

SURVEY OF THE MONUMENT CANYON RESEARCH NATURAL AREA

PRELIMINARY REPORT AND PROSPECTUS

A site visit was made on 9 September 1978 to the Monument Canyon Research Natural Area. During the site visit vegetation types were identified and plotted on a topographic map. Five vegetation types were tentatively determined from the initial survey. These divisions reflect plant composition and density. Refinements of interpretation may lead to further divisions in typing the communities. The tentative types follow Brown and Lowe (1974). They are:

1. Pinus ponderosa Associations - open mature stands
2. P. ponderosa Associations - dense dog-hair stands
3. P. ponderosa Mixed Conifer Associations
4. Cercocarpus Associations
5. Quercus Associations

Aerial photo interpretation will be performed with the aid of a mirror stereoscope and will follow methods outlined by Avery (1968).

From an initial vegetation map based on the above-mentioned classifications, the area occupied by each type will be determined by the use of a Gelman planimeter. Based on this determination of area a proportional number of transects will be established. Not less than three transects per vegetation type (excluding dense stands of ponderosa pine reproduction) will be established. At least three localities per vegetation type will be represented when possible. Each locality will have a minimum of one transect.

Each transect will be marked with a 3/8" diameter x 2-1/2' long rebar painted on the top with fluorescent orange paint, and will be pin-pointed on aerial photos. Transects will be run on random compass bearings, and must not cross vegetation type boundaries.

From each transect headstake, a pace transect will be run on the selected compass bearing. At each second step (approximately 1.7 m or 5.5 ft), a 5x10 cm microplot will be read (Morris 1973). At each microplot, instead of "hit", record living plant cover by species, by the following scale: t = <5%, 1 = 6-15%, 2 = 16-25%, 3 = 26-35%, 4 = 36-45%, 5 = 46-55%, 6 = 56-65%, 7 = 66-75%, 8 = 76-85%, 9 = 86-95%, 10 = 96-100%. Include shrubs and half shrubs, but not tree species. Synusae will be evaluated separately; hence, individual microplots may occasionally exceed 100% cover.

At each 20th step, locate and read a 1x1 m count-list quadrat, (Brown 1954; Phillips 1959). Tally all herbaceous perennials and shrubs rooted within the plot, as well as tree seedlings and sprouts less than 2 m tall. At the headstake, 5th and 10th count-list quadrat, basal area of stems over 5" dbh will be tallied using a prism with a basal area factor of 5 (metric).

One black and white photo taken from the head of each transect will be submitted with the final report.

Two specimens of each plant species other than common ones will be collected for identification and storage to initiate a reference collection and a permanent record of species from the Monument Canyon RNA. Additionally a list will be compiled of species observed though not intercepted along the transects. Nomenclature will follow that of Harrington (1964), Kearney and Peebles (1960), and Martin (unpublished).

Aerial photo interpretation in conjunction with data collected will be used to produce a final vegetation map of the Monument Canyon RNA. Map scale will be 8 in per mile.

References

- Avery, T. E. 1968. Interpretation of Aerial Photographs. Second ed. Burgess Publ. Co., Minneapolis, Minn.
- Brown, D.E., and C.H. Lowe. 1974. A digitized computer-compatible classification for natural and potential vegetation in the Southwest with particular reference to Arizona. J. Ariz. Acad. Sci. v.9. Supplement 2.
- Brown, Dorothy. 1954. Methods of surveying and measuring vegetation. Bull. 42. Commonwealth Agric. Bureaux, Farnham Royal, Bucks, England.
- Harrington, H.D. 1964. Manual of the Plants of Colorado. Swallow Press, Inc. Chicago, Ill.
- Kearney, T.H. and R.H. Peebles. 1960. Arizona Flora. Univ. Calif. Press. Los Angeles, Calif.
- Martin, W.C. A Flora of New Mexico, unpublished. Univ. New Mexico, Albuquerque, N.M.
- Morris, Meredith J. 1973. Estimating understory plant cover with rated microplots. USDA Forest Service Res. Pap. RM-104.
- Phillips, E.A. 1959. Methods of vegetation study. Henry Holt and Co.

Location Monument Canyon RNA

Count List Plots

Date 8/5/79 F2

9 T18N R3E

(1m)²

Obs. JWA

Study Vegetation Survey

Trans. No. 5 Type Pp

open mature

	Forb	Forb	Quercus	Senecio sp.	Forb	P. sp.	Milvaceae	Hale	Geranium	Leppidium	Lobelia	Forb	Forb	Species								
1			3		1	1																
2																						
3					2	1																
4	None																					
5	None																					
6		4					1	1	1													
7		4						1														
8		7								2	2											
9		17											5									
10		14	1																			
E	1	59	1	3	1	1	1	2	1	2	2	5										
7		6	1	2	1	1	1	2	1	1	1	1										

Additional spp.
Penstemon leucotis
Aster concolor
Pseudotsuga taxifolia
Rhus glabra
Colea sp.

