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Research Division
Arizona Game & Fish Department

CLIMATE AND ITS RELATIONSHIP TO
SURVIVAL OF YOUNG JAVELINA

A Final Report

Federal Aid in Wildlife Restoration Project W-78-R
Work Plan 2, Job 8
February 1, 1968 to June 30, 1977

Prepared by:
Gerald I. Day, Research Biologist

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Abstract: This study indicated only a weak relationship between either precipitation or temperature and survival of juvenile javelina. While there was a significant correlation for the Tortolita Mountains ($r=0.66$ with 9 d.f.) between annual rainfall and percent young, the correlation was not significant in either the Saguaro National Monument ($r=0.32$ with 13 d.f.) or the Three Bar Wildlife Area ($r=0.58$ with 10 d.f.).

There was a significant relationship between mean temperatures for the June-August period and juvenile survival on the Three Bar ($r= 0.78$ with 7 d.f.) but not on the Saguaro National Monument ($r=0.03$ with 12 d.f.) or on the Tortolitas ($r=0.06$ with 8 d.f.).

No statistically significant multiple correlation was found between rainfall, forage production, and young survival over a 6 year period on the Three Bar. The r^2 value indicates that 30 percent of the total variation in young survival may be due to rainfall and forage production.

OBJECTIVE

To determine if there is a correlation between precipitation, temperature, and the percent young among javelina observed on winter surveys.

ACKNOWLEDGMENTS

We wish to thank the personnel of the Saguaro National Monument who assisted on winter javelina counts on the Monument. Particularly thanks are due to the superintendent of the Monument for making available the manpower and transportation needed for the annual surveys.

BACKGROUND

Studies conducted by the Wildlife Research Unit at the University of Arizona have shown the reproductive potential of penned javelina to be relatively high (Sowls 1966). Female javelina in captivity breed for the first time when less than 1 year old. Mature captive females may produce two litters a year and average two young per litter. Also, javelina were found to breed year round. The potential for rapid population growth is consequently high. However, this high reproductive potential is seldom realized in wild populations.

Wild javelina have been observed with young during each month of the year but the peak parturition period is June, July, and August (Neal 1959, Sowls 1966). This peak production period occurs just prior to and during the summer rainy season. Nutrition undoubtedly has an important influence on reproduction and survival of javelina. Availability of important food items in desert habitat is dependent upon adequate rainfall. Sowls (1961) found evidence of a relationship between rainfall and young survival in the age composition of hunter-killed javelina.

This study was initiated to investigate the relationship between rainfall and temperature on the production and survival of young javelina. Knowledge of this relationship would help explain the fluctuations in populations of javelina.

While this study began in February 1968, javelina survey data are available from 1961, having been obtained under another job (WP4,J6--Investigations of Factors Influencing Javelina Populations).

STUDY AREAS

The Saguaro National Monument is located about 3 miles east of Tucson in the Rincon Mountains. The Monument was established in 1933 and has been closed to hunting ever since. Major javelina populations occur in the foothills from about 3000 to 4500 foot elevation. Javelina range primarily in the Sonoran desertscrub, desert grassland, chaparral, and encinal vegetation communities (Lowe 1964). Cattle once grazed over most of the javelina habitat, but are now restricted to the north end of the Monument.

The Tortolita Mountains are located about 8 miles northwest of Tucson. Javelina herds range in most of this area from about the 2500 to 4300 foot elevation. Cattle are grazed over most of the area on a mix of private, State, and BLM lands. According to Lowe (1964) the vegetation communities here consist of Sonoran desertscrub, desert grassland and chaparral.

The Three Bar Wildlife Area is about 2 miles west of the town of Roosevelt and about 50 miles northeast of Phoenix. The area is bordered on the east by State Route 188 and Roosevelt Lake, and on the south by Apache Lake. This study area is composed of about 60 square miles, 30 of which are considered javelina habitat. Javelina on the area range from about the 2000 to 4500 foot elevation. Vegetation communities used by javelina are desertscrub, desert grassland, and chaparral (Lowe 1964). No livestock grazing has been allowed since 1947. During this time, the Three Bar has been maintained for game and watershed studies conducted by the Rocky Mountain Range & Experiment Station and the Arizona Game & Fish Department.

Rainfall patterns are quite similar in the foothills of the Monument and in the Tortolitas. The two areas are about 20-25 miles apart and both received about the same amount of annual rainfall during this study. About half of the annual rainfall occurs during the summer rainy season of July, August, and September. These summer thunderstorms develop from moist air that flows into Arizona from the Gulf of Mexico (Sellers 1960). The winter rains develop from Pacific storm systems and are more widespread than the frequently localized summer storms.

The rainfall pattern is different on the Three Bar. This area lies about 80-100 miles north of the Tortolitas and Monument. The Roosevelt weather station near the Three Bar receives about half of its annual rainfall between December and March (Sellers 1960). In the summer months of July, August, and September, about 35 percent of the annual rainfall is measured.

PROCEDURES

In the Tortolitas, javelina counts were made in December from 1964-1974 in conjunction with another job. Weather records were collected at two locations. Mr. Cayton of the T-Bench Bar Ranch in the south end of the mountains (ca 3000 ft) collected temperature and rainfall data for 10 years. In addition, an accumulative type rain gauge and a maximum-minimum thermometer were checked periodically at Tortolita Catchment No.3 (ca 2500 ft).

Classification counts on the Three Bar were made each January from 1965-1977. Thirty-five survey routes were covered in conjunction with deer counts made annually under another job. Weather records were obtained from the U. S. Weather Bureau Station at Roosevelt (ca 2200 ft), 2 miles from the Three Bar.

Javelina classification counts were made in the Saguaro National Monument in November, December, or January from 1961-1974. The Park Service provided personnel and transportation for the 18 established foot surveys. Weather data used in the analysis were collected at the Monument headquarters (ca 3000 ft) by the Park Service.

Additional rainfall periods were used in analysis of the Three Bar and Monument. Annual rainfall (Jan.-Dec.), summer rainfall (June-Sept.), and winter rainfall (Oct.-March) were compared with survival of young javelina.

Data from four management units (33, 34A, 36B 37B) in game and fish administrative Region 6 were used to test the relationship between precipitation and survival of young javelina. Rainfall data were obtained from the U. S. Weather Bureau records for two stations in each unit. An average of the rainfall data from the two stations was used in the analysis.

Six years of javelina survival data were compared with forage production data collected on the Three Bar under another job.

FINDINGS AND DISCUSSION

Precipitation and Javelina Survival. In the Tortolitas there was a significant correlation ($r=0.66$ with 9 d.f.) at the 5 percent level between percent juveniles among javelina observed on winter counts and precipitation in the November 1 to October 31 period (Table 1, Fig. 1).

Eleven years (1965-1976) of rainfall records and estimated percent young in the population for the Three Bar are summarized in Table 2. A highly significant correlation was found between these variables ($r=0.95$ with 4 d.f.) from 1965 to 1970. However, with the addition of six more years of data (1971-1976) the correlation fell to 0.50 and was no longer statistically significant (Fig. 2).

There was a highly significant correlation ($r=0.79$ with 10 d.f.) for the period 1960-1970 (Table 3) which fell off to a not significant 0.32 by the inclusion of four more years of data (Fig. 3).

No statistically significant relationship was found between rainfall during a calendar year ($r=-0.56$), summer rainfall ($r=-0.12$), and winter rainfall ($r=0.48$) and the young survival on the Three Bar (Table 4) nor on the Saguaro National Monument where correlation coefficients were $r=0.26$, $r=0.39$, $r=0.49$, respectively (Table 5).

