

JOB PROGRESS REPORT

State: CaliforniaProject Number: W-54-R-15 Project Title: Nongame Wildlife InvestigationsJob Number: II-1.0 Job Title: Raptor Population SurveyPeriod Covered: July 1, 1982 - June 30, 1983 Job Type: Survey and Inventory

SUMMARY:

The 1983 Raptor Population Survey included 40 winter routes with a total of 1724.2 miles traveled, and 38 spring routes totaling 1636.6 miles. During the winter survey, 15 species were observed with an average of 193.1 birds per 100 miles traveled. The spring survey included 13 species with an average of 105.2 birds per 100 miles. The total birds per 100 miles from both the winter and spring surveys was 150.3, the second highest of any previous Raptor Survey. As in previous years, the most frequently sighted raptors were the Red-tailed Hawk (Buteo jamaicensis), the Turkey Vulture (Cathartes aura), and the American Kestrel (Falco sparverius).

BACKGROUND:

Raptor Population Surveys were first conducted in 1970, and included 54 routes sampled 4 times a year. In 1975, the number of routes surveyed was reduced to 43, which were sampled twice a year. It was decided in 1976 to run the 43 survey routes every third year and a 15 route sample in the intervening years. In 1977, it was recommended that the 15 route sample be discontinued entirely, and the 43 route sample be conducted every 4 years.

In an effort to improve coverage of the survey areas and to more accurately determine trends in raptor populations, it was decided in 1979 that the 43 route sample would be conducted twice annually. The 1979-1982 surveys were the first large samples taken in consecutive years since 1975.

OBJECTIVES:

The objectives were to determine the relative abundance and population trends of raptors wintering and breeding in California. The surveys do not yield absolute population numbers, but provide a comparative index of population trends for many species of diurnal birds of prey.

PROCEDURES:

Department personnel are requested to run 43 routes (Table 1, Figure 1), once between the first and fifteenth of January, and again between the first and fifteenth of May. In the event of work conflicts or bad weather, time may be extended to the end of each survey month. Survey routes are between 30 and 50 miles long, and are traveled at 20 mph or less whenever possible. Surveys begin at 1100 hours and must be completed by 1500 hours. All raptor sightings are recorded on standardized forms (Figure 2). Weather conditions are noted at the beginning and end of each survey.

TABLE 1. Raptor Survey Routes - 1983

<u>Route Name</u>	<u>County</u>	<u>Route No.</u>
<u>Region 1</u>		
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*
Total - 5 routes		
<u>Region 2</u>		
Sacramento River	Butte, Glenn & Tehama	R2-4-01
Calaveras-Stanislaus	Calaveras & Stanislaus	R2-5-01
Colusa	Colusa	R2-6-01
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 - 8 routes		
<u>Region 3</u>		
Bodega Bay-Stafford Lake	Marin & Sonoma	R3-21-01
Coast Highway #1	Mendocino	R3-23-01
Longvale-Covelo	Mendocino	R3-23-02
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 - 11 routes		
<u>Region 4</u>		
Los Banos Wildlife Unit	Fresno	R4-10-02
Tehachapi Wildlife Unit	Kern	R4-15-01*
Avenal Wildlife Unit	Kings-Kern	R4-16-01
Madera Wildlife Unit #1	Madera	R4-20-01
Turlock Wildlife Unit	Merced	R4-24-01
Ridgecrest Wildlife Unit	San Bernardino-Inyo	R4-36-01
Sequoia Wildlife Unit	Tulare	R4-54-01
Mendota	Merced	R4-10-03
Total - 8 routes		

TABLE 1 (Continued)

<u>Route Name</u>	<u>County</u>	<u>Route No.</u>
<u>Region 5</u>		
Imperial Wildlife Area (Wister Unit)	Imperial	R5-13-03A
Imperial Wildlife Area (Finney-Ramer Unit)	Imperial	R5-13-03B
Pleasant Valley-Big Pine	Inyo	R5-14-01
Palmdale-Gorman	Los Angeles	R5-19-01
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***
Topock Gorge	San Bernardino	R5-36-02**
New York-Providence Mt.	San Bernardino	R5-36-03 ✓
Camp Pendleton	San Diego	R5-37-01
Orcutt-Vandenberg	Santa Barbara	R5-42-03

