A PRELIMINARY REPORT – THE CALIFORNIA PRAIRIE FALCON NESTING SURVEY, 1971

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Abstract. During the 1971 reproductive season 134 prairie falcon (Falco mexicanus) locations were visited. At 77 locations we were able to evaluate utilization, and at 57 sites we were unable to assess activity. Fifty-eight of the 77 sites supported at least one adult and 19 locations were totally inactive. At 29 locations where nesting attempts were initiated, 21 sites produced 61 young plus 8 eggs from which we were unable to obtain fledgling data. Statewide, we observed 75.3 percent reproductive activity. However, only 36 percent of the active sites were successful, and a resulting 2.29 young per nest were observed. We concluded productivity was below normal for the California population; this judgment was based on the low number of initial nesting attempts and the low number of young per active site. A second year of field observation will be needed to evaluate these trends.

INTRODUCTION

During the spring of 1971 a major effort was made to determine the locations and nesting success of Falco mexicanus, the prairie falcon, in California. The objective of our survey was to locate historical and heretofore unreported nesting locations and to establish the current reproductive status of this raptor. The decline of other raptors, particularly the peregrine falcon (Falco peregrinus), in California prompted this investigation. The prairie falcon inhabited much of the great valley of California from the coast range up through the high Sierras. The deserts of eastern and southern California also provide favorable habitat. This report summarizes the progress of the 1971 survey.

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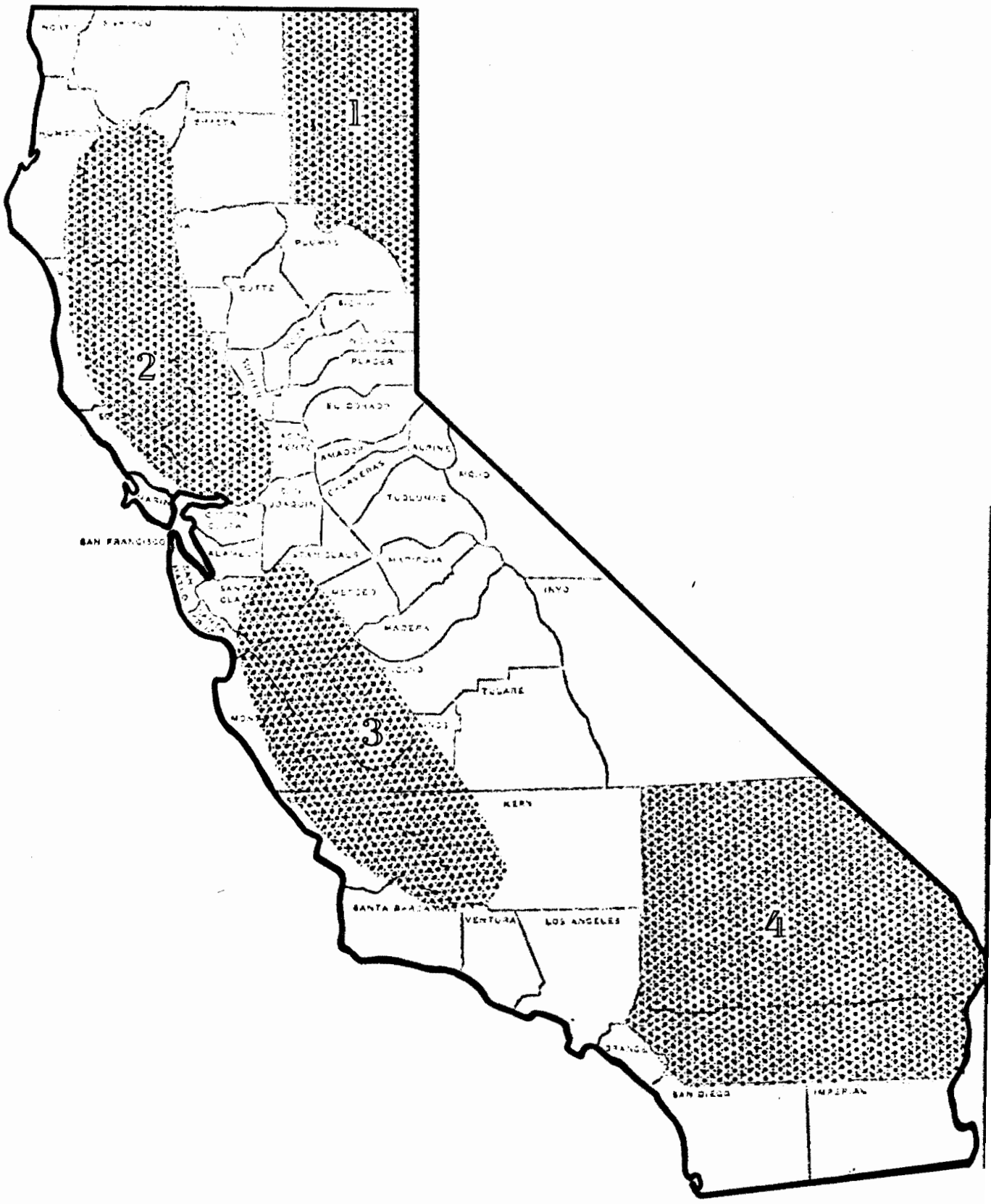

