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About the Institute

The Hunt Institute for Botanical Documentation, a research division of Carnegie Mellon University, specializes in the history of botany and all aspects of plant science and serves the international scientific community through research and documentation. To this end, the Institute acquires and maintains authoritative collections of books, plant images, manuscripts, portraits and data files, and provides publications and other modes of information service. The Institute meets the reference needs of botanists, biologists, historians, conservationists, librarians, bibliographers and the public at large, especially those concerned with any aspect of the North American flora.

Hunt Institute was dedicated in 1961 as the Rachel McMasters Miller Hunt Botanical Library, an international center for bibliographical research and service in the interests of botany and horticulture, as well as a center for the study of all aspects of the history of the plant sciences. By 1971 the Library's activities had so diversified that the name was changed to Hunt Institute for Botanical Documentation. Growth in collections and research projects led to the establishment of four programmatic departments: Archives, Art, Bibliography and the Library.



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Dear Dave:

This is the rest of the data on the Juniper-Pine problem that Truf Hall and I have mentioned to you. I think most of it is self explanatory and you should have the Juniper variation indexes from Truf already. You might note that the $\sum X_5$ or $\sum O_5$ values for each stand are very similar and there seems to be an indirect correlation between the Junipers & the Pines. Also we believe that there is some relationship between the degree of hybridity and the role each species plays in the community. At least this is what we are trying to show.

I should be in Boulder on July 10th and would like to meet with you at that time. I am enclosing an itinerary of our trips in case you would like to get anything clarified before we get there.

Sincerely,
Misty Fogg



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Travel Schedule

Fogg et al

June 8	Leave New York	
8-15	Greensburg, Indiana; 225 E. Central Ave.	812-663-6218
15-19	Naperville, Illinois (w/ Marion T. Hall)	312-355-0920
20	St. Louis, Missouri	
21-24	Norman, Oklahoma (w/ Donald Cox)	405-325-5023
25	Traveling	
26	Silver City, New Mexico (w/ William Hess)	505-538-2378
June 27 - July 10	Southwest Research Station American Museum of Natural History Portal, Arizona	602-558-2396
July		
11	Traveling	
12-13	Grand Canyon National Park	
14-15	Mesa Verde National Park, Colorado	
16-19	University of Colorado Boulder, Colo.	Department of Taximetrics (w/ Dave Rogers)
20-?	Traveling	

Table 2

(F₃ + C₃) (D₃ + C₄)
400

X ₅ Values	Location	Species	F ₃	D ₃	C ₃	C ₄	O ₅	Σ O ₅
36.38	Salida, Colorado	<i>Pinus edulis</i>	88.89	96.15	92.11	27.73	56.06	56.36
2.70		<i>Juniperus scopulorum</i>	11.11	3.85	7.89	2.38	0.30	
39.08								
25.88	Great Sand Dunes, Colorado	<i>P. edulis</i>	52.00	73.77	64.54	24.89	28.69	37.02
14.20		<i>J. scopulorum</i>	48.00	26.23	35.46	13.68	8.33	
40.08								
24.05	Mesa Verde, Colorado	<i>P. edulis</i>	50.00	65.21	59.81	26.99	25.31	37.24
17.03		<i>J. utahensis</i>	50.00	34.79	40.19	18.14	11.93	
41.08								
29.63	Tres Piedras New Mexico	<i>P. edulis</i>	55.20	81.34	83.08	28.18	37.86	40.64
7.53		<i>J. scopulorum</i>	37.90	17.16	12.57	4.26	2.70	
1.43		<i>P. ponderosa</i>	6.90	1.49	4.35	1.48	0.08	
38.59								
29.98	Questa, New Mexico	<i>P. edulis</i>	56.14	79.63	81.87	31.13	38.22	40.97
8.00		<i>J. scopulorum</i>	31.58	15.46	17.59	6.69	2.72	
0.50		<i>Q. gambelii</i>	7.02	0.94	0.26	0.10	0.02	
0.30		<i>J. monosperma</i>	3.51	0.47	0.28	0.11	0.01	
0.13		<i>P. ponderosa</i>	1.76	0.24	0.00	0.00	<0.01	
38.91								
17.85	Taos, New Mexico	<i>J. scopulorum</i>	38.46	31.97	53.92	23.88	12.90	22.90
13.45		<i>P. edulis</i>	38.46	26.64	33.45	14.81	7.45	
7.05		<i>Q. gambelii</i>	12.82	39.75	9.85	4.36	2.50	
0.53		<i>J. monosperma</i>	7.69	1.23	0.14	0.06	0.03	
0.70		<i>P. ponderosa</i>	2.56	0.41	2.63	1.16	0.02	
39.58								
18.83	Bandelier, New Mexico	<i>J. monosperma</i>	51.85	46.79	57.16	11.33	15.84	29.88
17.20		<i>P. edulis</i>	48.15	53.21	42.84	8.49	14.04	
36.03								
26.78	Santa Fe, New Mexico	<i>P. edulis</i>	40.79	71.53	66.64	39.24	29.75	35.16
10.28		<i>J. scopulorum</i>	34.21	19.06	20.99	12.36	4.34	
4.88		<i>J. monosperma</i>	21.05	8.42	8.78	5.17	1.01	
1.20		<i>P. ponderosa</i>	3.95	0.99	3.59	2.12	0.06	
43.14								