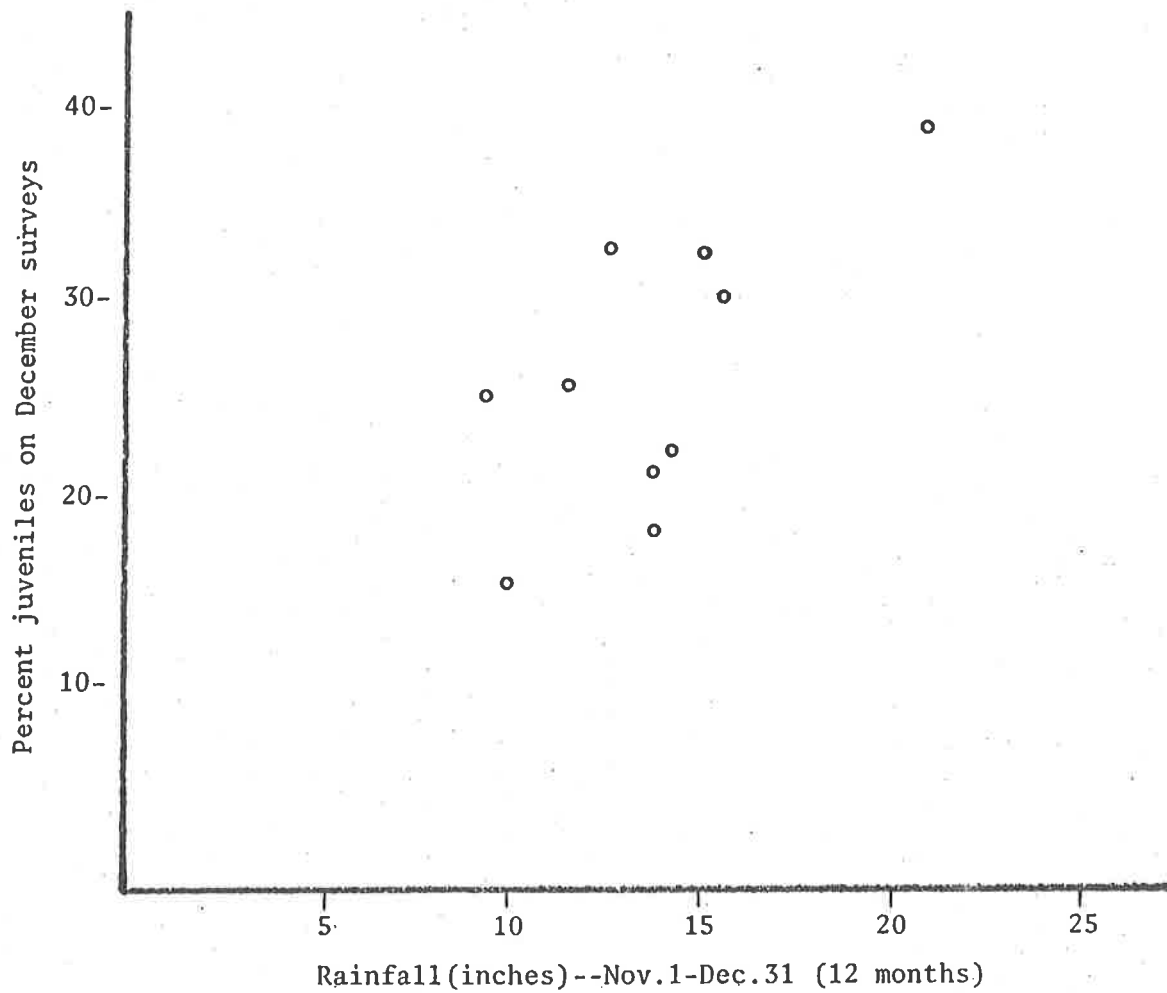


Fig. 1. Comparison of rainfall and percent of juvenile javelina, Tortolita Mountains.

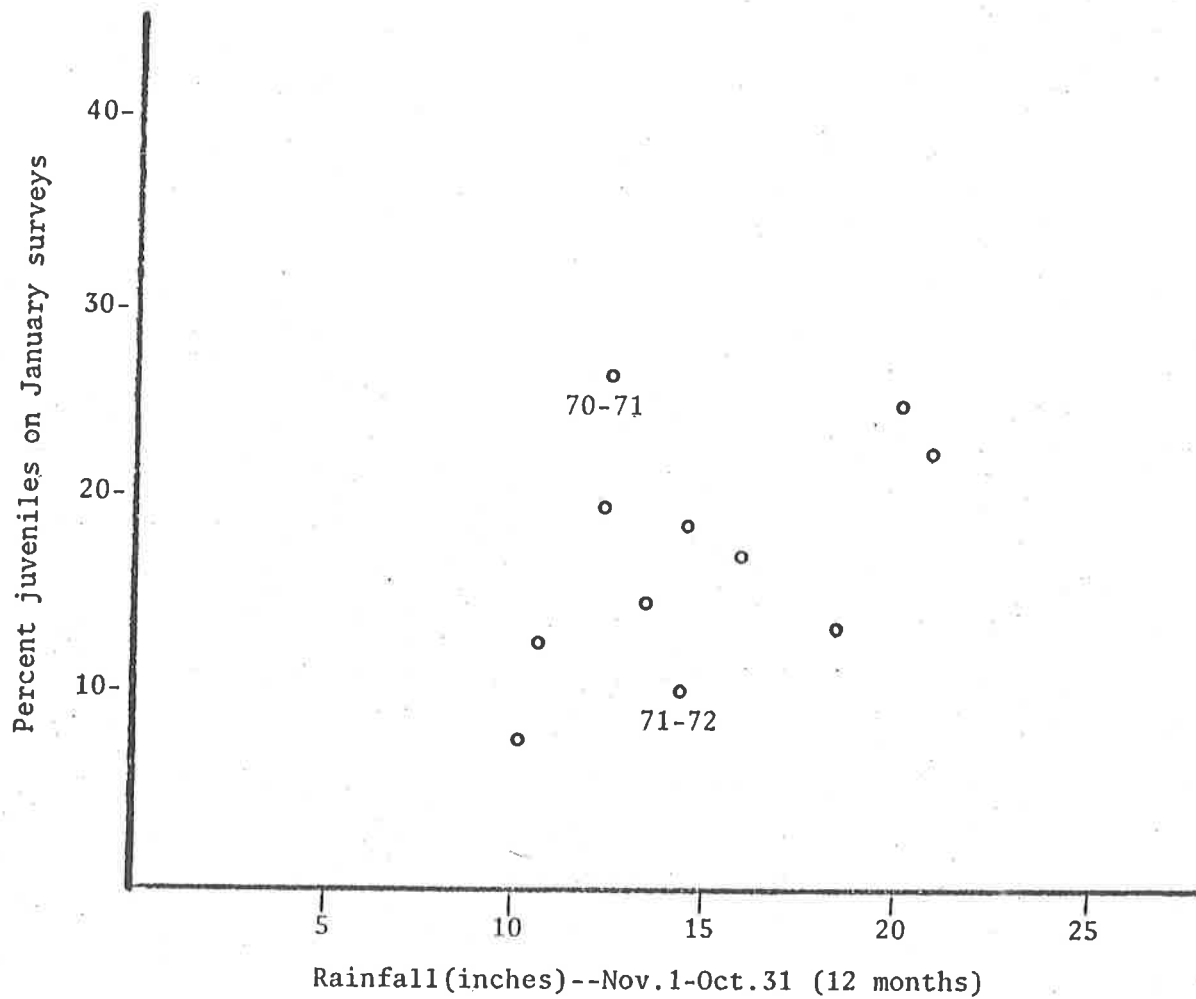


Fig. 2. Comparison of rainfall and percent of juvenile javelina, Three Bar Wildlife Area.

