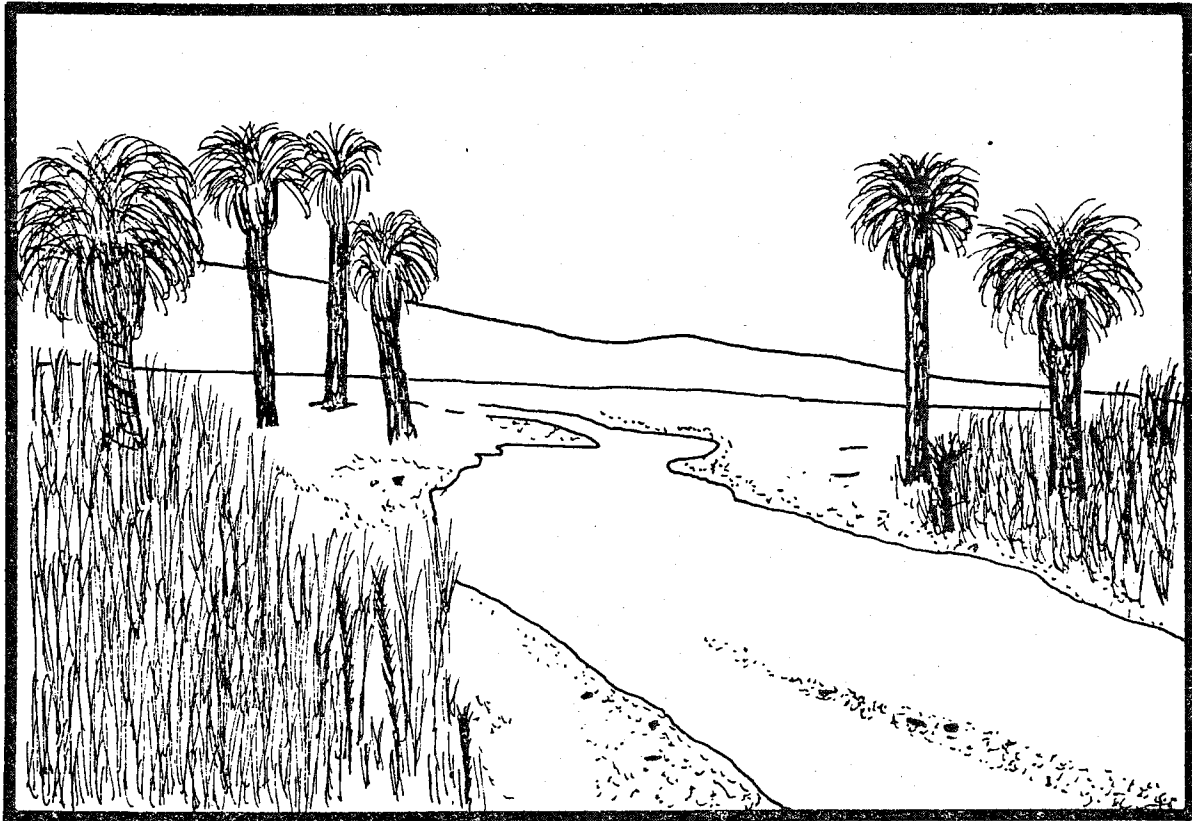
