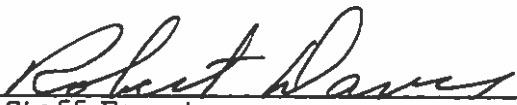


TIMBER MANAGEMENT PLAN

PARASHAUNT

PARASHAUNT TIMBER MANAGEMENT PLAN

PREPARED BY:



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Shivwits Resource Area

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TIMBER MANAGEMENT PLAN

Parashaunt

I. INTRODUCTION

A. Purpose and Objectives

The purpose of this report is to develop a timber management or activity plan, for the Parashaunt forest. The primary objective of this plan is to create a timber harvest schedule which will allow the forest to attain maximum timber production, while enhancing other resource values. A timber harvest, while maintaining a continuous canopy, will place the forest under even-aged, sustained yield management, provide a small but tangible income to the Government, the State of Arizona and industry and increase forage production for cattle and wildlife.

B. Area

The forest lies on the south end of the Shivwits Plateau approximately 80 miles south of St. George, Utah. Primary access to the area is provided by the Quail Canyon-Wolfhole, Mainstreet-Poverty Mt. road systems.

The forest has been divided into two compartments, the East and the West Parashaunt drainages. The East Parashaunt forest is broken only by eighty acres of state land in Section 2. The West Parashaunt is typical O/c scattered ownership.

C. Description

1. Physiography

The timbered lands lie in stringers within the headwaters of the Parashaunt Wash. On its way to the Colorado River, the Parashaunt Wash flows north to Poverty Mtn. before turning southeast towards the Colorado.

The Parashaunt forest is quite unique in that it lies well below the "text-book" minimum elevation of 6500'. By locating itself within the drainages, the Ponderosa Pine is more moisture efficient while enjoying a longer growing season. The north slopes of Mt. Dellenbaugh and Castle Peak are higher in elevation but are devoid of Ponderosa Pine.

2. Climate

The Parashaunt experiences the semi-annual droughts typical of the Southwest. Precipitation ranges from 16" to 20" in the form of violent thunderstorms in the summer and the more gentle frontal systems in the winter. A large portion of the winter moisture is in the form of snow. Local phenological data on the Ponderosa Pine is not available.

1988
Gubler-frey

4. History

The District sold two timber sales in the Parashaunt in the 1950's. Approximately 800 MBF on the East Parashaunt in 1950 and 300 MBF on the West Parashaunt in 1955. The scars from both sales remain, especially on the East Parashaunt where poor logging practices left little to no regeneration.

Personal communication with Reid Mathis revealed that approximately 9 MMBF have been harvested from private lands on the Parashaunt. All timber, public and private, was sawn by small portable sawmills and removed as lumber. The sawmill at the head of Green Spring Canyon was destroyed by fire in the middle 50's.

II FOREST RESOURCES

A. Non-productive Forest Lands

Non-productive forest lands are defined as those areas not capable of producing 20 cubic feet of a commercial species per acre per year. All areas within the forest are considered capable of producing the required 20 cubic feet. With further study, several fringe areas may also fall into this category.

B. Productive Forest Lands

A total of 1940 acres were identified in the 1978-79 operations inventory and were classified as productive forest lands.

Listed below are the acreage and type breakdown of the productive forest area.

TIMBER TYPE	ACREAGE
PP1-/PP2=	156
PP1-/PP2-	229
PP1-/PP3=	23
PP1-/PP3-	18
PP1-/PP3-	46
PP2-/PP3=	328
PP2-/PP3=	68
PP2-/PP3-	63
PP2-/PP3-	30
PP2=	16
PP2=	138
PP2-	227
Scattered PP	598
	1,940

A representative type classification PP1-/PP2= is interpreted as a ponderosa pine (PP) stand with a mature-to-overmature overstory (1) and a 0-33% crown closure (-). The understory

consists of a ponderosa pine (PP) stand, young sawtimber (2) with a 34-66% crown closure density.

Age Classes		Densities	
1.	Mature and Overmature Sawtimber	- 0 -	33% Crown Closure
2.	Young Sawtimber	= 34 -	66% Crown Closure
3.	Poles and Smaller	= 67 -	100% Crown Closure

The following table is the result of the 1978-79 operations inventory:

TABLE 1

AREA	ACRES	TYPE	STEMS /A	AVE DBA	AVE HT	MERCH DBH	VOL/A	TOT VOL MERCH	BA/A	R I	ANN INC CUFT	CUVOL PER/A	AGE	S I
1	46	11/31	14	20.0	53	28.2	7692	253832	45.3	.6	15.0	1842	50	70
2	538	SCAT	6	11.8	37	13.8	425	228650	5.2	.9	2.7	120	60	65
3	60	SCAT	3	12.0	29	13.0	100	6000	2.4	.9	.8	36	60	50
4	68	22/32	92	11.6	40	15.5	7509	510612	86.5	.7	38.7	2260	70	60
5	121	21	26	12.0	36	13.9	1602	193842	25.0	.7	9.8	539	70	55
6	165	11/21	70	9.3	37	13.0	3166	522390	44.9	.6	16.0	1129	70	60
7	13	21	8	8.0	21	10.0	220	2860	5.2	.9	2.8	50	50	60
8	328	22/33	133	9.7	40	13.5	6285	2061480	83.2	.7	44.0	2131	70	60
9	61	21	17	10.1	36	12.6	690	42090	11.0	.8	6.0	232	60	60
10	32	21	26	9.0	26	13.3	488	15616	13.9	.9	6.8	231	60	60
11	63	22/31	111	12.0	44	15.1	10396	688968	105.6	.8	56.0	3021	70	70
12	143	SCAT												
13	12	22	66	11.1	40	13.1	4884	58608	42.8	.7	28.7	1349	70	60
14	12	11/22	105	10.7	42	14.8	7883	94586	86.1	.6	41.5	2335	70	70
15	46	22	35	9.0	28	14.0	2258	102868	24.3	.6	9.2	616	70	50
16	16	23	108	14.0	60	14.8	14332	229312	125.6	.7	68.3	4142	90	70
17	10	22	41	14.3	51	15.0	4386	43860	48.9	.9	27.9	1357	90	70
18	38	22	161	9.7	39	11.9	4259	161842	90.9	.6	45.1	1987	70	60
19	23	11/33	268	7.8	32	12.9	7083	162909	113.5	.7	62.9	2651	70	60
20	32	22	88	9.6	36	12.0	2588	82816	50.0	.7	24.2	1039	70	60
21	18	11/32	50	10.8	31	15.5	4634	83412	58.0	.6	20.4	1379	70	50
22	71	11/22	204	9.8	37	12.7	6926	491746	125.0	.6	60.5	2846	70	65
23	30	21/31	32	8.9	27	12.3	717	21510	16.3	1.0	8.8	274	60	60
24	73	11/22	164	9.6	44	13.1	8910	650430	101.3	.5	50.0	2969	70	70
25	29	11/21	107	11.1	47	15.9	10988	219760	93.4	.4	39.1	2945	80	70
26	35	11/21	104	8.5	31	13.6	5523	192205	56.9	.7	27.3	1627	60	70
T 1940			69	10.5	38	14.0	3689	7124304	46.8	.8	22.8	1221	68	65