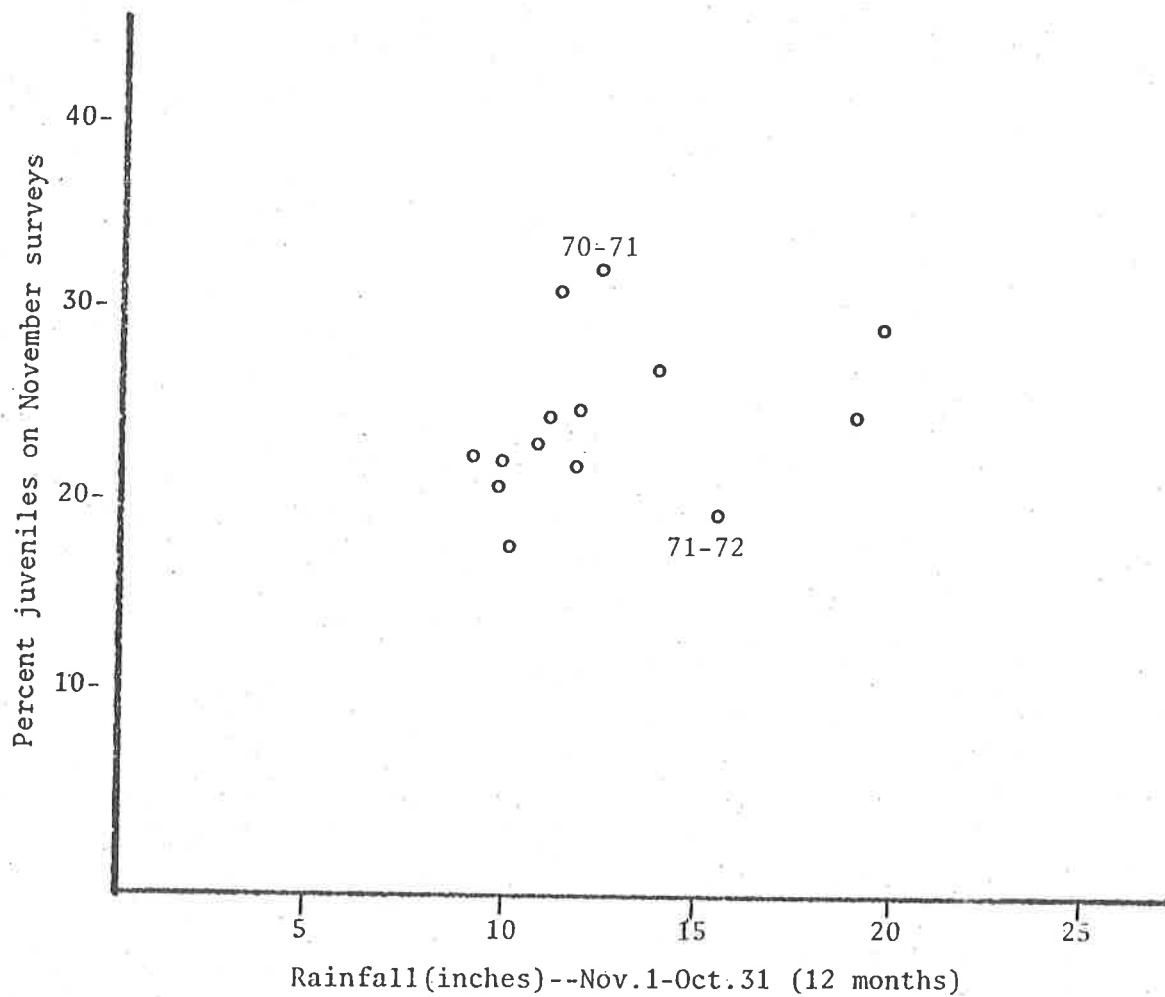


Fig. 3. Comparison of rainfall and percent of juvenile javelina, Saguaro National Monument.

Table 1. Summary of precipitation, temperature, and winter javelina classification counts; Tortolita Mountains 1964-1974

Date	Rainfall Nov.1-Oct.31 (inches)	Mean Temperatures June-August(°F)	Javelina Classified		% Juveniles in Populations
			Adult	Young	
1964-1965	10.74	84.7	42	14	25
1965-1966	20.94	85.0	38	22	37
1966-1967	9.81	86.9	52	9	15
1967-1968	14.50	82.7	26	12	32
1968-1969	8.81	84.6	12	4	25
1969-1970	12.53	84.9	26	12	32
1970-1971	13.46	81.9	24	5	17
1971-1972	13.20	82.4	20	6	23
1972-1973	15.31	82.2	19	8	30
1973-1974	12.75	--	33	9	21

Table 2. Summary of precipitation, temperature, and winter javelina classification counts, Three Bar Wildlife Area 1965-1976

Date	Rainfall Nov.1-Oct.31 (inches)	Mean Temperatures June-August(°F)	Javelina Classified		% Juveniles in Populations
			Adult	Young	
1965-1966	19.74	87.4	95	31	25
1966-1967	10.32	84.3	126	10	7
1967-1968	20.64	87.3	106	31	23
1968-1969	15.89	87.7	159	36	18
1969-1970	12.68	86.9	142	26	15
1970-1971	11.81	88.8	57	21	27
1971-1972	13.81	84.4	71	8	10
1972-1973	17.49	86.2	132	50	27
1973-1974	12.15	--	112	28	20
1974-1975	10.96	--	120	18	13
1975-1976	13.99	--	150	30	20

Table 3. Summary of precipitation, temperature, and winter javelina classification counts; Saguaro National Monument 1960-1974.

Date	Rainfall Nov.1-Oct.31 (inches)	Mean Temperatures June-August (°F)	Javelina Classified		% Juveniles in Populations
			Adult	Young	
1960-1961	9.80	--	132	35	167 21
1961-1962	12.12	86.2	149	51	200 26
1962-1963	11.57	85.2	130	39	169 23
1963-1964	10.86	85.8	93	30	123 24
1964-1965	9.35	88.9	117	33	150 22
1965-1966	19.80	86.4	114	50	164 30
1966-1967	9.59	84.1	168	46	214 21
1967-1968	18.96	83.5	168	55	223 25
1968-1969	10.61	86.4	92	30	122 24
1969-1970	13.82	86.4	152	58	210 28
1970-1971	12.49	85.3	131	61	192 32
1971-1972	15.93	84.8	102	26	128 20
1972-1973	11.48	85.6	151	69	220 31
1973-1974	10.38	86.0	140	31	171 18

Table 4. Summary of annual and seasonal precipitation (in inches) and winter javelina classification counts; Three Bar Wildlife Area 1965-1975

Date	An. Rainfall Jan.1-Dec.31	Sum.Rainfall June-Sept.	Wint.Rainfall Oct.-Mar. ^{1/}	% Juveniles in Population
1965	23.99	3.79	9.17	12
1966	10.17	4.55	14.68	25
1967	17.53	5.78	4.69	7
1968	16.02	5.86	13.50	23
1969	13.97	3.69	11.37	18
1970	11.05	6.17	6.84	15
1971	12.01	6.10	2.06	27
1972	17.40	3.90	4.81	10
1973	13.86	1.48	22.31	27
1974	11.95	3.10	5.15	20
1975	13.66	3.41	9.16	13

^{1/} 1965 rainfall is for the Oct.1964-March 1965 period. Same pattern for other years.

Table 5. Summary of annual and seasonal precipitation (in inches) and winter javelina classification counts; Saguaro National Monument 1960-1973.

Date	An. Rainfall Jan.1-Dec.31	Sum.Rainfall June-Sept.	Wint.Rainfall Oct.-March ^{2/}	% Juveniles in Population
1960	8.09	3.14	2.41	14
1961	11.71	6.77	2.91	21
1962	11.32	6.70	6.07	26
1963	11.20	4.53	6.02	23
1964	11.53	5.07	3.79	24
1965	15.12	4.82	5.34	22
1966	12.51	6.86	12.43	30
1967	13.43	6.69	1.50	21
1968	16.85	8.10	10.28	25
1969	10.63	5.18	5.41	24
1970	12.09	8.50	4.95	28
1971	15.13	8.24	1.75	32
1972	14.77	7.24	5.63	20
1973	10.12	3.60	12.28	31

^{1/} 1960 rainfall is for the Oct.1959-March 1960 period. Same pattern for other years.