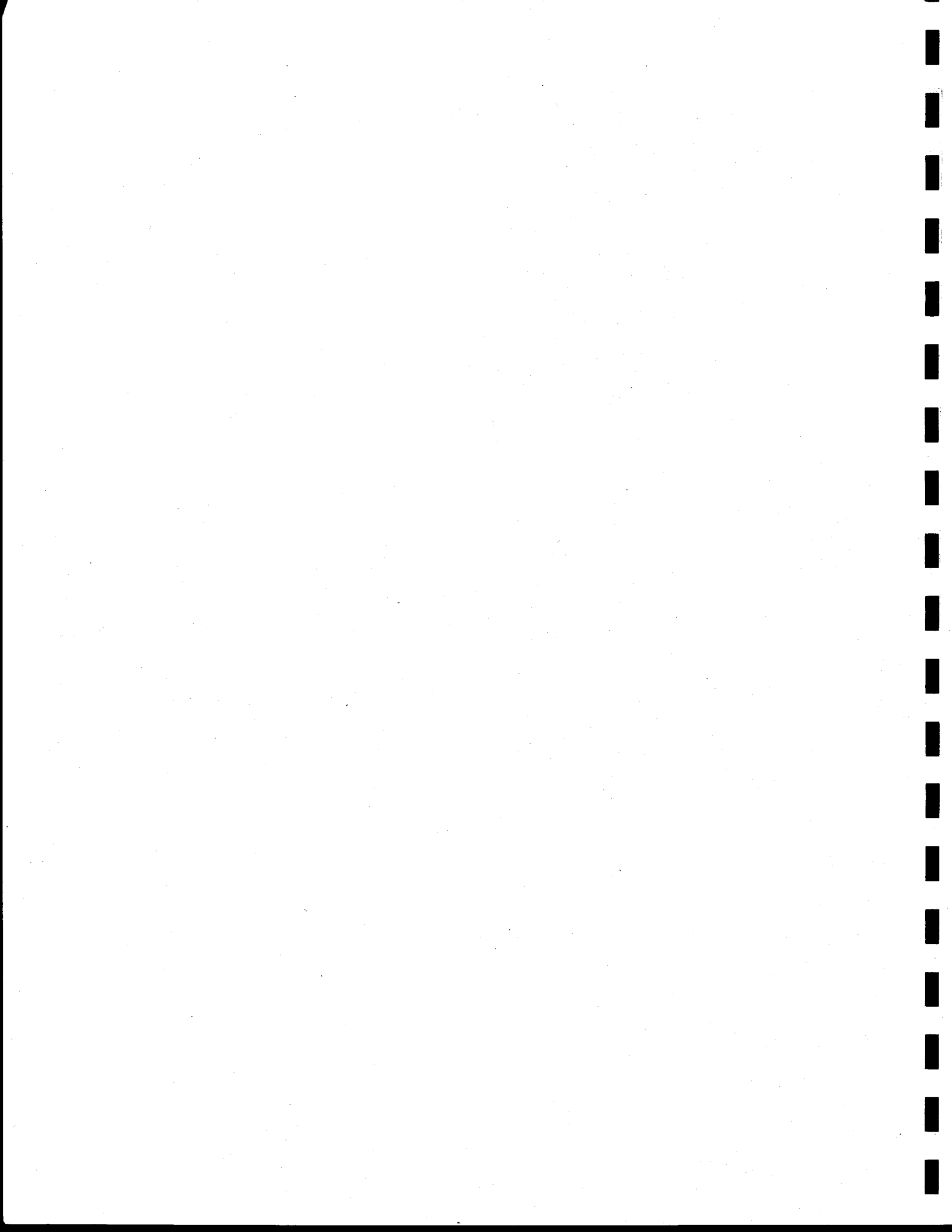


