

JOB PROGRESS REPORT

State: California

Cooperators: U. S. Forest Service

Project No.: W-54-R-4 Project Title: Special Wildlife Investigations

Job No.: III-6 Job Title: Raptor Survey

Period Covered: July 1, 1971 to June 30, 1972

SUMMARY:

A Raptor Survey, initiated in December 1970, involves reporting four times a year all raptor species and numbers observed along permanently established survey routes throughout the state. Fifty-four routes were originally established in areas where raptors concentrate either in winter or during the breeding season. Fifty-three routes were surveyed during 1971-72 resulting in a report of 9,518 raptor sightings of 17 species. The 1970-71 survey reported a closely comparable 9,662 sightings of 19 species. Sightings of California condor and goshawk were not reported this year. Sightings this year averaged 105.0 birds per 100 miles which compares closely with 106.3 birds during the 1970-71 count.

Four hundred and sixty-seven eyries were inventoried during this period compared to 426 in 1971 and 283 in 1970. A bald eagle study was initiated to more fully determine its breeding status in California. Of 60 bald eagle eyries, 21 were known to be active in 1972. Three active peregrine falcon eyries were reported in 1972. Due to completion of the Department's osprey research in 1972, a substantial reduction in successful eyries was reported.

BACKGROUND:

The objectives of the Raptor Survey and Raptor Eyrie Inventory are to establish population trends and determine seasonal distribution of selected raptor species. The numbers can never be used as absolute population data. They merely provide a comparative index used in the formulation of trends.

PROCEDURES:

Raptor Survey

Raptor survey routes were established by regional personnel in areas of high raptor concentrations. Most of the routes were run in December, January, March and May. Attached are the directions for running routes and recording sightings on Form FG 887. A trinomial numbering system was established for identifying routes.

Raptor Eyrie Inventory

An inventory of eyries for eight species of raptors was compiled. These were

species whose present reproductive status is largely unknown. Regional personnel were instructed to report eyrie locations and to make observations during nesting season. Other agencies were requested to contribute to the inventory. The U. S. Forest Service, in particular, was asked to report the eyries on National Forest Service lands in California. All eyrie locations were to be recorded on a nesting survey Form FG-882 (attached), and submitted to Sacramento for data processing. A numbering system similar to that used for Raptor Surveys was also used for eyries.

FINDINGS:

Raptor Survey

Fifty-three routes were counted in areas where raptors concentrate in the winter and during breeding season. Two routes (R5-19-02 and R5-33-01) were not counted. One new route (R5-37-01) was added during 1971-72 and on five routes, seven counts were not made. Table 1 identifies the survey routes. Figure 1 shows their general location and geographical areas. Raptor sightings for the five regions are summarized in Table 2, which shows the number of birds observed of each species. Table 3 shows the number of birds per 100 miles.

In December and January the most common species in order of abundance were the red-tailed hawk, sparrow hawk, and turkey vulture. These three species were also the most abundant last year. During March and May, turkey vultures, red-tailed hawks and sparrow hawks occurred in that order of abundance and in the same order of abundance as in 1970-71. Sparrow hawk counts dropped by 319 while red-tailed hawks increased by 416. Fluctuations such as this are believed to be normal and should be expected. However, a continued year-to-year decline of a species could be a warning signal and would warrant more in-depth investigation.

A total of 9,067 miles were covered for the four months the survey was conducted. Of the 9,518 raptors reported, red-tailed hawk (30.0 percent), turkey vulture (28.3 percent), sparrow hawk (21.8 percent), marsh hawk (5.3 percent), and white-tailed kite (2.5 percent) were the most frequently reported. These five species made up 87.9 percent of all raptors sighted and compare closely with the 1971 figure of 86.7 percent. Twelve other species constituted 7.3 percent of the raptors reported, and 4.8 percent were unidentified. The slight decrease in number of unidentified species from last year's 5.6 percent suggests that field personnel are increasing their competence in raptor identification.

Numbers of birds observed "per 100 miles travelled" increased over last year in December and January, but decreased slightly in March and May. Figures for May 1971, and May 1972 were 90.0 and 78.5 percent, respectively, probably reflecting variations in survey procedure and raptor dispersal.

The summary of sightings and birds per 100 miles (Table 3) closely parallel similar data compiled for the 1970-71 period. This comparison reveals a relative degree of stability in raptor populations. There is also evidence of consistency in the overall survey method from year to year. Variations in population numbers are probably a result of changing weather patterns,

shift in raptor populations and survey procedures. Hard-and-fast conclusions are difficult to deduce from such limited data.

Tables 4 and 5 summarize the sightings and birds per 100 miles by geographical regions. Survey data indicates the Sacramento Valley-Delta area is a principal raptor wintering area in California, followed by the North Coast, San Joaquin and Antelope Valleys and South Coast geographical regions. Survey data indicates the North Coast area is the principal breeding area, followed by Sacramento Valley-Delta, South Coast and San Joaquin and Antelope Valleys geographical areas. These data reflect the raptor use for the habitat along raptor survey routes and raptor population can not be determined from these data for the geographical areas as a whole. However, data is similar to 1970-71 survey results and as additional survey data is obtained comprehensive evaluations will be made.

Eyrie Inventory

In order to gather information on the reproduction of some of the less-common raptors, a program involving a sample check of eyries during the breeding season was undertaken. An inventory of eyrie locations of eight species was originally compiled by the Department's regional personnel, U. S. Forest Service, and others. Species included in the eyrie inventory were red-shouldered hawk, Swainson's hawk, golden eagle, bald eagle, osprey, peregrine falcon, prairie falcon, and goshawk.

Table 6 summarizes the 1970 to 1972 eyries by region. Four hundred and sixty-seven eyries were inventoried during this period compared to 426 in 1971 and 283 in 1970. This year's total is the highest count yet in spite of the fact that 67 eyries were deleted from the list because of abandonment, destruction or disappearance. The increase in eyries can not be interpreted as an increase in nesting activity. It reflects an intensified effort of field personnel and cooperative agencies in reporting newly discovered eyries.