The two variables, precipitation and javelina survival data from Region 6 (Table 6), were not significant at the .05 level in Unit 33 ($r=0.50$), Unit 34A ($r=-0.24$), Unit 36B ($r=-0.42$), or Unit 37B ($r=-0.63$).

Rainfall undoubtedly plays an important role in javelina production and survival. However, the results obtained in this study have shown rainfall to be poorly correlated with young survival. Significant correlations between these two variables were found on the Three Bar and Monument until 1970-1971. Extreme changes in the distribution of rainfall for a couple of years completely changed the relationship (Figs.2 & 3). During 1970-1971, unusually high summer rainfall on these areas may have contributed to increased survival of juvenile javelina even though the November to October totals were below normal. In 1971-1972 there was no measurable rainfall for the 4-month January to April period on the Monument and for the 5-month January to May period on the Three Bar. These extreme dry periods no doubt affected young production and survival yet the total rainfall (Nov. to Oct.) was above average due to heavy rains in October of the same Year (Tables 2 & 3). According to U. S. Weather Bureau records at

Table 6. Summary of precipitation (in inches) and winter javelina classification counts; Units 33, 34A, 36B and 37B in Region 6 (1964-1974).

Date	Rainfall Nov.1-Oct.31				% Javelinas in Population			
	U-33	U-34A	U-36B	U-37B	U-33	U-34A	U-36B	U-37B
1964-1965	14.7	15.9	10.7	9.0	35	36	31	31
1965-1966	24.2	31.1	22.3	19.7	52	26	13	25
1966-1967	15.8	17.1	10.7	11.7	42	37	13	39
1967-1968	20.2	21.0	16.8	17.7	38	33	--	20
1968-1969	16.0	17.1	11.3	11.4	22	35	22	33
1969-1970	16.4	16.8	14.5	14.4	32	25	17	24
1970-1971	16.4	18.4	13.4	12.6	39	28	28	20
1971-1972	16.4	20.2	14.5	16.6	44	29	27	8
1972-1973	18.9	17.6	10.9	15.7	35	21	23	26
1973-1974	20.0	21.2	12.8	19.2	33	35	25	14

Roosevelt, this was the driest January to May period since 1905 while the October 1972 precipitation of 8.57 inches had never before been approached.

Temperature and Javelina Survival. A significant relationship ($r=0.78$ with 7 d.f.) was found between javelina young survival and July to August temperatures for the 8-year 1967-1974 period on the Three bar. These data suggested that the greatest production and survival occurred during the period when temperatures were highest. However, no significant correlation existed between these same variables in the Tortolitas (Table 1, $r=0.06$ with 8 d.f.) and in the Monument (Table 3, $r=0.03$ with 12 d.f.).

Normal daily temperatures probably have little effect on young javelina survival. Zervanos and Hadley (1973) reported that adult javelina can tolerate summer temperatures above 122°F if fully shaded and about 100°F temperature in winter. Such a wide temperature range probably rarely if ever occurs in javelina range. Temperature probably affects young javelina more than adults, particularly winter lows. On the Three Bar there seems to be better survival of winter piglings during mild winters. Few winter born piglings are observed in the population following unusually cold and wet winters.

Precipitation, Forage and Javelina Survival. On the Three Bar there was no significant correlation between juvenile javelina, the preceeding year's rainfall (Nov. to Oct.) and the preceeding summer's forage production ($r=0.55$ with 5 d.f., Table 7). Employing the usual interpretation of the r^2 , it would appear that 30 percent of the total variation in survival of young javelina may be accounted for by rainfall and forage production in the 1970-1975 period.

Table 7. Evaluation of relationship between percent of juvenile javelina in January with preceeding rainfall (in inches) and vegetation production on the Three Bar Wildlife Area.

Date(Jan.)	% Juvenile Javelina	Measured Rainfall Nov.1-Oct.31	Summer Forage Production (Average) lbs/acre
1967	25	19.74	
1968	7	10.32	
1969	23	20.64	
1970	18	15.89	160.50
1971	15	12.68	274.75
1972	27	11.81	254.75
1973	10	13.81	122.00
1974	27	17.49	96.25
1975	20	12.15	106.44

r_{12} = .2108 percent juveniles and rainfall

r_{13} = .01866 percent juveniles and forage production

r_{23} = -.5376 rainfall and forage production

R = .5543 not significant

R^2 = .3072 (obtained from 1970-1975 data)

CONCLUSIONS

Estimates of juvenile survival based on winter classification counts may not be accurate enough to reflect the influence of rainfall, temperature, or forage production. Various factors may contribute to errors in distinguishing juvenile from adult javelina including the following.

1. While young are born in every month of the year, the peak production months are May, June, July, and August. Javelina born during this 4-month period are 5 to 7 months at the time of the January surveys, large enough to be mistaken for adults.
2. Some of the javelina observed are disturbed before classification is complete. The behavior of alarmed javelina further contributes to classification error.
3. Herds with more than 15 javelina are difficult to count and classify. Occasionally herds are found with 20 to 30 animals.

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[illegible]

[illegible]

Saguaro Nat. Mon. Survey

Dec. 19 - 27, 1962

Surveyor	Date	Route	Hrs	Mule Deer #					Javelina				G. Quail	cotton tails	Jacks		Other
				♂	♀	F	Und	TOT.	Ad	J	Pig ling	TOT			all	to	
Seemeyer	Dec. 19	N.E.-of Loop Rd	6	1	-	-	-	1	10	2	1	13	3C	1	1		1 coyote 1 G.H. Owl 2 coyote
Day	"	W. St. 4 "	5	2	5	-	-	7	9	2	0	11	3C	6	2	8	
Walker	"	S.W. Picnic Area	5	1	4	-	-	5	3	4	0	12	2C	6	0	2	
Warren	"	S.E. Loop Rd.	6	1	4	-	1	6	0	0	0	0					2 coyote
Olsen	"	W. & S. St. S Loop Rd	5	1	1	1	-	3	14	2	0	16	1C	3	-	-	
Austin	"	N.W. of Loop Rd	6	1	6	0	8	15	0	0	0	0					16. Eagle
Hauley	Dec. 20	Ridge N. Boy Can.	5 1/2	5	4	3	0	12	0	0	0	0	1C	3	-	-	
Day	"	N.W. X 9 Rds.	5 1/2	1	1	3	1	6	0	0	0	0		1	-	-	
Austin	"	" " "	5 1/2														
Hamley	"	" " "	5 1/2														
Day	Dec. 21	N. Brnd. Tng/Hugo	5 1/2	1	8	1	5	15	17	9	1	27					
Roy R.	"	" " E. 4 "	5 1/2	-	4	-	-	4	0	0	0	0		1	-	-	
Austin	"	" " "	5 1/2	-	-	-	-	-	0	0	0	0					
Hauley	Dec. 26	S. Madonna R. Sta.	6	2	-	-	13	15	10	3	1	14	1C	2	-	-	
Day	"	" " "	6	3	-	-	1	1	0	0	0	0	1C	-	-	-	
Olsen	"	N.E. " "	8	-	-	-	-	-	1	2	0	1					
Day	Dec. 27	N.E. " "	6	2	1	-	-	3	22	5	0	31	1C	1	-	-	
Austin	"	E. " "	6	-	-	-	-	-	19	5	0	18					
Hamley	"	S.E. " "	6	-	-	-	-	-	3	-	-	-					4 coyotes

18 main days 96 1/2 18 38 8 28 93 149 44 7 200 13C 24 3 10 9 coyotes
 net. 78.5 miles

Summary
 Herds
 Tot Javelina
 Avg. herd size
 % of young in pop.
 Largest herd count
 Does / buck
 Fawns / 100 does