Where:

Ave DBH = Average diameter breast height, all stems.
 Merch DBH = Average of all items over 10" DBH.
 Volumes = Board foot volumes, Scribner Decimal C.
 R I = Ten years radial increment.
 S I = Site Index, a function of total height over age.

For management purposes, the parashaunt forest was divided into two geographical compartments, East and West. Each compartment was further divided into sub-units to facilitate harvest schedules. This breakdown is as follows:

TABLE 2

<u>EAST</u>							
AREA	ACRES	VOL/A	TOTAL VOL	AREA	ACRES	VOL/A	TOTAL VOL
14	12	7883	94586	13	12	4884	58608
16	16	14332	229312	15	46	2258	103868
19	23	7083	162909	17	10	4386	43860
22	71	6926	491746	18	38	4259	161842
24	73	8910	650430	20	32	2588	82816
25	29	10988	219760	21	18	4634	83412
				23	30	717	21510
	<u>224</u>		<u>1848743</u>		<u>186</u>		<u>555916</u>
<u>WEST</u>							
8	328	6285	2061480	1	46	7962	253822
11	63	10396	688968	2	538		
4	68	7509	510612	3	60		
				5	121	1602	193842
				6	165	3166	522390
				7	13	220	2860
				9	61	690	42090
				10	32	488	15616
	<u>459</u>		<u>3261060</u>		<u>1036</u>		<u>1030630</u>

The second sub-unit in each compartment is not considered commercial and was removed from the harvest plan. Area #26 is in an adverse location.

III. MANAGEMENT PLAN OBJECTIVES

A. Sales Plan

The object of this timber management plan is to provide for the commercial harvest of timber while maintaining or enhancing other resource values. The commercial acreage and volume is not sufficient to make the Parashaunt an economically sustained yield unit. However, occasional timber sales will:

1. Provide a small income to the Federal Government and the State of Arizona.
2. Increase available forage for cattle and wildlife.

3. Continuous canopy management would maintain a cover for some game and non-game animals.
4. Harvests will be planned so the aesthetic qualities of the forest are not compromised.
5. Cultural resources will be more readily located and protected or mitigated as the situation warrants.
6. Available water will be increased by reducing losses by evaporation and transportation.
7. In the long run, sediment loss will be reduced.
8. Road systems will be upgraded and maintained.
9. Fire danger will be reduced.

B. Reforestation

In order to provide good natural regeneration, ponderosa pine requires an area with:

1. A large supply of good seed
2. On a well prepared seed bed
3. Free of competing vegetation
4. A low population of seed eating pests
5. Sufficient moisture for early seed germination (June rains)
6. Protection from browsing animals
7. A stand basal area between 14 and 50 square feet per acre

The difficulty has been to get these requirements to coincide. Adequate June rains in this area are not common. Good cone crops occur on an average of every four years. On the Parashant, good seed years occur during leap years. A sound management plan can provide for all but the fifth requirement.

Artificial regeneration would require:

1. On site cone collection
2. Shipment to a forest nursery
3. Two years in the nursery for containerized stock
4. Reshipment and storage
5. Site preparation, I.E., plowing
6. Planting
7. Construction of a fence to protect the area from browsing animals.

Areas 2, 3, 7 and 9 fall below the minimum of 14 square feet per acre basal area needed to provide an adequate seed source. When funds become available as a result of the initial harvest, these areas, totaling 672 acres, should be cleared of the competing P-J,

plowed and planted with 2-1 containterized stock. Failure to treat these areas will result in little or no timber production for a century. Approximately 500 acres in sections 11, 14 and 23 may also fall into this catagory.

C. Silvicultural Treatments And Prescriptions

Sanitation Cutting

In addition to the preceeding paragraph, areas 1, 5, 6, 10, 15, 17, and 23 are inadequately stocked. The primary reason for this low stocking is completion with P-J. Sagebrush is an asset to regeneration of ponderosa pine because the soil is loose near the base of the plant and it provides a small amount of shade, preventing sun scald.

The prescription for these areas is to initially sever all juniper stems within 14 feet of every ponderosa pine. This may be achieved by contract, YACC project or partially by concentrating post permits in designated areas. Removal of the competing juniper within 14 feet would allow full and open growth for the existing ponderosa pine for use as future seed trees wihtout significantly altering the micro-climate of the area. As the Ponderosa mature and become seed-bearing, the remaining juniper may be removed.

Pre-commercial Thinning

Only areas 19 and 22 will require a pre-commercial thinning in the future. Approximately 50 stems/acre in the 2" to 8" diameter classes will be removed resulting in a 14' x 14' spacing for the residual trees. The severed stems may be sold as poles for fuel wood. The slash will be placed in East Parashaunt Wash, which dissects the area, to reduce erosion. Since this is a thinning from below, forage production will not be substantially increased.

