

Orloff, S. 1980

JOB PROGRESS REPORT

State: California

80.23

Project Number: W-54-R-12 Project Title: Nongame Wildlife Investigations

Job Number: II-1 Job Title: Raptor Population Survey

Period Covered: July 1, 1979 - June 30, 1980 Job Type: Survey and Inventory

SUMMARY:

The 1980 Raptor Survey included 35 routes conducted during the winter survey resulting in sightings of 2,903 raptors of 17 species; 32 routes were conducted during the summer survey resulting in sightings of 1,302 raptors of 13 species.

During the winter survey, an average of 205 raptors were sighted per 100 miles. A total of 1,415.9 miles were covered during this period. During the summer survey, there was an average of 94 raptors per 100 miles. A total of 1,385.1 miles were surveyed during the summer. The Red-tailed Hawk, Turkey Vulture and American Kestrel were, as in previous years, the most frequently sighted raptors. More raptors were sighted per mile this winter than in any other year since 1971.

BACKGROUND:

Raptor surveys, initiated in December, 1970, involve reporting all raptor species and numbers observed along permanently established survey routes throughout the state.

During the first survey years, 54 routes were sampled four times a year. In 1975 the number of routes surveyed was reduced to 42 which were sampled twice a year. It was decided in 1976 to run a 42 route sample 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 42 route sample be conducted every four years. These changes were made in efforts to improve coverage of survey routes and produce more useable data. Logistical considerations also effected changes.

Following the 42 route sample conducted in 1979, it was decided that in order to more accurately determine trends in raptor populations, the 42 route sample would have to be conducted twice annually. The 1979 and 1980 surveys were the first large sample size surveys run in consecutive years since 1975. It is hoped this latest modification will ensure that adequate samples of data will be produced even if work conflicts, bad weather, and other considerations prevent complete coverage of raptor survey routes during a particular period.

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 indicative of population trends in diurnal birds of prey.

PROCEDURES:

Department personnel are requested to run 42 raptor routes (Table 1) 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:

During 1980, 35 of 42 raptor routes were completed in January and 32 of 42 routes were run in May. The average of 79.5% routes completed is considerably lower than the 94% completed in 1979.

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 1,415.9 miles were traveled in January and 1,385.1 miles were traveled in May yielding 2,903 and 1,302 raptor sightings respectively. This represents 205 raptors per 100 miles during the winter and 94 per 100 miles during the breeding season (Table 2).

Raptor sightings were tabulated by region (Tables 3 and 4) and geographical area (Tables 5 and 6). Most frequently reported raptors were Red-tailed Hawk (30.4% of all sightings), Turkey Vulture (25.0%), American Kestrel (24.0%), Marsh Hawk (5.2%), Rough-legged Hawk (2.3%), and Golden eagle (2.0%). Six percent of the raptors sighted could not be identified and the remaining 12 species constituted 4.9% of the total.

Both Goshawks and Peregrine Falcons were sighted this year for the first time since 1971 and 1977 respectively. Peregrine sightings were from Tulare and Inyo counties and a Goshawk was reported in Modoc County. The California Condor was not observed during this year's survey.

As in past years, the Sacramento Valley-Delta area was the principle raptor wintering ground, with 347 birds per 100 miles (Table 6). This was followed by the North Coast and South Coast with 224 and 216 raptors per 100 miles respectively. For the past two years the North Coast has demonstrated its importance as a wintering ground for raptors.

During the breeding season, the North Coast and the Sacramento Valley-Delta had the highest number of raptors per 100 miles. The Cascade region has ranked high in the last two surveys (1975 and 1979), however, the Cascade survey was not conducted this year.

ANALYSIS:

Efforts were made to ensure as complete coverage of the 42 routes to be surveyed each season as possible. Although completion percentages were not as high as in 1979, there was enough coverage to provide adequate data for analysis.

The apparent population declines of Marsh Hawk and American Kestrel in the Sacramento Valley-Delta and San Joaquin Valley which appeared in 1979 did not continue in 1980.

This year's sightings of American Kestrels and Marsh Hawks were greater or equal to that reported in 1975 and 1979.

Sightings of White-tailed Kites indicate a slight increase this year over 1979 data, but sightings are still fewer than in 1975.