Mule Deer	Javelina
15	
200	
13.3	
25.5	
31	
2.11	
21.0	

Sagehen Salinas Nat. Mon
-1964-

(17 mandays)

approx (70)
est. 72 miles
away

$$\begin{array}{r} 10.5 \\ 17 \overline{) 180} \\ \underline{17} \\ 100 \\ \underline{95} \\ 50 \end{array}$$

37
21
15
15
13
11
10
9
8
7
6
6
6
5
5
3

Survey Saguaro National Monument

1965

Date	Location	map miles	Sandelbar				Deers					Coyotes	R	Other sp.
			Adults	Red	Juv	Other	Total	♂	♀	F	Un.			
Nov-16	S.W. end	4	10	1	2	13✓	0	3	0	3	6	1	6	—
"	" " "	4	11	2	3	16✓	2	0	0	0	2	1	6	1 Jack.
Nov 17	Inside Loop west	3	3	2	0	5✓	1	1	0	0	2	3	4	4 Jacks
"	" " East	3 1/2	0	0	0	0	3	3	0	0	6	2	5	—
Nov 18	N. End (S. 74) Strip	3 1/2	9	1	3	13✓	0	0	0	0	0	0	1	—
Nov 18	E. of loop	3 1/2	8	0	2	10 + 1	0	0	0	0	0	0	—	—
Nov 18	E. of loop picnic area	3 1/2	16	2	3	21✓	0	0	0	0	0	1	7	—
Nov 18	W. of loop		5 +	0	1	6✓	0	0	0	0	0	0	0	—
Dec. 7	N. of P. Madrona RS	4	0	0	0	0✓	0	1	1	9	11	1	0	Gray fox
Dec. 21	W. " " "	4	10	0	1	11✓	1	0	0	0	1	2	2	—
"	" " N & W. " "	4	12	0	3	15✓	1	0	0	0	1	0	0	—
Dec. 27	N & E " "	3 1/2	2	0	0	2	0	0	0	0	0	2	1	—
"	E " "	4	16 (unc)	0	0	16✓	1	0	0	0	1	2	2	—
		7	9	0	2	11✓								
Dec. 28	N. end Mon.	3	15	0	2	17✓	6	17	3	0	26	2	1	Bulge
"	" " "	3	0	0	0	0✓	0	4	1	0	5	1	1	Coyote
Dec 29	S.E. Madrona	4 1/2	7	0	4	11✓	2	2	0	0	4	1	5	—
"	" " "	5	0	0	0	0✓	0	0	0	0	0	1	5	Falson
			120	8	28	156	17	31	5	12	65	20	46	

- 15 man days -
65

56 1/2

16 heads -
[Avg herd size 11.3

[3.2 jaw/mile

$99/107 = 1.8$

$F/100 \text{ } \eta \eta = 16.1$

% juv. 21.7

adjusted for heads not talked completely
117 AD 33 J 150 = 22.0% juv.
32

117 25 142

Saguaro Nat. Mon

J. Day - T. Givillier
Dane Minor

1966

1966	Location	Javelina			Deer					G. C. J.			Other	map miles
Date		Ad.	Juv.	Tot.	♂	♀	F	Un.	DL.	G. R.	C. R.	J. R.		
11/15	N. of Maricopa									2				4
11/16	E. of "	12	6	18	2	3	0	0	5	1	2	-	1 coyote	2
"	W. of "	15	5	20	0	3	0	0	3	0	0	-	1 coyote	2
11/17	E. of "	9	5	14	0	1	0	0	1	2	1	0		2 1/2
11/17	S. Trail to Rincon (one herd heard)				0	2	0	0	2	3	0	0		3
"	S. Boundary			0	1	11	0	0	12	4	7	0	2 coyote	3
11/18	E. of Deer Camp	4	14	23	0	6	0	0	6	1	1	0		3
"	N. of "	8	4	12	3	12	4	0	19	1	3	0		3
"	W. of "	18	16	34	2	2	1	0	3	1	0	0	1 gray fox	3
11/21	N. of Loop Rd.	8	3	11	3	11	1	0	15	0	2	1 (A)		3
11/22	S. of Loop Rd.	1	0	1	0	3	2	0	5	2	3	0		2
11/23	S. "	11	4	15	0	2	0	0	2	0	6	0		2 1/2
11/25	Inside Loop Rd.	8	4	12	4	7	3	0	14	7	5	1	1 coyote	3 1/2
"	E. of Loop Rd.	uncl.		14	0	2	0	0	2	3	6	0		3 1/2
11/28	N. end Monument	9	0	9	1	4	4	0	9	1	3	0		2 1/2
"	"	0	0	0	0	0	0	0	0	0	3	0	3 more	4
		114	50	37	201	14	64	15	0	98	28	42	2 5 coyote 1 G. fox	46

% young 38.5

22 F / 100 ♀ R
4.89 ♀ / 107

Maricopa	
12	6
15	5
9	9
9	5
8	4
13	6
66	35

101

Loop	
8	3
1	0
11	4
11	4
8	4
39	15
54	

$$\begin{array}{r} 26.9 \\ 54 \overline{) 15.00} \\ \underline{108} \\ 420 \end{array}$$

Saguaro Nat. Mon

1967

Date	Start/Fin Time	Location	map miles	Javelina				Mule Deer				G. ails	BT	A	Other Comment
				Ad.	Jw.	Un.	Tot.	♂	♀	F	Un.	T.			
11-27-67	7:30-1:40	SW end	3	6	1	0	7	0	6	0	0	6	2	2	1 (red) JD
"	7:30-1:30	"	4	0	4	0	4	0	2	0	0	2	1	2	0 JS
11-28-67	8:10-1:30	E. of Loop Rd.	4	0	0	0	0	1	1	0	0	2	1	4	0 JS
"	8:00-1:40	1/2 Inside Loop Rd.	4	18	4	0	22	0	2	1	0	3	1	3	2 JI
"	8:00-12:15	Loop Rd.	4	10	2	0	12	0	2	1	0	3	1	3	0 GS
"	8:00-12:15	Loop Rd.	4	0	0	0	0	1	0	0	0	1	5	3	0 3
11-29-67	8:00-1:00	E. Deer Camp	3	17	3	0	20	0	3	2	0	5	0	0	0 (red) JI
"	8:00-2:00	N. " "	5	0	0	14	14	0	3	2	0	5	0	0	0 JS
"	8:00-1:00	N. " "	3	4	1	0	5	0	8	2	0	10	0	2	0 0
"	8:00-1:00	N. " "	3	0	0	0	0	0	0	0	0	0	0	0	0 TC
11-30-67	8:00-1:30	N. of Loop Rd.	5	0	0	0	0	0	10	0	0	10	2	0	2 0 TC
"	8:00-1:30	1/2 of Loop Rd.	3 1/2	11	3	0	14	0	0	0	0	0	1	2	1 0 JD
12-6-67	8:00-1:30	1/2 of Loop Rd.	3	8	1	0	9	0	0	0	0	0	1	2	1 0 JI
"	8:00-1:30	N. End	3	10	3	0	13	0	0	0	0	0	2	3	0 0 JI
"	8:00-1:00	1/2 of Loop Rd.	4	6	2	0	8	2	6	0	0	8	0	0	0 0 IWT 6H
"	8:00-1:30	"	5	0	0	0	0	1	0	0	0	0	0	1	0 0 JS
12-7-67	7:40-1:45	N. of Loop Rd.	4	16	6	0	22	0	1	1	0	2	1	1	0 0 (red) JI
"	7:40-1:30	NW. " "	4	0	0	0	0	1	0	0	24	25	1	0	0 0 6H
"	7:40-1:30	SE " "	3	0	0	0	0	1	5	0	0	6	2	1	0 0 JS
12-8-67	7:45-1:30	N. of Loop Rd.	3	10	2	0	12	0	0	0	0	0	0	0	0 0 300 ft JS
"	7:45-1:30	N. of Loop Rd.	4	18	4	0	22	0	0	0	0	0	0	0	0 0 G.
"	7:45-1:30	"	4	0	0	11	11	0	1	0	0	1	0	0	0 0
"	"	"	4 1/2	13	3	0	16	0	1	0	4	5	2	1	0 0 100 ft JS
19 man days			73	168	42	29	245	7	46	6	28-87	22	25	6	3