UTILIZATION BY MIGRANT AND RESIDENT BIRDS OF THE SAN GORGONIO PASS, COACHELLA VALLEY, AND SOUTHERN MOJAVE DESERT OF CALIFORNIA, 1979-80



Robert L. McKernan, William D. Wagner, Ross E. Landry,
and Michael D. McCrary

Report Prepared for Research and Development,
Southern California Edison Company, Rosemead, California
Through the Los Angeles County Natural History Museum
Foundation, Section of Ornithology, Los Angeles, California



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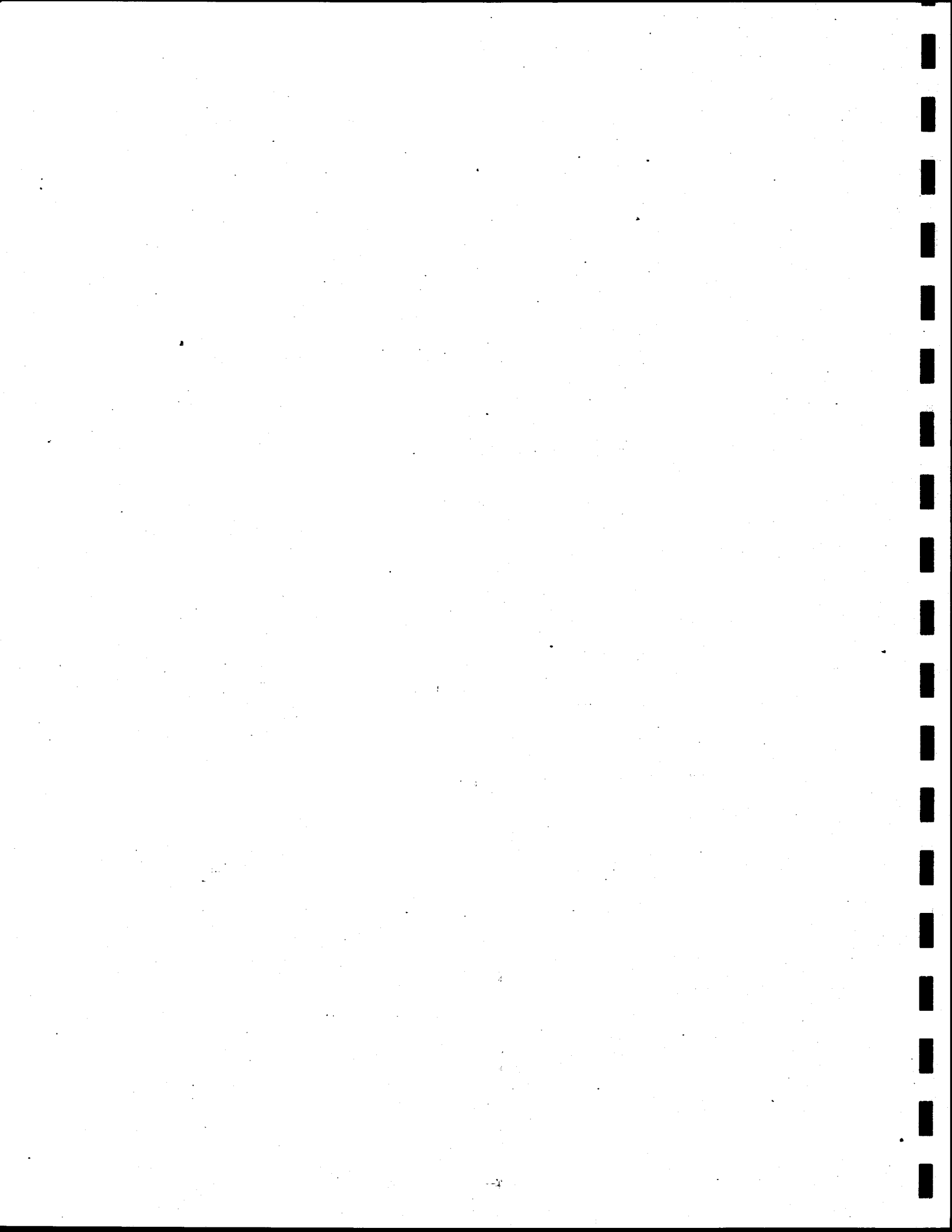
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INTRODUCTION

The development of alternate energy technologies has long been a goal of the Southern California Edison (SCE). These technologies--wind, solar, and geothermal--have been planned for specific areas in southern California. The development of these energy resources, especially wind and solar, require the use of extensive land areas. A large scale wind energy development is planned for the San Gorgonio Pass and Coachella Valley areas of Riverside County (Figure 1). This development may encompass as much as 186 km² and could involve the installation of up to 32,000 wind turbine generators (WTG) (Wagstaff and Brady 1982). Along with SCE's goal to develop and distribute alternate energy resources, there is a commitment to protect the environment in relation to each energy-related development. Therefore, this environmental concern by SCE prompted an investigation of the biological impact of wind energy development in the San Gorgonio Pass and Coachella Valley.

In 1979, SCE funded a study to gather baseline information to gain a better understanding of the dynamics of migratory and resident bird utilization of the San Gorgonio Pass and adjacent desert areas. This was initiated because of the highly land consumptive nature of wind energy development which could affect critical migratory and resident bird habitats. Other concerns with this new technology are whether WTG's could interfere with seasonal movements of migratory birds, their ecology and/or behavior, and possibly result in significant bird deaths due to collisions.

