Scenic Resource

(SR)

Appendix Table SR1: South Fork Historic Viewshed Condition - 1900

South Fork Watershed	Seedlings and Saplings	Poles	Small Trees	Medium Trees	Large/Old Growth Trees	Non-Forest	Total Acres
Age	XX	XX	XX	XX	XX	-	-
Acres	1,630	45,170	12,397	23,306	47,655	7,308	137,469
Percent	1%	33%	9%	17%	35%	5%	100%

Appendix Table SR2: South Fork Historic Viewshed Condition - 1956

South Fork Watershed	Seedlings and Saplings	Poles	Small Trees	Medium Trees	Large/Old Growth Trees	Non-Forest	Total Acres
Age	0-20 yrs	21-50 yrs	1-100 yr	101-200 yrs	>200 yrs	-	-
Acres	5,626	6,604	47,389	45,875	25,644	5,757	137,262
Percent	4%	5%	35%	33%	19%	4%	100%

Appendix Table SR3: Developed Recreation Opportunities
South McKenzie Watershed

	Boating Site	Swimming Site	Trail head	Picnic-ground	Camp-ground	Info. Site
Number of Site	2	2	4	1	11	1
ROS Class	2 RN	1 SPN 1 RN	4 RN	1 RN	11 RN	1 RN
Acres	5	2	8	1	58	5
PAOT	208	65	135	35	725	10
Managed Season	138	1-365 1-138	154	183	1-365 1-184	108
Theoretical Cap. RVD'	28,704	12,375	20,790	6,405	281,110	1,080
Practical Cap. RVD's	11,482	4,950	8,316	2,562	112,471	432
PAOT Days	28,704	12,375	20,790	6,405	281,110	1,080

PAOT = Persons At One Time
ROS = Recreation Opportunity Spectrum
RVD = Recreation Visit Days

Appendix Table SR4: Dispersed Campsite Disturbance Data

District/Area	Number of Sites by Ros Class*	Campsite Disturbance Quantities Site Area	Ave. Size	Barren Core	Ave. Size
Blue River - Dispersed	RN 325	686,351	2,112	448,698	1,380
Totals/Averages in Sq. Ft.	-	686,351	2,112	448,698	1,380
Totals/Averages in Acres	-	15.8 Ac.	0.05 c.	10.3 Ac.	0.03 Ac.

^ = Quantities are in square feet
* = Based on a sample of 55 sites
ROS = Recreation Opportunity Spectrum
RN = Roaded Natural - ROS Class

Appendix Table SR5: Dispersed Campsite Conditions

Category	Number of Sites by ROS Class*	RATING Number and Percent of Sites by Rating Class 1 Norm	2	3
Vegetation Loss	RN 325	36 - 11	36 - 11%	253 - 75%
Tree Damage	RN 325	88 - 27	42 - 13%	195 - 75%
Camp Area Size	RN 325	16 -	42 - 13	267 - 82%
Barren Core	RN 325	114 - 3	88 - 27	123 - 38%
Visible Sites	RN 325	173 - 53	29 - 9	123 - 38%

* = Based on a sample of 55 sites
ROS = Recreation Opportunity Spectrum
RN = Roaded Natural

Appendix Table SR6: Wilderness Campsite Condition Summary

Category	Number of Wilderness Sites	RATING Number and Percent of Sites by Rating Class 1 Norm	2	3
Vegetation Loss	181	13 -	64 - 35	114 - 63%
Tree Damage	181	49 - 27	67 - 37	65 - 36%
Camp Area Size	181	46 - 25	44 - 24	91 - 51%
Barren Core	181	121 - 6	28 - 15	32 - 18%

Appenxi Table SR7: Wilderness Campsite Disturbance Data

District/Area	Number of Sites by WRS Class	CAMPSITE Site Area	DISTURBANCE QUANTITIES Ave. Size	Barren Core	Ave. Size
Blue River - Wilderness	SP 38	42,000	1,105	27,000	711
McKenzie - Wilderness	TR 68	206,646	3,339	70,850	1,042
	SP 47	67,800	1,443	22,400	477
	PT 21	23,725	1,130	5,754	274
	PTL 7	4,550	650	650	93
Totals/Averages In Sq. Ft.		344,721	1,900	126,654	700
Totals/Averages In Acres		7.9 Ac.	0.04 Ac.	2.9 Ac.	0.03 Ac.