Location RNA

Count List Plots
(1m²)

Date 7/29/79 F2

9 T 18N R 3E

Obs. JWD

Study Veg. Survey

Trans. No. 5 Type sp

	<i>Scirpus sp.</i>	<i>Muhlenbergia</i>	<i>Panicum</i>	<i>Setaria</i>	<i>Eragrostis sp.</i>	Species												
1	28																	
2			6															
3	10		15															
4			2	3														
5			3															
6	None																	
7	21	7		3	5	4												
8	5	17			1													
9			12															
10	None																	
Σ	245	62	31	3	6	4												
Σ	119	71	11	2	1													

Amaranthus arida
Pectanthera pulcherrima

Location RNH

Rated

Date 7/21/78 F1

S 9 T 18N R 3E

Microplot

Obs. JS

STUDY Veg. Survey

Transect
(5x10 cm)

Trans. No. 3 Type J

Brg. 278°

Species					Species					Species						
LR	Fest	Sily	Fest	Munro	LR	Fest	Munro	Fest	Sily	Anar	LR	Fest	Munro	Fest	Sily	Anar
5	5				5	7	2				9	10				
1					6	10					7	10				
1					7	10										
1	1				8	10					1	11	3			
1	+				9	10					2	9	1			
9		1			4	10					3	10				
9	1										4	10				
10					1	10					5	10				
10					2	9	1				6	10				
10					3	10					7	10		t		
					4	10					8	10				
4	4				5	10					9	10				
9				1	6	10					8	10	10			
10					7	10										
10					8	10					1	10				
10					9	10					2	5	5			
10					5	9	1				3	10				
10											4	5	5			
	5			5	1	10					5	10				
10					2	10		t			6	10				
10					3	10					7	10				
					4	10					8	10				
10					5	10					9	10				
10					6	8	2				9	8	2			
8	2				7	10					1	9	1			
10					8	10					2	10				
10					9	10					3	10				
10					10	10					4	10				
10											4	10	4			
10					1	10					5	10				
10					2	10					6	10				
	10				3	10					7	10				
					4	10					8	10				
10				t	5	10					9	10				
6	1				6	10					10	10				
5				2	7	5	5				1	2	3	1	1	5
					0	10					1	2	3	1	1	5

Added 217° to shaded

Location RNA

Count List Plots
(1m)²

Date 7/10/79 F2

9 T18N R3E

Obs. JUD

Study Veg. Survey

Trans. No. 2 Type PP
open pasture

							1/	Species												
1	2	3	4	5	6	7	8	9	10											
1																				
2	5	1																		
3		2																		
4	4	2	2	1																
5		7																		
6		1																		
7																				
8		2	1																	
9				2																
10	7	1		6	8	5														
Σ										1	35	7	3	2	2	8	8	5		
Σ										2	1	2	1	7	1	2	2	1	1	

Lotus wrightii
Penstemon Eatonii
Geranium Coespitosum
G. Richardsonii
Antennaria marginata

Additional spp:
Quercus gambelli
Larrea americana
Croton sp.

Location Mount Canyon RWA

Rated

Date 7/10/79 F1

S 9 T 18N R 3E

Microplot

Obs. Scd

STUDY Veg. Survey

Transect (5x10cm)

Trans. No. 1 Type sp-log

Brg. 183°

Species

Species

Species

L R	L R			L R				Species
	Bare	Harbovia	Feov	Bare	Harbovia	Feov	Pip	
1/10								
2/10								
3/10								
4/10								
5/10								
6/10								
7/10								
8/10								
9/10								
10/10								
11/10								
12/10								
13/10								
14/10								
15/10								
16/10								
17/10								
18/10								
19/10								
20/10								
21/10								
22/10								
23/10								
24/10								
25/10								
26/10								
27/10								
28/10								
29/10								
30/10								
31/10								
32/10								
33/10								
34/10								
35/10								
36/10								
37/10								
38/10								
39/10								
40/10								
41/10								
42/10								
43/10								
44/10								
45/10								
46/10								
47/10								
48/10								
49/10								
50/10								

5-3
108 .03

Location RNA

Count List Plots

Date 7/10/79 F2

9 T 18N R 3E

(1m)²

Obs. Jud

Study Veg. Survey

Trans. No. 1 Type sp-day

1/

	Plan	Floor	Plants	Species																
1																				
2	8	2																		
3																				
4																				
5																				
6		5																		
7		1																		
8		1																		
9		3																		
10		2																		
11	8	2	10																	
12	1	1	5																	