2--Table 2

26.20	Placitas, New Mexico	<i>P. edulis</i>	48.00	55.38	60.81	46.10	27.61	38.57
15.90		<i>J. monosperma</i>	48.00	37.80	34.07	14.58	10.75	
2.18		<i>Q. gambelii</i>	4.00	6.82	5.12	2.19	0.21	
44.28								
19.63	Sandia Park, New Mexico	<i>P. edulis</i>	35.82	45.99	53.69	25.14	15.92	24.90
13.43		<i>J. monosperma</i>	35.82	28.20	32.37	15.16	7.39	
5.48		<i>J. scopulorum</i>	16.42	18.66	8.40	3.93	1.40	
1.40		<i>Q. gambelii</i>	4.48	5.86	1.60	0.75	0.10	
1.48		<i>J. deppeana</i>	7.46	1.30	3.93	1.84	0.09	
41.42								
23.50	Manzano Mountains, New Mexico	<i>P. edulis</i>	44.44	61.85	63.27	24.99	23.38	31.62
13.70		<i>J. monosperma</i>	38.89	32.53	31.65	12.50	7.94	
2.60		<i>J. scopulorum</i>	12.96	4.42	5.08	2.08	0.29	
0.28		<i>Q. gambelii</i>	3.70	1.20	0.00	0.00	0.01	
40.08								
22.60	Chilili, New Mexico	<i>P. edulis</i>	36.36	67.74	65.13	21.15	22.55	26.25
6.28		<i>J. deppeana</i>	13.64	8.06	25.79	8.38	1.62	
5.48		<i>J. monosperma</i>	27.27	12.90	9.08	2.95	1.44	
2.00		<i>J. scopulorum</i>	22.73	11.30	0.00	0.00	0.64	
36.36								
31.60	Haynes Canyon, New Mexico	<i>P. edulis</i>	57.14	84.83	83.20	35.32	42.19	44.21
5.83		<i>J. monosperma</i>	28.57	12.07	9.78	4.15	1.56	
1.40		<i>J. deppeana</i>	9.53	2.07	2.32	0.98	0.39	
1.33		<i>Q. gambelii</i>	4.77	1.04	4.71	2.00	0.07	
40.16								
16.48	Mayhill, New Mexico	<i>J. deppeana</i>	41.03	30.63	66.27	12.40	11.54	21.43
12.30		<i>P. edulis</i>	38.46	51.35	20.86	3.90	8.19	
5.88		<i>J. monosperma</i>	20.51	18.02	12.83	2.40	1.70	
34.66								
20.30	16 Springs New Mexico	<i>J. deppeana</i>	39.47	64.17	57.93	13.51	18.92	23.90
9.53		<i>P. edulis</i>	34.21	23.33	23.04	5.38	4.11	
3.30		<i>P. ponderosa</i>	7.89	5.00	13.83	3.23	0.45	
2.83		<i>J. monosperma</i>	15.79	6.67	4.93	1.15	0.41	
0.30		<i>Robinia neomexicana</i>	2.63	0.83	0.27	0.06	0.01	
36.26								

