

Signed Original 79.12
JOB PROGRESS REPORT

State: California
Project Number: W-54-R-11 Project Title: Nongame Wildlife Investigations
Job Number: III-1.0 Job Title: California Raptor Survey
Period Covered: July 1, 1978 - June 30, 1979 Job Type: Survey and Inventory

SUMMARY:

In January and May 1979 forty-two routes totaling 3,420 miles were surveyed resulting in sightings of 3,826 raptors of 16 species. This represents an average of 112 raptor sightings per 100 miles, the lowest recorded since 1973 when 110 raptors per 100 miles were reported on a similar sized sample of raptor survey routes.

BACKGROUND:

Raptor surveys were initiated in December 1970. During the first surveys, a total of 54 routes were sampled 4 times per year to record the number of raptor species observed. Raptor routes were established in areas where raptors were known to concentrate during the winter and breeding season. The number of routes sampled was reduced to 42 in 1975 and these were run during January and May. In 1976 it was decided to run a 15 route sample each year and a 42 route sample every third year.

After a 15 route sample was run during 1977 it was recommended to discontinue the 15 route surveys and conduct a 42 route survey once every 4 years; in 1979 the first 42 route survey was conducted according to the latest recommendations.

OBJECTIVES:

The objectives are to determine the relative abundance and population trends of raptors wintering and breeding in California. The surveys are not intended to yield absolute population numbers, but rather to provide a comparative index of population trends in diurnal birds of prey.

PROCEDURES:

Department personnel are requested to run 42 raptor routes in January and May. Surveys are run between the first and fifteenth of each month along routes that were first established in December, 1970. The routes are 30 to 50 miles long and are traveled at speeds of 20 miles per hour or less whenever possible. Surveys begin at 1100 hours and are completed by 1500. All raptors sighted are recorded and weather conditions are noted at the beginning and end of each survey.

FINDINGS:

In the past, data on surveys often was incomplete thus reducing usefulness of

information gathered in meeting the objectives. However, during 1979, 41 of 42 routes were completed in January and 38 of 42 routes were run in December (Table 1) thereby resulting in a successful generation of data adequate to meet the objectives. The time period for running raptor routes was extended an additional 10-15 days each month to ensure that work conflicts and poor weather conditions would not result in unsurveyed routes.

A total of 1,712 miles were traveled in January and 1,702 miles were traveled in May yielding 2,409 and 1,417 raptor sightings respectively. This represents 135 raptors per 100 miles during winter and 89 per 100 miles during the breeding season (Table 2).

Raptor sightings were tabulated by region (Tables 3 and 4) and geographic area (Tables 5 and 6). Most frequently reported raptors were Red-tailed Hawk (31.4% of all sightings), Turkey Vulture (27.4%), American Kestrel (18.5%), Marsh Hawk (4.6%), Rough-legged Hawk (2.6%), Golden Eagle (2.2%), and White-tailed Kite (2.0%). The remaining nine species represented 11.3% of the sightings and 5.4% were unidentified. There were no reports of California Condor, Goshawk, or Peregrine Falcon.

The Sacramento Valley-Delta and North Coast routes produced the most winter raptor sightings per 100 miles (175.3 and 166.6 raptors per 100 miles respectively) with South Coast (135.5) and San Joaquin and Antelope Valleys (125.1) following. During the breeding season, North Coast (157.7) and Sacramento Valley-Delta (113.1) had the highest number of raptors per 100 miles.

ANALYSIS:

During the 1979 survey adequate information was gathered to meet the objectives; however, it is unknown what relevance these data have to those gathered on previous, sometimes incomplete surveys. An effort was made to ensure as complete coverage of the 42 routes each season as possible. In addition, it was stressed that two observers be present to survey each route. This appeared to be the case in over 80% of the surveys.

Since some trends appeared in 1979 that may warrant close monitoring over the next few years, it will be necessary to run full 42 route surveys each year until more complete information can be gathered on apparent declines of such species as White-tailed Kites and American Kestrels, particularly in the Sacramento and San Joaquin Valley areas. Most of the remaining soaring species populations appear to remain stable with some notable exceptions. Swainson's Hawks were virtually undetected, indicating an extremely small breeding population; Marsh Hawk populations may be declining in certain portions of their range in California; and the Accipiters and Red-shouldered Hawks remain largely undetected due to the unsuitability of the survey method used.