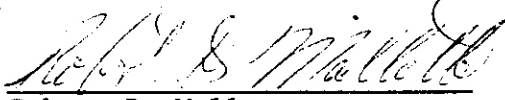
Most of the remaining populations of soaring species appear to be stable with the exception of the Swainson's Hawk. Sightings of this species continue to indicate an extremely small breeding population.

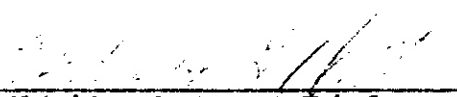
Accipiters and Red-shouldered Hawks remain largely undetected due to the unsuitability of this survey method to census these woodland species.

RECOMMENDATIONS:

1. Continue to run the 42-route survey program to determine trends of White-tailed kites, 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. Initiate and develop alternate survey methods to determine population trends of Accipiters and Red-shouldered Hawks.
4. Contact personnel designated to run raptor routes prior to established survey periods, and schedule alternate observers if necessary, to achieve full coverage of routes.

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Raptor Survey Routes - 1980

<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		

Table 2

Raptor Survey, Statewide Summary of Birds
per 100 Miles, 1971-1980

<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	2,337.7	2,103	90.0
Total		4,672.9	4,896	104.8
1972	Jan	2,331.0	2,687	115.2
	May	2,197.0	1,711	78.5
Total		4,528.0	4,398	97.1
1973	Jan	1,658.7	2,394	144.3
	May	1,662.0	1,568	94.3
Total		3,320.7	3,962	110.3
1975	Jan	1,777.6	2,470	139.0
	May	1,451.5	1,403	96.6
Total		3,229.1	3,873	119.9
1979	Jan	1,712.4	2,409	134.7
	May	1,707.1	1,417	88.9
Total		3,419.5	3,826	111.8
1980	Jan	1,415.9	2,903	205.0
	May	1,385.1	1,302	94.0
Total		2,801	4,205	150.0

TABLE 3
Raptor Survey, Sightings Summarized by Region
1980

REGIONS	NO. OF ROUTES	MONTHS	MILES	TURKEY VULTURE	GOLDEN EAGLE	BALD EAGLE	OSPREY	RED-	RED-	RED-	SWAINSON'S HAWK	ROUGH-LEGGED HAWK	FERRUGINOUS HAWK		COSHAWK	COOPER'S HAWK		SHARP-SHINNED HAWK	WHITE-TAILED KITE		FERRENE FALCON	PRAIRIE FALCON	MERLIN	AMERICAN KESTREL	UNKNOWN	TOTAL
								TAILED HAWK	SHOULDERED HAWK	HAWK			HAWK	HAWK		HAWK	HAWK		HAWK	HAWK						
1	5	JAN	173.1	25	24	15	--	70	--	--	--	57	--	26	1	1	--	--	--	--	7	1	36	112	375	
	3	MAY	110.0	39	5	--	--	30	--	--	--	--	--	--	--	--	--	--	--	--	--	--	11	4	82	
Total			283.1	64	29	15	--	100	--	--	--	57	--	26	1	1	--	--	--	--	7	1	47	116	464	
2	5	JAN	205.7	126	7	2	--	188	1	--	--	16	--	52	--	2	2	11	--	4	--	207	44	662		
	7	MAY	311.6	124	3	--	--	97	--	1	1	--	--	9	--	--	--	3	--	--	--	--	56	13	307	
Total			517.3	250	10	2	--	285	1	--	1	16	--	61	--	2	3	14	--	4	--	263	57	969		
3	11	JAN	476.1	261	15	3	--	375	18	--	--	6	3	60	--	6	5	19	--	6	--	327	35	1,141		
	10	MAY	460.7	363	11	--	10	105	7	--	--	--	--	10	--	2	--	9	--	5	--	54	6	582		
Total			936.8	624	26	3	10	480	25	--	--	6	3	70	--	10	5	28	--	11	--	381	41	1,723		
4	7	JAN	318.8	1	15	4	--	173	4	--	--	2	9	45	--	5	1	17	1	4	1	169	10	461		
	7	MAY	322.8	74	--	--	--	108	--	1	1	--	--	4	--	6	--	1	--	2	--	46	8	243		
Total			641.6	75	15	4	--	279	4	--	1	2	9	49	--	11	1	18	--	6	1	215	18	704		
5	7	JAN	242.3	39	3	5	--	201	--	--	--	13	--	9	--	2	--	2	1	2	--	74	11	262		
	7	MAY	122.0	16	--	--	--	45	1	--	--	--	--	4	--	--	--	--	--	--	--	17	2	78		
Total			364.3	55	3	5	--	246	1	--	--	13	--	13	--	2	--	2	1	2	--	91	13	340		
All Regions	35	JAN	1,115.9	452	64	29	--	907	23	--	--	94	12	192	1	18	8	49	2	23	2	813	212	2,901		
	32	MAY	1,353.1	1,116	22	--	10	373	6	--	2	--	--	27	--	3	1	13	--	7	--	184	33	1,299		
Grand Total	67		2,469.0	1,568	86	29	10	1,280	31	--	2	94	12	219	1	21	9	62	2	30	2	997	245	4,200		
Percent of Total		JAN		16.0	2.0	0.9	--	31.0	0.5	--	--	3.2	0.4	6.6	*	0.6	0.3	1.6	*	0.8	*	28.0	7.3			
		MAY		17.3	1.7	--	0.8	28.0	0.6	0.2	0.2	--	--	2.1	--	0.2	*	1.0	--	0.5	--	14.0	2.5			
Grand				25.0	2.0	0.6	0.2	30.4	0.7	*	*	2.3	0.3	5.2	*	0.5	0.2	1.4	*	0.7	*	24.0	5.8			