Figure 1. Four cooperative prairie falcon study areas

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MATERIALS AND METHODS

The California prairie falcon survey commenced in mid-January 1971, extending over a period of five months. The most intensive field work, however, occurred between March 15 and June 1. A minimum of 80 field days (1320 man-hours) were expended in travel, observation, and data gathering.

Approximately 11,500 miles were traveled, and 134 prairie falcon nest sites were visited at least once. Seventy-seven sites were visited on two or more occasions, and detailed observations were made at 41 of these sites.

Four study areas were established (Fig. 1). One cooperator per study area conducted preliminary observations on active (defined as having one "territorial" adult falcon present) and inactive nesting sites. All reported locations in regions one, two, and four were visited by the authors. Area three was for the most part left in the hands of the cooperator; however, we visited 11 of the 43 historic sites in 1971.

Considerable effort was expended in locating historical prairie falcon sites. In all cases a fixed time search of one hour duration was allowed for each location. If, however, a prairie falcon was observed, an additional one or two hours was spent in an attempt to locate the nesting site. Notes on each site were recorded in field data books or on tape. Observations were made with spotting scopes and binoculars, and, when desirable, photographs were taken. When possible the nest sites were climbed and the contents noted. If the nesting site was not climbed, the location was revisited to ascertain the number of young fledged. Prey items were collected as were addled eggs or shell fragments. Addled eggs and prey items were refrigerated until processed and then frozen (-17°C) to await further analysis.

Supplemental to field data, approximately 2000 raptor survey letters were distributed to State and Federal agencies, falconers and bird-watchers. From these groups it was anticipated that an exchange of data and cooperation would be realized and be particularly valuable in the second year of study. However, only a brief analysis of historical and current reproductive activity will be discussed.

RESULTS AND DISCUSSION

A summary of the current data available for 50 "Northern" (Fig. 2) nesting locations is tabulated in Table 1. These data are of territories where historical activity of nesting was documented.

Eleven of the 50 locations were active in 1969. Fifteen young were produced at five sites, and no production data were available for the remaining six locations. For the 1970 season we obtained reports for 11 active sites, six of which produced young. Complete data were available at four sites where a total of 16 young were produced; four or five additional young were suspected on the basis of available reports.

In 1971, 30 locations were visited on two or more occasions. Twenty-eight locations were active, and two locations were unoccupied. A total of 24 young were observed at eight locations, and at three other locations eggs were observed. Confirmation of fledglings at these three sites was not possible. From our data 93 percent of the observed locations in 1971 were active, but only 39 percent of the active sites produced young. These locations produced 2.15 young per site (Table 4).