Eyrie inventory has supplied a repository of eyrie information for a selected group of raptors. Inventory is not complete, but available information is being used to provide protection to many eyries by cooperating agencies for many threatened species.

Table 7 summarizes available active eyrie data for 1970 to 1972, for golden eagle, bald eagle, osprey and peregrine falcon.

During the 1972 breeding season additional effort was devoted to more fully understand the status of bald eagles in California. Of 60 eyries in the Department's inventory files, 21 were found to be active, 19 were inactive, the status of three undetermined and 17 were deleted because eyries were destroyed, never located, were sightings of birds only or were erroneous reports. Of the 21 inactive eyries 11 were found to be alternate nest sites for birds actively nesting in the area, two were not used because of human disturbance near the nest and eight were inactive for unknown reasons. Of the three eyries on which the status was undetermined two were never checked and one could not be located in 1972.

Twenty-one bald eagle eyries were known to be active because adults and/or young were observed at the nest during the breeding season. No effort was made to determine clutch size or hatching success. Of these 21 eyries, 11 were visited late during the nesting season by Department or cooperating agency personnel. Thirteen young were counted for an average of 1.2 young for 11 active nests. Limited time and shift in work assignments prevented a check of other active eyries. A comprehensive bald eagle study will be conducted during the 1973 breeding season. Objectives are to determine: (1) If the three-year average (1970-72) of 1.5 young per reported active nest is a realistic figure; (2) Nesting requirements; and, (3) Factors threatening the continued survival of the species.

Success of three active peregrine falcon eyries found in California is as follows: (1) Newly reported peregrine eyrie fledged three young in 1972; (2) Three eyases were taken from the Morro Rock eyrie and never recovered; and, (3) Success of the third eyrie was never determined.

Upon completion of the osprey study in Lassen and Plumas Counties in 1971, intensive effort to determine clutch and fledging success was reduced. This accounts for a reduction in reproduction data on osprey in Table 7.

RECOMMENDATIONS:

1. Complete study on the breeding status of bald eagles in California.
2. Discontinue the raptor eyrie inventory and develop an eyrie sampling program to evaluate breeding success.
3. Discontinue the December raptor survey count.
4. Review existing survey procedures to determine the validity of survey counts being scheduled to account for geographical differences in raptor movement and nesting.

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TABLE 1

Raptor Survey Routes - 1971-72

Route Name	County	Route No.
Region I		
Garberville-Bridgeville	Humboldt	R1-12-01
Litchfield-Nevada Line	Lassen	R1-18-01
Warm Springs Valley	Modoc	R1-25-01
Redding-Platina	Shasta	R1-45-01
Lower Klamath-Butte Valley	Siskiyou	R1-47-01
Engle Lake	Trinity	R1-53-01
	Total -- 6 routes	
Region II		
Sacramento River	Butte, Glenn & Tehama	R2-4-01
Calaveras-Stanislaus	Calaveras & Stanislaus	R2-5-01
Colusa	Colusa	R2-6-01
El Dorado	El Dorado	R2-9-01
Sierra Valley	Plumas & Sierra	R2-32-01
White Rock	Sacramento	R2-34-01
Bradford-Jersey Island	Sacramento	R2-34-02
Sutter-Natomas	Sutter	R2-51-01
North Yolo	Yolo	R2-57-01
	Total -- 9 routes	
Region III		
Lake County	Lake	R3-17-01
Bodega Bay-Stafford Lake	Marin & Sonoma	R3-21-01
Coast Highway #1	Mendocino	R3-23-01
Longvale-Covelo	Mendocino	R3-23-02
King City-San Antonio Res.	Monterey	R3-27-01
King City-Santa Ana Valley	Monterey	R3-27-02
Napa-Lake Berryessa	Napa	R3-28-01
San Juan Valley	San Luis Obispo	R3-40-01
Paso Robles-Laguna Lake	San Luis Obispo	R3-40-02
Mt. Hamilton-Livermore	Santa Clara & Alameda	R3-43-01
Santa Cruz-Pescadero Marsh	Santa Cruz	R3-44-01
Grizzly Island	Solano	R3-48-01
Laguna de Santa Rosa-Sulphur Creek	Sonoma	R3-49-01
	Total -- 13 routes	

TABLE 1 (Contd.)

Raptor Survey Routes - 1971-72

Route Name	County	Route No.
Region IV		
Kings Wildlife Unit	Fresno	R4-10-01
Los Banos Wildlife Unit	Fresno	R4-10-02
Tehachapi Wildlife Unit	Kern	R4-15-01
Avernal Wildlife Unit	Kings-Kern	R4-16-01
Madera Wildlife Unit #1	Madera	R4-20-01
Madera Wildlife Unit #2	Madera	R4-20-02
Turlock Wildlife Unit	Merced	R4-24-01
Ridgecrest Wildlife Unit	San Bernardino-Inyo	R4-36-01
Sequoia Wildlife Unit	Tulare	R4-54-01
Sonora Wildlife Unit	Tuolumne-Mariposa	R4-55-01
	Total -- 10 Routes	
Region V		
Coachella Canal	Imperial	R5-13-01
Colorado River Wildlife Unit	Imperial	R5-13-02
Imperial Wildlife Area	Imperial	R5-13-03
Pleasant Valley-Big Pine	Inyo	R5-14-01
Palmdale-Gorman	Los Angeles	R5-19-01
Palmdale-Lancaster	Los Angeles and Kern	R5-19-02*
North Mono	Mono	R5-26-01
Lake Mathews	Riverside	R5-33-01*
Palo Verde Valley	Riverside	R5-33-02
San Jacinto Unit	Riverside	R5-33-03
Chemehuevi Valley-Essex	San Bernardino	R5-36-01
Topock Gorge	San Bernardino	R5-36-02
New York-Providence Mt.	San Bernardino	R5-36-03
Camp Pendleton	San Diego	R5-37-01
New Cuyama-Santa Maria	Santa Barbara	R5-42-01
Lompoc-Santa Ynez Valley	Santa Barbara	R5-42-02
Orcutt-Vandenberg	Santa Barbara	R5-42-03
	Total -- 15 Routes	
	State Total -- 53 Routes	

*Not counted in 1972.