A pre-commercial thinning in both areas should be scheduled for this decade.

A tree in fully stocked stand will fall into one of four major crown catagories: dominant, co-dominant, intermediate and suppressed. In a typical Parashaunt stand, DBH classes 2" to 6" are suppressed, 8" to 10" are intermediate, 12" to 18" are co-dominants and trees 20" and over are dominants. Dominants and co-dominants are the future crop trees. Refer to Table 3 for diameter distributions in each area.

TABLE 3

STEMS/A BY DBH CLASS

AREA	.1-4.9	5-8.9	9-11.9	12-15.9	16-19.9	20-23.9	24-27.9	28-31.9	32+
1	3	1	1	2	1			1	5
2		1	1	3	1				
3			1	1					
4	15	19	8	26	16	3	4		1
5	1	5	5	9	5	1			1
6	19	13	14	19	3		1		1
7	3	2			3				
8	23	44	16	33	15	1			1
9	3	3	2	7	2				
10	4	12	3	5	2				
11	12	25	15	24	21	13		1	
13	8	18	5	2					2
14	15	34	17	15	20	3			1
15	8	18	5	2					2
16		11	13	42	29	11	2		
17		3	5	16	11	6			
18	8	62	41	41	8		1		
19	63	129	42	18	13			3	
20	7	31	22	22	6				
21	3	13	14	11	3			6	
22	22	61	36	69	13	2	1		
23	4	13	5	9	1				
24	16	65	35	28	15	2	2	1	
25	12	41	15	10	12	12	5		
26	25	43	11	15	5	4			1

D. Commercial Harvest

The most environmentally acceptable harvest method in southwestern ponderosa pine is the shelterwood. This method will maintain the even-aged structure while the selection method favors the uneven or all-aged stand.

Even-aged stands are managed most effectively by the two-cut shelterwood. This method would not be acceptable in the District because the first or seed cut would remove 60-70% of the stand at one time.

Harvests on the Parashaunt are planned utilizing 1-2 intermediate harvests at 30-year intervals. With a single intermediate cut in the West Parashaunt and a second intermediate cut in the East Parashaunt, the final harvests would be staggered by 30 years. Intermediate cuts would remove approximately 1/3 of the basal area while the seed cut must lower the basal area to 40 sq. ft. per acre to allow for cone production. The final harvest will remove all but 3-5 mature trees per acre. These trees will be retained as a back-up seed source in case of wildfire and for wildlife.

Table 4 lists the proposed harvest schedule for the first rotation.

TABLE 4

<u>YEAR</u>	<u>EAST</u>	<u>WEST</u>
1988		1582 (mbf)
1998	984	
2018		2082
2028	1136	1895
2058	1816	
2068	777	

The entire commercial harvest program is predicated on the assumption that the forest will regenerate following the seed cut. Since the logging history is poorly documented, there is a question as to the Parashaunt's reproductive capability. Therefore, during the initial harvest, a 40 acre test area will be selected to receive a seed cut. In this area the basal area will be reduced to 40 sq. feet retaining the best seed trees, the slash will be piled and burned and the soil scarified. An evaluation of the test plot in the 10 years following harvest will determine the direction of the commercial harvest program on the Parashaunt.

E. Prescribed Burning

Prescribed burning, once an understory of trees has been established, is a recognized effective forest management tool to reduce potentially high intensity forest fires. When fire is totally excluded from an area, debris of all types will accumulate. If allowed to continue, this situation can be most detrimental should a project fire develop.

Through evolution, ponderosa pine was assured preservation by the development of resistance to fire. Periodic lightning-caused fires occurring in the past, prior to total fire exclusion as we recognize it today, maintained low fuel levels. Thus, when fires occurred during extreme conditions, the results were not as significant as would be the situation now due to current fuel buildups. Also, by near total fire exclusion, the stagnated condition that now is prevalent, undoubtedly would not have developed had nature's selection method been allowed to progress. Stands would have been thinned and fire would have pruned dead branches from these trees while they were in the sapling and pole stages. Vast areas of sagebrush present throughout most of the timbered area would have been substantially reduced.

Recognizing the potential buildup of slash and after cutting operations have been completed in a given area, a control burning schedule should be established. Treatment should be on a systematic basis, both from the standpoint of the area treated and the periodic recurrence of this treatment. Recurring treatments on any one area may be conducted at six year intervals. In some cases, it may be desirable to extend this period.

Natural barriers, such as roads, trails, ridges, etc., should be used in establishing burning units. In situations where natural barriers are lacking, construction of barriers may be necessary.

The benefits derived from a prescribed burning operation can be seen in the reduction of fuels, lessening the potential of wild-fires, grass species would increase due to the diminished solid needle cover created by coniferous species and wildlife would benefit from the succulent growth of rejuvenated browse species.

Once the fire hazard has been reduced, modified fire suppression tactics should be used on lightning caused fires in lieu of prescribed burning. Under favorable conditions, natural fires would be allowed to burn to natural or artificial barriers.

F. Transportation

With the exception of Area #25, all other areas are serviced by an existing road. Approximately 1.5 miles of dirt spur will be necessary to reach Area #25. This road and the short spurs required to log each area will be temporary. At the end of a timber sale contract, the purchaser will be required to plow and seed to grass all spur roads and landings.

Where proposed spur roads encounter a fence line, cattleguards will be constructed by the purchaser.

the existing road system to Highway 389 is in need of some improvement. This would include smoothing the approaches to large washes, placing culverts in the smaller washes and minor curve re-alignment. This work would be done by the purchaser and the costs amortized by the value of the timber.

G. Realty

It is imperative that the district make a timely determination of the ownership of the West Parashaunt road system. If it is determined that G & F Ranch owns and controls the roads across private lands, a right-of-way agreement must be negotiated. The district should allow sufficient time for the worst possible situation, condemnation.

IV. MULTI-PURPOSE OBJECTIVES

One of the primary uses of our productive forest lands is, of course, timber production. According to the principles of multiple-use, however, management of a single resource should not be detrimental to other resource values. Implementation of this timber management plan will be in accordance with this principle. Trade-offs will be made to insure that other resource values are maintained.