Central California has a rich history of nesting prairie falcons. The data (Table 2) for the 1969 and 1970 seasons are not complete, and a full evaluation is not possible at this writing.

During 1971, 18 young were observed at eight locations, and 11 nesting attempts were observed at 31 of the 50 historic sites. For this region 13 abandonments were recorded, the highest incidence of the three areas. Eighteen locations, with one or both adults, were observed in various stages of reproductive activity. Two locations, C20 and C24, supported single adults. Interestingly, eight abandoned locations contained nesting

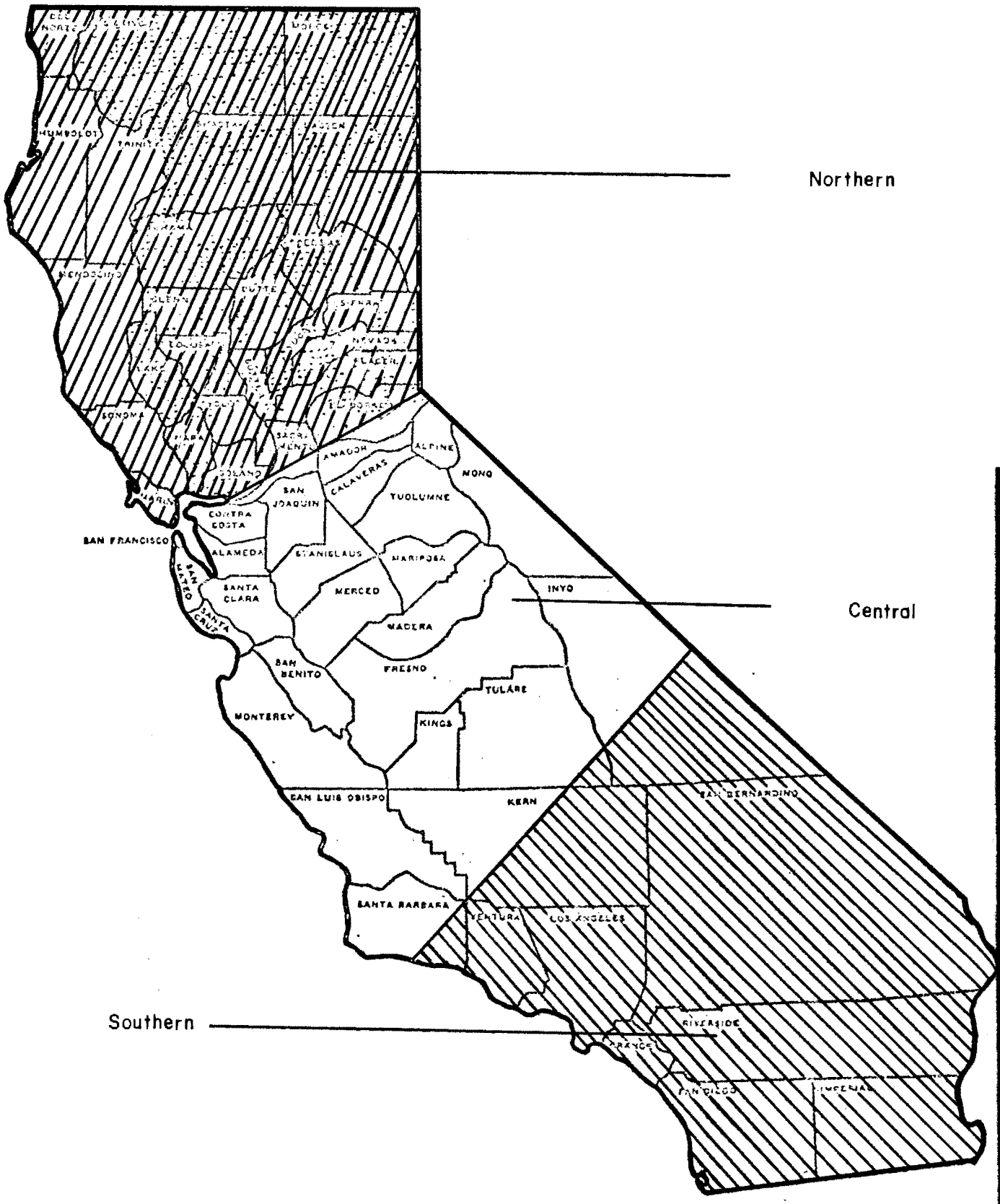

Figure 2. The three California prairie falcon survey regions

ravens (Corvus corax). No detailed historical data has been gathered on seven of these sites; however, one location, C40, produced four young falcons in 1970. From Table 4 the most reliable young/site ratio was 2.04, the lowest of the three areas.

Data for 34 nest sites observed in southern California are summarized in Table 3. Records for this region are relatively complete for 1970 and 1971, but information concerning nesting activity in 1969 was meager, although eight sites were reported active and five of these produced 11 young. During 1970, 17 sites were active; while nine of these sites were confirmed to have had eggs, seven locations produced a total of 20 young. In 1971, 12 locations were active, seven sites with eggs and five sites with 19 young.

The total number of known active sites have decreased from 17 to 12 between 1970 and 1971. This is a 15 percent reduction in active territories. The total number of young produced during the past two years has remained the same. This situation is explicable in that increased production per nest occurred during the 1971 season. More precisely, birds which were allowed to complete the nesting cycle produced good numbers of young. Unfortunately a great deal of human intervention occurs in this region and has contributed to the reduction of known active sites. It is interesting to note that only three of the locations which produced birds in 1970 produced young in 1971.