Plan = *Pteris* *andromeda*

Floor = *Festuca ovina*

Additional S.H.:

Perennials rooted in plot

Location Monument Canyon RNA

Rated

Date 5/5/79 Fl

S 9 T 18 N R3E

Microplot

Obs. JWS

STUDY Veg. Survey

Transect
(5x10cm)

Trans. No. 6 Type A70 mixed

Brg. 241°

Species

LR	Species				LR	Bare	Flov.	Ftbl.	Mumo	Fragaria	Anura	Elytra	Umbel	Clematis
	Bare	Flov.	Ftbl.	Anura										
1/0					5	10								
2/8					6/0									
3/7/2					7/0									
4/5/5					8/0									
5/9/1					9/8									
6/0					4/10		5							
7/0														
8/0					1/9		1							
9/0					2/8									
10/0					3/5/5									
					4		3	7						
					5/0									
11/5					6/0									
12/0					7/0									
13/0					8/0									
14/0					9/0									
15/0					10/0									
16/5/5														
17					1/0									
18/1/8					2/0									
19/10					3/0									
20/9					4/1									
					5/0									
21/7					6/0									
22/0					7/0									
23/0					8/9									
24/5/5					9/10									
25/1/8					10/0									
26/6/4														
27/5/5					1/0									
28/0					2/0									
29/5/5					3/0									
30/8/2					4/0									
					5/0									
31/7/1					6/0									
32/5/5					7/0									
33/10					8/6/2									
34/10														

LR 1 2 3 4 5 6 7 8 9 10
 Bare 1 2 3 4 5 6 7 8 9 10
 Fluv. 1 2 3 4 5 6 7 8 9 10
 Ftbl. 1 2 3 4 5 6 7 8 9 10
 Mumo 1 2 3 4 5 6 7 8 9 10
 Fragaria 1 2 3 4 5 6 7 8 9 10
 Anura 1 2 3 4 5 6 7 8 9 10
 Elytra 1 2 3 4 5 6 7 8 9 10
 Umbel 1 2 3 4 5 6 7 8 9 10
 Clematis 1 2 3 4 5 6 7 8 9 10

Location Monument Canyon RNA

Count List Plots

Date 8/5/79 F2

S: 9 T18N R 3E

(1m)²

Obs. SWJ

Study veg. Survey

Trans. No. 6 Type Pipo mixed

Plot	Floov	Fyabl	Pipo	Mimn	Ammon	Flagella	Pstai	Hymenoxys	Chrysothamnus	Jamessia	Abco	Duga	Species						
1	None																		
2	1																		
3	7			4	3														
4				4	6	1													
5				1	2														
6					8														
7	5			9	12			2											
8				2	6	7					3	1							
9	5			5								2							
10				5			1												
Σ	23	5	1	19	28	26	2	2			3	1	2						
freq	3	1	1	4	5	4	2	1			1	1	1						

Anna: *Antennaria marginata*

Additional spp.
Juniperus communis
Ribes cereum
Ribes sp.
Jakasia americana

1/Perennials rooted in plot

Location Mammoth Canyon RRA

Count List Plots

Date 8/19/79 F2

9 T18N R3E

(1m²)

Obs. WJA

Study Veg. Survey

Trans. No. 8 Type Mixed

Plot	Species									
	P. fl.	F. L.	F. S.	F. P.	J. S.	P. fl.	F. P.	M. S.	F. S.	P. S.
1	3									
2	8	1	3	1						
3	none									
4	none									
5			1							
6			5	4	6	7				
7						1	8			
8			4			1	6			
9			1			3	4	3	1	
10			3			1	2			
Σ	11	17	16	1	4	12	23	4	3	1
Frog	1	2	5	1	1	5	4	1	1	

1/Perennials rooted in plot

Location Mooney Canyon RNA

Rated

Date 8/26/79 F1

S 9 T 18N R 3E

Microplot

Obs. Jan

STUDY veg Survey

Transect
(5x100')

Trans. No. 10 Type mixed

Brg. 134'