Implementation of this plan will require a programmatic E.A.R. and a site specific E.A.R. preceeding each timber sale.

V. PROPOSED ACTION PLAN

Prior to offering a timber sale in 1988, all realty questions should be solved and an agreement signed by FY86. Ten work-months should be planned during that year for the following activities:

1. Recon
2. Property line determination
3. Layout of area and spur roads
4. Timber marking and cruise
5. Appraisal and E.A.R.

Since this will be the first timber sale on public lands in Arizona in nearly 30 years, the review process can be expected to be quite lengthy.

Another operations inventory should be scheduled for completion by FY89 and at ten year intervals into the future.

TABLE 5

AREA	ACRES	DATE	PHOTO	SEC	40	ELEVA- TION	ASPECT	PAST TREAT- MENT	DATE
1	46	8/23/78	AS2163	5	SE	5900	NW		
2	538	8/25/78	AS2168	18,19		5900	NE		
3	60	8/09/78	AS2168	20	NW	5900	NE		
4	68	8/08/78	AS2168	20	W2	5920	NE		
5	121	8/09/78	AS2168	20	SW	5960	NW		
6	165	1/16/81	AS2169	30	W2	6000	NW		
7	13	7/27/78	AS2169	32	NWNW	5960	SE		
8	328	8/24/78	AS2169	32	N2	5960	N	LOGGED	5/55
9	61	8/24/78	AS2169	32	N2	5980	NE	LOGGED	5/55
10	32	7/27/78	AS2169	32	NWSE	5960	SE	LOGGED	5/55
11	63	9/06/78	AS2169	32	W2SE	5980	W	LOGGED	5/55
12	143	9/07/78	AS2169	32	SW	6000	W		
13	12	10/31/78	AS2267	22	NESW	6140	SE		
14	12	10/31/78	AS2267	22	SWSE	6140	W		
15	46	11/01/78	AS2267	22	E2SE	6190	W		
16	16	9/08/78	AS2267	23	SESW	6140	NW		
17	10	9/08/78	AS2267	23	SE	6200	W	LOGGED	11/50
18	38	5/30/79	AS2267	23	SWSE	6180	W	LOGGED	11/50
19	23	5/30/79	AS2267	23	SE	6160	W		
20	32	5/17/79	AS2267	23	W2NE	6180	W	LOGGED	11/50
21	18	5/22/79	AS2267	23	SENW	6160	E	LOGGED	11/50
22	71	5/23/79	AS2267	14	E2SW	6150	E	LOGGED	11/50
23	30	5/30/79	AS2267	14	W2SE	6150	E	LOGGED	11/50
24	73	5/16/79	AS2267	11,14		6140	N	LOGGED	11/50
25	29	10/09/78	AS2363	2,11		6000	N		
26	35	5/15/79	AS2362	2	E2NE	5900	N		

APPENDIX - A

Shivwits Resource Area Operations Inventory 1978-79

The 1978 Shivwits R.A. Operations Inventory was similar to SVIM in that homogenous areas within the heterogenous forest were selected to reduce variability.

The small size of the forest and inadequate funding ruled out the standard five or ten-point inventory methods suggested by the BLM Manual. Instead, a 1/5 acre, fixed radius plot method was used resulting in a 1-2% sample.

Field measurements included DBH in 2" classes, merchantable height, total height, age, ten year radial and height increments and an estimate of defect. Programs were devised on the TI-59 programmable calculator for the following for the following formulae:

Merchantable Volume - Scribner Decimal C

$$V = .79D^2 - 2D - 4$$

Where:

$$V = 16'' \text{ log volume}$$

$$D = \text{Scaling diameter}$$

Merchantable top diameter was set at 5' or 40% of the scaling diameter of the first 16' log, whichever was greater.

The taper of the tree above the first log is established through the determination of the diameter of each log above the butt log (the diameter of the butt log having been determined by multiplying the form class by the D.B.H.o.b.) through the use of the formula $D = \frac{L}{.9L + 1.1} + 0.5$. In

this formula, D is a decimal fraction representing the ratio of the scaling diameter at any point on the tree to the scaling diameter of the first log, e.g., if the scaling diameter of the butt log is 40 inches and the scaling diameter of the third log is 30 inches divided by 40 inches, or 75 percent. The value L is the ratio of the number of logs (or lineal distance) between a given D and the merchantable top, to the total number of logs (or total lineal distance) between the top of the butt log and the merchantable top, e.g., in a 5 log tree the L for the third log would be .5 since there are 2 logs above its scaling diameter (to the merchantable top) and 2 logs below (to the top of the butt log).

$$\begin{aligned} \text{Basal Area is of course: } BA &= \pi R^2 \\ \text{and Cubic Volume: } CV &= .5 (\pi R^2) \times L \end{aligned}$$

For the lack of anything better, annual increment was computed by similiar cones.

The basic difference between a timber cruise and timber inventory is the inventory gathers growth data. This was the initial inventory of the Shivwits Resource Area, since neither Solenburger and Suhr obtained growth estimates.

APPENDIX - B

Type Maps

APPENDIX - C

Programatic Environmental Analysis Record

PROGRAMMATIC ENVIRONMENTAL ANALYSIS RECORD

Arizona Strip District Timber Management Program

I. Description of the Proposed Action and Alternatives

A. Proposed Action

The purpose of a timber management plan is to initiate a forest development program designed to achieve maximum timber production while maintaining or enhancing other resource values.

The Arizona Strip District contains four separate and unique areas of productive forest lands located in the Virgin Mountains, Black Rock Mountain, the Parashaunt and in the vicinity of Mount Trumbull. The proposed action for each of the four ponderosa pine forests is:

1. The Virgin Mountains - No action

The primitive area designation prohibits timber harvest in the area. Even without the primitive area designation, the steep fragile slopes cannot be harvested by conventional logging systems.