Total - 11 routes

State Total - 43 routes

✓Route not run in winter

*Route not run in spring

**Route not run this year

***Discontinued

Figure 1. Location of Raptor Survey Routes

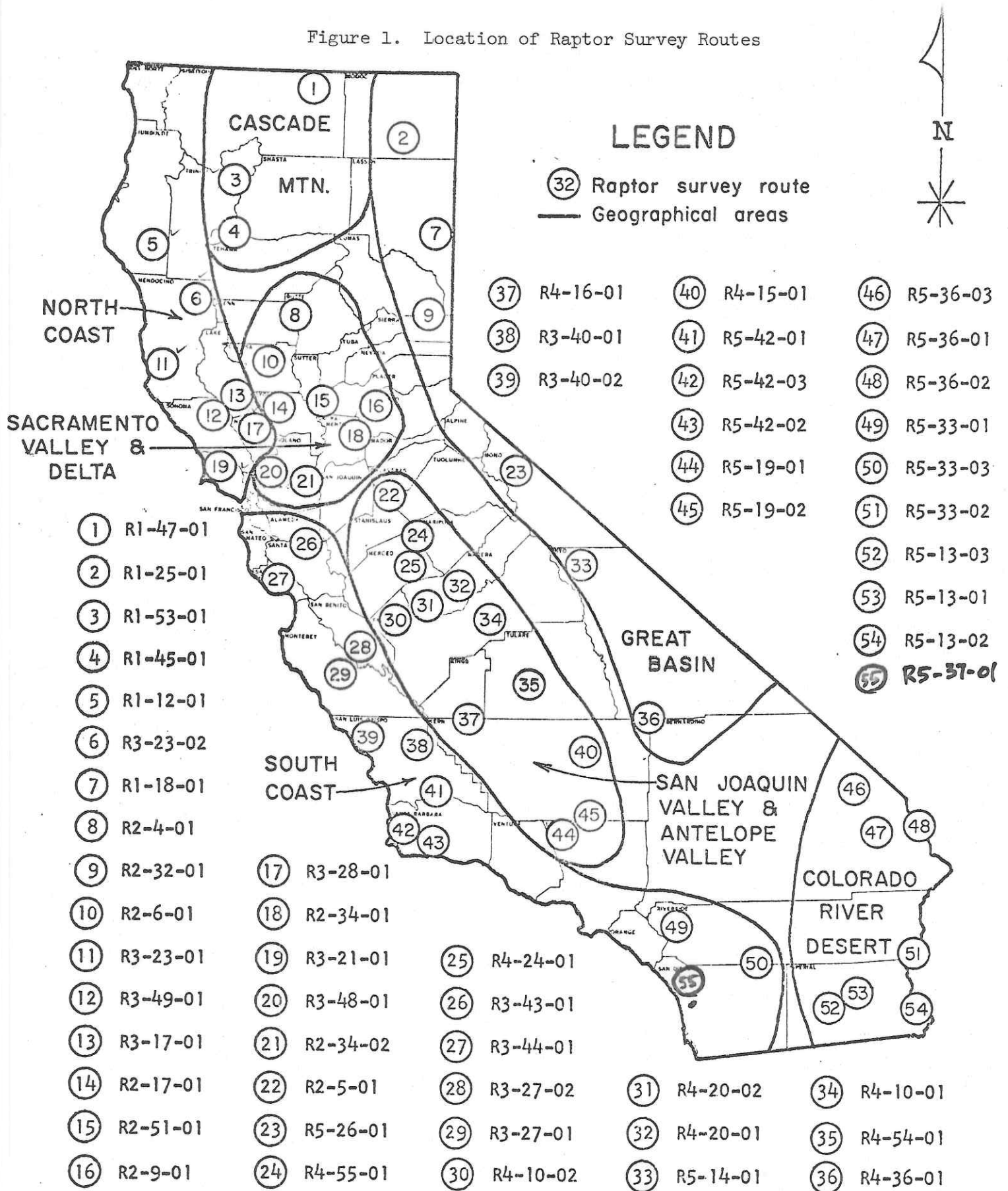


Figure 2. Raptor Survey Field Data Form

CALIFORNIA DEPARTMENT OF FISH AND GAME
NONGAME WILDLIFE INVESTIGATIONS

1416 Ninth Street, Sacramento, CA 95814

RAPTOR SURVEY

ROUTE _____ NUMBER _____

TIME Start Finish

MILEAGE Total

OBSERVERS _____ DATE Month Day Year

WIND SPEED Start Finish

SKY Start Finish

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				
Merlin	357				
American kestrel	360				
Others : _____					

Unidentified	998				
TOTAL					

Notes :

FINDINGS:

During the 1983 Raptor Survey, 91% of all routes (40 out of 43 winter routes and 38 out of 43 summer routes) were completed. Only 73% of the routes were completed in 1981 compared to 79% in 1980, and 94% in 1979.

A total of 1724.2 miles were traveled in January yielding data on 15 species with a sighting rate of 193.1 raptors per 100 miles, slightly lower than the 214.0 sightings per 100 miles in 1982 (Table 2). In May, 13 species were observed along 1636.6 miles, with an average of 105.2 raptors per 100 miles, the highest figure for the breeding season ever recorded.

Raptor sightings were tabulated by Departmental Region (Tables 3 and 4) and geographical area (Tables 5 and 6). The most frequently observed raptors were, in order of abundance, the Red-tailed Hawk (34.5% of all sightings), Turkey Vulture (25.8%), American Kestrel (19.6%), Northern Harrier (Circus cyaneus) 5.5%, Black-shouldered Kite (Elanus leucurus) 3.0%, and the Rough-legged Hawk (Buteo lagopus) 2.6%, for a total of 87.0 of all raptors sighted. Eleven additional species accounted for 10.3%, and unidentified raptors 2.7% of all sightings. The California Condor (Gymnogyps californianus) was not observed during the 1983 survey. Raptors showing increases in total numbers sighted include the Red-tailed Hawk, Turkey Vulture, Marsh Hawk, and American Kestrel.