Species		Species		Species	
LR	Bare	LR	Bare	LR	Bare
	<i>Eriogonum</i>		<i>Eriogonum</i>		<i>Eriogonum</i>
	<i>Artemisia</i>		<i>Artemisia</i>		<i>Artemisia</i>
	<i>Yucca</i>		<i>Yucca</i>		<i>Yucca</i>
	<i>Fragaria</i>		<i>Fragaria</i>		<i>Fragaria</i>
1/10		5/10		9/10	
2/10		6/10		7/8	
3/10		7/10			1
4/10		8/10		1/10	
5/10		9/10		2/10	
6/10		4/10		3/10	3
7/10				4/10	1
8/10		1/10		5/10	
9/10		2/10		6/10	
10/10		3/10		7/10	
		4/10		8/10	
		5/10		9/10	
11/10		6/7	1	30/10	
12/10		7	10		
13/10		8/7	2	1/10	
14/10		9/1	9	2/10	
15/10		5/10		3/10	
16/10	1			4/10	
17/10		1/9		5/9	1
18/10		2/10		6/10	
19/5	5	3/10		7/10	
20/10	2	4/10		8/10	
		5/10		9/10	
21/10		6/10		30/10	
22	10	7/10			
23/9	1	8/10		1/10	
24/5		9/10		2/10	
25/10		6/10		3/10	
26/10				4/10	
27/10		1/10		5/10	
28/10		2/10		6/10	
29/10		3/10		7/10	
30/10		4/10		8/10	
		5/10	1	9/10	
31/10		6/9		10/10	
32/10		7/10		E 2/10	0 0 12 32 3 / 3
33/10		8/10		X 4/10	0 0 14 2 3 .03
34/10				E 5	

Location Mount Canyon RWA

Count List Plots

Date 8/26/79 F2

9 T18N R3E

(1m²)

Obs. JWD

Study veg Survey

Trans. No. 10 Type Mixed

Plot	Species										
	Eriogonum	Feov	Pipa	Arma	Pifl	Psta	Fragaria	Challice	Abaco	Pine, Dopp	Claytonia sp.
1											
2	6	3	1								
3		5	4								
4				3	1						
5						15	4	1			
6		2	2						1	1	
7	9	2									
8		2									
9		5								1	
10		3									

E 15 17 6 6 3 1 5 4 1 1 1 1

Frag 2 6 2 2 1 1 1 1 1 1 1 1

Arma: Antennaria marginata
Geranium Richardsonii

Additional spp
Limonium scopulorum
Oxycoccus gambelli
Theropod andromeda

1/Perennials rooted in plot

Location Monument Canyon RWA Rated

Date 8/26/79 F1

S 9 T 18N R 3E

Microplot

Obs. SWD

STUDY Veg Survey

Transect
(5x10cm)

Trans. No. 9 Type Cemo

Brg. 278°

Species					Species					Species				
L	R	Bare	Cemo	Mumo	L	R	Bare	Cemo	Mumo	L	R	Bare	Cemo	Mumo
1	7		3		5	10				9	3			7
2	10		2		6	10				10	10			
3	8		2		7	10								
4	10				8	10				1				10
5	10				9	10				2	9			t
6	10				10			10		3			10	
7	5	6								4	7		2	
8	10				1			10		5	10			
9	10				2	10			10	6			10	
10	10		t		3	10				7	10			
					4	10				8	10			
11	9		1		5	10				9	10			
12	10				6	10				10	10			10
13	10				7	10								
14	10				8	10		10		1	10			
15	10				9	10				2			1	10
16	10				10	7			3	3				10
17	10									4	10			
18	10				1			10		5	10			
19	10				2	10				6	10			
20	10				3	10				7	6			4
					4	10				8	10			
21	10				5	10		10		9			10	
22	10				6	5		5		10	10			
23	10	10			7	10		10		1	10		7	
24	10				8	10		10		2	9			v
25	10				9	10				3	8		1	
26		10			10	4		6		4	10			
27	10									5	10			
28					1					6	10			
29					2	10				7	10			
30					3	4				8	10			
31	10				4			10		9	10			
32	10				5	4		6		10	9			1
33		10			6	10		10		10	10			
34	10				7			10		E 2	19	20	20	11, 108
					8	10				X 19	20	20	11, 108	

Location Maunant Canyon RNA

Rated

Date 7/29/79 F1
Obs.

S 9 T 18N R 3E

Microplot

Trans. No. 4 Type Quercus

STUDY Veg Survey

Transect
(5x10cm)