214

168 46 = 214 IWT
27 J/100 heads

21.5% J. in pop. (4 red pigs) (16 heads avg. h size 13.4)
3.4 pigs/mile map

Day 7 man days
J.S.-6 " "
Park Ser. 6 " "

Javelina
182 74.5%
39 15.8
24 9.7
245

Saguaro Nat. Mon. Survey

1968

Date	Time start-end	Est. map miles	Savannah					Deer				Quail	JR. - CoH	Coyotes	Other		
			Ad	Juv.	Red	Un.	Tot.	♂	♀	F	Un					Tot.	
11-18	7:30-12:50	3 1/2	8	2	0	0	10	3	11	3	3	20	2	3	0	1	JD
"	7:30-12:50	3 1/2	10	3	0	0	13	2	3	0	0	5	7	9	7	5	GS
"	7:30-1:00	3 1/2	4	1	0	0	5	1	3	0	0	4	0	0	3	0	JS
11-19	7:20-12:50	3 1/2	6	3	0	0	9	0	0	0	1	1	6	0	7	1	JD
"	7:20-1:00	3	9	1	1	0	11	0	0	0	1	1	5	10	15	4	GS
~~11~~	~~7:20-1:00~~	~~4~~	~~4~~	~~1~~	~~0~~	~~0~~	~~5~~	~~0~~	~~3~~	~~0~~	~~0~~	~~3~~	~~5~~	~~10~~	~~15~~	~~4~~	~~JS~~
11-20	7:45-1:15	4	8	6	0	0	14	0	0	0	3	3	2	0	2	0	JD
"	7:40-1:05	3 1/2	0	0	0	0	0	1	2	0	0	3	2	0	2	0	JS
11-21	7:40-1:00	3	0	0	0	0	0	1	0	0	0	1	2	0	1	0	HL
"	"	4	8	4	0	0	12	1	1	0	2	4	1	0	1	0	JD
"	7:40-1:00	3	1	0	0	0	1	0	2	0	0	2	5	0	2	0	JS
11-22	7:40-1:15	4	10	5	0	0	15	0	12	4	0	16	1	0	3	0	JD
"	"	3	12	2	0	0	14	0	2	0	0	2	0	0	1	0	BS
~~11-23~~	~~7:45-12:30~~	~~4~~	~~12~~	~~2~~	~~1~~	~~0~~	~~15~~	~~0~~	~~6~~	~~2~~	~~0~~	~~8~~	~~0~~	~~0~~	~~2~~	~~0~~	~~JS~~
11-25	7:45-12:30	3	7	2	0	0	9	0	2	0	0	2	0	0	0	0	GH
"	7:45-1:40	3	18	4	0	0	22	0	0	0	0	0	3	0	0	0	JS
"	" 2:15	3 1/2	6	5	0	0	11	0	0	0	0	0	0	0	0	0	JD
11-26	8:00-12:30	2 1/2	9	9	2	0	18	2	1	0	0	3	1	0	0	0	JD
"	8:00-1:10	3	0	0	0	0	0	0	0	0	0	1	0	0	2	0	JS
"	8:00-1:00	3	0	0	0	0	0	0	0	0	0	2	1	0	0	0	JS
11-27	8:00-1:00	3	12	2	0	0	14	1	0	0	0	1	0	0	0	1	GH
"	8:00-1:15	3	7	2	0	0	9	0	0	0	0	0	2	0	1	2	JD
"	8:00-1:15	4	15	2	0	0	17	0	0	0	0	0	2	0	1	2	JD
"	8:00-1:15	4	10	0	0	0	10	0	17	1	0	18	0	0	2	0	JS
22-	7:30-1:40	73 1/2	209+	63	5	0	277	12	65	10	9	86	40	22	51	14	
		9 1/2															
		6 1/2															
									(2W)	(1WT)			(3WT)				

Savannah

All % young - 24.5

Avg. herd size - 11.1

Good counts % young - 24.7 ✓

Avg. herd size - 10.6

Day/Stanley % young - 26.6

Avg. herd size - 12.1

J. White - 25

Ad - 148

J - 55 (3 Red included)

223

Un - 54

277

3.8/mile

3.5/mile

1969 Survey Saguaro Nat Mon.

Date	Location	ent. map miles	Ad	Ju Pig	TOT.	Deer	Obs	with	Sp	Grass	co	A Jack	B Jack	other	JD
11-17-69	Inside Loop	3	6	1	7	2	-	1	4 MD	8	5	2	2	Bergy	GS
"	W. Loop	3	-	-	-	2	-	-	2 MD	8	5	2	2	Bergy	JS
"	E. Loop	4	10	1 Sub	16	6	2	-	8 MD	-	6	-	-	-	JS
11-18-69	Tria Longa	4	-	-	-	2	-	-	2 MD	8	4	2	2	-	GS
"	"	5	12	4	16	-	-	-	-	2	2	-	-	-	JD
"	"	3 1/2	-	-	-	2	-	-	2	2	2	-	-	-	JS
11-19-69	N. Deer Fork	2 1/2	7	-2	9	4	-	-	4 MD	0	0	0	1	-	RS
"	NW "	4 1/2	-	-	-	-	-	-	-	1	-	-	-	-	JD
"	E-Deer Camp	3 1/2	-	-	-	-	-	-	-	-	-	-	-	-	JS
11-20-69	N. Loop	4	9	4	13	2	1	1	0 4 MD	1	3	-	-	-	JD
"	"	-	-	-	-	-	1	1	- 2 MD	2	7	1	1	Red fox	JS
11-21-69	N. Pine	5	-	-	-	2	1	-	3 MD	0	4	-	-	-	JD
"	S. Pine	3 1/2	-	-	-	-	-	-	-	2	4	-	3	-	TC
"	SW corner	4	7	1 Sub	10	2	-	-	2 MD	-	1	-	-	-	JS
11-24-69	N. Pine	4	18	6	24	-	-	-	-	-	2	-	-	-	JD
"	NW "	4	5	-	5	-	-	-	-	-	2	-	2	-	GS
11-25-69	NE "	3 1/2	-	-	-	1 WT	-	-	1 WT	-	-	-	-	-	JD
"	E "	-	-	-	-	-	-	-	4 4 MD	-	-	-	-	-	JD
11-26-69	SE "	3	-	-	-	2	3	-	4 MD	1	2	-	-	-	JD
"	SE "	3	-	-	-	-	-	-	-	-	-	-	-	-	GH

11-28-69	S. Loop	3	15	4	2	2	9	1	12	0	17 MD	-	-	-	JD
"	"	3 1/2	-	-	-	-	-	-	-	-	-	-	-	-	GH

90 28 2 122 6 35 6 5 53 21 47 3 10
 2nd 1WT

20

640
 20 92 30
 24.6%
 25.2

FIGURES MAN DAYS
 USED 20 64 92 30 122 6 35 2nd

Survey Saguaro National Mon.