^ = Quantities are in square feet
WRS = Wilderness Resource Spectrum
TR = Transition
SP = Semiprimitive
PT = Primitive Trailes
PTL = Primitive Trail-less

Appendix Table VEG2: Harvest Acres by Decade by Subwatershed

Sub watersheds	Decades	Acres
	0	4,231.29
	1950	149.43
	1960	114.96
	1970	56.19
	1980	55.91
	1990	4.09
13G		4,611.88
	0	21,851.25
	1950	24.04
	1960	23.13
	1980	49.58
13H		21,948.00
	0	13,036.43
	1950	118.95
	1960	100.99
	1970	61.74
	1980	265.52
	1990	199.37
13I		13,783.00
	0	7,758.64
	1950	71.19
	1960	72.7
	1980	665.35
	1990	260.79
13J		8,828.68
	0	1,810.16
	1960	1.88
13K		1,812.04
	0	2,472.95
	1960	269.23
	1970	148.32
	1980	176.94
	1990	87.85
13L		3,155.29

Appendix Table VEG2: Harvest Acres by Decade by Subwatershed

Sub watersheds	Decades	Acres
	0	2,379.46
	1960	490.66
	1970	411.56
	1980	411.81
	1990	458.39
13M		4,151.88
	0	3,425.32
	1950	0.03
	1960	524.29
	1970	482.49
	1980	481.58
	1990	98.77
13N		5,012.47
	0	2,412.08
	1940	163.14
	1950	693.04
	1960	453.77
	1970	831.89
	1980	314.49
	1990	28.31
13P		4,896.72
	0	1,684.62
	1940	41.12
	1950	699.27
	1960	720.04
	1970	693.35
	1980	445.83
	1990	96.1
13Q		4,380.34
	0	2,088.79
	1940	202.25
	1950	289.46
	1960	411.58
	1970	408.27
	1980	209.8
	1990	27.87
13R		3,638.01

Appendix Table VEG2: Harvest Acres by Decade by Subwatershed

Sub watersheds	Decades	Acres
	0	2,356.35
	1940	809.56
	1950	10.28
	1960	576.6
	1970	250.61
	1980	310.76
	1990	8.9
13S		4,323.06
	0	1,863.07
	1960	164.39
	1970	330.4
	1980	14.13
	1990	52.72
13U		2,424.72
	0	4,153.04
	1970	65.55
	1980	278.12
	1990	20.43
13V		4,517.14
	0	0
14E		0
	0	0.01
14I		0.01
	0	0.01
17L		0.01
	0	0
24A		0
		136,677.19

Appendix Report VEG3:

Regional Ecological Assessment Project (REAP)

Assumptions for the Range of Natural Variability of Plant Series

Willamette N.F. Range of Natural Conditions
Percent of series in early and late seral stage

	Early Seral	Late Seral	
Mountain Hemlock	1-30	2-25	
Pacific Silver Fir	3-35	40-70	
Western Hemlock	2-35	35-85	(3 northern HUCs)
	3-30	45-75	(Middle Fork Willamette)
Climax Douglas Fir	3-30	50-90	

Estimates of the range of natural condition for the seral stages were based on three fires studies done on the Blue River District of the Willamette National Forest (Morrison and Swanson 1990, Teensma 1987, Connelly and Kertis 1992) and on one fire study in the Mt.Jefferson Wilderness, Deschutes National Forest (Simon 1991). The Mt.Jefferson study was used for information on fire patterns in the Mountain Hemlock zone. For the other series, GIS maps of fire events from the H.J.Andrews Experimental Forest and the Augusta Creek drainage, both in Blue River District, were used to track patches and seral stages from 1600-1850 in 50 year time steps. Series maps of the study areas were derived from a model using elevation and aspect to predict series. Ranges in percentages by series over the 250 year period were compared between the two study areas, and the final percentages were applied to the HUCs within the same ecoregion. Because the Middle Fork Willamette is in a warmer, drier ecoregion, the Western Hemlock zone percentages were adjusted to reflect a higher proportion of higher frequency, lower intensity fires.

METHODOLOGY FOR DEVELOPING TERRESTRIAL RANGE OF NATURAL CONDITIONS

We used the spatial fire patterns from the HJ Andrews (Teensma 1987) and Augusta Creek (Connelly and Kertis 1992) study areas to determine percentages of early (0-50 years) and late (> or = 200 years) seral by series for the period 1600-1850 for the McKenzie HUC. Series lines were derived from forest models at HJ Andrews, and from local site information from stand exams and fire history plots at Augusta Creek. The Tshe series was further stratified by PAGs Bene and Rhma at Augusta Creek. The methods and assumptions we used to develop ranges are outlined below.