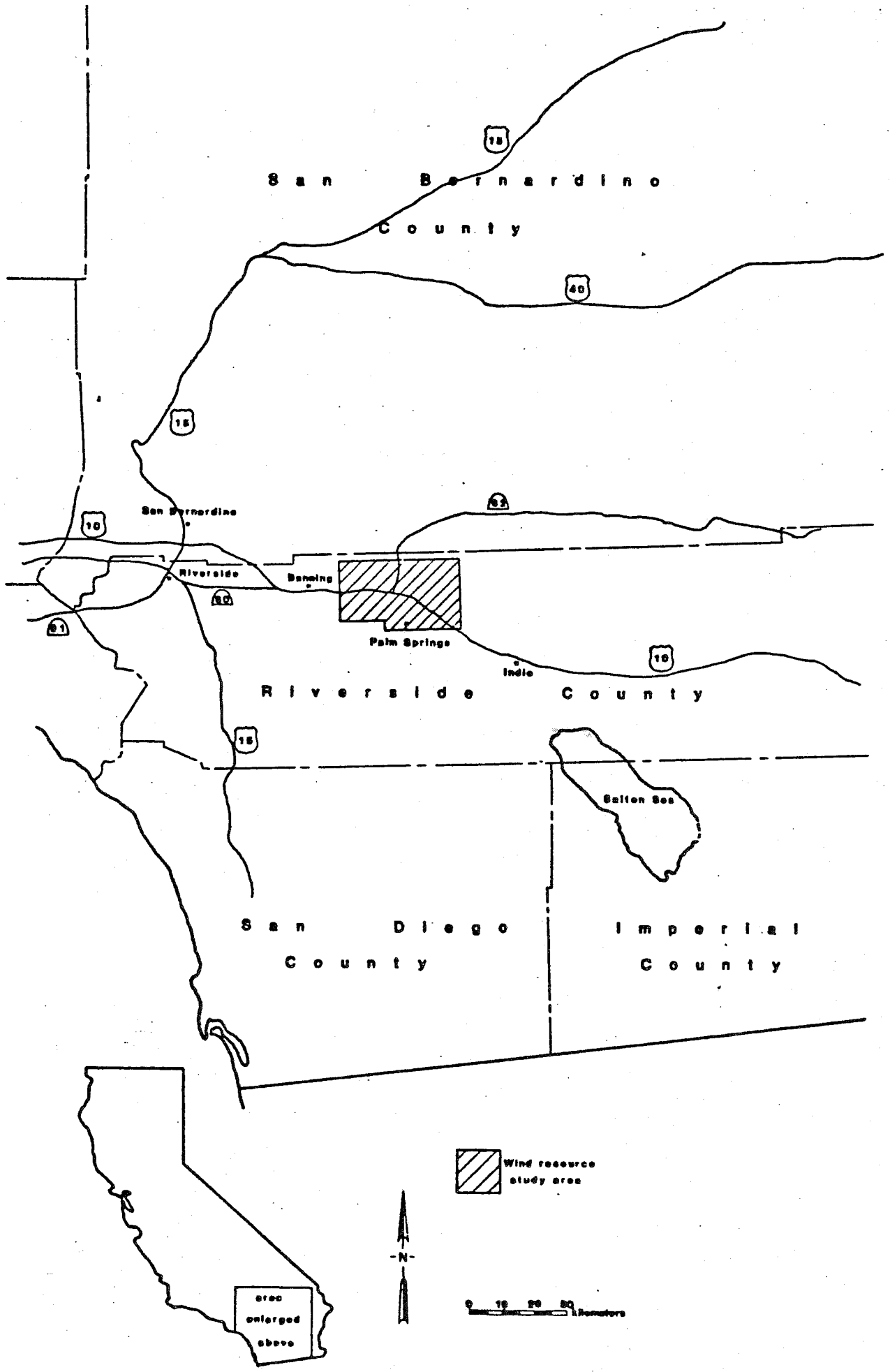


Figure 1. Southern California and the location of the Wind Resource Study Area.

Bird distribution of southern California, in general, has been thoroughly examined by both Grinnell and Miller (1944) and Garrett and Dunn (1981). However, the details of species distribution, migration, and population densities along with habitat utilization are poorly documented. Specific locations, such as the San Gorgonio Pass-Coachella Valley region, are essentially unknown. While some anecdotal sightings of birds in this region have been made over the years, prior to this study, no systematic survey has been conducted.