Figure 1.
Location of Raptor Survey Routes and
Geographical Areas, 1971-72

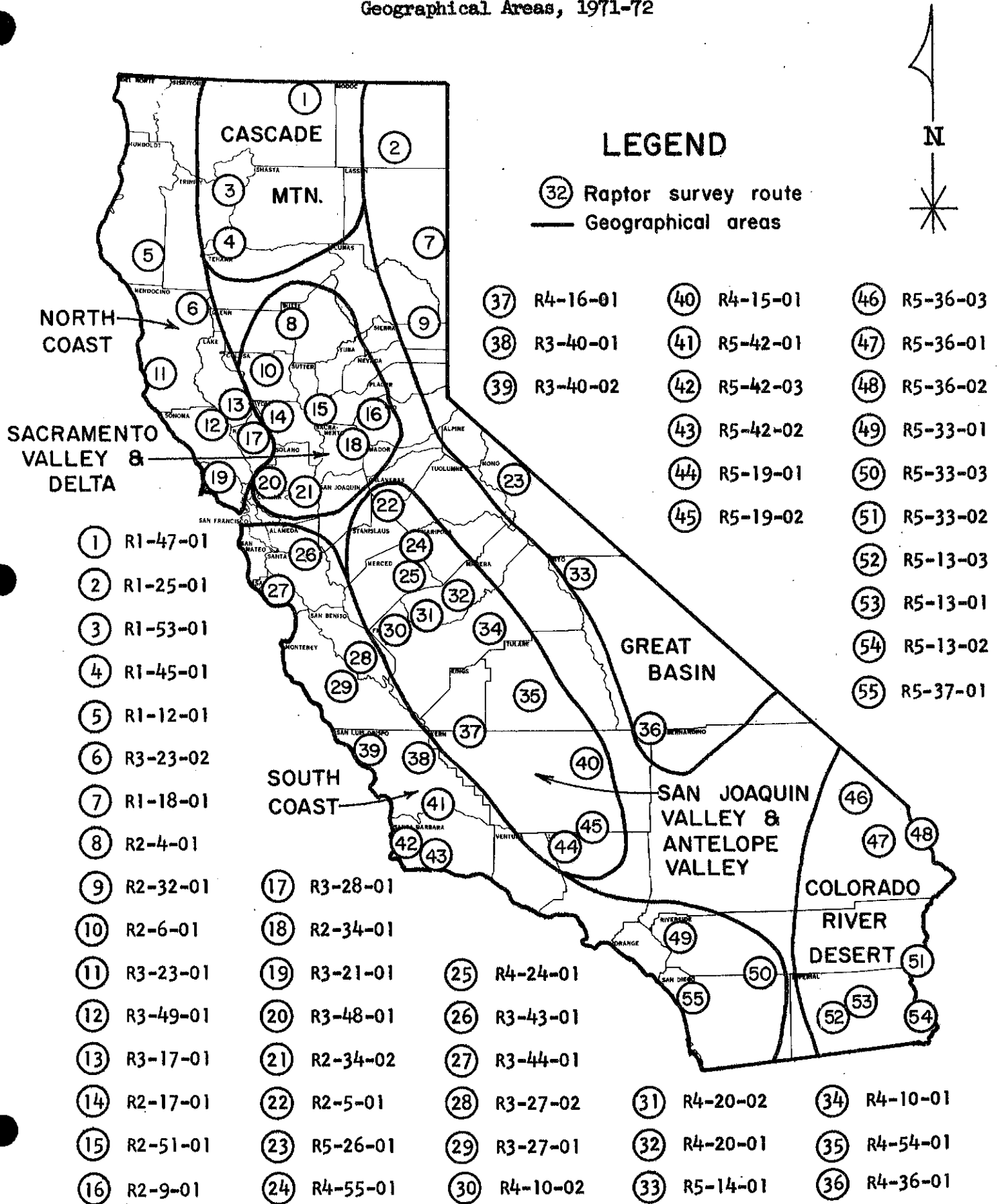


TABLE 2
Raptor Survey, Sightings Summarized by Region
1971-72

REGION	NO. OF ROUTES	MONTH	MILES	TURKEY VULTURE	CALIF. CONDOR	GOLDEN EAGLE	BALE EAGLE	OSPREY	RED-TAILED HAWK	RED-SHULDERED HAWK	SHAWNSON'S HAWK	ROUGH-LEGGED HAWK	FERRUGINOUS MARSH HAWK	GOSHAWK	COOPER'S HAWK	SHARP-SHOULDERED HAWK	WHITE-TAILED KITE	PEREGRINE FALCON	PRATERIE FALCON	PIGEON HAWK	SPARROW HAWK	UNKNOWN	TOTAL		
1	6	Dec.	238.8	2	--	25	14	--	47	--	--	19	1	24	--	--	--	--	4	--	--	16	36	189	
		Jan.	236.8	--	--	12	6	--	57	--	--	42	2	20	--	--	--	--	7	1	--	14	46	209	
		March	236.8	35	--	5	6	--	49	--	--	33	--	5	--	--	--	--	1	1	--	14	35	185	
		May	203.0	37	--	3	26	--	42	--	1	--	94	3	10	--	--	--	--	2	14	--	50	4	105
		Total	913.4	74	--	45	76	--	155	--	1	--	94	3	39	--	--	--	--	14	14	--	50	171	686
		May	272.3	82	--	6	1	--	135	--	7	3	25	1	29	--	--	--	--	2	2	--	117	21	429
2	9	Dec.	283.1	85	--	2	--	--	129	1	3	25	2	33	--	--	12	--	2	--	--	117	21	429	
		Jan.	354.1	75	--	2	--	--	158	6	5	25	2	33	--	1	34	--	2	--	--	190	20	556	
		March	320.1	186	--	2	1	--	130	--	--	9	--	29	--	--	27	--	--	1	--	51	23	462	
		May	272.3	82	--	6	1	--	130	--	1	9	3	1	1	--	16	--	--	4	--	25	2	158	
		Total	1229.6	428	--	6	1	--	448	7	9	9	9	3	92	--	8	89	--	4	--	58	66	1,605	
		May	600.8	346	--	25	2	--	314	1	--	3	3	3	54	--	4	8	--	5	--	--	257	23	1,050
3	13	Dec.	600.8	270	--	17	2	--	347	6	--	2	5	38	--	6	22	--	5	--	--	245	20	990	
		Jan.	600.8	521	--	11	--	--	300	10	3	2	1	36	--	11	4	--	1	--	--	170	37	1,107	
		March	600.8	640	--	13	--	8	8	3	--	2	1	12	--	4	4	--	1	--	--	52	29	964	