Fewer Swainson's Hawks (B. swainsoni) were reported this year (5) than last year (7). Two of the 1982 sightings, however, were reported during the January surveys. Since Swainson's Hawks do not normally winter in California, the reliability of these two sightings is questionable. Spring sightings normally occur in the Sacramento Valley and Delta, and Great Basin areas.

The Sacramento Valley and Delta region remained the most important wintering ground for raptors in terms of relative abundance, with 292.6 birds of 11 species per 100 miles of survey route. The Red-tailed Hawk was the most frequently recorded species in this area (87.0 per 100 miles), followed by the American Kestrel (83.7) and the Turkey Vulture (51.0). The San Joaquin and Antelope Valleys had a greater diversity of wintering species (13), but fewer birds per 100 miles (212.2). The Red-tailed Hawk was also the most abundant in this area (94.8 per 100 miles), followed by the American Kestrel (50.7), and the Northern Harrier (20.2). During the breeding season, the North Coast had the highest number of raptors per 100 miles (210.3) followed by the Sacramento Valley and Delta (127.3), and the South Coast (114.1). Turkey Vultures and Red-tailed Hawks were the most numerous raptors in these areas.

ANALYSIS:

Coverage of the 43 routes was the highest of any survey since 1979. However, the Colorado River and Desert area in Region 5 has had poor coverage since 1979, making it difficult to monitor raptor population trends in that geographical area. The Raptor Survey method is not suitable for censusing of woodland species such as the three Accipiters (Accipiter sp.) and the Red-shouldered Hawk (Buteo lineatus). Population trends of these species cannot be accurately determined from these data.