The 1971 nesting season was quite irregular in California. The usual egg laying, hatching, and fledgling sequence was not south to north as usually occurs. "Odd" weather patterns produced unseasonable storms locally and in general contributed to a disrupted reproductive season.

Statewide, 75.3 percent of the evaluated nesting territories were active during 1971 and 52.96 percent of the initial nesting attempts produced eggs. Thirty-six percent of these sites produced an average 2.29 young/site (Table 4). Fledgling success was not available for all locations, and production was slightly lower than we indicated in Table 4.

From these data we conclude the 1971 production was below expectation. In fact, single adults were observed at 13 locations and at one site egg eating occurred. Thus, approximately 25 percent of the nesting prairies exhibited symptoms described by Radcliffe (Nature, 215:208, 1967)--the peregrine syndrome. Radcliffe observed a high frequency of adult absences, often the male, at the nest site. This observation was preceded by aberrant behavior patterns such as egg breakage or egg eating followed by total desertion of the nesting location. Despite these negative aspects of the data, it is clear that those prairies which produced young in 1971 did rather well and on the average produced 3.04 young/site. We feel that the population dynamics of the species has yet to be clarified and at this time we do not have sufficient data to determine if we are witness to the terminal phases of local extinction; the final stages in the decline of the prairie falcon over parts of its range; or the beginning of a population recovery. Thus, considering the above data and its possible ramifications we believe a second year of field work is critical in order to evaluate the population status of the prairie falcon.