RECOMMENDATIONS:

1. Continue to run 42-route surveys to determine direction of population trends of White-tailed Kites, American Kestrels, Swainson's Hawks, and Marsh Hawks.
2. Subject all raptor survey data to computer and statistical analyses to determine validity of apparent population trends.

3. Develop alternate survey methods to determine population trends of Accipiters and Red-shouldered Hawks. Initiate first surveys in 1980.
4. Continue to maintain close communication with personnel designated to run raptor routes to ensure complete coverage. Use volunteers or make necessary adjustments to ensure that no survey route is neglected during each scheduled time period.

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Date: October 1, 1979

TABLE 1

Raptor Survey Routes - 1979

| <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 |
| Avernal 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 |
| Total -- 7 routes | | |

TABLE 1 (Cont.)

| <u>Route Name</u> | <u>County</u> | <u>Route No.</u> |
|--------------------------|----------------|------------------|
| <u>Region 5</u> | | |
| Imperial Wildlife Area | Imperial | R5-13-03* |
| 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 -- 42 routes

* 15 Sample routes.

TABLE 2

Raptor Survey, Statewide Summary of Birds
per 100 Miles, 1971-1975

| <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 | 106.2 |
| | 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 | 115.2 |
| | May | <u>2,197.0</u> | <u>1,711</u> | <u>78.5</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 | 110.3 |
| 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 | 134.7 |
| | May | <u>1,707.1</u> | <u>1,417</u> | <u>88.9</u> |
| Total | | 3,419.5 | 3,826 | 111.8 |