		May	2405.2	1,777	--	60	2	--	1194	20	--	7	9	180	--	26	14	--	11	--	--	724	109	4,111	
		Total	495.8	32	--	7	2	--	180	2	--	7	2	52	--	6	15	--	--	2	--	--	228	44	987
		May	495.8	126	--	12	3	--	221	1	--	2	7	61	--	15	8	--	--	5	--	210	52	622	
4	10	Dec.	495.8	3	--	14	3	--	143	1	--	5	1	32	--	7	4	--	4	--	1	70	30	446	
		Jan.	495.8	103	--	7	--	1	6	6	--	2	1	32	--	2	4	--	4	--	1	78	18	317	
		March	495.8	264	--	10	3	--	96	3	--	2	1	11	--	2	1	--	1	--	1	86	144	517	
		May	1983.2	264	--	40	3	--	640	10	--	7	10	156	--	30	28	--	1	--	2	586	144	1,872	
		Total	495.8	22	--	7	3	--	180	2	--	7	2	52	--	6	15	--	--	2	--	--	228	44	987
		May	495.8	126	--	12	3	--	221	1	--	2	7	61	--	15	8	--	--	5	--	210	52	622	
5	15	Dec.	641.5	22	--	5	1	--	129	4	--	20	2	34	--	4	34	--	1	--	--	131	4	394	
		Jan.	641.5	7	--	6	3	--	132	4	--	2	1	10	--	3	28	--	1	--	--	108	4	310	
		March	641.5	56	--	8	7	--	105	1	2	1	--	10	--	3	10	--	--	--	--	65	4	273	
		May	607.1	70	--	1	11	--	57	2	--	1	3	34	--	1	7	--	1	--	--	27	2	167	
		Total	2531.6	155	--	20	11	--	421	10	--	7	25	94	--	11	79	--	2	3	--	331	14	1,144	
		May	2531.6	155	--	20	11	--	421	10	--	7	25	94	--	11	79	--	2	3	--	331	14	1,144	
ALL REGIONS	51	Dec.	2260.0	487	--	64	15	--	799	6	5	82	9	193	--	17	69	--	14	--	--	749	128	2,649	
		Jan.	2331.0	355	--	49	14	--	915	17	7	89	17	162	--	23	92	--	20	--	3	767	142	2,687	
		March	2297.9	924	--	40	14	2	725	12	8	50	2	112	--	21	45	--	6	--	2	370	129	2,471	
		May	2279.3	912	--	24	13	8	419	4	4	34	3	34	--	7	55	--	3	--	1	188	95	1,711	
		Total	9867.2	2,688	--	177	52	10	2,333	27	22	201	28	301	--	68	240	--	3	53	--	2,074	554	9,518	
		May	9867.2	2,688	--	177	52	10	2,333	27	22	201	28	301	--	68	240	--	3	53	--	2,074	554	9,518	