1970

Surveyor -
J. D. Dwyer
F. Blackman
R. H. Slomaker

Date	Location	Est. map miles	Survivors				D.R.E.				Cottontails	Jacks	quail	conies	Other
			Ad.	Juv.	Un.	Tot.	♂	♀	Imm	Tot					
11-18-70	Tena Lagatank	2	-	-	-	0	-	-	-	0	-	-	-	1	R
"	N. " " "	2 1/2	-	-	-	0	9	2	0	11	-	-	-	-	J
"	N. " " "	2	3	-	-	3+	-	-	-	3	3	-	-	-	F
"	Off Monument	-	-	-	-	0	1	3	2	7	13	-	-	-	-
11-19-70	NE end of N. Loop	2	10	4 (pig)	14	0	11	2	5	18	3	0	1	-	J
"	N. of Steel Tank	1 1/2	-	-	-	0	1	-	-	1	1	0	1	-	R
"	S. of " "	1	1	-	-	1	6	-	-	6	0	0	0	1 coyote	F
11-20-70	Inside Loop Rd.	3	16	8	-	24	1	10	1	2	14	1	3	4	J
"	E. of Loop Rd.	3	13	4	-	17	1	12	-	0	13	8	2	4	FI
"	Inside Loop Rd.	3	17	4	-	21	-	4	-	-	4	0	0	3	FOX? R
11-23-70	N. Madonna RS	-	18	3	-	21	1	-	-	-	1	3	0	2	J
"	N. " "	-	-	-	17	17	3	10	-	-	13	0	0	0	FA
"	N. Madonna RS	-	7	4	-	11	-	1	-	-	1	2	0	2	-
"	N. Madonna RS	-	4	3	-	7	-	-	-	-	-	-	-	-	-
11-24-70	E. Madonna Trail	-	9	1	-	10	-	-	-	-	-	2	0	1	GH
"	" "	-	-	-	0	4	-	-	-	-	4	1	0	0	1 coyote
"	" "	-	13	6 (3 ad)	19	-	4	1	-	5	1	0	1	-	J
11-25-70	S. Lincoln Peak Trail	-	5	3 (1 ad)	8	-	2	-	-	2	1	0	1	-	GA
"	" "	-	-	-	-	1	-	-	-	1	0	0	2	-	FI
"	" "	3	14	6	-	20	1	6	-	7	0	0	2	-	FI
11-27-70	S. end of S. Natl. Mon	3	0+	-	3	3+	-	-	-	-	-	1	0	1	F
"	" " " "	3	9	8	-	17	-	3	2	-	5	2	0	3	J
"	" " " "	3 1/2	8	3	-	11	1	13	-	-	14	2	0	0	1 fox 1 coyote
12-4-70	N. Box Canyon	2	19	4	-	23	-	-	-	0	0	2	0	2	F
"	S. of picnic area	2	-	-	-	0	2	5	1	0	8	4	0	4	1 coyote

16 101 11 17 115 35 5 35

accurate classification? (13) 152 58 (grouped) 210

by hand - 22.5% F
Sheds incl. in sample counts 513 67 9 43 132

Total (18) herds 50706 215

Sagami Nat. Mon Survey 1971

Nov. 17-30 (7 days)

Date	Location	Saw 1 min				Deer				Tot	Young	Cottontail	Bobcat	Other
		H	J	M	Tot	♂	♀	F	un					
11-17-71	Inside Loop Rd.	✓ 17	9	0	26	4	4	0	3	11	1	1	1(A)	
"	E. of " "	✓ -	-	-	0	3	11	6	3	18	1	2	0	1 bobcat
"	W. Inside Loop Rd.	✓ -	-	6	6	-	-	-	-	0	1	1	1	
11-18-71	N. of Loop Rd.	✓ 9	5	-	14	-	1	-	3	4	2	2	0	2 coyote
"	Box Canyon	✓ 7	5	-	12	1	1	-	-	2	2	3	0	2 "
"	S. of Loop Rd.	✓ 9	7	-	16	-	1	-	2	3	2	1	0	2 "
11-22-71	Terra Langa Rd.	✓ 4	6	-	10	-	-	-	0	0	0	1	0	
"	E. " " "	✓ 9	3	-	12	-	-	-	0	0	0	3	0	
11-23-71	Deeds Camp N.	✓ -	-	-	-	-	-	-	-	-	1	-	-	
"	" " E	✓ 2	6	8	16	2	3	1	-	6	-	1	-	
"	" " W	✓ 5	2	7	14	-	-	-	-	-	1	-	-	
"	" " "	✓ 9	6	(2 red)	15	-	-	-	-	-	-	-	-	
11-24-71	Madreva	✓ 12	3	-	15	-	5	3	-	8	2	2	-	
"	"	2	-	-	2	-	5	-	-	7	1	-	-	
11-29-71	"	18	7	(3 in)	25	3	4	-	-	7	1	1	-	
11-30-71	"	4	1	-	5	-	-	-	-	-	1	1	-	1 coyote
"	"	-	-	heard	1	-	-	-	-	1	1	2	-	
"	E. Madreva	21	8	-	29	2	-	-	-	2	0	1	-	

19

31 11 19 20 16 35 5 11 67 17 22 2

1 bobcat
7 coyote

$$\begin{array}{r} 14.8 \text{ avg. } 1 \text{ min. } \\ 131 \overline{) 192} \\ 13 \\ \underline{62} \\ 52 \\ \underline{100} \\ 4 \end{array}$$

$$\begin{array}{r} 31.8 \\ 192 \overline{) 61.00} \\ 576 \\ \underline{340} \\ 192 \\ \underline{1480} \\ 1344 \\ \underline{136} \\ 4 \end{array}$$

31.8 % young
in pop.

$$\begin{array}{r} 2.2 \\ 161 \overline{) 35.00} \\ 322 \\ \underline{280} \\ 680 \\ \underline{656} \\ 240 \\ \underline{240} \\ 0 \end{array}$$

$$\begin{array}{r} 5/35 = 1/7 \\ 14.3 \\ 35 \overline{) 500} \\ 143 \\ \underline{357} \\ 143 \\ \underline{140} \\ 40 \\ \underline{35} \\ 50 \\ \underline{35} \\ 150 \\ \underline{140} \\ 100 \\ \underline{100} \\ 0 \end{array}$$

out 13 park

Nov. 1972

19 man days

Saguaro Nat. Mon. 1973

Date	Location	Landline				Deer			Co. Hwtail	O. quail Jacks			Bobcat
		Ad	J	Pg	Tot	♀	F	in Tot.					
11-19	E. End Inside Loop	16	1	3	20.3	13	1	18	1	4	0	0	0 JD
"	E. of Loop Rd.	-	-	-	1	5	2	8	4	1	0	0	0 FM
"	W. side Loop	-	-	-	-	2	-	2	4	5	4	0	0 LW
11-20	NE of Loop Rd.	-	-	-	1	7	-	8	3	3	0	0	0 JD
"	E. End Loop	(7 um)	7	-	-	5	1	6	2	1	0	0	0 -
"	Box Can. area	11	4	1	16.4	3	3	10	1	3	0	1	1 FM
11-21	Deer camp - W	15	7	4	26.5	4	2	11	4	4	0	0	0 JD
"	" " N	6	3	0	9.0	0	0	0	2	2	0	0	1 grey fox
"	" " E	6	3	0	9.0								
11-26	Recker Allot.	13	8	2	23			0	0				0 JD
"	" " "				0			0	0				0 LW
"	" " "				0			0	4	5	0	0	2 m. deer
11-27	Madonna - W	15 13	4 7	1	20.1	9	5	15	2	2	0	0	0 JD
"	" - N	8	3	1	12.0	0	0	0	2	2	0	0	0 FM
"	" NE				6.1	0	0	1	2	0	0	0	0 F.
11-28	F "	8	6	2	15.0	0	0	0	1	0	0	0	0 JD
"	"	2	1	0	3.0	1	0	1	3	0	0	2	0 FM
"	"	1	1	0	2.0	0	0	0	0	0	0	0	0 F.
11-29	"	7	3	0	10.0	2	4	7	0	2	0	0	0 JD
"	"	7	3	0	10.0			0	0	2	0	0	0 FM
"	"	19	3		22			0	2	3	0	0	0 FM