2. Black Rock Mountain - Maintenance

The Black Rock - Trails End forest is small and contains the lowest site quality on the district. It is not environmentally or economically feasible to initiate a harvest program in the foreseeable future. The timber management plan calls for pre-commercial thinnings, sanitation cutting of competing juniper, controlled burns and plantings.

3. The Parashaunt and Mt. Trumbull - Harvest

Both forests contain sufficient amounts of merchantable ponderosa pine to justify a timber harvest plan. Mt. Trumbull can support harvests every five years and the Parashaunt every ten years. The timber will be managed on a 120-year sustained yield rotation. Two variations of the shelterwood harvest method will be used depending on site quality.

On the more productive sites, a 20-year re-entry will remove approximately 40% of the volume at 20 year intervals to year 110 when the seed cut must reduce the stand basal area below 40 sq. ft./acre to allow for regeneration. If natural regeneration is successful, year 120 will see the removal of the remaining overstory with the exception of 4-5 mature trees per acre. These residual trees will serve as wildlife trees as well as a back-up seed source should the understory be destroyed by wildfire. The lower quality sites will experience only one intermediate cut. Individual cutting units could range from 5-300 acres in size. As with

the Black Rock forest, the Parashaunt and Mt. Trumbull timber management plans will call for pre-commercial thinnings, sanitation cuttings of competing juniper, controlled burns and plantings.

B. Two Alternatives to the Proposed Actions Were Considered:

Alternative #1 - Maintenance of the Parashaunt and Mt. Trumbull forests. This would allow for the occasional timber stand improvement project as mentioned in the Black Rock TMP.

Alternative #2 - The timber resources on the district will remain unmanaged.

II. Description of Existing Environment

A. Non-living Components

1. Air - The Strip, characteristic of the mesa country of the Colorado Plateau. Skies are clear over 80% of the time. Air quality is very high with little visible pollution. The primary storm track is from the southwest. Most of the annual precipitation is received during July and August and during the winter months December through March.
2. Land - The topography of the area is relatively flat to rolling with several areas of steep terrain near Mt. Trumbull. With the exception of the Parashaunt, ponderosa pine occurs above 6500' in elevation. The Parashaunt is unique in that it occurs between 5900' to 6200' elevations. Soils in the ponderosa pine are relatively deep and well drained with a higher moisture holding capacity than the surrounding areas. The soils are derived from basaltic parent material with a mixture of limestone in the West Parashaunt. Most areas contain a basaltic cobble which tends to control run-off and allow for greater percolation.
3. Water - There is no surface water except intermittent water in small livestock ponds. Moisture generally comes in the form of violent summer thunderstorms usually of short duration or winter precipitation which is received as frontal action and is gentle in nature. Summer thunderstorms produce considerable surface run-off if measures are not taken to impede the velocity of the run-off water.

Moisture produced from either rain or snow enters the ground or flows as surface run-off and eventually reaches the Colorado River, unless it is trapped upstream in some way or utilized by vegetation.

B. Living Components

1. Plants

Ponderosa pine comprises the major vegetative type in association with the juniper-pinyon type scattered on the more exposed and drier sites to aspen on the moist areas on Mt. Trumbull. Shrubs, forbs and grasses are included in the understory along with other broad leaf trees species such as Gambel's oak and New Mexican locust.

2. Animals

The area is inhabited by a variety of wildlife species. Common mammals include mule deer, coyotes, cottontail rabbits, rock squirrels and the Kaibab squirrel. There is a good representation of birdlife including warblers, wrens, sparrows, jays, woodpeckers and Merriam turkey. Common birds of prey include Cooper's hawk, redtailed hawk and golden eagle. Prominent reptiles include western rattlesnakes, western whiptail lizards, sagebrush lizards and short-horned lizards. A more complete list of animals and their incidence of occurrence in each vegetative type can be found in the District Wildlife Species listings.

C. Ecological Interrelationships

Within its range of elevation and aspect, ponderosa pine is the climax species. Some areas of mixed ponderosa/juniper-pinyon are slowly returning to pure ponderosa stands. Closed stands of pine are nearly devoid of vegetative understory which proportionately lowers the animal population.

More open stands promote a well ordered food chain with man at the top of the chain utilizing both herbivores, deer, cattle, and predators.

D. Human Values

1. Landscape Character

The ponderosa pine type occupies mostly flat to gently rolling northerly slopes on three prominent land masses. The Black Rock-Virgin Mountain complex, the Parashaunt and the Uinkaret Mountains are considered among the more scenic areas on the district carrying a Class II scenic rating.

2. Sociocultural Interests

- a. Attitudes and Expectations - The timber management plan will have a slight effect, both positive and negative depending on the interest groups. Harvent operations will be both unsightly and noisy to recreationists. There undoubtedly will be opposition to the burning

program. However, the more knowledgeable will recognize these inconveniences as a step towards management of a natural resource.

- b. Cultural Resource - Archaeological evidence indicate that man has been a semi-permanent resident of the ponderosa pine forests for several millennia. Known sites on Black Rock and the Parashaunt appear more transitory, While the Mt. Trumbull area contains larger more permanent sites.

The history of the Mt. Trumbull area dates back to J.W. Powell and Jacob Hamblin in the early 1870's. Much of the lumber utilized in the early days of St. George and Mesquite came from the Arizona Strip's pine forests. Evidence of this early logging still remain.

Several Indian trails as well as the historic Temple Trail pass through the Mt. Trumbull area.

3. Wilderness

The entire Black Rock forest and large portions of the Parashaunt and Mt. Trumbull forests have been designated as wilderness study areas. Until these designations are dropped, the forests will remain an unmanaged natural resource.

III. Analysis of the Proposed Action and Alternatives

A. Environmental Impacts

1. Anticipated Impacts

- a. Proposed Action - The proposed action is to initiate a timber management plan which would include a harvest schedule on the Mt. Trumbull and Parashaunt forests and a timber stand improvement program on Black Rock.