TABLE 3
Raptor Survey, Birds Per 100 Miles, Summarized by Region 1971-72

REGION	MONTH	TURKEY VULTURE	CALIF. CONDOR	GOLDEN EAGLE	BALD EAGLE	OSPREY	RED-TAILED HAWK	RED-SHOULDERED HAWK	SWAINSON'S HAWK	ROUGH-LEGGED HAWK	FERRUGINOUS HAWK	MARSH HAWK	GOSHAWK	COOPER'S HAWK	SHARP-SHINNED HAWK	WHITE-TAILED KITE	PEREGRINE FALCON	PRAIRIE FALCON	PIGEON HAWK	SPARROW HAWK	UNKNOWN	TOTAL
1	Dec.	.8	--	10.5	5.9	--	19.7	--	--	8.0	.4	10.1	--	--	.4	--	--	1.7	--	6.7	15.1	79.2
	Jan.	--	--	5.0	2.5	--	23.9	--	--	17.6	.8	8.4	--	--	.8	--	--	2.9	.4	5.9	19.3	87.5
	March	14.7	--	2.1	2.5	--	20.5	--	--	13.8	--	2.1	--	--	--	--	--	.4	--	5.9	14.7	76.6
	May	18.2	--	1.5	2.8	--	20.7	--	.5	10.2	--	6.4	--	--	--	--	--	1.0	--	3.0	2.0	51.7
Total	30.1	--	4.5	2.8	--	21.2	--	.5	10.2	10.2	10.2	6.4	--	--	1.7	--	1.5	--	5.4	13.2	74.6	
2	Dec.	30.0	--	.7	--	--	45.6	.4	1.1	8.8	.4	10.2	--	--	.7	4.2	--	.7	--	41.3	7.4	151.5
	Jan.	21.2	--	.6	--	--	44.6	1.7	1.4	7.1	.6	9.3	--	.3	.9	9.6	--	.6	--	53.7	5.7	177.0
	March	58.1	--	.6	.5	--	40.6	--	--	2.8	--	9.1	--	--	.9	8.4	--	--	.3	15.9	7.2	144.5
	May	30.1	--	.5	1.1	--	11.4	.6	.4	4.8	--	7.5	--	.1	.7	5.9	--	--	--	9.2	.7	59.0
Total	98.8	--	2.5	1.1	--	36.4	2.6	.7	4.8	4.8	2.2	7.5	--	2.7	7.2	--	--	2.3	31.2	30.2	5.4	130.5
3	Dec.	57.6	--	4.2	--	--	52.3	.2	--	.5	.5	9.0	--	1.2	.7	1.3	--	.8	--	42.8	3.8	174.8
	Jan.	44.9	--	2.8	.3	--	57.8	1.0	--	.5	.8	6.3	--	.7	1.0	3.7	--	.8	--	40.8	3.3	164.8
	March	86.7	--	1.8	--	--	49.9	1.7	--	.3	.2	6.0	--	1.8	.5	1.7	--	.2	--	28.3	6.2	184.3
	May	106.5	--	2.2	1.1	1.3	32.1	.5	--	--	--	2.0	--	.7	--	1.7	--	--	--	8.7	4.8	160.2
Total	75.9	--	2.8	1.1	1.3	48.0	.8	--	--	--	5.8	--	1.1	.5	1.8	--	--	2.5	30.1	30.1	4.5	171.1
4	Dec.	6.5	--	1.4	--	--	36.3	--	.4	3.0	.4	10.5	--	1.2	.4	3.0	--	.4	--	46.0	8.9	118.4
	Jan.	6	--	2.4	.6	--	44.6	.2	.4	3.6	1.4	12.3	--	3.0	.6	1.6	--	1.0	.2	42.4	10.5	125.5
	March	25.4	--	2.8	--	.2	28.8	.2	1.2	1.0	.2	6.5	--	1.4	.2	.8	--	.8	.2	14.1	6.1	90.0
	May	20.8	--	1.4	--	--	19.4	--	--	--	--	2.2	--	.4	--	2.2	.2	--	--	15.7	3.6	63.9
Total	15.3	--	2.0	.2	1.1	32.3	1.1	.5	1.9	1.9	5.5	7.9	--	1.5	1.4	2.2	2.2	2.6	29.8	7.3	99.4	
5	Dec.	3.4	--	.8	.2	--	20.1	.6	--	3.1	.3	5.3	--	.6	.2	5.3	.3	.2	--	20.4	.6	61.4
	Jan.	1.1	--	.9	.5	--	20.6	.6	--	.3	.2	1.6	--	.5	.2	4.4	--	.2	--	16.8	.6	48.3
	March	8.7	--	1.3	1.1	.2	16.1	.2	.3	.2	--	1.6	--	.5	.3	1.6	--	--	--	10.1	.6	42.6
	May	11.5	--	2.2	--	--	9.4	.4	1.1	1.9	1.1	2.1	--	.2	.2	1.2	1.1	.2	--	4.5	.3	27.5
Total	6.1	--	.8	.4	1.1	16.6	1.4	.7	1.9	1.9	2.1	2.1	--	1.2	3.1	3.1	1.1	1.1	13.1	1.8	45.2	
All Regions	Dec.	21.6	--	2.8	.7	--	35.4	.3	.2	3.6	.4	8.5	--	.8	.4	3.1	.1	.6	--	33.1	5.7	117.2
	Jan.	15.2	--	2.1	--	--	39.3	.3	.3	3.8	.7	7.0	--	1.0	.6	4.0	--	.9	--	32.9	6.1	115.3
	March	40.2	--	1.7	.6	.1	31.6	.5	.4	2.2	.1	4.9	--	.9	.4	2.0	--	.3	.1	16.1	5.6	107.6
	May	42.8	--	1.1	1.1	.4	19.2	.2	.1	2.4	1.1	1.6	--	.3	.7	1.6	.1	.1	--	8.6	2.5	78.5
Total	20.8	--	2.8	1.1	1.1	34.3	1.4	.7	2.4	2.4	3.3	3.3	--	1.7	2.7	2.7	1.1	1.1	22.9	5.0	105.0	