Results of the 1979 Raptor Survey closely approximated those of the 1982 survey. There appear to be no significant differences (increases or decreases) in the major populations of soaring raptors except for the Northern Harrier which appears to have

TABLE 2

Raptor Survey, Statewide Summary of Birds
per 100 Miles, 1971-1983

<u>Year</u>	<u>Month</u>	<u>Miles Traveled</u>	<u>Raptors Reported</u>	<u>Raptors per 100 Miles</u>
1971	Jan	2,335.2	2,793	119.6
	May	<u>2,337.7</u>	<u>2,103</u>	<u>90.0</u>
	Total	4,672.9	4,896	104.8
1972	Jan	2,331.0	2,687	115.3
	May	<u>2,197.0</u>	<u>1,711</u>	<u>77.9</u>
	Total	4,528.0	4,398	97.1
1973	Jan	1,658.7	2,394	144.3
	May	<u>1,662.0</u>	<u>1,568</u>	<u>94.3</u>
	Total	3,320.7	3,962	119.3
1975	Jan	1,777.6	2,470	139.0
	May	<u>1,451.5</u>	<u>1,403</u>	<u>96.6</u>
	Total	3,229.1	3,873	119.9
1979	Jan	1,712.4	2,409	140.7
	May	<u>1,707.1</u>	<u>1,417</u>	<u>83.0</u>
	Total	3,419.5	3,826	111.8
1980	Jan	1,415.9	2,903	205.0
	May	<u>1,385.1</u>	<u>1,302</u>	<u>94.0</u>
	Total	2,801.0	4,205	150.0
1981	Jan	1,612.5	3,346	207.5
	May	<u>1,221.8</u>	<u>949</u>	<u>77.7</u>
	Total	2,834.3	4,295	151.5
1982	Jan	1,622.2	3,471	214.0
	May	<u>1,649.7</u>	<u>1,519</u>	<u>92.1</u>
	Total	3,271.9	4,990	152.5
1983	Jan	1,724.2	3,350	193.1
	May	<u>1,636.6</u>	<u>1,722</u>	<u>105.2</u>
	Total	3,360.8	5,072	150.3

TABLE 3
Raptor Survey, Sightings Summarized by Regions
1983

REGIONS	NO. OF ROUTES	MONTHS	MILES	TURKEY VULTURE	GOLDEN EAGLE	BALD EAGLE	OSPREY	RED- TAILED HAWK	RED- SHOULDERED HAWK	SWAINSON'S HAWK	ROUGH- LEGGED HAWK	FERRUGINOUS HAWK	NORTHERN HARRIER	NORTHERN GOSHAWK	COOPER'S HAWK	SHARP- SHINNED HAWK	BLACK- SHOULDERED KITE	PEREGRINE FALCON	PRAIRIE FALCON	MERLIN	AMERICAN KESTREL	UNK.	TOTAL
1	5	JAN	199.3	24	22	65	--	103	--	--	43	1	14	--	1	--	--	1	4	--	30	25	333
	2	MAY	64.5	9	--	--	--	21	--	--	--	2	2	--	--	--	--	--	--	--	--	--	--
TOTAL	7		263.8	33	22	65	--	124	--	--	43	1	16	--	1	--	--	1	4	--	32	26	368
2	8	JAN	324.1	123	10	13	--	270	6	--	91	3	50	--	2	--	14	--	6	--	323	27	838
	8	MAY	340.3	191	3	--	--	92	--	3	--	--	21	--	1	--	15	--	6	--	31	12	369
TOTAL	16		664.4	314	13	13	--	362	6	3	91	3	71	--	3	--	29	--	6	--	254	39	1207
3	11	JAN	515.0	261	10	3	--	378	12	--	7	13	42	--	3	5	25	--	--	1	314	11	1085
	11	MAY	529.2	518	15	--	2	239	6	--	6	--	29	--	3	1	12	--	--	--	63	7	895
	22		1044.2	779	25	3	2	617	18	--	7	13	71	--	6	6	37	--	--	1	377	18	1980
4	8	JAN	377.0	7	16	2	--	344	--	--	6	10	85	--	9	15	73	--	8	--	182	22	779
	7	MAY	323.6	106	6	--	--	108	--	2	--	--	11	--	1	1	2	--	2	--	25	8	273
TOTAL	15		700.6	113	22	2	--	452	--	2	6	10	96	1	10	16	75	--	10	--	207	30	1052
5	8	JAN	308.8	19	6	5	--	121	4	--	3	2	23	--	4	1	3	--	1	--	103	20	315
	10	MAY	379.0	45	--	--	--	65	2	--	--	--	3	--	--	--	10	--	--	--	22	3	150
TOTAL	18		687.8	64	6	5	--	186	6	--	3	2	26	--	4	1	13	--	1	--	125	23	465
ALL REGIONS	40	JAN	1724.2	434	64	88	--	1216	22	--	150	29	214	--	19	21	115	1	19	1	852	105	3350
	38	MAY	1636.6	869	24	--	2	525	8	5	--	--	66	1	5	2	39	--	2	--	143	31	1722
TOTAL	78		3360.8	1303	88	88	2	1741	30	5	150	29	280	1	24	23	154	1	21	1	995	136	5072
PERCENT OF TOTAL		JAN		13.0	1.9	2.6	--	36.3	0.7	--	3.8	0.9	6.4	--	0.6	0.6	3.4	*	0.6	*	25.4	3.1	
		MAY		51.0	1.4	--	0.1	30.4	0.5	0.3	--	--	3.8	*	0.3	0.1	2.8	--	0.1	--	8.2	1.8	
GRAND TOTAL				25.8	1.7	1.7	*	34.5	0.6	0.1	2.6	0.6	5.5	*	0.3	0.5	3.0	*	0.4	*	19.6	2.7	