1. Fire Severity--
Historical and recent fire patterns reveal a complex mosaic of fire severity in any one given fire event. We used fire severity estimates, averaged by century from the Cook Quentin and Deer Creek drainages (Morrison and Swanson 1990) to determine percentages of each individual fire event that would burn hot enough to create post-fire early seral conditions. We assumed that all of the high severity (70-100% mortality) and half of the moderate severity (30-70% mortality) areas would create post-fire early seral conditions. The following percentages were applied to each fire event for the given century to determine amount of area in post-fire early seral condition:

1500-1600--75%
1600-1700--55%
1700-1800--40%
1800-1900--45%

2. Spatial placement of fire severity patches--
In order to effectively track percentages of early and late seral over time we needed to provide some rules for spatial context. We assumed the areas that reburned more frequently had a higher probability of burning more intensely, or maintaining early seral conditions, than those areas that burned less frequently. Fuel loads often increase after fire. Stands are more open to solar radiation and wind, creating potntial for high intensity reburning to occur (Rothermel 1983). Furthermore, younger stands have a higher probability of reburning than older stands (Franklin and Hemstrom 1981). Since the 1500's were a period of fairly intense fires, generating the bulk of stands present in both study areas, fire intensity in the young stands that resulted from these fires would seem to follow the above logic.
Each site was gridded into .25 ha pixels. All fire episodes were then overlayed, and the number of times each pixel burned was recorded. This information was then used to determine spatial placement of high severity patches on the landscape. The 'hottest pixels' (those that had burned the most) formed the high severity patches for each individual fire episode. Adjacent pixels were added into the high severity patches when needed. The remainder of the fire episode retained its pre-fire age class.
This method yielded areas within each series that had no recorded fire activity. These areas were included in the late seral category when calculating percentages.

Results

lculations were done at 50 year increments, since we assumed that early seral nditions could continue for up to 50 years after a fire event.

Year	HJ ANDREWS Site Tot		Tshe		Abam		AUGUSTA CREEK Site Tot		Psme/Abgr		Tshe		Abam	
	E	L	E	L	E	L	E	L	E	L	E	L	E	L
1600	* 30	28	35	36	21	12	32	35	31	52	33	37	** 11	35
1650	23	28	17	36	34	12	11	35	6	52	14	37	0	35
1700	12	44	7	51	23	30	0	36	0	52	0	37	0	36
1750	8	57	4	61	18	47	2	40	0	52	2	42	0	67
1800	10	76	5	86	18	56	11	79	3	91	12	76	3	67
1850	20	76	13	83	30	64	16	79	9	92	18	75	4	66

E=early seral (0-50 yrs)
L=late seral (> or = 200 yrs)
* values expressed as % area within the series
**adjusted values for late seral %s due to very low sample size over 30% of Abam zone in study area.
The Tshe zone was further stratified in the Augusta Creek study area into Bene (hot, dry) and Rhma (cold, dry) types.

Year	Tshe/Bene		Tshe/Rhma	
	E	L	E	L
1600	28	45	41	25
650	19	45	6	25
00	0	45	0	25
750	3	46	2	36
1800	10	71	14	57
1850	14	78	25	71

Ranges were then developed from the above information as follows:

Series	Early seral %s	Late seral %s
Psme/Abgr	3-31	52-92
Tshe	2-35	36-86 (North Santiam, South Santiam, and McKenzie HUCs)
	* 3-28	45-78 (Middle Fork Willamette HUC)
Abam	3-34	12-66

*--range would follow the range for the hot, dry Tshe/Bene type

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FIRE RETURN INTERVAL MODES AND RANGES--WILLAMETTE

HUC	TSME	ABAM	TSHE	PSME/ABGR
17090005 North Santiam	*180 100-345	#275	200 125-500	160 85-250
17090006 South Santiam	*180 100-345 variable	275 limited data	170 70-300	130 limited data
1709004 McKenzie	*180 100-345 variable	248 117-377	155 94-377	139 79-225
17090001 Middle Fork Willamette	*180 100-345e variable	235 170-300	**95 150 87-260	112 67-170

*--no data available--used values from literature (Simon 1991)
#--insufficient data--used professional judgement
** 2 modes present in this HUC, although not geographically distinct

Fire size--
TSME zone--700-1800 acres (Simon 1991)
ABAM/TSHE/PSME/ABGR zones--1500-26000+ acres (Teensma 1991, Connelly and Kertis 1991)
Acres burned (fire size) may not accurately reflect the spatial distribution of fires. For instance, 1500 acres may burn, however the distribution is one of patches of 100% mortalitly interspersed with patches of underburned/unburned. In other words, the 1500 acres that burned may actually be spread across 30,000 acres.

The central Cascade Range is characterized as a complex set of fire regimes. Historical fires exhibited a mosaic of stand replacing and low intensity underburns across the landscape. The PSME and ABGR zones were lumped together for this exercize. These zones are so spatially linked, often forming a matrix on low elevation slopes. Ecoplot data was limited for these series as well. We used intensity, size and spatial patterns from fire history work in the Augusta drainage (Connelly and Kertis 1992), the H.J. Andrews (Teensma 1987), and adjacent areas (Morrison and Swanson 1990) to determine the range and modal fire frequencies for the ABAM, TSHE, AND PSME/ABGR zones within the McKenzie HUC. TSME fire frequencies and sizes were determined from fire history work on either side of the Cascade Crest (Simon 1991, Dickman and Cook 1989). Age class data from ecoplots was used to determine modal and range for the remaining HUCS, using the McKenzie HUC frequencies as a guide for adjustment.

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