*Less than 0.1% of total.

TABLE 4
Raptor Survey, Birds per 100 Miles
1960

RE- GIONS	NO. OF ROUTES	MONTHS	MILES	THUNDER BOLT	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	PERGOVINE FALCON	PRAIRIE FALCON	MERLIN	AMERICAN KESTREL	UNKNOWN	TOTAL
1	2	JAN	173.1	14.4	13.6	6.6	--	40.4	--	--	32.9	--	15.0	0.6	0.6	--	--	--	4.0	0.5	--	65.0	216.0
		MAY	110.0	11.5	10.2	5.3	--	27.3	--	--	20.2	--	9.2	0.3	0.3	--	--	--	--	--	10.0	3.6	80.9
Total			283.1	25.9	23.8	11.9	--	67.7	--	--	53.1	--	24.2	0.9	0.9	--	--	--	2.5	0.3	--	110.0	197.0
2	5	JAN	205.7	51.0	3.0	0.9	--	91.0	0.5	--	7.6	--	25.2	--	1.0	1.0	5.3	--	--	--	--	100.0	321.0
		MAY	211.6	17.0	1.0	--	--	31.0	0.2	0.2	3.1	--	2.8	--	0.4	0.6	2.7	--	--	--	18.0	4.1	99.0
Total			417.3	68.0	4.0	0.9	--	122.0	0.7	0.4	10.7	--	28.0	--	1.4	1.6	8.0	--	0.8	--	118.0	11.0	187.0
3	11	JAN	476.1	55.0	4.2	0.6	--	79.0	3.6	--	1.2	0.6	13.0	--	1.7	1.0	3.9	--	--	--	--	69.0	240.0
		MAY	460.7	79.0	2.4	--	2.2	22.8	1.5	--	0.6	0.3	2.2	--	0.4	0.5	1.2	--	1.2	--	--	11.2	127.0
Total			936.8	134.0	6.6	0.6	--	101.8	5.1	--	1.8	0.9	15.2	--	2.1	1.5	5.1	--	2.4	--	--	80.2	367.0
4	7	JAN	318.8	0.3	4.7	1.5	--	54.3	1.3	--	0.6	2.6	14.1	--	1.6	0.3	5.3	0.3	1.3	0.3	--	3.1	145.0
		MAY	222.8	23.0	2.3	0.6	--	33.0	0.6	0.2	0.5	1.1	7.6	--	0.3	0.2	0.3	0.2	0.8	0.2	--	25.0	75.2
Total			541.6	23.3	7.0	2.1	--	87.3	1.9	0.4	1.1	3.7	21.7	--	1.9	0.5	5.6	0.5	2.1	0.5	--	28.1	110.0
5	7	JAN	247.3	16.1	1.2	2.1	--	42.0	--	--	5.4	--	3.7	--	0.8	--	0.8	0.4	0.8	--	--	31.0	108.0
		MAY	180.0	8.9	1.7	--	--	19.4	0.6	--	3.1	--	2.2	--	--	--	--	--	--	--	--	9.4	43.3
Total			427.3	25.0	2.9	2.1	--	61.4	0.6	--	8.5	--	5.9	--	0.8	--	0.8	0.4	0.8	--	--	40.4	151.3
All Regions	35	JAN	1,415.9	32.0	4.5	2.0	--	64.0	1.6	--	6.6	0.9	14.0	*	1.3	0.6	3.5	0.1	1.6	0.1	--	15.0	205.0
	32	MAY	1,385.1	44.0	1.6	--	0.7	27.0	0.6	0.1	0.2	--	1.9	--	0.2	0.1	0.9	--	0.5	--	--	2.4	94.0
Grand Total	67		2,801.0	76.0	6.1	4.0	0.4	121.0	2.2	0.5	13.7	0.9	26.0	*	2.5	1.1	9.4	0.5	3.1	*	36.0	6.7	150.0