*Less than 0.1% of total

TABLE 4
Survey, Birds per 100 Miles
1983

REGIONS	NO. OF ROUTES	MONTHS	MILES	TURKEY VULTURE	GOLDEN EAGLE	BALD EAGLE	OSPREY	RED-TAILED HAWK	RED-SHOULDERED HAWK	SWAINSON'S HAWK	ROUGH-LEGGED HAWK	FERRUGINOUS HAWK	NORTHERN HARRIER	NORTHERN GOSHAWK	COOPER'S HAWK	SHARP-SHINNED HAWK	BLACK-SHOULDERED KITE	PEREGRINE FALCON	PRAIRIE FALCON	MERLIN	AMERICAN KESTREL	UNK.	TOTAL
1	5	JAN	199.3	12.0	11.0	32.6	--	51.7	--	--	21.6	0.5	7.0	--	0.5	--	--	0.5	2.0	--	15.1	12.5	167.1
	2	MAY	64.5	14.0	--	--	--	32.6	--	--	--	--	3.1	--	--	--	--	--	--	--	3.1	1.6	54.3
TOTAL	7		263.8	12.5	8.3	24.6	--	47.0	--	--	16.3	0.4	6.1	--	0.4	--	--	0.4	1.5	--	12.1	9.9	139.5
2	8	JAN	324.1	38.0	3.1	4.0	--	83.3	1.9	--	28.1	0.9	15.1	--	0.6	--	4.3	--	1.9	--	68.8	8.3	258.6
	8	MAY	340.3	56.1	0.9	--	--	27.0	--	0.9	--	--	6.2	--	0.3	--	4.4	--	--	--	9.1	3.5	108.4
TOTAL	16		664.4	47.3	2.0	2.0	--	54.5	0.9	0.5	13.7	0.5	10.7	--	0.5	--	4.4	--	0.9	--	38.2	5.9	181.7
3	11	JAN	515.0	50.7	1.9	0.6	--	73.4	2.3	--	1.4	2.5	8.2	--	0.6	1.0	4.9	--	--	0.2	61.0	2.1	210.7
	11	MAY	529.2	97.9	2.8	--	0.4	45.2	1.1	--	--	--	5.5	--	0.6	0.2	2.3	--	--	--	11.9	1.3	169.1
TOTAL	22		1044.2	74.6	2.4	0.3	0.2	59.1	1.7	--	0.7	1.2	6.8	--	0.6	0.6	3.5	--	--	0.1	36.1	1.7	189.6
4	8	JAN	377.0	1.9	4.2	0.5	--	91.2	--	--	1.6	2.7	22.5	--	2.4	4.0	19.4	--	2.1	--	48.3	5.8	206.6
	7	MAY	323.6	38.2	2.2	--	--	33.4	--	0.7	--	--	3.4	0.4	0.4	0.4	0.6	--	0.7	--	7.7	2.5	84.4
TOTAL	15		700.6	17.3	3.4	0.3	--	64.5	--	0.3	0.9	1.5	13.7	0.2	1.5	2.4	10.7	--	1.5	--	29.5	4.3	150.2
5	8	JAN	308.8	6.2	1.9	1.6	--	39.2	1.3	--	1.0	0.6	7.4	--	1.3	0.3	1.0	--	0.3	--	33.4	6.5	102.0
	10	MAY	379.0	11.9	--	--	--	17.2	0.5	--	--	--	0.8	--	--	--	2.6	--	--	--	5.8	0.8	39.6
	18		687.8	9.3	0.9	0.7	--	27.0	0.9	--	0.4	0.3	3.6	--	0.6	0.1	1.9	--	0.1	--	18.2	3.3	67.6
ALL REGIONS	40		1724.2	25.2	3.7	5.1	--	70.5	1.3	--	7.5	1.7	12.4	--	1.1	1.2	6.7	0.1	1.1	0.1	48.9	6.1	193.1
	38		1636.6	54.6	1.5	--	0.1	32.1	0.5	0.3	--	--	4.0	0.1	0.3	0.1	2.4	--	0.1	--	8.7	1.9	105.2
GRAND TOTAL	78		3360.8	39.3	2.7	2.7	*	51.8	0.9	0.2	3.9	0.9	6.3	*	0.7	0.7	4.6	*	0.6	*	29.6	4.0	150.3