Brg. 237°

Species

Species

Species

LR	Quercus	Bark	Fern	Grass	LR	Quercus	Bark	Fern	Grass	LR	Quercus	Bark	Fern	Grass	LR	Quercus	Bark	Fern	Grass	LR	Quercus	Bark	Fern	Grass	LR	Quercus	Bark	Fern	Grass
10					5	10				9	4	6																	
10					6	10				7	10				4						2								
10					7	10				8																			
10	3				8	10				9	6				1						10								
10					9	2				10	6				8						10								
10					10	7				11	3										10								
10					11	9				12	1										10								
10					12	1				13	1										10								
10					13	2				14	1										10								
10					14	1				15	1										10								
10					15	2				16	1										10								
10					16	1				17	1										10								
10					17	1				18	1										10								
10					18	1				19	1										10								
10					19	1				20	1										10								
10					20	1				21	1										10								
10					21	1				22	1										10								
10					22	1				23	1										10								
10					23	1				24	1										10								
10					24	1				25	1										10								
10					25	1				26	1										10								
10					26	1				27	1										10								
10					27	1				28	1										10								
10					28	1				29	1										10								
10					29	1				30	1										10								
10					30	1				31	1										10								
10					31	1				32	1										10								
10					32	1				33	1										10								
10					33	1				34	1										10								
10					34	1				35	1										10								
10					35	1				36	1										10								
10					36	1				37	1										10								
10					37	1				38	1										10								
10					38	1				39	1										10								
10					39	1				40	1										10								
10					40	1				41	1										10								
10					41	1				42	1										10								
10					42	1				43	1										10								
10					43	1				44	1										10								
10					44	1				45	1										10								
10					45	1				46	1										10								
10					46	1				47	1										10								
10					47	1				48	1										10								
10					48	1				49	1										10								
10					49	1				50	1										10								
10					50	1				51	1										10								
10					51	1				52	1										10								
10					52	1				53	1										10								
10					53	1				54	1										10								
10					54	1				55	1										10								
10					55	1				56	1										10								
10					56	1				57	1										10								
10					57	1				58	1										10								
10					58	1				59	1										10								
10					59	1				60	1										10								
10					60	1				61	1										10								
10					61	1				62	1										10								
10					62	1				63	1										10								
10					63	1				64	1										10								
10					64	1				65	1										10								
10					65	1				66	1										10								
10					66	1				67	1										10								
10					67	1				68	1										10								
10					68	1				69	1										10								
10					69	1				70	1										10								
10					70	1				71	1										10								
10					71	1				72	1										10								
10					72	1				73	1										10								
10					73	1				74	1										10								
10					74	1				75	1										10								
10					75	1				76	1										10								
10					76	1				77	1										10								
10					77	1				78	1										10								
10					78	1				79	1										10								
10					79	1				80	1										10								
10					80	1				81	1										10								
10					81	1				82	1										10								
10					82	1				83	1										10								
10					83	1				84	1										10								
10					84	1				85	1										10								
10					85	1				86	1										10								
10					86	1				87	1										10								
10					87	1																							

Location Monument Canyon RNA

Count List Plots

Date 7/29/79 F2

9 T18N R3E

(1m²)

Obs. JWA

Study Veg Survey

Trans. No. 4 Type Qu

		1/							Species										
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	1	3	7																
2	2																		
3	6		5	1															
4			2																
5	None																		
6			1	1															
7		3	11			1	20												
8		3	1	1	1		11												
9		2	5	4															
0		1	16				7												
Σ	22	16	55	1	1	1	31	7											
Σ	5	5	6	1	1	1	2	1											

Pentstemon strictus

Additional spp.
Sitona leptrix
Ribes sp.
Linum flexile
Robinia neomexicana

Perennials rooted in plot

Location Monument Canyon RMA

Rated

Date 8/9/79 Fl

S 9 T 18N R 3E

Microplot

Obs. SwB

STUDY Veg Survey

Transect
(5x10cm)