Each resource discipline will be impacted by the cutting of ponderosa pine:

Forestry - The Arizona Strip District contains one of few remaining public forests not under some form of timber management. The proposed action will remedy the situation. A harvest/TSI program will allow the forest to attain maximum timber growth while realizing a small but tangible income to the Federal Government and the State of Arizona. There are no negative impacts.

Range - Available forage for cattle could increase up to 25% by opening the stands and allowing more sunlight to reach the understory.

Cattle could be negatively impacted if logging operations coincided with season of use.

Wildlife - Forage for wildlife would also be increased by a reduction in crown closure and controlled burns. Cone and seed production would be increased as the stand basal area falls below 40 sq. ft/acre. This would benefit the merriam turkey.

Slight adverse impacts would be felt by deer, some non-game birds and on Mt. Trumbull, the Kaibab squirrel. The ponderosa forests are the summer range for deer and turkey. The deer would temporarily move out of the area being harvested.

Harvest operations would slightly decrease the populations of non-game birds and the Kaibab squirrel and cause shifts to adjacent areas. However no species would be threatened. The largest population shifts would occur following the seed cut and continue for approximately 30 years.

The final goal of the timber management program is a patchwork of even-aged stands within an uneven-aged forest. In the individual stand species diversity would suffer however, for the entire forest, species diversity would be enhanced.

Improvement of existing roads in the forest would have a slight adverse impact on wildlife as a result of a slight increase in visitor use. Logging spurs constructed off of the main roads would be ripped and seeded to grasses and forbs increasing the available forage and browse.

Recreation - Improving the road systems up to and in the forest will benefit recreationists. Until final harvest the stand will appear more parklike allowing for greater visibility and access.

Logging and slash disposal operations will have a short term negative impact on aesthetics.

Cultural - The timber management program will indirectly lead to a more comprehensive inventory of the forest's cultural resources by the intensive coverage of the timber cruisers and the cultural clearance that the timber sale would require. Prescribed burning would uncover many small sites now hidden by duff.

Logging and burning operations could damage or destroy previously unfound sites. Moderate or high intensity fires will alter the chemical and physical characteristics of cultural remains.

Soils and Watershed - Various methods of timber harvest from horses to rubber or tracked skidders could be employed according to the capability of the purchaser. The ideal situation would be to cable log between parallel spur roads. The presence of heavy machinery in the forest would compact the soil to the point where the site will be unproductive for decades. Surface runoff and erosion would increase proportionately. Use of heavy equipment in wet weather would cause puddling which rearranges the soil horizon allowing unproductive B & C horizons to rise to the surface. These areas will remain unproductive until the A horizon is regenerated.

A requirement for natural reproduction of ponderosa pine is a disturbed soil. This soil disturbance will have a short term negative impact of an intensity proportional to the slope. In the long run, however, the soil disturbance will prepare a seed bed for grasses, forbs and browse as well as pine seedlings. A lush understory will reduce surface runoff. Reduction of the overstory will reduce water loss by evaporation and transpiration.

b. Alternatives

Alternative #1 - Timber stand improvement projects are designed to maximize a growth on those trees designated for final harvest. With this alternative there would be no final harvest.

TSI projects would reduce stand stagnation, allow the forest to reach its maximum limits and be more aesthetically pleasing.

Without a harvest program to amortize TSI costs, this alternative is not economically feasible. There remains on Black Rock Mountain the potential for a future timber harvest, therefore, maintenance of that forest is a part of the proposed action.

Alternative #2 - No action would allow the timber stands to stagnate resulting in a loss of vigor and exposing them to harmful insects and disease. The constantly closed canopy would maintain a barren understory severely limiting animal use.

An example of the no action alternative is in the Virgin Mountains. The stands are either over-mature where volume loss by rot exceeds annual growth or slowly dying from a severe dwarf mistletoe infection. Roughly half of the existing ponderosa pine stand plus any regeneration in the old burns will be killed by the mistletoe within the next several decades. There are no positive impacts.

2. Possible Mitigating or Enhancing Measures

- a. a. Adjust the grazing schedule and/or the timber sale so cattle are not within the cutting area.
- b. Cut only those snags that: (1) are located on an exposed ridgeline thereby creating a fire hazard, (2) are hazardous to loggers or other forest users.
- c. c. Retain 4-5 mature trees per acre for a back-up seed source in case of wildfire, for wildlife trees and as future large snags.
- d. Coordinate with the VRM specialist about the requirements for possible roadside buffer strips.
- e. The logger will immediately shut down upon location of a previously unrecorded cultural site.
- f. Plan for low intensity prescribed burns.
- g. Rip up and seed to grasses and forbs all spur roads, cat roads and landings.
- h. Allow no logging operations while the sap is running i.e., May 15 to June 30.
- i. Allow no logging operations in wet weather.

3. Recommendations for Mitigation or Enhancement

- a. It is recommended that items a through i above be adopted.

4. Residual Impacts

- a. Meeting objectives for timber harvesting may inadvertently destroy archaeological sites not previously identified.
- b. Although the resultant even-aged patchwork of even-aged stands should increase species diversity, some individual species such as the Kaibab squirrel will experience slight population decreases.

B. Short Term Use vs. Long Term Productivity

Looking at a short-term (5-year or less) of the area the aesthetic values will be lessened. Wildlife habitat will remain relatively static with slight increases in vegetative material. There will be slight increases in soil erosion and runoff.

Over the long-term considerable vegetation suitable for cattle and wildlife species will be made available providing a more

diverse cover and food supply. Residual timber will be stimulated in growth rate and productive capacity. Stagnated conditions will be eliminated along with undesirable competition through the increased growth rate of these residual trees. Increases in understory vegetation will eventually stabilize the soil and reduce surface runoff. Aesthetically, the managed forest will take on a more heterogenous appearance.