*Less than 0.1% of total

TABLE 5
Raptor Survey, Sightings Summarized by Geographical Area
1983

AREA	NO. OF ROUTES	MONTHS	MILES	TURKEY VULTURE	GOLDEN EAGLE	BALD EAGLE	OSPREY	RED- TAILED HAWK	RED- SHOULDERED HAWK	SWAINSON'S HAWK	ROUGH- LEGGED HAWK	FERRUGINOUS HAWK	NORTHERN HARRIER	NORTHERN GOSHAWK	COOPER'S HAWK	SHARP- SHINNED HAWK	BLACK- SHOULDERED KITE	PEREGRINE FALCON	PRAIRIE FALCON	MERLIN	AMERICAN KESTREL	UNK.	TOTAL
North Coast	6	JAN	277.1	199	4	3	--	165	8	--	3	5	7	--	1	4	5	1	--	1	161	1	568
	5	MAY	247.7	384	8	--	2	100	5	--	--	--	--	--	--	--	2	--	--	--	19	1	521
TOTAL	11		524.8	583	12	3	2	265	13	--	3	5	7	--	1	4	7	1	--	1	180	2	1089
South Coast	8	JAN	383.4	68	6	4	--	273	5	--	3	9	9	--	6	3	4	--	--	--	221	10	621
	8	MAY	384.0	155	7	--	--	190	3	--	--	--	7	--	3	8	6	--	--	--	50	9	438
TOTAL	16		767.4	223	13	4	--	463	8	--	3	9	16	--	9	11	10	--	--	--	271	19	1059
Sacramento Valley and Delta	7	JAN	241.3	123	1	1	--	210	6	--	14	--	80	--	2	--	32	--	2	--	202	33	706
	7	MAY	255.3	156	--	--	--	71	--	2	--	--	44	--	--	--	22	--	--	--	19	11	325
TOTAL	14		496.6	279	1	1	--	281	6	2	14	--	124	--	2	--	54	--	2	--	221	44	1031
San Joaquin and Antelope Valleys	9	JAN	419.8	6	22	10	--	398	3	--	14	7	85	--	13	11	74	--	10	--	213	25	891
	8	MAY	364.7	138	6	--	--	131	--	2	--	--	11	1	2	1	2	--	2	--	37	8	341
TOTAL	17		784.5	144	28	10	--	529	3	2	14	7	96	1	15	12	76	--	12	--	250	33	1232
Great Basin	5	JAN	208.6	1	18	12	--	115	--	--	112	7	12	--	1	--	--	--	5	--	9	25	317
	6	MAY	246.2	22	3	--	--	30	--	1	--	--	4	--	--	--	--	--	--	--	16	2	78
TOTAL	11		454.8	23	21	12	--	145	--	1	112	7	16	--	1	--	--	--	5	--	25	27	395
Colorado River and Desert	3	JAN	105.9	13	--	--	--	13	--	--	--	1	14	--	--	--	--	--	--	--	36	3	80
	4	MAY	138.7	14	--	--	--	3	--	--	--	--	--	--	--	--	--	--	--	--	2	--	19
TOTAL	7		244.6	27	--	--	--	16	--	--	--	1	14	--	--	--	--	--	--	--	38	3	99
Cascade Mountains	2	JAN	88.1	24	13	58	--	42	--	--	4	--	7	--	--	--	--	--	2	--	10	8	168
	No Data	MAY	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TOTAL	2		88.1	24	13	58	--	42	--	--	4	--	7	--	--	--	--	--	2	--	10	8	168