TABLE 3
Raptor Survey, Sightings Summarized by Region
1979

| REGION | NO. OF ROUTES | MONTH | MILES | TURKEY VULTURE | GOLDEN EAGLE | BALD EAGLE | OSPREY | RED- TAILED HAWK | RED- SHOULDERED HAWK | SWAINSON'S HAWK | ROUGH- LEGGED HAWK | FERRU- GINOUS HAWK | MARSH HAWK | COOPER'S HAWK | SHARP- SHINNED HAWK | WHITE- TAILED KITE | PRAIRIE FALCON | MERLIN | AMERICAN KESTREL | UNIDENT. | TOTAL |
|------------------|------------------|-------|---------|-------------------|-----------------|---------------|--------|------------------------|----------------------------|--------------------|--------------------------|--------------------------|---------------|------------------|---------------------------|--------------------------|-------------------|--------|---------------------|----------|-------|
| 1 | 5 | Jan. | 200.8 | 5 | 18 | 7 | -- | 95 | -- | -- | 53 | -- | 13 | 1 | 1 | 1 | 4 | -- | 34 | 42 | 273 |
| | 5 | May | 200.4 | 75 | 9 | -- | -- | 45 | -- | -- | -- | -- | 13 | -- | 1 | -- | 1 | -- | 18 | 16 | 178 |
| Total | | | 401.2 | 80 | 27 | 7 | -- | 140 | -- | -- | 53 | -- | 26 | 1 | 2 | 1 | 5 | -- | 52 | 58 | 451 |
| 2 | 8 | Jan. | 324.4 | 98 | 1 | 2 | -- | 175 | -- | -- | 18 | -- | 33 | 2 | 1 | 20 | 2 | -- | 82 | 34 | 468 |
| | 6 | May | 279.6 | 142 | 1 | -- | -- | 60 | -- | -- | -- | -- | 5 | -- | -- | 1 | -- | -- | 41 | 3 | 253 |
| Total | | | 604.0 | 240 | 2 | 2 | -- | 235 | -- | -- | 18 | -- | 38 | 2 | -- | 21 | 2 | -- | 123 | 37 | 721 |
| 3 | 11 | Jan. | 470.4 | 187 | 20 | 1 | -- | 275 | 16 | -- | 8 | 5 | 27 | 4 | 4 | 20 | 3 | 2 | 229 | 24 | 825 |
| | 10 | May | 459.0 | 372 | 5 | -- | 5 | 112 | 6 | -- | -- | -- | 15 | 1 | -- | 3 | 1 | -- | 36 | 5 | 561 |
| Total | | | 929.4 | 559 | 25 | 1 | 5 | 387 | 22 | -- | 8 | 5 | 42 | 5 | 4 | 23 | 4 | 2 | 265 | 29 | 1,386 |
| 4 | 6 | Jan. | 297.3 | 12 | 19 | 4 | -- | 168 | -- | -- | 6 | -- | 36 | 2 | -- | 12 | -- | -- | 135 | 27 | 421 |
| | 7 | May | 336.6 | 95 | 4 | -- | -- | 81 | -- | -- | -- | -- | 8 | 1 | -- | 1 | -- | -- | 29 | 9 | 228 |
| Total | | | 633.9 | 107 | 23 | 4 | -- | 249 | -- | -- | 6 | -- | 44 | 3 | -- | 13 | -- | -- | 164 | 36 | 649 |
| 5 | 11 | Jan. | 419.5 | 36 | 3 | 12 | -- | 124 | 6 | -- | 16 | 2 | 22 | 7 | 1 | 15 | 2 | -- | 145 | 37 | 428 |
| | 10 | May | 431.5 | 26 | 6 | -- | -- | 68 | 6 | 2 | -- | -- | 5 | 1 | -- | 5 | 1 | -- | 59 | 11 | 190 |
| Total | | | 851.0 | 62 | 9 | 12 | -- | 192 | 12 | 2 | 16 | 2 | 27 | 8 | 1 | 20 | 3 | -- | 204 | 48 | 618 |
| All Regions | 41 | Jan. | 1,712.4 | 338 | 61 | 26 | -- | 837 | 22 | -- | 101 | -- | 131 | 16 | 7 | 68 | 11 | 2 | 625 | 164 | 2,409 |
| | 38 | May | 1,707.1 | 710 | 25 | -- | 5 | 366 | 12 | 2 | -- | 7 | 46 | 3 | 1 | 10 | 3 | -- | 183 | 44 | 1,417 |
| Grand Total | | | 3,419.5 | 1,048 | 86 | 26 | 5 | 1,203 | 34 | 2 | 101 | 7 | 177 | 19 | 8 | 78 | 14 | 2 | 808 | 208 | 3,826 |
| Percent of Total | | Jan. | | 14.0 | 2.5 | 1.1 | * | 34.7 | 0.9 | * | 4.1 | * | 5.4 | 0.7 | 0.3 | 2.8 | 0.5 | * | 25.9 | 6.8 | |
| | | May | | 50.1 | 1.8 | * | 0.4 | 25.8 | 0.8 | 0.1 | * | 0.5 | 3.2 | 0.2 | * | 0.7 | 0.2 | * | 12.9 | 3.1 | |
| | | Grand | | 27.4 | 2.2 | 0.7 | 0.1 | 31.4 | 0.9 | * | 2.6 | 0.2 | 4.6 | 0.5 | 0.2 | 2.0 | 0.4 | * | 18.5 | 5.4 | |