Table 1. Data on prairie falcons for Northern California 1969-71

Identity	1969		1970		1971		Misc.
	Active	Egg/Young	Active	Egg/Young	Active	Egg/Young	
N 1	+	o	+	-/-	+	-/-	
N 2	o	o	+	o	+	-/-	
N 3	o	o	o	o	+	o	♂ 1971
N 4	o	o	o	o	o	o	
N 5	o	o	o	o	o	o	
N 6	o	o	o	o	+	o	single adult, 1971
N 7	o	o	o	o	o	o	
N 8	o	o	+	o	+	o	single adult, 1971
N 9	o	o	o	o	o	o	
N 10	o	o	o	o	+	o	single adult, 1971
N 11	o	o	o	o	+	o	♀ 1971
N 12	o	o	o	o	o	o	
N 13	o	o	o	o	o	o	
N 14	+	o	o	o	++	-/2	
N 15	o	o	o	o	o	o	
N 16	+	o	+	o	++	-/4	
N 17	o	o	++	-/1+	-	-	
N 18	o	o	o	o	o	o	
N 19	+	o	+	o	++	-/3+	
N 20	o	o	o	o	++	-/3	
N 21	o	o	o	o	o	o	
N 22	o	o	o	o	o	o	
N 23	+	o	o	o	o	o	
N 24	o	o	o	o	o	o	
N 25	++	6/4	++	5/5	++	5/5	
N 26	++	-/4	++	4/4	+	-/-	♂ 1971
N 27	o	o	o	o	o	o	
N 28	o	o	o	o	o	o	
N 29	++	3/3	++	3/3	++	1/3+	
N 30	++	3/3	o	o	+	3/o	
N 31	o	o	o	o	o	o	
N 32	o	o	++	3/3	+	-/-	
N 33	o	o	o	o	++	-/+	
N 34	o	o	o	o	o	o	
N 35	++	5*/1	++	-/+	+	o	*thin shell
N 36	+	o	o	o	-	-	
N 37	o	o	o	o	++	-/1+	
N 38	o	o	o	o	+	o	on eggs 1971
N 39	o	o	o	o	o	o	
N 40	o	o	o	o	+	o	
N 41	o	o	o	o	+	o	
N 42	o	o	o	o	++*	-/3	*♀with bell
N 43	o	o	o	o	o	o	
N 44	o	o	o	o	+	o	
N 45	o	o	o	o	+	o	
N 46	o	o	o	o	o	o	
N 47	o	o	o	o	++	5/o	
N 48	o	o	o	o	+	o	
N 49	o	o	o	o	o	o	
N 50	o	o	o	o	+	o	single adult, 1971

(+) one or more adult birds observed
(++) young observed
(o) data not evaluated or incomplete
(-) confirmed negative observations, i.e. not active, not available, etc.

Table 2. Data on prairie falcons for central California, 1969-71

Identity	1969		1970		1971		Misc
	Active	Egg/Young	Active	Egg/Young	Active	Egg/Young	
C 1	o	o	o	o	+	o	
C 2	o	o	o	o	+	o	
C 3	o	o	o	o	+	o	
C 4	+	o	+	o	o	o	
C 5	o	o	o	o	+	+/o	
C 6	o	o	o	o	++	o/2	
C 7	o	o	++	o/2	+	4*/o	parents ate eggs
C 8	o	o	o	o	o	o	
C 9	o	o	o	o	o	o	
C 10	o	o	o	o	o	o	
C 11	o	o	++	o/4	++	-/3	
C 12	o	o	o	o	-	-	
C 13	o	o	o	o	o	o	
C 14	o	o	++	o/3	o	o	
C 15	o	o	o	o	o	o	
C 16							
C 17	o	o	o	o	-	-	
C 18	o	o	o	o	-	-	
C 19	o	o	o	o	-	-	
C 20	o	o	o	o	+	o	single adult
C 21	o	o	o	o	o	o	
C 22	o	o	o	o	o	o	
C 23	o	o	o	o	o	o	ravens, 1971
C 24	o	o	o	o	+	o	♂ 1971
C 25	o	o	o	o	o	o	ravens, 1971
C 26	o	o	o	o	-	-	ravens,1971
C 27	+	o	o	o	-	-	
C 28	o	o	o	o	++	-/1	
C 29	o	o	o	o	++	-/3	
C 30	o	o	+	o	-	-	♀ 1970
C 31	o	o	o	o	o	o	
C 32	o	o	o	o	++	-/3	
C 33	o	o	o	o	++	-/2	
C 34	o	o	o	o	-	-	ravens,1971
C 35	o	o	o	o	-	-	ravens,1971
C 36	o	o	o	o	-	-	ravens,1971
C 37	o	o	o	o	+	o	
C 38	o	o	o	o	++	-/ 1	
C 39	o	o	o	o	++	-/+3	
C 40	o	o	++	-/4	-	-	ravens,1971
C 41	o	o	o	o	-	-	ravens,1971
C 42	+	+/o	-	-	-	-	
C 43	o	o	+	o	o	o	
C 44	o	o	o	o	o	o	
C 45	o	o	o	o	o	o	
C 46	o	o	o	o	o	o	
C 47	o	o	o	o	o	o	
C 48	o	o	o	o	o	o	
C 49	o	o	++	-/+	++	+/+	
C 50	o	o	o	o	+	o	