TABLE 6
Raptor Survey, Birds per 100 Miles, Summarized by Geographical Areas
1983

AREA	NO. OF ROUTES	MONTHS	MILES	TURKEY VULTURE	GOLDEN EAGLE	BALD EAGLE	OSPREY	RED- TAILED HAWK	RED- SHOULDERED HAWK	SWAINSON'S HAWK	ROUGH- LEGGED HAWK	FERRUGINOUS HAWK	NORTHERN HARRIER	NORTHERN GOSHAWK	COOPER'S HAWK	SHARP- SHINNED HAWK	BLACK- SHOULDERED KITE	PEREGRINE FALCON	PRAIRIE FALCON	MERLIN	AMERICAN KESTREL	UNK.	TOTAL
North Coast	6	JAN	277.1	71.8	1.4	1.1	--	59.5	2.9	--	1.1	1.8	2.5	--	0.4	1.4	1.8	0.4	--	0.4	58.1	0.4	205.0
	5	MAY	247.7	155.0	3.2	--	0.8	40.4	2.0	--	--	--	--	--	--	--	0.8	--	--	--	7.7	0.4	210.3
TOTAL	11		524.8	111.1	2.3	0.6	0.4	50.5	2.5	--	0.6	1.0	1.3	--	0.2	0.8	1.3	0.2	--	0.2	34.3	0.6	207.5
South Coast	8	JAN	383.4	43.8	1.6	1.0	--	71.2	1.3	--	0.8	2.3	2.3	--	1.6	0.8	1.0	--	--	--	57.6	2.6	162.0
	8	MAY	384.0	40.4	1.8	--	--	49.5	0.8	--	--	--	1.8	--	0.8	2.1	1.6	--	--	--	13.0	2.3	114.1
	16		767.4	29.1	1.7	0.5	--	60.3	1.0	--	0.4	1.2	2.1	--	1.2	1.4	1.3	--	--	--	35.3	2.5	138.0
Sacramento Valley and Delta	7	JAN	241.3	51.0	0.4	0.4	--	87.0	2.5	--	5.8	--	33.2	--	0.8	--	13.3	--	0.8	--	83.7	13.7	292.6
	7	MAY	255.3	61.1	--	--	--	27.8	--	0.8	--	--	17.2	--	--	--	8.6	--	--	--	7.4	4.3	127.3
TOTAL	14		496.6	56.2	0.2	0.2	--	56.6	1.2	0.4	2.8	--	25.0	--	0.4	--	10.9	--	0.4	--	44.5	8.9	207.6
San Joaquin and Antelope Valleys	9	JAN	419.8	1.4	5.2	2.4	--	94.8	0.7	--	3.3	1.7	20.2	--	3.1	2.6	17.6	--	2.4	--	50.7	6.0	212.2
	8	MAY	364.7	37.8	1.6	--	--	35.9	--	0.5	--	--	3.0	0.3	0.5	0.3	0.5	--	0.5	--	10.1	2.2	93.5
TOTAL	17		784.5	18.4	3.6	1.3	--	67.4	0.4	0.3	1.8	0.9	12.2	0.1	1.9	1.5	9.7	--	1.5	--	31.9	4.2	157.0
Great Basin	5	JAN	208.6	0.5	8.6	5.8	--	55.1	--	--	53.7	3.4	5.8	--	0.5	--	--	--	2.1	--	4.3	12.0	152.0
	6	MAY	246.2	8.9	1.2	--	--	12.2	--	0.4	--	--	1.6	--	--	--	--	--	--	--	6.5	0.8	31.7
TOTAL	11		454.8	5.1	4.6	2.6	--	31.9	--	0.2	24.6	1.5	3.5	--	0.2	--	--	--	1.1	--	5.5	5.9	86.9
Colorado River and Desert	3	JAN	105.9	12.3	--	--	--	12.3	--	--	--	0.9	13.2	--	--	--	--	--	--	--	34.0	2.8	75.5
	4	MAY	138.7	10.1	--	--	--	2.2	--	--	--	--	--	--	--	--	--	--	--	--	1.4	--	13.7
TOTAL	7		244.6	11.0	--	--	--	6.5	--	--	--	0.4	5.7	--	--	--	--	--	--	--	15.5	1.2	40.4
Cascade Mountains	2	JAN	88.1	27.2	14.8	65.8	--	47.7	--	--	4.5	--	7.9	--	--	--	--	--	2.3	--	11.4	9.1	190.7
	No Data	MAY	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TOTAL	2		88.1	27.2	14.8	65.8	--	47.7	--	--	4.5	--	7.9	--	--	--	--	--	2.3	--	11.4	9.1	190.7