* - Less than 0.1 Percent of Total

TABLE 4

Raptor Survey, Birds Per 100 Miles
1979

| REGION | NO. OF ROUTES | MONTH | MILES | TURKEY VULTURE | GOLDEN EAGLE | BALD EAGLE | OSPREY | RED- TAILED HAWK | RED- SHOULDERED HAWK | SWAINSON'S HAWK | ROUGH- LEGGED HAWK | FERRU- GINOUS HAWK | MARSH HAWK | COOPER'S HAWK | SHARP- SHINNED HAWK | WHITE- TAILED KITE | PRAIRIE FALCON | MERLIN | AMERICAN KESTREL | UNIDENT. | TOTAL |
|-------------|------------------|-------|---------|-------------------|-----------------|---------------|--------|------------------------|----------------------------|--------------------|--------------------------|--------------------------|---------------|------------------|---------------------------|--------------------------|-------------------|--------|---------------------|----------|-------|
| 1 | 5 | Jan. | 200.8 | 2.5 | 9.0 | 3.5 | -- | 47.3 | -- | -- | 26.4 | -- | 6.5 | 0.5 | 0.5 | 0.5 | 2.0 | -- | 16.9 | 20.9 | 136.9 |
| | 5 | May | 200.4 | 37.4 | 4.5 | -- | -- | 22.5 | -- | -- | -- | -- | 6.5 | -- | 0.5 | -- | 0.5 | -- | 9.0 | 8.0 | 88.8 |
| Total | | | 401.2 | 19.9 | 6.7 | 1.7 | -- | 34.9 | -- | -- | 13.2 | -- | 6.5 | 0.2 | 0.5 | 0.2 | 1.2 | -- | 13.0 | 14.5 | 112.4 |
| 2 | 8 | Jan. | 324.4 | 30.2 | 0.3 | 0.6 | -- | 53.9 | -- | -- | 5.5 | -- | 9.6 | 0.6 | 0.3 | 6.2 | 0.6 | -- | 25.3 | 10.5 | 144.3 |
| | 6 | May | 279.6 | 50.8 | 0.4 | -- | -- | 21.5 | -- | -- | -- | -- | 1.8 | -- | -- | 0.4 | -- | -- | 14.7 | 1.1 | 90.5 |
| Total | | | 604.0 | 39.7 | 0.3 | 0.3 | -- | 38.9 | -- | -- | 3.0 | -- | 6.0 | 0.3 | 0.2 | 3.5 | 0.3 | -- | 20.4 | 6.1 | 119.4 |
| 3 | 11 | Jan. | 470.4 | 39.8 | 4.3 | 0.2 | -- | 58.5 | 3.4 | -- | 1.7 | 1.1 | 5.7 | 0.9 | 0.9 | 4.3 | 0.6 | 0.4 | 48.7 | 5.1 | 175.4 |
| | 10 | May | 459.0 | 81.0 | 1.1 | -- | 1.1 | 23.3 | 1.3 | -- | -- | -- | 3.3 | 0.2 | -- | 0.7 | 0.2 | -- | 7.8 | 1.1 | 123.3 |
| Total | | | 929.4 | 60.1 | 2.7 | 0.1 | 0.5 | 41.1 | 2.4 | -- | 0.9 | 0.5 | 4.5 | 0.5 | 0.4 | 2.5 | 0.4 | 0.2 | 28.5 | 3.1 | 149.7 |
| 4 | 6 | Jan. | 297.3 | 4.0 | 6.4 | 1.3 | -- | 56.5 | -- | -- | 2.0 | -- | 12.1 | 0.8 | -- | 4.0 | -- | -- | 45.4 | 9.1 | 141.6 |
| | 7 | May | 336.6 | 28.2 | 1.2 | -- | -- | 24.1 | -- | -- | -- | -- | 2.4 | 0.3 | -- | 0.3 | -- | -- | 8.6 | 2.7 | 67.7 |
| Total | | | 633.9 | 16.9 | 3.6 | 0.6 | -- | 39.3 | -- | -- | 0.9 | -- | 6.9 | 0.5 | -- | 2.1 | -- | -- | 25.9 | 5.7 | 102.4 |
| 5 | 11 | Jan. | 419.5 | 8.6 | 0.7 | 2.9 | -- | 29.6 | 1.4 | -- | 3.8 | 0.5 | 5.2 | 1.7 | 0.2 | 3.6 | 0.5 | -- | 34.6 | 8.8 | 102.0 |
| | 10 | May | 431.5 | 6.0 | 1.4 | -- | -- | 15.8 | 1.4 | 0.5 | -- | -- | 1.2 | 0.2 | -- | 1.2 | 0.2 | -- | 13.7 | 2.5 | 44.0 |
| Total | | | 851.0 | 7.3 | 1.1 | 1.4 | -- | 22.6 | 1.4 | 0.2 | 1.9 | 0.2 | 3.2 | 0.9 | 0.1 | 2.4 | 0.4 | -- | 24.0 | 5.6 | 72.6 |
| All Regions | 41 | Jan. | 1,712.4 | 19.7 | 3.6 | 1.5 | -- | 48.9 | 1.3 | -- | 5.9 | -- | 7.5 | 0.9 | 0.4 | 4.0 | 0.6 | 0.1 | 36.5 | 9.6 | 134.7 |
| | 38 | May | 1,707.1 | 41.6 | 1.5 | -- | 0.3 | 21.1 | 0.7 | 0.4 | -- | 0.4 | 2.7 | 0.2 | 0.1 | 0.6 | 0.2 | -- | 10.7 | 2.6 | 88.9 |
| Grand Total | | | 3,419.5 | 30.6 | 2.5 | 0.8 | 0.1 | 35.0 | 1.0 | 0.2 | 3.0 | 0.2 | 5.1 | 0.6 | 0.2 | 2.3 | 0.4 | 0.1 | 20.7 | 6.1 | 111.8 |