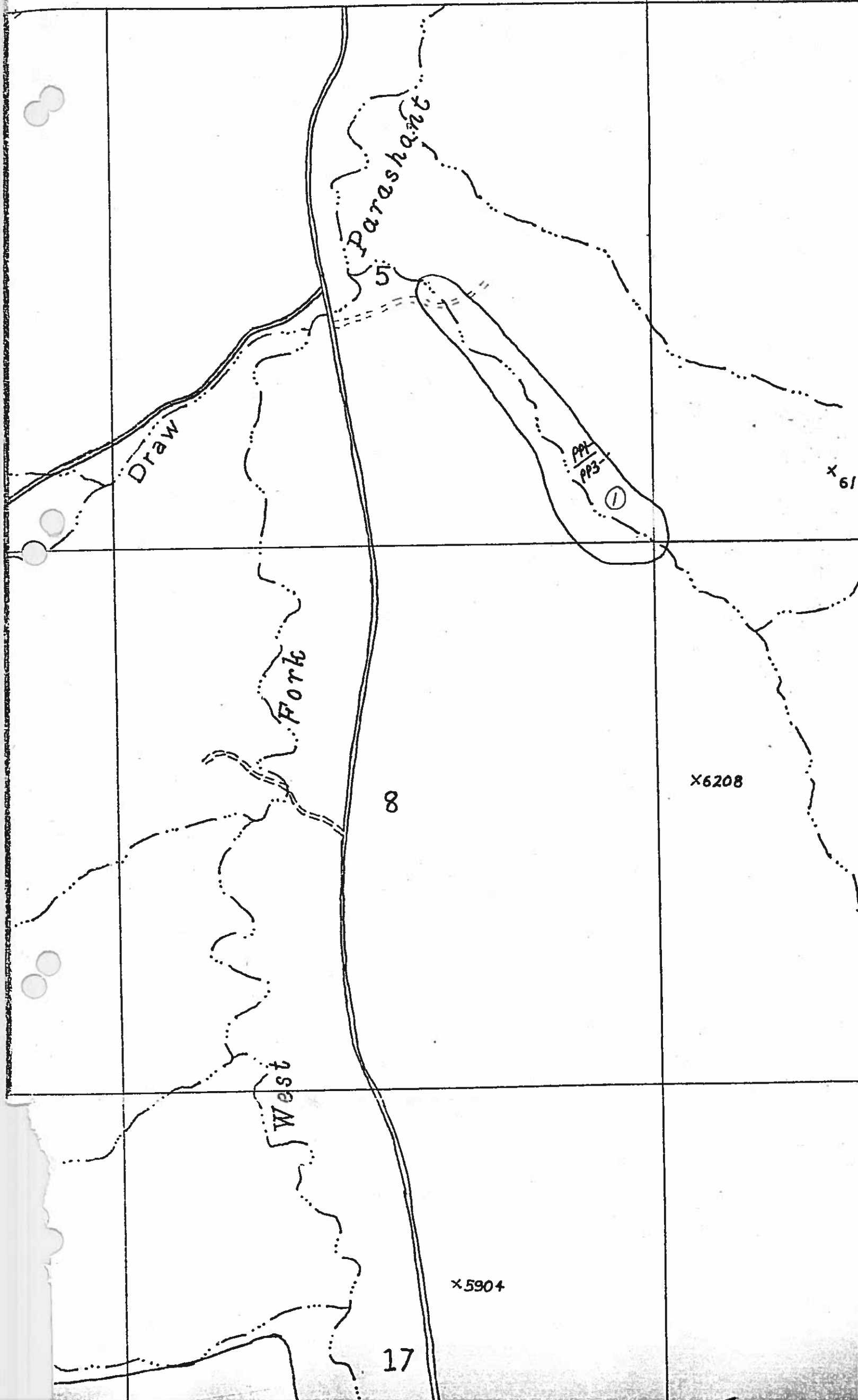
C. Irreversible and Irretrievable Commitments of Resources

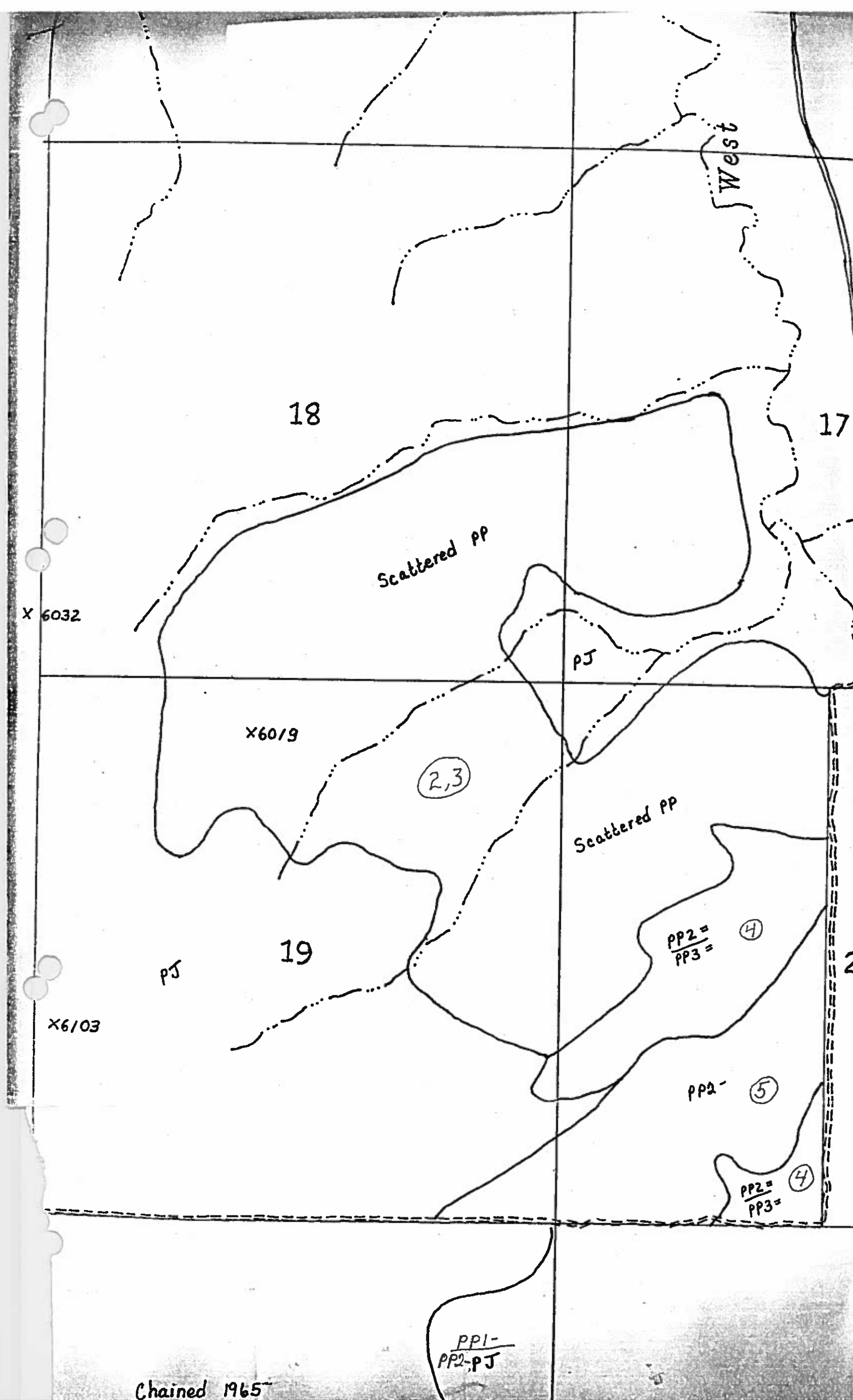
The Forest Management Plan calls for the development and management of the timbered resource as a multi-purpose benefit to all activities. No irreversible commitments of resources are being proposed with the exception of archeological resources. Clearance prior to operations will be gained on archeological values in the area and those areas identified will either be preserved in place if significant or the artifacts removed and stored in the District Office.