declined slightly in terms of the relative number of raptors reported (i.e., percent of all raptors reported that are Northern Harriers) (Table 7). The percentage of the total raptor population reported for 2 of 4 selected raptor species was slightly lower in 1983 compared to 1982 (Table 7). There may be cyclic highs and lows occurring with these raptors in response to weather factors and prey numbers which accumulation of additional years of data may help to clarify. Although in 1982 and 1983, Swainson's Hawk sightings increased slightly over 1980 and 1981, the low number of sightings continues to indicate a very small breeding population. A Department study conducted in 1979 (Bloom 1980) and subsequent monitoring bears this out.

TABLE 7. Percent of Total Raptor Survey Sightings
of Four Species of Raptors, 1971-1983

<u>Species</u>	<u>1971</u>	<u>1972</u>	<u>1973</u>	<u>1975</u>	<u>1979</u>	<u>1980</u>	<u>1981</u>	<u>1982</u>	<u>1983</u>
Northern Harrier	6.1	5.3	5.0	5.2	5.1	5.2	8.5	7.6	5.5
Black-Shouldered Kite	3.8	2.5	2.6	4.1	2.3	1.4	3.2	3.1	3.0
Swainson's Hawk	*	0.1	*	*	0.2	*	*	0.1	0.1
American Kestrel	24.8	21.8	20.3	22.7	20.7	24.0	21.1	19.0	19.6

*Less than 0.1% of total

Total number of birds per 100 miles traveled was 150.3, only slightly lower than last year (152.5). This apparently indicates that most of the soaring raptor populations are stable.

RECOMMENDATIONS:

1. Continue to run the 43 Raptor Survey routes to monitor population trends in all raptors.
2. Contact Department personnel designated to run raptor routes prior to survey period and schedule alternate observers or use volunteers, if necessary, to achieve full coverage of routes.
3. Subject all Raptor Survey data to computer and statistical analyses to determine validity of apparent population trends.
4. Initiate and develop alternate survey methods to determine population trends of Accipiters and Red-shouldered Hawks.

LITERATURE CITED:

Bloom, P. H. 1980. The Status of the Swainson's Hawk in California, 1979. Federal Aid in Wildlife Restoration, Project W-54-R-12, Nongame Wildlife Invest., Job Final Report 11-8.0, 24 p. + Appendix.

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