3P	24	24	6	16	0	6	16	0	24
JPN3M	45	45	39	6	0	44	6	0	50
JPN3D	5	5	5	0	0	0	0	0	0
SMC3S	7	3	2	0	0	2	0	0	7
SMC3P	33	2	0	0	0	0	0	0	33
SMC3M	8	6	3	0	0	3	0	0	8
SMC3D	7	0	0	0	0	0	0	0	7
SMC4S	14	14	1	1	4	1	1	4	14
SMC4P	23	12	8	1	1	8	1	1	23
SMC4M	78	65	36	6	8	36	6	8	78
SMC4D	**26**	**11**	**7**	**0**	**0**	**7**	**0**	**0**	**26**
SMC5S	4	4	4	0	0	4	0	0	4
SMC5M	65	65	48	3	3	48	3	3	65
SMC5D	**109**	**63**	**57**	**0**	**0**	**57**	**0**	**0**	**109**
RFR4S	5	5	5	0	0	5	0	0	5
RFR4P	33	33	10	23	0	10	23	0	33
RFR4M	22	16	9	2	5	9	2	5	22

CWHR	Total Project Acres	Treatment Analysis Area Acres	Acres Before Treatments			Acres After Treatments			Total Project Acres After Treatments
			Tractor	Mastication	Rx	Tractor	Mastication	Rx	
RFR4D	**9**	**3**	**0**	**3**	**0**	**0**	**3**	**0**	**9**
RFR5M	23	20	14	1	0	14	1	0	23
RFR5D	**51**	**19**	**13**	**0**	**0**	**13**	**0**	**0**	**51**
WTM	**14**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**14**
Total	**682**	**451**	**267**	**94**	**23**	**267**	**94**	**23**	**682**

Table 6. Sugar Pine EIS Appraisal Cost Summary

	Alt 2	Alt 3	Alt 4
Sawlog CCF Volume	8383.8	6683.3	1497.9
Sawlog MBF Volume	4200.1	3378.2	690.9
Biomass CCF Volume	1394.6	1145.2	406.9
Biomass Green Ton Volume	7883.3	6428.8	1852.0
Sawlog Pond Value	**$1,477,390**	**$1,175,264**	**$261,045**
Sawlog Haul Cost	$601,118	$479,195	$107,399
Biomass Haul Cost	$94,915	$77,403	$22,298
Sawlog Stump to Truck Cost	$770,807	$628,500	$297,683
Biomass Stump to Truck Cost	$57,566	$57,517	$57,553
PreHaul Road Maintenance Cost	$12,266	$10,426	$2,010
During Haul Road Maintenance Cost	$14,708	$12,150	$5,371
Post Haul Road maintenance Cost	$24,336	$20,693	$3,988
Specified Road Construction Cost	$120,000	$120,000	$120,000
Specified Road Reconstruction Cost	$88,387	$88,387	$88,387
Road Surface Replacement Deposit	$19,141	$13,948	$3,139
Erosion Control - Waterbars Cost	$16,782	$16,782	$16,782
Erosion Control - Landings Cost	$1,715	$1,715	$1,715
PAL Cost	$21,567	$17,827	$7,918
Chipper and Operator Cost	$11,317	$11,274	$11,265
Present Net Value	**$(377,235)**	**$(380,554)**	**$(484,464)**