TABLE 5

Raptor Survey, Sightings Summarized by Geographical Area
1979

| AREA | NO. OF ROUTES | MONTH | MILES | TURKEY VULTURE | GOLDEN EAGLE | BALD EAGLE | OSPREY | RED- TAILED HAWK | RED- SHOULDERED HAWK | SWAINSON'S HAWK | ROUGH- LEGGED HAWK | FERRU- GINOUS HAWK | MARSH HAWK | COOPER'S HAWK | SHARP- SHINNED HAWK | WHITE- TAILED KITE | PRAIRIE FALCON | MERLIN | AMERICAN KESTREL | UNIDENT. | TOTAL |
|-----------------------------------|------------------|-------|-------|-------------------|-----------------|---------------|--------|------------------------|----------------------------|--------------------|--------------------------|--------------------------|---------------|------------------|---------------------------|--------------------------|-------------------|--------|---------------------|----------|-------|
| North Coast | 6 | Jan. | 296.6 | 165 | 17 | -- | -- | 139 | 16 | -- | 4 | 3 | 4 | 3 | 2 | 3 | 2 | 1 | 121 | 14 | 494 |
| | 6 | May | 293.6 | 351 | 5 | -- | 5 | 59 | 6 | -- | -- | -- | -- | 1 | 3 | -- | 1 | -- | 29 | 3 | 463 |
| Total | | | 590.2 | 516 | 22 | -- | 5 | 198 | 22 | -- | 4 | 3 | 4 | 4 | 5 | 3 | 3 | 1 | 150 | 17 | 957 |
| Cascade | 2 | Jan. | 87.5 | 4 | 14 | 7 | -- | 35 | -- | -- | 3 | -- | 2 | 1 | -- | 1 | 1 | -- | 6 | 5 | 79 |
| | 2 | May | 87.6 | 34 | 7 | -- | -- | 28 | -- | -- | -- | -- | 10 | -- | -- | -- | 1 | -- | 7 | 7 | 94 |
| Total | | | 175.1 | 38 | 21 | 7 | -- | 63 | -- | -- | 3 | -- | 12 | -- | -- | 1 | 2 | -- | 13 | 12 | 173 |
| South Coast | 9 | Jan. | 415.9 | 34 | 6 | 10 | -- | 224 | 6 | -- | 2 | 2 | 9 | 5 | 2 | 16 | 3 | 1 | 219 | 24 | 563 |
| | 7 | May | 325.9 | 67 | 3 | -- | -- | 99 | 5 | 2 | -- | -- | 2 | 1 | -- | 5 | 1 | -- | 44 | 8 | 237 |
| Total | | | 741.8 | 101 | 9 | 10 | -- | 323 | 11 | 2 | 2 | 2 | 11 | 6 | 2 | 21 | 4 | 1 | 263 | 32 | 800 |
| Sec. Valley & Delta | 6 | Jan. | 214.5 | 98 | 1 | 1 | -- | 88 | -- | -- | 4 | -- | 48 | -- | 1 | 35 | 2 | -- | 71 | 27 | 376 |
| | 5 | May | 200.7 | 128 | 1 | -- | -- | 49 | -- | -- | -- | -- | 20 | -- | -- | 2 | -- | -- | 24 | 3 | 227 |
| Total | | | 415.2 | 226 | 2 | 1 | -- | 137 | -- | -- | 4 | -- | 68 | -- | 1 | 37 | 2 | -- | 95 | 30 | 603 |
| San Joaquin & Antelope Valleys | 7 | Jan. | 331.7 | 12 | 19 | 4 | -- | 168 | -- | -- | 9 | -- | 37 | 3 | -- | 9 | -- | -- | 126 | 28 | 415 |
| | 8 | May | 379.3 | 107 | 4 | -- | -- | 99 | -- | -- | -- | -- | 6 | 1 | -- | 1 | -- | -- | 34 | 11 | 263 |
| Total | | | 711.0 | 119 | 23 | 4 | -- | 267 | -- | -- | 9 | -- | 43 | 4 | -- | 10 | -- | -- | 160 | 39 | 678 |
| Great Basin | 5 | Jan. | 232.0 | -- | 1 | 3 | -- | 79 | -- | -- | 79 | -- | 15 | 3 | 1 | -- | 3 | -- | 12 | 52 | 248 |
| | 6 | May | 242.6 | 15 | 2 | -- | -- | 27 | 1 | -- | -- | -- | 8 | -- | -- | -- | -- | -- | 43 | 11 | 107 |
| Total | | | 474.6 | 15 | 3 | 3 | -- | 106 | 1 | -- | 79 | -- | 23 | 3 | 1 | -- | 3 | -- | 55 | 63 | 355 |
| Colorado River & Desert | 4 | Jan. | 139.8 | 25 | 3 | 1 | -- | 17 | -- | -- | -- | 2 | 14 | 1 | -- | -- | -- | -- | 41 | 9 | 113 |
| | 4 | May | 149.0 | 8 | 3 | -- | -- | 5 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 2 | -- | 16 |
| Total | | | 388.8 | 33 | 6 | 1 | -- | 22 | -- | -- | -- | 2 | 14 | -- | -- | -- | -- | -- | 43 | 9 | 131 |