(+) one or more adult birds observed
(++) young observed
(o) data not evaluated or incomplete
(-) confirmed negative observations, i.e. not active, not available, etc.

Table 3. Data on prairie falcons for southern California, 1969-71

Identity	1969		1970		1971		Misc
	Active	Egg/Young	Active	Egg/Young	Active	Egg/Young	
S 1	+	o	+	5/-	o	o	
S 2	o	o	o	o	+	o	
S 3	o	o	++	-/2	o	o	
S 4	o	o	o	o	o	o	
S 5	o	o	+	o	o	o	
S 6	o	o	++	3/3	+	o	
S 7	+	o	+	o	+	o	
S 8	o	o	o	o	o	o	
S 9	o	o	o	o	o	o	
S 10	o	o	+	o	o	o	
S 11	-	-	-	-	+	o	red tail & horne owl 1969-70
S 12	o	o	o	o	+	o	
S 13	o	o	o	o	o	o	
S 14	o	o	+	o	o	o	
S 15	++	5/5	o	o	++	-/4	
S 16	o	o	o	o	o	o	
S 17	o	o	o	o	-	-	
S 18	o	o	o	o	o	o	
S 19	o	o	o	o	o	o	
S 20	o	o	++	4/4	++	5/6	
S 21	o	o	+	o	+	1/o	♂ 1971 egg addled, 1971
S 22	o	o	o	o	o	o	
S 23	+	3/-	++	3/3	++	4/3	
S 24	o	o	+	3/o	-	-	
S 25	o	o	o	o	o	o	
S 26	o	o	o	o	o	o	
S 27	o	o	o	o	o	o	
S 28	o	o	+	o	++	-/4	
S 29	o	o	o	o	o	o	
S 30	+	o	++	-/4	o	o	
S 31	++	-/3	++	4/1	++	-/3	
S 32	++	-/1	++	4/3	+	4/o	nest destroyed 1971
S 33	++	5/2	+	o	-	-	♂ shot 1970
S 34	o	o	+	o	-	-	

(+) one or more adult birds observed
(++) young observed
(o) data not evaluated or incomplete
(-) confirmed negative observations, i.e. not active, not available, etc.

Table 4. Summary of 1971 prairie falcon nesting survey

	No. Calif.	Cent. Calif.	So. Calif.	Total Calif.	
s/o x100	93.2%	58.0%	75.0%	75.3%	observed activity
a/s x100	39.4%	61.2%	58.3%	52.96%	successful initial attempts
(a/s x100)-100	60.6%	20.8%	41.7%	47.04%	failure
y/s x100	28.6%	44.5%	41.6%	36.2%	% active site which produced young
y+5*/o x100	----	----	----	33.6%	*y+5: five highly suspected.....
#young/#eggs x100	73.8%	----	78.3%	----	for all years available, 1969, 1970, 1971
H/s	0.86	1.00	1.58	1.05	least reliable
H/a	2.15	2.04	2.71	2.29	most reliable
H/y	3.00	2.25	3.80	3.04	

(a) = Nesting attempts
(o) = Sites observed
(s) = Active sites
(y) = Sites with young
(H) = Number of hatchlings observed