IV. NONE

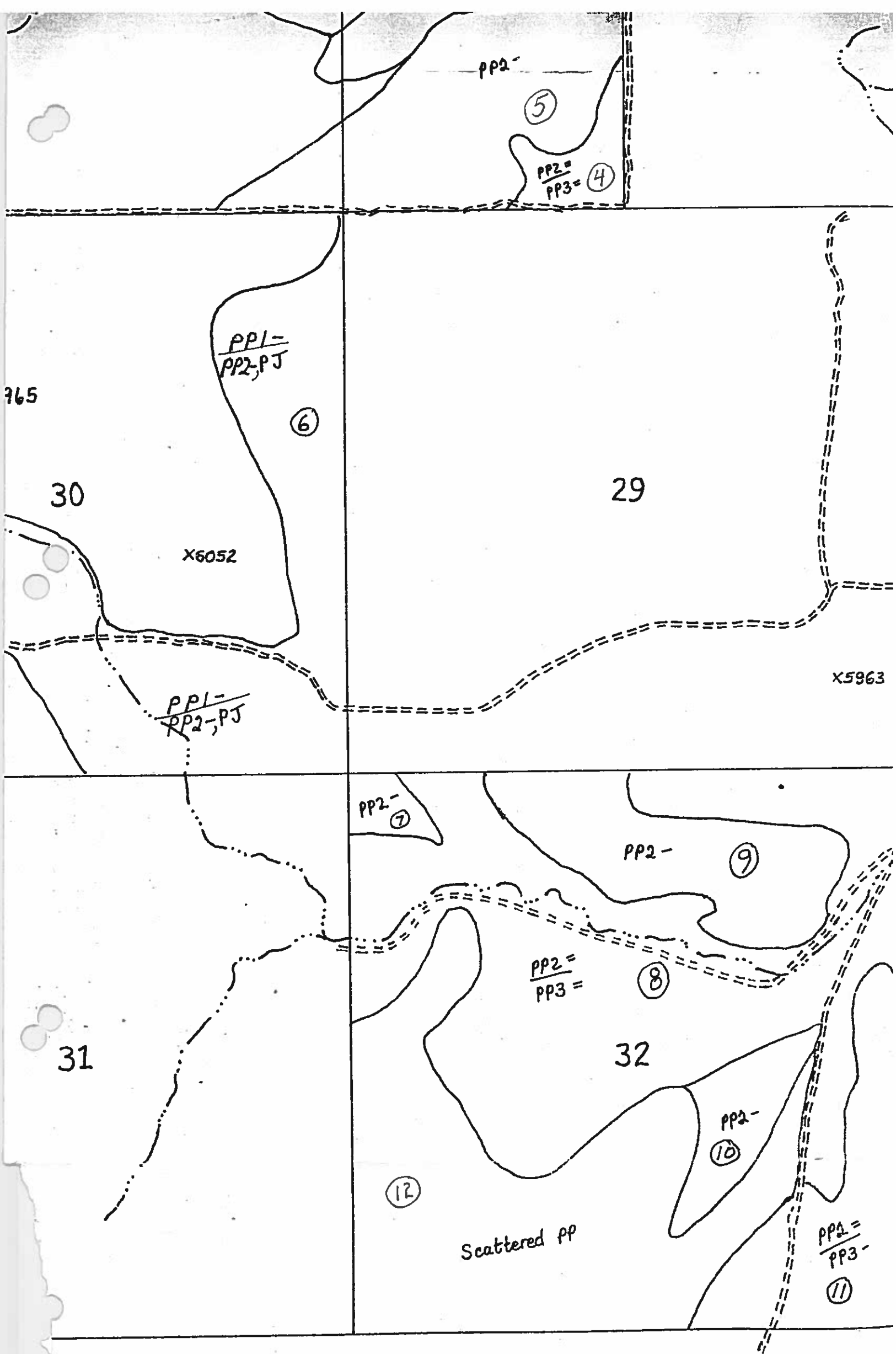
V. Intensity Of Public Interest

Public interest is of low to moderate intensity with the major emphasis generated by recreationists and livestock operators. By improving the diversity of vegetative cover, and enhancing forage production, these and other potential interest groups will have a natural environment to explore.





Chained 1965



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Castle

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Peak

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14

22

X6290

Kelly
Dam

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