TABLE 6

Raptor Survey, Birds per 100 Miles, Summarized by Geographical Area
1979

| AREA | NO. OF ROUTES | MONTH | MILES | TURKEY VULTURE | GOLDEN EAGLE | BALD EAGLE | OSPREY | RED- TAILED HAWK | RED- SHOULDERED HAWK | SWAINSON'S HAWK | ROUGH- LEGGED HAWK | FERRU- GINOUS HAWK | MARSH HAWK | COOPER'S HAWK | SHARP- SHINNED HAWK | WHITE TAILED KITE | RAIRIE FALCON | MERLIN | AMERICAN KESTREL | UNIDENT. | TOTAL |
|-----------------------------------|------------------|-------|-------|-------------------|-----------------|---------------|--------|------------------------|----------------------------|--------------------|--------------------------|--------------------------|---------------|------------------|---------------------------|-------------------------|------------------|--------|---------------------|----------|-------|
| North Coast | 6 | Jan. | 296.6 | 55.6 | 5.7 | -- | -- | 46.9 | 5.4 | -- | -- | 1.3 | 1.0 | 1.3 | 1.0 | 0.7 | 0.7 | 0.3 | 40.8 | 4.7 | 166.6 |
| | | May | 293.6 | 119.6 | 1.7 | -- | 1.7 | 20.1 | 2.0 | -- | -- | -- | -- | -- | 1.0 | -- | 0.3 | -- | 9.9 | 1.0 | 157.7 |
| | | Total | 590.2 | 87.4 | 3.7 | -- | 0.8 | 33.5 | 3.7 | -- | -- | 0.7 | 0.5 | 0.7 | 0.8 | 0.8 | 0.5 | 0.2 | 25.4 | 2.9 | 162.1 |
| Cascade | 2 | Jan. | 87.5 | 4.6 | 16.0 | 8.0 | -- | 40.0 | -- | -- | 3.4 | -- | 2.3 | 1.1 | -- | 1.1 | 1.1 | -- | 6.9 | 5.7 | 90.3 |
| | | May | 87.6 | 38.8 | 8.0 | -- | -- | 32.0 | -- | -- | -- | -- | 11.4 | -- | -- | -- | 1.1 | -- | 8.0 | 8.0 | 107.3 |
| | | Total | 175.1 | 21.7 | 12.0 | 4.0 | -- | 36.0 | -- | -- | 1.7 | -- | 6.9 | 0.6 | -- | 0.6 | 1.1 | -- | 7.4 | 6.9 | 98.8 |
| South Coast | 6 | Jan. | 415.9 | 8.2 | 1.4 | 2.4 | -- | 53.9 | 1.4 | -- | 0.5 | 0.5 | 2.2 | 1.2 | 0.5 | 3.8 | 0.7 | 0.2 | 52.7 | 5.8 | 135.5 |