Trans. No. 7 Type Overws

Brg. 218°

Species

Species

Species

Species				Species				Species			
L	R	Bare	Chna	L	R	Bare	Chna	L	R	Bare	Chna
10											
9		1	5	5	10			9	10	10	
1		9		6	10			7	10		
10				7	10			7	10		
10				8	10			8	10		
10				9	10			9	10		
10				10	10			10	10		
10				11	10			11	10		
10				12	10			12	10		
10				13	10			13	10		
10				14	10			14	10		
10				15	10			15	10		
10				16	10			16	10		
10				17	10			17	10		
10				18	10			18	10		
10				19	10			19	10		
10				20	10			20	10		
10				21	10			21	10		
10				22	10			22	10		
10				23	10			23	10		
10				24	10			24	10		
10				25	10			25	10		
10				26	10			26	10		
10				27	10			27	10		
10				28	10			28	10		
10				29	10			29	10		
10				30	10			30	10		
10				31	10			31	10		
10				32	10			32	10		
10				33	10			33	10		
10				34	10			34	10		
10				35	10			35	10		
10				36	10			36	10		
10				37	10			37	10		
10				38	10			38	10		
10				39	10			39	10		
10				40	10			40	10		
10				41	10			41	10		
10				42	10			42	10		
10				43	10			43	10		
10				44	10			44	10		
10				45	10			45	10		
10				46	10			46	10		
10				47	10			47	10		
10				48	10			48	10		
10				49	10			49	10		
10				50	10			50	10		
10				51	10			51	10		
10				52	10			52	10		
10				53	10			53	10		
10				54	10			54	10		
10				55	10			55	10		
10				56	10			56	10		
10				57	10			57	10		
10				58	10			58	10		
10				59	10			59	10		
10				60	10			60	10		
10				61	10			61	10		
10				62	10			62	10		
10				63	10			63	10		
10				64	10			64	10		
10				65	10			65	10		
10				66	10			66	10		
10				67	10			67	10		
10				68	10			68	10		
10				69	10			69	10		
10				70	10			70	10		
10				71	10			71	10		
10				72	10			72	10		
10				73	10			73	10		
10				74	10			74	10		
10				75	10			75	10		
10				76	10			76	10		
10				77	10			77	10		
10				78	10			78	10		
10				79	10			79	10		
10				80	10			80	10		
10				81	10			81	10		
10				82	10			82	10		
10				83	10			83	10		
10				84	10			84	10		
10				85	10			85	10		
10				86	10			86	10		
10				87	10			87	10		
10				88	10			88	10		
10				89	10			89	10		
10				90	10			90	10		
10				91	10			91	10		
10				92	10			92	10		
10				93	10			93	10		
10				94	10			94	10		
10				95	10			95	10		
10				96	10			96	10		
10				97	10			97	10		
10				98	10			98	10		
10				99	10			99	10		
10				100	10			100	10		
10				101	10			101	10		
10				102	10			102	10		
10				103	10			103	10		
10				104	10			104	10		
10				105	10			105	10		
10				106	10			106	10		
10				107	10			107	10		
10				108	10			108	10		
10				109	10			109	10		
10				110	10			110	10		
10				111	10			111	10		
10				112	10			112	10		
10				113	10			113	10		
10				114	10			114	10		
10				115	10			115	10		
10				116	10			116	10		
10				117	10			117	10		
10				118	10			118	10		
10				119	10			119	10		
10				120	10			120	10		
10				121	10			121	10		
10				122	10			122	10		
10				123	10			123	10		
10				124	10			124	10		
10				125	10			125	10		
10				126	10			126	10		
10				127	10			127	10		
10				128	10			128	10		
10				129	10			129	10		
10				130	10			130	10		
10				131	10			131	10		
10				132	10			132	10		
10				133	10			133	10		
10				134	10			134	10		
10				135	10			135	10		
10				136	10			136	10		
10				137	10			137	10		
10				138	10			138	10		
10				139	10			139	10		
10				140	10			140	10		
10				141	10			141	10		
10				142	10			142	10		
10				143	10			143	10		
10				144	10			144	10		
10				145	10			145	10		
10				146	10			146	10		
10				147	10			147	10		
10				148	10			148	10		
10				149	10			149	10		
10				150	10			150	10		
10				151	10			151	10		
10				152	10			152	10		
10				153	10			153	10		
10				154	10			154	10		
10				155	10			155	10		
10				156	10			156	10		
10				157	10			157	10		
10				158	10			158	10		
10				159	10			159	10		
10				160	10			160	10		
10				161	10			161	10		
10				162	10			162	10		
10				163	10			163	10		
10				164	10			164	10		
10				165	10			165	10		
10				166	10			166	10		
10				167	10			167	10		
10				168	10			168	10		
10				169	10			169	10		
10				170	10			170	10		
10				171	10			171	10		
10				172	10			172	10		
10											

Location CVA

Count List Plots

Date 8/19/79 F2

9 T18N R3E

(1m²)

Obs. JAS

Study Veg Survey

Trans. No. 7 Type Quercus

1/

	Robinia	Alnus	Mycobas	Quercus	Morus	Chama	FRON	Species												
1																				
2																				
3				1	1															
4				3	6	1														
5																				
6																				
7				8	2															
8				2		1														
9					4															
10				7	10	1														
Σ	5			21	29	3	1													
cg.	3			5	5	3	1													

1/Perennials rooted in plot

Summer 1979
Deichman (CPP)