TABLE 4
 Raptor Survey, Sightings Summarized by Geographical Area
 1971-72

AREA	NO. OF ROUTES	MONTH	MILES	TURKEY VULTURE	CALIF. CONDOR	GOLDEN EAGLE	BALD EAGLE	OSPREY	RED- TAILED HAWK	RED- SHOULDERED HAWK	SWAINSON'S HAWK	ROUGH- LEGGED HAWK	FERRUGINOUS HAWK	MARSH HAWK	GOSHAWK	COOPER'S HAWK	SHARP- SHINNED HAWK	WHITE- TAILED KITE	PEREGRINE FALCON	PRAIRIE FALCON	PIGEON HAWK	SPARROW HAWK	UNKNOWN	TOTAL
North Coast	7	Dec.	354.6	264	--	19	--	--	147	1	--	1	2	15	--	3	2	3	--	2	2	143	13	615
	7	Jan.	374.6	184	--	9	2	--	188	6	--	--	2	5	--	3	2	13	--	3	1	150	11	579
	7	March	374.6	419	--	9	2	--	199	9	--	2	1	7	--	5	1	4	--	--	--	108	28	792
	7	May	374.6	545	--	8	2	8	623	18	--	--	3	30	--	14	--	27	--	5	--	25	14	702
Total	7		1378.4	1,510	--	45	2	8	623	18	--	3	30	--	14	--	27	--	5	--	428	66	2,688	
Cascade Mt.	3	Dec.	119.3	2	--	18	14	--	22	--	--	8	1	14	--	--	1	--	--	--	--	6	9	95
	3	Jan.	119.3	--	--	9	4	--	35	--	--	19	2	6	--	--	2	--	--	3	--	4	9	93
	3	March	119.3	18	--	4	4	--	20	--	--	9	--	--	--	--	--	--	--	1	--	11	6	73
	3	May	83.5	2	--	4	4	--	32	--	--	3	--	6	--	--	--	--	--	2	--	3	2	49
Total	3		411.4	22	--	35	22	--	109	--	--	30	3	26	--	--	3	--	2	--	24	26	310	
South Coast	11	Dec.	550.8	84	--	10	--	--	277	4	--	--	2	22	--	7	2	35	--	3	--	215	13	674
	11	Jan.	550.8	87	--	9	3	--	265	4	--	2	4	9	--	2	4	29	--	2	--	178	13	611
	11	March	550.8	148	--	9	7	--	196	2	2	--	4	10	--	8	4	10	--	1	--	105	11	513
	11	May	550.8	152	--	6	10	--	153	2	2	--	2	41	--	19	10	7	--	6	--	47	16	384
Total	11		2203.2	471	--	34	10	--	891	11	--	2	6	41	--	19	10	81	--	6	--	545	53	2,182
Sacramento Valley-Delta	6	Dec.	200.3	85	--	1	--	--	107	1	3	5	1	53	--	--	2	16	--	--	--	114	16	406
	8	Jan.	271.3	75	--	--	--	--	140	6	5	14	2	60	--	--	3	42	--	--	--	180	16	545
	7	March	237.3	166	--	--	--	--	107	--	--	2	2	53	--	1	2	27	--	--	1	46	18	423
	6	May	189.5	56	--	1	--	--	11	--	8	21	3	10	--	2	7	19	--	3	--	18	2	116
Total	8		898.4	382	--	1	--	--	365	7	8	21	3	176	--	2	7	104	--	3	--	358	52	1,490
San Joaquin and Antelope Valleys	11	Dec.	551.1	32	--	8	3	--	201	--	2	17	2	56	--	6	3	15	--	3	--	234	47	625
	11	Jan.	551.1	3	--	14	3	--	241	--	2	21	7	61	--	14	3	8	--	5	--	225	57	666
	11	March	551.1	149	--	14	4	1	169	1	6	8	1	35	--	7	2	4	--	2	1	75	35	508
	11	May	551.1	113	--	7	3	--	114	1	10	46	10	161	--	29	7	1	--	1	2	81	18	349
Total	11		2283.4	297	--	43	3	1	725	3	10	46	10	161	--	29	7	28	--	10	2	615	157	2,188
Great Basin	6	Dec.	235.2	--	--	6	2	--	32	--	--	31	--	19	--	1	--	--	--	4	--	3	30	146
	6	Jan.	235.2	--	--	6	2	--	36	--	--	33	--	18	--	2	--	--	--	6	--	5	36	145
	5	March	235.2	--	--	3	3	--	24	--	2	29	--	7	--	--	--	--	--	2	--	8	27	103
	6	May	198.8	33	--	15	5	--	114	--	2	113	--	4	--	3	--	--	--	12	--	9	9	65
Total	6		898.4	33	--	15	5	--	106	--	2	113	--	48	--	3	--	--	12	--	25	96	499	
Colorado River Desert	7	Dec.	270.7	20	--	2	1	--	13	--	--	--	1	14	--	--	1	--	2	--	--	34	--	88
	7	Jan.	270.7	6	--	2	2	--	10	--	--	--	--	3	--	1	1	--	--	--	--	25	--	48
	7	March	270.7	24	--	1	--	1	10	--	--	--	--	2	--	--	--	--	--	--	--	17	4	59
	7	May	270.7	33	--	1	1	--	6	--	--	--	--	19	--	--	--	--	--	1	--	5	--	46
Total	7		1082.8	83	--	6	1	--	39	--	--	--	19	--	--	--	2	--	2	--	81	--	241	
GRAND TOTAL	53		9067.0	2,698	--	177	43	10	2,858	39	22	221	28	501	--	68	34	240	3	43	5	2,074	454	9,518

TABLE 5
Raptor Survey, Birds Per 100 Miles, Summarized by Geographical Area, 1971-72