151 - 55-14-220 17-51-18-86 (um) 37 39 4 3 1 Bobcat
1 q. fox
2 m. deer

				uncounted heads
1-9	3	0	22	unk. H
16	1	3	20	4
11	4	1	16	7
15	7	4	26	6
6	3	0	9	3
5	0	0	5	20
13	8	2	23	
15	4	1	20	
13	7	0	20	
8	3	1	12	
7	4	2	15	
9	3	0	12	
7	3	0	10	
7	3	0	10	

$$44 / 10^3 = 3.0$$

$$F / 100.44 = 35.3$$

Sag Nat. Monument

1974	Deer					Sawbeams				Jack	G.O.	Predators:	Other
Date	♂	♀	F	Un	Tot	Ad	Juv.	Tot					
11-25-74	1	-	-	-	1	11	1	12	2	0	0	1 coyote	JD
11-26	4	3	3	1	11	1	-	1	0	3			JD
11-27	1	1	1	0	3	18	3	21	3	0			JD
12-2	1	1	1	1	4	-	-	-	0	4	4	1 Golden E.	JD
12-3	1	2	1	2	6	-	-	0	0	0	1		JD
"	-	1	1	WT	(2)	9	1	4	4	0	2		PS
"	-	-	-	-	0	3	1	4	4	0	2		Dispers
"	1	6	2	0	9	4	5	4	0	1	4		J.W.
12-4	1	-	-	-	1	10	2	12	0	0	4		JD
"	-	-	-	-	-	18	7	25	0	0	0		LW
"	-	-	-	-	-	28	3	25	0	0	2		JW
12-5	-	-	-	-	-	22	6	28	1	0	2		JD
"	-	-	-	-	-	4	3	7	1	0	0		1
"	-	-	-	-	-	9	6(3)	15			75%		JW
12-6	-	-	-	1	1	13	2	15	-	-	-		JD
"	2	4	-	-	6	-	-	-	-	-	5		JW.
"	-	1	-	-	1	-	-	-	-	-	-		LW.
12-9	-	1	2	-	3	-	-	-	4	-	1		
"	3	16	8	-	26	-	-	-	4	-	1		J.D.
Totals	15	35	18	5	73	140	31	171	17	6	2425		
	WT	1	1		2		(5)	12d			144		
10 birds - Avg. bandage 17.1%													
70 egg - 18.1%													
2.3 eagle													

Summary of Eight Years of Surveys Conducted in the
Saguaro National Monument

Compiled by J. Day, AG&F

	<u>Feb.</u> <u>1961</u>	<u>Dec.</u> <u>1961</u>	<u>Dec.</u> <u>1962</u>	<u>Jan.</u> <u>1964</u>	<u>Jan.</u> <u>1965</u>	<u>Dec.</u> <u>1965</u>	<u>Nov.</u> <u>1966</u>	<u>Nov.</u> <u>1967</u>
Man-days	14	14	18	17	11	15	16 ✓	19
Map Miles	68.5	69	78.5	72	41	56.5	46 ✓	73
<u>Javelina</u>								
Adults	69	132	149	130	93	130	114 ✓	168
Young	11	35	51	39	30 ₁	36	50 ✓	46
Unknown	18	22	0	11	0	16	37 ✓	31
Total	98	189	200	180	123	182	201 ✓	245
Avg. Herd Size	8.9	11.1	13.3	10.5	13.5	11.8 ^{1/}	14.4 ✓	13.4
% young in pop.	13.8	20.9	25.5	23.1	24.4	22.0 ^{1/}	30.5 ✓	21.4
Firs per mile	1.4	2.7	2.5	2.5	3.0	3.2	4.4 ✓	3.4
<u>Mule Deer</u>								
Bucks	35	29	18	36	21	17	14 ✓	7
Does	25	46	38	81	28	31	69 ✓	46
Fawns	11	9	8	6	8	5	15 ✓	6
Unknown	10	5	29	110	2	12	0 ✓	28
Total	81	89	93	123	59	65	98 ✓	87
Does per buck	0.7	1.6	2.1	2.2	1.3	1.8	4.8 ✓	6.6
Fawns/100 does	44.0	19.6	21.0	7.4	28.6	16.1	21.8 ✓	13.0
<u>Other Species</u>								
Whitetail deer	5	4	0	0	0	0	0 ✓	1
Gambel coveys	25	8	13	25	18	20	28 ✓	22
Cottontails	71	27	24	45	30	46	42 ✓	25
Jack Rabbits	40	9	13	12	2	8	2 ✓	9
Coyotes	5	5	9	6	5	1	10	4
Bobcats	0	0	0	2	0	0	0	0

^{1/} Herds not accurately classified or counted were not used.

Summary of Surveys Conducted in the Saguaro National Monument

	Feb. 1961	Dec. 1961	Dec. 1962	Jan. 1964	Jan. 1965	Dec. 1965	Nov. 1966	Nov. 1967	Nov. 1968	Nov. 1969	Nov. 1970
Man-days	14	14	18	17	11	15	16	19	22	20	23
Map miles	68.5	69	78.5	72	41	56.5	46	73	73.5	64	55.5
<u>Javelina</u> Adults	69	132	149	130	93	130	114	168	168	92	152
Young	11	35	51 ⁽⁷⁾	39 ⁽⁵⁾	30 ⁽¹⁾	36 ⁽⁸⁾	50 ⁽¹⁾	46 ⁽⁹⁾	55 ⁽³⁾	30 ⁽²⁾	58 ⁽⁵⁾
Unknown	18	22	0	11	0	16	37	31	54	0	35
Total	98	189	200	180	123	182	201	245	277	122	245
Avg. Herd Size	8.9	11.1	13.3	10.5	13.5	11.8 ¹	14.4	13.4 ¹	10.6 ²	13.0 ¹	16.1
Percent of young	13.8	20.9	25.5	23.1	24.4	22.0 ¹	30.5	21.4	24.7 ¹	24.6 ¹	27.6
Pigs per mile	1.4	2.7	2.5	2.5	3.0	3.2	4.4	3.4	3.8	1.9	4.4

Mule Deer

Bucks	35	29	18	36	21	17	14	7	12	6
Does	25	46	38	81	28	31	69	46	65	35
Fawns	11	9	8	6	8	5	15	6	10	6
Unknown	10	5	29	0	2	12	0	28	9	5
Total	81	89	93	123	59	65	98	87	96	52
Does per buck	0.7	1.6	2.1	2.2	1.3	1.8	4.8	6.6	5.4	5.9
Fawns/100 does	44.0	19.6	21.0	7.4	28.6	16.1	21.8	13.0	15.4	17.1

Other Species

Whitetail deer	5	4	0	0	0	0	0	1	3	1
Gambel covers	25	8	13	25	18	20	28	22	40	21
Cottontails	71	27	24	45	30	46	42	25	51	47
Jack Rabbits	40	9	13	12	2	5	2	9	22	13
Coyotes	5	5	9	6	5	1	10	4	14	3
Bobcats	0	0	0	2	0	0	0	0	0	0

¹/ Herds not accurately classified or counted were not used.

Survey Data N. End Saguaro Nat. Mon.

Year	Mule Deer					Javelina			Black Corns	Cottontails
	♂	♀	F	?	Tot.	Ad.	Juv.	Tot.	# Herds	↓
1961	5	7	0	0	12	13	3	16	1	0
1961	4	12	3	0	19	18	4	22	2	7
1962	1	12	1	5	19	17	10	27	1	0
1964	8	5	2	0	15	10	3	13	2	0
1965	6	21	4	0	31	15	2	17	1	3
1966	1	4	4	0	9	9	0	9	1	1
1967	3	6	0	0	9	27	12	39	4	2
1968	2	3	0	2	7	9	4	13	2	8
1969	0	2	0	0	2	12	4	16	1	2
1970	0	10	2	0	12	3	0	3	1	1
1971	0	0	0	0	0	13	9	22	2	0
1972	2	8	0	0	10	18	6	24	2	2
1973	0	0	0	0	0	13	10	23	1	5
1974	2	5	0	1	8	13	2	15	1	5

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