*Less than 0.1% of total.

TABLE 5

Raptor Survey, Sightings Summarised by
Geographical Area
1980

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	GOSHAWK	COOPER'S HAWK	SHARP- SHINNED HAWK	WHITE- TAILED KITE	PEREGRINE FALCON	PRAIRIE FALCON	MERLIN	AMERICAN KESTREL	UNKNOWN	TOTAL	
North Coast	6	JAN	274.0	213	5	3	--	161	16	--	3	2	--	4	4	7	--	4	1	1	168	19	614
	6	MAY	287.8	345	12	--	10	64	7	--	--	--	--	2	--	5	--	1	--	--	21	3	470
	Total		561.8	558	17	3	10	225	23	--	3	2	--	6	4	12	--	5	1	--	189	22	1,084
Cascade	2	JAN	89.6	25	19	15	--	38	--	--	8	--	--	--	--	--	--	3	--	--	9	13	145
	--	MAY	--	25	--	15	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	145
	Total		89.6	50	19	15	--	38	--	--	8	--	--	--	--	--	--	3	--	--	9	13	290
South Coast	7	JAN	275.4	55	11	5	--	267	2	--	2	1	--	5	1	3	--	2	--	--	211	18	595
	7	MAY	317.4	62	3	--	--	81	1	--	--	--	--	--	--	3	--	4	--	--	50	5	213
	Total		592.8	117	14	5	--	348	3	--	2	1	--	5	1	6	--	6	--	--	261	23	808
Sac. Valley & Delta	4	JAN	185.3	123	7	--	--	155	1	--	15	--	--	1	2	22	--	4	--	--	191	31	642
	5	MAY	238.2	120	3	--	--	73	--	1	15	--	--	1	3	4	--	--	--	--	45	11	276
	Total		423.5	243	10	--	--	228	1	--	30	--	--	--	5	26	--	4	--	--	236	42	918
San Joaquin & Antelope Valleys	8	JAN	373.9	4	15	6	--	225	4	--	4	3	--	6	1	17	1	3	--	--	204	22	569
	7	MAY	231.3	74	--	--	--	121	--	1	--	--	--	1	--	18	--	1	--	--	46	8	258
	Total		605.2	78	15	6	--	346	4	--	4	3	--	7	1	35	1	4	--	--	250	30	827
Great Basin	5	JAN	143.9	--	5	--	--	53	--	--	62	6	1	2	--	--	1	6	1	8	108	6	269
	4	MAY	155.5	15	4	--	--	34	--	--	62	--	--	--	--	--	--	1	--	--	19	8	78
	Total		299.4	15	9	--	--	87	--	--	124	6	1	2	--	--	1	7	1	27	116	14	348
Colorado River & Desert	2	JAN	73.9	32	2	--	--	8	--	--	--	--	--	--	--	--	--	1	--	--	22	1	67
	2	MAY	62.2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3	--	3
	Total		136.1	32	2	--	--	8	--	--	--	--	--	--	--	--	--	--	1	--	25	1	70