AREA	NO. OF ROUTES	MONTH	TURKEY VULTURE	CALIF. CONDOR	GOLDEN EAGLE	BALD EAGLE	OSPREY	RED-TAILED HOODED HAWK	REP-SHOULDERED HAWK	SWAINSON'S HAWK	ROUGH-LEGGED HAWK	FERRUGINOUS HAWK	MARSH HAWK	GOSHAWK	COOPER'S HAWK	SHARP-SHINNED HAWK	WHITE-TAILED KITE	PEREGRINE FALCON	PRAIRIE FALCON	PIGEON HAWK	SPARROW HAWK	UNKNOWN	TOTAL	
																								78.9
North Coast	7	Dec.	78.9	5.7	15.1	11.7	18.4	43.9	3	6	4.5	4	11.7	6.7	1.7	8	9	6	9	2.5	6	42.7	3.9	185.8
	7	Jan.	55.0	2.7	2.7	3.4	29.3	1.8	1.8	1.5	15.9	1.7	5.0	15.9	1.7	1.7	3.9	3.9	2.5	3	44.8	3.3	175.0	
	7	March	125.2	2.7	3.4	3.4	16.8	2.7	2.7	2.1	7.5	7.5	7.2	7.5	7.5	7.5	1.2	1.2	8	9	32.3	8.4	236.7	
	7	May	162.3	2.4	2.4	5.0	28.5	2.6	6	2.9	2.2	8.2	7.2	5.9	7.2	7.2	2.0	2.0	4	4	7.5	4.2	209.8	
Total	7		105.4	3.4	7.5	5.0	46.6	1.5	1.5	2.2	2.2	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	31.8	4.9	200.8	
Cascade Mountains	3	Dec.	1.7	15.1	11.7	18.4	18.4	18.4	18.4	18.4	18.4	18.4	18.4	18.4	18.4	18.4	18.4	18.4	18.4	18.4	18.4	18.4	18.4	79.6
	3	Jan.	15.1	2.5	2.5	3.4	29.3	1.8	1.8	1.5	15.9	1.7	5.0	15.9	1.7	1.7	3.9	3.9	2.5	3	3.4	7.5	78.0	
	3	March	15.1	3.4	3.4	3.4	16.8	2.7	2.7	2.1	7.5	7.5	7.2	7.5	7.5	7.5	1.2	1.2	8	9	9.2	5.0	61.2	
	3	May	5.0	2.4	2.4	5.0	28.5	2.6	6	2.9	2.2	8.2	7.2	5.9	7.2	7.2	2.0	2.0	4	4	3.6	2.4	58.7	
Total	3		5.0	7.5	5.0	5.0	28.5	2.6	2.6	2.2	8.2	7.2	5.9	7.2	7.2	2.0	2.0	4	4	3.6	2.4	58.7		
South Coast	11	Dec.	15.3	1.8	1.8	5	50.3	7	7	4	4	4	4	4	4	4	6.4	6.4	5	5	39.0	2.4	122.4	
	11	Jan.	15.8	1.6	1.6	5	48.1	7	7	4	4	4	4	4	4	4	5.3	5.3	4	4	32.3	2.4	110.9	
	11	March	26.9	1.6	1.6	1.3	35.6	4	4	4	4	4	4	4	4	4	1.8	1.8	2	2	19.1	2.0	95.1	
	11	May	27.6	1.3	1.3	5	27.8	4	4	4	4	4	4	4	4	4	3.7	3.7	3	3	8.5	2.9	69.7	
Total	11		21.4	1.5	1.5	5	40.4	5	5	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	24.7	2.4	99.0	
Sacramento Valley-Delta	6	Dec.	42.4	5	5	5	53.4	5	5	1.5	2.5	5	26.5	26.5	26.5	1.0	8.0	8.0	1.0	1.0	56.9	8.0	202.7	
	8	Jan.	27.6	5	5	5	51.6	2.2	2.2	1.8	5.2	7	22.1	22.1	22.1	1.1	15.5	15.5	1.1	1.1	66.4	5.9	200.9	
	7	March	70.0	5	5	5	45.1	8	8	4	4	4	22.3	22.3	22.3	8	11.4	11.4	4	4	19.4	7.6	178.3	
	6	May	29.6	5	5	5	5.8	8	8	4	4	4	5.3	5.3	5.3	8	10.0	10.0	4	4	9.5	1.1	61.2	
Total	8		42.5	5	5	5	40.0	8	8	1.9	2.5	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	39.9	5.8	165.9		
San Joaquin & Antelope Valleys	11	Dec.	5.8	1.5	1.5	5	36.5	5	5	4	4	4	10.2	10.2	10.2	4	2.7	2.7	5	5	42.5	8.5	113.4	
	11	Jan.	5	2.5	2.5	5	43.7	2	2	4	4	4	11.1	11.1	11.1	5	1.5	1.5	5	5	40.8	10.3	120.9	
	11	March	27.0	2.5	2.5	5	30.7	2	2	1.1	1.5	1.5	6.8	6.8	6.8	4	2	2	4	4	13.6	6.4	92.2	
	11	May	20.5	2.0	2.0	5	20.7	2	2	2.0	2.0	2.0	7.3	7.3	7.3	4	1.3	1.3	2	2	14.7	3.3	63.3	
Total	11		15.5	2.0	2.0	5	32.9	2	2	2	2	7.3	7.3	7.3	4	1.3	1.3	2	2	27.9	7.1	97.6		
Great Basin	6	Dec.	13.7	2.6	2.6	5	13.7	13.7	13.7	13.7	13.7	13.7	13.7	13.7	13.7	1.7	1.7	1.7	1.7	1.7	1.3	1.3	62.6	
	6	Jan.	15.4	2.6	2.6	5	15.4	15.4	15.4	15.4	15.4	15.4	15.4	15.4	15.4	2.6	2.6	2.6	2.6	2.6	2.4	2.4	62.2	
	6	March	10.3	1.3	1.3	5	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	9	9	9	9	9	3.4	11.6	44.2	
	6	May	7.0	1.7	1.7	5	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	3	3	3	3	3	1.5	1.5	32.7	
Total	6		3.7	1.7	1.7	5	11.8	2	2	2	2	2	2	2	3	3	3	3	3	2.8	10.7	51.1		
Colorado River Basin	7	Dec.	7.4	7	7	4	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	4	4	4	4	4	12.6	12.6	32.5	
	7	Jan.	2.2	7	7	4	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	4	4	4	4	4	9.2	9.2	17.7	
	7	March	8.9	4	4	4	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	4	4	4	4	4	6.3	1.5	21.8	
	7	May	16.2	4	4	4	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	4	4	4	4	4	1.9	1.9	17.0	
Total	7		7.7	4	4	4	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	4	4	4	4	4	1.9	1.9	22.5		

TABLE 6
Raptor Eyrrie Locations by Regions
1971-72

SPECIES	REGION 1		REGION 2		REGION 3		REGION 4		REGION 5		TOTAL						
	1970	1971	1970	1971	1970	1971	1970	1971	1970	1971	1970	1971					
Red-Shouldered Hawk	3	3	2	2	1	10	11	14	2	3	4	1	7	12	18	26	32
Swainson's Hawk	-	-	-	-	-	-	-	4	4	6	4	-	-	-	4	6	4
Golden Eagle	2	2	-	2	4	9	12	15	5	8	10	4	7	15	20	31	48
Bald Eagle	24	32	13	17	20	4	5	5	2	2	1	-	-	-	43	56	60
Osprey	129	201	28	30	31	25	51	64	2	2	2	-	-	-	184	284	294
Peregrine Falcon	1	1	-	-	-	1	4	5	-	-	-	-	1	1	2	6	6
Prairie Falcon	-	-	-	-	-	4	4	7	5	7	8	2	5	6	11	16	21
Goshawk	1	-	-	-	-	-	-	-	-	1	1	-	-	1	1	1	2
TOTAL	160	239	43	51	56	53	87	110	20	29	30	7	20	35	283	426	467*

*68 Eyrries were deleted because of destruction, disappearance, or abandonment.

TABLE 7
Summary of Active Eyries
1970-1972

Successful Eyrie ^{1/}

SPECIES	No. of Active Nests		No. of Nests		No. of Eggs		Avg. Clutch		No. of Nests		No. of Young		Avg. No. of Young								
	1970	1971	1970	1971	1970	1971	1970	1971	1970	1971	1970	1971	1970	1971							
Golden Eagle	10	17	24	--	5	--	9	--	1.8	6	9	13	11	16	21	1.8	1.8	1.6			
Bald Eagle	16	20	21	--	--	--	--	--	--	5	11	11	8	19	13	1.6	1.7	1.2			
Osprey	116	169	172	52	40	7	134	106	10	2.6	2.7	1.4	48	68	50	86	118	80	1.8	1.7	1.6
Peregrine Falcon	1	2	3	1	--	--	3	--	3.0	--	--	2	2	2	2	6	3	--	3.0	1.5	

^{1/} Successful eyries are those for which data is available on either clutch size or fledgling success.