| | | May | 325.9 | 20.6 | 0.9 | -- | -- | 30.4 | 1.5 | 0.6 | -- | -- | 0.6 | 0.3 | -- | 1.5 | 0.3 | -- | 13.5 | 2.5 | 72.7 |
| | | Total | 741.8 | 13.6 | 1.2 | 1.3 | -- | 84.3 | 1.5 | 0.3 | 0.3 | 0.3 | 1.5 | 0.8 | 0.3 | 2.8 | 0.5 | 0.1 | 35.5 | 4.3 | 107.8 |
| Sac. Valley & Delta | 6 | Jan. | 214.5 | 45.7 | 0.5 | 0.5 | -- | 41.0 | -- | -- | 2.0 | -- | 22.3 | -- | 0.5 | 16.3 | 1.0 | -- | 33.1 | 12.6 | 175.3 |
| | | May | 200.7 | 63.8 | 0.5 | -- | -- | 24.4 | -- | -- | -- | -- | 10.0 | -- | -- | 1.0 | -- | -- | 12.0 | 1.5 | 113.1 |
| | | Total | 415.2 | 54.4 | 0.5 | 0.2 | -- | 33.0 | -- | -- | 1.0 | -- | 16.4 | -- | 0.2 | 3.1 | 0.5 | -- | 22.9 | 0.7 | 145.2 |
| San Joaquin & Antelope Valleys | 7 | Jan. | 331.7 | 3.6 | 5.7 | 1.2 | -- | 50.6 | -- | -- | 2.7 | -- | 11.2 | 0.9 | -- | 2.7 | -- | -- | 38.0 | 8.4 | 125.1 |
| | | May | 379.3 | 28.2 | 1.1 | -- | -- | 26.1 | -- | -- | -- | -- | 1.6 | 0.3 | -- | 0.3 | -- | -- | 9.0 | 2.9 | 69.3 |
| | | Total | 711.0 | 16.7 | 3.2 | 0.6 | -- | 37.6 | -- | -- | 1.3 | -- | 6.0 | 0.6 | -- | 1.4 | -- | -- | 22.5 | 5.5 | 95.4 |
| Great Basin | 5 | Jan. | 232.0 | -- | 0.4 | 1.3 | -- | 34.1 | -- | -- | 34.1 | -- | 6.5 | 1.3 | 0.4 | -- | 1.3 | -- | 5.2 | 22.4 | 106.9 |
| | | May | 242.6 | 6.2 | 0.8 | -- | -- | 11.1 | 0.4 | -- | -- | -- | 3.3 | -- | -- | -- | -- | -- | 17.7 | 4.5 | 44.1 |
| | | Total | 474.6 | 3.2 | 0.6 | 0.6 | -- | 22.3 | 0.2 | -- | 16.6 | -- | 4.8 | 0.6 | 0.2 | -- | 0.6 | -- | 11.6 | 13.3 | 74.8 |
| Colorado River & Desert | 4 | Jan. | 139.8 | 17.9 | 2.1 | 0.7 | -- | 12.2 | -- | -- | -- | 1.4 | 10.0 | 0.7 | -- | -- | -- | -- | 29.3 | 6.4 | 80.8 |
| | | May | 149.0 | 5.4 | 2.0 | -- | -- | 3.4 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 1.3 | -- | 12.1 |
| | | Total | 388.8 | 8.5 | 1.5 | 0.3 | -- | 5.7 | -- | -- | -- | 0.5 | 3.6 | 0.3 | -- | -- | -- | -- | 11.1 | 2.3 | 33.7 |