TABLE 6

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	MARSH HAWK	GOSHAWK	COOPER'S HAWK	SHARP-SHOULDERED HAWK		WHITE-THROATED KITE		PHEASANT FALCON	PRAIRIE FALCON	MEALIN	AMERICAN KESTREL	UNKNOWN	TOTAL	
																HAWK	BANK	SHARPSHAWK	SHARP-THROATED							SHARP-THROATED
North Coast	6	JAN	274.0	77.7	1.8	1.1	--	58.7	5.8	--	1.1	0.7	1.5	--	--	1.5	1.5	2.5	--	--	0.4	61.0	6.9	224		
	6	MAY	287.8	120.0	4.2	--	22.0	2.4	--	--	--	--	--	0.7	--	0.7	--	1.7	--	--	7.2	1.0	163			
Total			561.8	99.3	3.0	0.5	1.6	40.0	4.0	--	0.5	0.4	0.7	--	--	1.0	0.7	2.1	--	--	0.2	34.0	3.9	193		
Cascade	2	JAN	89.6	28.0	21.1	16.6	--	42.2	--	--	8.8	--	16.6	--	--	--	--	--	--	--	--	3.3	1.0	14.4	161	
	--	MAY	--	--	--	--	--	--	--	--	8.8	--	16.6	--	--	--	--	--	--	--	--	3.3	1.0	14.4	161	
Total			89.6	28.0	21.1	16.6	--	42.2	--	--	8.8	--	16.6	--	--	--	--	--	--	--	--	3.3	1.0	14.4	161	
South Coast	7	JAN	275.4	20.0	4.0	1.8	--	97.0	0.7	--	0.7	0.4	4.4	--	--	1.8	0.3	1.1	--	--	--	0.7	--	77.0	6.5	216
	7	MAY	317.4	19.5	0.9	--	25.5	0.3	--	--	--	--	1.7	--	--	--	0.2	0.9	--	--	1.3	--	16.0	1.6	67	
Total			592.8	20.0	2.4	0.8	--	50.6	0.5	--	0.3	0.2	2.7	--	--	0.8	0.2	1.0	--	--	--	1.0	--	44.0	3.9	136
Sac. Valley & Delta	4	JAN	185.3	66.5	3.8	--	--	84.0	0.5	--	8.1	--	49.0	--	--	0.5	1.1	11.9	--	--	2.2	--	103.0	16.8	347	
	5	MAY	238.9	50.2	1.3	--	30.5	--	0.4	--	--	--	7.5	--	--	0.2	0.4	1.7	--	--	--	--	18.8	4.6	116	
Total			424.2	57.3	4.1	--	--	94.0	0.2	--	3.5	--	7.5	--	--	0.2	0.7	6.1	--	--	0.9	--	56.0	10.0	216	
San Joaquin & Antelope Valleys	8	JAN	373.4	1.1	4.0	1.6	--	60.2	1.1	--	1.1	0.8	14.4	--	--	1.6	0.3	4.5	0.2	0.8	--	--	55.0	5.8	152	
	7	MAY	243.3	23.0	--	--	--	37.0	0.3	0.3	--	--	1.2	--	--	0.3	--	0.3	--	--	0.3	--	14.0	2.5	80	
Total			697.2	11.3	2.1	0.9	--	50.0	0.6	0.1	0.6	0.4	8.4	--	--	1.0	0.1	2.8	0.1	0.6	--	--	36.0	4.3	119	
Great Basin	5	JAN	143.9	--	3.5	--	--	37.0	--	--	43.0	4.2	11.1	0.7	--	1.4	--	--	--	0.7	4.2	0.7	5.5	75.0	187	
	4	MAY	155.5	9.6	2.6	--	--	21.9	--	--	--	--	2.0	5.3	0.3	0.6	--	--	--	--	0.6	--	12.2	3.8	51	
Total			299.4	5.0	3.0	--	--	29.0	--	--	21.0	2.0	5.3	0.3	--	0.6	--	--	--	0.3	2.3	0.3	9.0	30.0	116	
Colorado River & Desert	2	JAN	73.9	43.2	2.7	--	--	10.8	--	--	--	--	1.4	--	--	--	--	--	--	--	1.4	--	30.0	1.4	91	
	2	MAY	62.2	--	--	--	--	--	--	--	--	--	--	0.7	--	--	--	--	--	--	--	--	4.0	0.7	4	
Total			136.1	23.5	1.5	--	--	5.9	--	--	--	--	0.7	--	--	--	--	--	--	--	--	--	18.4	0.7	51	