California Department of Fish and Game
Special Wildlife Investigations

RAPTOR SURVEY

Directions for Running Routes
and Recording Sightings

Purpose

To obtain an index of abundance of wintering and breeding diurnal raptor populations in California. Such a survey method will provide information on relative abundance, seasonal occurrence and an index to population trends. Survey is not designed to provide total population.

Survey Routes

Routes are selected in areas which are known to have high raptor populations during the winter and/or breeding season. A map and specific instructions for running this route are herein attached. Routes are selected along all-weather roads when possible and are generally 30 to 50 miles long. Routes shall be run at a speed not to exceed 20 miles per hour where road conditions permit, stopping only to identify and record raptor sightings.

Time Period

Routes will be run three times this fiscal year under favorable conditions -- once each month between the first and fifteenth for the months of January, March and May. Start routes at 1100 (11:00 a.m.) and complete survey within a four-hour period.

Please do not change your survey route. If you have problems or difficulty in conducting your survey, contact your supervisor or survey coordinator for instructions.

Equipment and Observers

Check the following list of equipment to ensure you have necessary items to conduct survey: map of route, forms supplied by Department of Fish and Game, clipboard, pencils, 7x binoculars or better, reference book for bird identification, and vehicle equipped to run entire route without refueling. Scopes may be taken to identify birds only, not to scan area for birds. Two people will conduct survey, driver and one additional observer. Include the names of both observers on the report form.

Weather

For comparing survey results, routes must be run under favorable weather conditions -- good visibility, no precipitation and light winds. Do not run surveys when winds exceed a Beaufort 3 (12 miles/hour) or when sky conditions exceed 2 (fog, drizzle or rain). Make your judgment on weather conditions according to criteria listed below and enter appropriate Beaufort wind and sky condition code numbers in proper space.

Weather Codes

<u>Beaufort Number</u>	<u>Wind Speed MPH</u>	<u>Indicators of Wind Speed</u>
0	Less than 1	Smoke rises vertically
1	1 to 3	Wind direction shown by smoke drift
2	4 to 7	Wind felt on face; leaves rustle
3	8 to 12	Leaves and small twigs in constant motion; wind extends light flag
4	13 to 18	Raises dust and loose paper; small branches are moved
5	19 to 24	Small trees in leaf begin to sway; crested wavelets form on inland waters

Sky Conditions

0	Clear or a few clouds	4	Fog or smoke
1	Partly cloudy (scattered) or variable sky	5	Drizzle
2	Cloudy (broken) or overcast	8	Shower(s)

Raptor Survey Form

Survey route name and number is provided on special route instructions with route map.

A place is provided for you to record time survey was started, finished and total time taken. Surveys should be started at 1100. Use the 2400-hour system (1100, 1350, etc.) for recording time.

A place is provided to record the speedometer reading your survey was started and finished. Mileage driven should be to the nearest one-tenth mile.

Name and address of observer(s) is required. Be sure to include the proper Beaufort wind and sky condition code numbers for the start and finish of each survey.

Column Headings -

Species - Listed are the principal species of raptors you will most likely see along route. Record all raptors sighted regardless of distance from your route of travel. Write in those species not listed.

A.O.U. Number - This is a number assigned to each species by the American Ornithologist Union and will be a code number for computer analysis of survey data.

Number of Birds - Make a special effort to age species wherever possible and record each sighting under the appropriate column (adult, immature and unknown). Use a tally system in recording numbers of each species and age class on the form provided or transcribe totals from notes at the end of the survey. Care must be taken not to report duplicate sightings of the same bird. Add up sightings for each species placing totals in the right hand column and a total of all raptors entered below.

Processing Completed Survey Forms

Check survey form to ensure it is filled out completely. Mail survey form to your immediate supervisor or to the Department of Fish and Game, Wildlife Management Branch, Special Wildlife Investigations, 1416 Ninth Street, Sacramento, California 95814, within two days after each month's survey is run. Include notes which are pertinent in evaluating survey results at the bottom of the form. If you have need for additional forms or questions, insert these on the completed form.

CALIFORNIA DEPARTMENT OF FISH AND GAME
1416 Ninth Street
Sacramento, California 95814

ENDANGERED WILDLIFE INVENTORY

NESTING SURVEY

Species _____ Nest No. _____

Nest Description

General Location: _____

Specific Location: _____
(Township and Range)

County _____ Region _____

Nest Description: _____

Property Owner: _____

CURRENT STATUS OF NEST

Active Nest:

Observation Date _____

Nesting activity _____

Eggs (Number) _____

Young (Number) _____

Inactive Nest:

Reason for Abandonment

Land Use Change _____

Harassment _____

Other _____

Unknown _____

Observer: _____ Date: _____

NOTES

CALIFORNIA DEPARTMENT OF FISH AND GAME
 SPECIAL WILDLIFE INVESTIGATIONS
 1416 Ninth Street, Sacramento, CA 95814

RAPTOR SURVEY

ROUTE _____ NUMBER _____

TIME Start Finish

MILEAGE Total

OBSERVERS _____ DATE

_____ Month _____ Day _____ Year

_____ WIND SPEED

_____ SKY

_____ Last Name _____ First _____ Initial _____

MAILING ADDRESS _____ ZIP CODE _____

Species	A.O.U. Number	Number of Birds			Total
		Adult	Immature	Unknown Age	
Turkey vulture	325				
California condor	324				
Golden eagle	349				
Bald eagle	352				
Osprey	364				
Red-tailed hawk	337				
Red-shouldered hawk	339				
Swainson's hawk	342				
Rough-legged hawk	347				
Ferruginous hawk	348				
Marsh hawk	331				
Goshawk	334				
Cooper's hawk	333				
Sharp-shinned hawk	332				
White-tailed kite	328				
Peregrine falcon	356				
Prairie falcon	355				
Pigeon hawk	357				
Sparrow hawk	360				
Others : _____					

Unidentified	998				
TOTAL					

Notes :