Monument Canyon RNA

	IV
Type I - <i>Pinus ponderosa</i> (doghair)	
<i>Pterospora andromeda</i>	1.300
<i>Festuca ovina</i>	1.200
<i>Harbouria trachypleura</i>	.500
	$\Sigma = 3.000$
Type II - <i>Pinus ponderosa</i> (mature)	
<i>Festuca ovina</i>	1.376
<i>Muhlenbergia montana</i>	.772
<i>Lotus wrightii</i>	.143
<i>Penstemon eatoni</i>	.110
<i>Robinia neomexicana</i>	.078
<i>Setaria</i> sp.	.070
<i>Fragaria</i> sp.	.068
<i>Geranium</i> sp.	.058
<i>Senecio</i> sp.	.058
<i>Arctostaphylos uva-ursi</i>	.055
<i>Festuca arizonica</i>	.039
<i>Erigeron</i> sp.	.039
<i>Potentilla pulcherrima</i>	.035
<i>Hilaria jamesii</i>	.027
<i>Lepidium</i> sp.	.027
<i>Ribes</i> sp.	.024
<i>Arar</i> (?)	.020
<i>Sitanion hystrix</i>	.005
<i>Lithospermum</i> sp.	.004
	$\Sigma = 3.008$

Summer - 1979
Deichman (CPP)

Monument Canyon RNA

				IV				
type III	Pinus ponderosa - mixed							
	Festuca ovina			.616				
	Antennaria marginata			.481				
	Fragaria sp.			.333				
	Muhlenbergia montana			.267				
	Arctostaphylos uva-ursi			.267				
	Forb 1			.257				
	Eriogonum sp.			.152				
	Forb 3			.140				
	Erigeron sp.			.097				
	Jamesia americana			.082				
	Psilostrophe tagetina			.077				
	Clematis ligusticifolia			.052				
	Quercus gambeli			.049				
	Umbel-1			.047				
	Potentilla sp.			.027				
	Hymenoxys sp.			.022				
	Geranium sp.			.021				
	Pterospora andromeda			.019				
			Σ =	3.006				

Summer 1979

Deichman (CPP)

Monument Canyon RNA

					IV					
Type III <i>Quercus gambeli</i>										
						1.262				
						.844				
						.249				
						.245				
						.187				
						.104				
						.075				
						.031				
				Σ =		2.999				
Type V <i>Cercocarpus montanus</i>										
						1.296				
						.455				
						.358				
						.218				
						.176				
						.134				
						.125				
						.087				
						.050				
						.050				
				Σ =		2.999				

Monument Canyon RNA

Type & Transect #		% Cover	ABSOLUTE density	Freq.
I Pinus ponderosa - "doghair" 1	Hatr	.025		
	Feov	.025	.200	.100
	Plan		.800	.100
	Litter	92.000		
	Rock	0		
	Σ (plants)	.050	1.000	.200
	Bare	7.950		
II Pinus ponderosa - open mature 2, 3, 5	Feov	5.790	3.133	.467
	GERA	.033	.067	.067
	RIBES	.200		
	LOTUS	.500	.133	.100
	PENST.	.667	.067	.033
	FRAG	.108	.267	.033
	MUMO	.450	3.733	.400
	Feav	.033	.100	.033
	Sihy	.042		
	Arar (?)	.167		
	Rone	.433	.033	.033
	LITH	.033		
	Aruv	.033	.233	.033
	Anmq		.100	.067
	SENE		.100	.033
Popu		.200	.067	
SETARIA		.133	.033	
ERIG		.033	.033	
Hija		.033	.033	
Lepidium		.033	.033	
Plant cover		8.489	8.765	1.465
	Rock	9.800		
	Litter	79.267		
	Bare	2.440		

July - Aug '79

Jean Deichman
CP Pass

Cover	Relative density	Freq.	Σ I.V.					
.500	0	0	.500					
.500	.200	.500	1.200					
0	.800	.500	1.300					
.682	.375	.319	1.376	✓				
.004	.008	.046	.058	✓				
.024			.024	✓				
.059	.016	.068	.143	✓				
.079	.008	.022	.110	✓				
.013	.032	.022	.068	✓				
.053	.446	.273	.772	✓				
.004	.012	.022	.039	✓				
.005			.005	✓				
.020			.020	✓				
.051	.004	.023	.078	✓				
.004			.004					
.004	.028	.023	.055	✓				
	.012	.046	.058	✓				
	.012	.023	.035	✓				
	.024	.046	.070	✓				
	.016	.023	.039	✓				
	.004	.023	.027	✓				
	.004	.023	.027	✓				
(1.002)	(1.001)	(1.005)	(3.005)					

Monument Canyon RNA

Type of Transects			Absolute % Cover	Absolute Density		Freq.
III 6, 8, 10	Pinus ponderosa	Mixed				
	Feov		1.250	1.733	1.70	.467
	Muma		.133	1.400	.80	.267
	FRAG		.350	1.933	.70	.233
	Anma		.133	4.467	.70	.233
	Puga		.133	.067	.10	.033
	Chc		.167	.033	.10	.033
	Forb 1		.833	.533	.50	.100
	UMBEL-1		.233			
	ERIG		.067		.50	.167
	Forb 3		.083	1.433	.10	.033
	Aruv		1.200	.133	.80	.033
	ERID-1		.400	.500	.70	.067
	GERA		.008	.033	.10	.033
	Psta			.133	.40	.133
	HYME			.067	.10	.033
	Jaam			.633	.80	.067
	POTE			.133	.10	.033
Plan			.033	.10	.033	
			4.990	13.264		1.998