3--Table 2

17.35	Davis	<i>P. cembroides</i>	42.22	55.79	42.64	10.18	14.00	
16.55	Mountains,	<i>Q. grisca</i>	44.44	37.89	50.33	12.02	11.82	26.23
3.00	Texas	<i>J. deppeana</i>	13.33	6.32	7.02	1.68	0.41	
36.90								
21.33	Saltillo, Coah.	<i>J. erythrocarpa</i>	48.50	67.50	40.50	21.00	19.69	
20.60	Mexico	<i>P. cembroides</i>	48.50	32.00	59.50	31.00	17.01	36.70
0.15		<i>J. erythrocarpa</i>	3.00	0.50	0.00	0.00	<0.01	
42.08		var. coahuila						

FREQUENCY

$$F_i = n_i/n \times 100$$

RELATIVE FREQUENCY

$$F_3 = F_i/F_c \times 100$$

RELATIVE BASAL AREA

$$B_3 = b_i/b_c \times 100$$

RELATIVE DENSITY

$$D_3 = N_i/N_c \times 100$$

RELATIVE VEGETATION COVER

$$C_3 = I_i/I_c \times 100$$

PERCENT GROUND COVER

$$C_4 = I/L_c \times 100$$

PREDOMINANCE

$$O_4 = \frac{(B_3 + C_3)(D_3 + C_4)}{400}$$

INFLUENCE

$$O_5 = \frac{(F_3 + C_3)(D_3 + C_4)}{400}$$

Canter +
Cortium } new com.

$$X_4 = \frac{(\sqrt{B_3} + \sqrt{C_3})(\sqrt{D_3} + \sqrt{C_4})}{8}$$

$$X_5 = \frac{(\sqrt{F_3} + \sqrt{C_3})(\sqrt{D_3} + \sqrt{C_4})}{8}$$

EXPLANATION OF TERMS:

n_i · number of areal plots in which a given species occurs

n · number of areal plots

F_c · total of frequency values (F_i) for all species

b · sum of basal areas for a species in all areal plots.

b_c · total basal area for all species in all areal plots

N · number of individuals of a species in sample

N_c · total number of all individuals in sample

I · sum of interception distances for a given species on all lines

I_c · total interception distance for all species on all lines

L_c · total length of all lines in sample

Code for Pinon Varieties
Index

<u>Character</u>	<u>$P. embooides = 0$</u>	<u>Intermediate = 1</u>	<u>$P. edulis = 2$</u>
Leaf diameter	≤ 0.8 mm	0.9 mm	≥ 1.0 mm
Leaf length	≥ 3.32 cm	3.15 - 3.31	≤ 3.14
Leaf number/fascicle	3	—	2
Leaf coverage (i.e. years of retention)	≤ 4	5-6	≥ 7

"Purum" $P. edulis = 8$

"Purum" $P. embooides = 0$

Totally intervarietal hybrid = 5

Variation Index for Pinyon

Salida, Colo.	5.26
Grand Sand Dunes	6.25
Mesa Verde	5.39
Tres Piedras	} 2 5.0
Quivira	
Taos	
Bandelier	4.75
Santa Fe	?
Placitas	5.86
Sandwich Park	4.38
Mangona Mts	} 5.55
Chilili	
Hogwits Canyon	5.00
May Hill	} ?
16 Springs	
Davis Mts	2.94
Saltillo	0.65