Cover	Relative Density	Freq.	Σ I. V.
.251	.131	.234	.616 ✓
.027	.106	.134	.267 ✓
.070	.146	.117	.333 ✓
.027	.337	.117	.481 ✓
.027	.005	.017	.049 ✓
.033	.002	.017	.052 ✓
.167	.040	.050	.257 ✓
.047			.047 ✓
.013		.084	.097 ✓
.017	.106	.017	.140 ✓
.240	.010	.017	.267 ✓
.080	.038	.034	.152 ✓
.002	.002	.017	.021 ✓
	.010	.067	.077 ✓
	.005	.017	.022 ✓
	.048	.034	.082 ✓
	.010	.017	.027 ✓
	.002	.017	.019 ✓
1.001	.998	1.007	3.006

Monument Canyon RNA

Type # Trans. #		Absolute % cover	density	freq.					
IV 4, 7	QUERCUS gambelii								
	Quqa	14.050	2.400	.500					
	Feov	.100	.850	.300					
	Mumo	2.400	4.200	.550					
	PHIL	.250	.350	.050					
	Forb 1	.650	1.550	.100					
	Chna	1.150	.200	.200					
return)	Pest		.050	.050					
	Rone		.250	.150					
		18.600	9.850	1.900					
V #9	Cercocarpus montanus								
	Cemo	12.100	.100	.100					
	Boqr	1.900	2.000	.300					
	Arfr	2.000	.800	.200					
	PHIL	2.000	.300	.100					
	RIBES	1.100	.100	.100					
	Mumo	10.800	7.100	.800					
	Chna		.100	.100					
	Quqa		.500	.200					
	Feov		.100	.100					
	Gusa		.600	.300					
	ERIO-1		.100	.100					
		29.900	11.800	2.400					

July - Aug

Jan - Dec

		Relative		Σ	
Cover		density	freq.	IV	
	.755	.244	.263	1.262 ✓	
	.005	.086	.158	.249 ✓	
	.129	.426	.289	.844 ✓	
	.013	.036	.026	.075 ✓	
	.035	.157	.053	.245 ✓	
	.062	.020	.105	.187 ✓	
		.005	.026	.031	
		.025	.079	.104 ✓	
	.999	.999	.999	2.997	
	.405	.008	.042	.455 ✓	
	.064	.169	.125	.358 ✓	
	.067	.068	.083	.218 ✓	
	.067	.025	.042	.134 ✓	
	.037	.008	.042	.087 ✓	
	.361	.602	.333	1.296 ✓	
		.008	.042	.050 ✓	
		.042	.083	.125 ✓	
		.008	.042	.050	
		.051	.125	.176 ✓	
		.008	.042	.050	
	1.001	.997	1.001	2.999	

BASAL AREA OF STEMS OVER 5 IN. D.B.H.

TALLY BY SPECIES

TRANSECT No.	<u>Apo</u>	<u>P.H</u>	<u>Abco</u>	<u>Psta</u>
1 a.	5			
b.	4			
c.	21			
Σ	30			

2 a.	11			
b.	7			
c.	6			
Σ	24			

3 a.	3			
b.	5			
c.	8			
Σ	16			

4 a.	2	0		
b.	2	0		
c.	0	1		
Σ	4	1		

5 a.	6			
b.	3			
c.	2			
Σ	11			

$\times 5 = m^2/HA. \text{ BASAL A}$

25
20
105
150

55
35
30
120

15
25
40
80

10
10
5
25

30
15
10
55

TRANSECT No.	TALLY BY SPECIES				X5 = m ² /HA. BASALA.
	<u>Pip</u>	<u>Pif</u>	<u>Abco</u>	<u>Rsta</u>	
6a.	2	1	1	0	20
b.	3	4	0	4	55
c.	4	1	2	2	45
Σ	9	6	3	6	120
7a.	4				20
b.	0				0
c.	1				5
Σ	5				25
8a.	0	3	3	3	45
b.	8	0	0	0	40
c.	3	0	0	2	25
Σ	11	3	3	5	110
9a.	0				0
b.	0				0
c.	0				0
Σ	0				0
10a.	8	0	0	3	55
b.	3	2	0	0	25
c.	2	0	0	0	10
Σ	13	2	0	3	90