Historically, several ornithologists postulated on bird migration and usage in the California deserts. Miller (1951) noted "each year across the deserts of the lower Colorado River basin of the southwestern United States and northwestern Mexico move great numbers of migrant birds, passing between their mesic or even humid and cool breeding grounds and the wintering ranges in the mountains or mesic areas of the mainland of Mexico." Jehl (1977) states migrants wintering in Baja California pass through the desert areas to breeding areas in the Great Basin and beyond. Shorebirds and waterbirds that winter along the Pacific Coast of California or Mexico, or at the Salton Sea, cross the area in several directions while returning to inland breeding colonies in the central United States and prairie provinces of Canada. The most extreme of these trans-desert movements requires a flight of 804-1,126 km (500-700 miles) across terrain that is largely unsuitable for the survival of most species. And in fall, especially, the movement is made all the more rigorous by hot and dry conditions of that period. The route that Jehl refers to is the region between the Pacific slope (west of the transverse range) and the highland of west Mexico in the State of Sonora.

Lying between these two localities are two regions, the San Gorgonio Pass and Coachella Valley, which have been identified as major routes of migration. Howell (1923) considered that the shores of the Salton Sea basin provided leading lines for migrants northward to the Coachella Valley. Small (1975) postulated that, of the five California deserts, the Colorado Desert (Coachella Valley and Imperial Valley) figures most importantly in the spring migratory patterns of birds into California from Mexico.

The influence of topography on migrants has also been considered by Miller (1951) in his review of "Avian flyways of Western America." He discusses the importance and effects of topography, especially fault lines and mountain passes, in directing migration. He also considered the route from the Gulf of California through the Coachella Valley and San Gorgonio Pass to be the major route of birds crossing the desert.

With these historic perspectives defined, research in the San Gorgonio Pass and Coachella Valley was initiated in March 1979 and continued for four diurnal migratory periods (spring and fall 1979 and spring and fall 1980). The spring 1979 field season was considered preliminary in nature and involved study site and methodology evaluations. These data from the spring 1979 season, although not interpreted in this report, clearly indicated the need for a more extensive biological study of the region; therefore, we conducted more systematic studies in fall 1979 and spring and fall 1980.

The objectives of this study were to:

1. Collect baseline information on the extent of use of migratory and resident birds within and adjacent to the wind resource study area (WRSAs).
2. Determine and evaluate seasonal trends in spring and fall bird migration.
3. Obtain data on habitat utilization and identify high-use areas within or near the WRSAs.
4. Complement further nocturnal avian studies with a baseline data set of diurnal observation of species compositions and numbers of migrant birds.
5. Develop recommendations for mitigating the potential effects of the WTG park on migratory and resident birds.

STUDY AREA

Location

This study was conducted in northern Riverside County and southern San Bernardino County. The area extends from Palm Springs on the south to Joshua Tree National Monument and Morongo Valley on the north. The area begins east of Redlands and runs through the San Gorgonio Pass to the north shore of the Salton Sea at the southern end of the Coachella Valley, covering an area of approximately 5,200 km². Only specific sites within this area have been studied. The area encompasses portions of the Colorado Desert, southern Mojave Desert, and interior valley and foothill areas of the San Bernardino and San Jacinto Mountains (Figure 2, Table 1).

The San Gorgonio Pass is formed by the San Bernardino Mountains (3,350 m) to the north and the San Jacinto Mountains (3,050 m) to the south. The elevation of the floor of the pass is approximately 365 m, decreasing from west to east. The east-west lying San Gorgonio Pass is narrow (approximately 5 km in width) and connects the coastal region of southern California with the Colorado Desert, one of the hottest and driest deserts of North America. This vast and arid area extends from the Coachella Valley and Salton Sea eastward. The Coachella Valley is located to the east of the San Gorgonio Pass, between the Little San Bernardino Mountains (1,220 m) to the northeast and the San Jacinto and Santa Rosa Mountains (1,980 m) to the southwest. The elevation of the Coachella Valley varies from 300 m where it meets the San Gorgonio Pass at its northwest end to 70 m below sea level at the north shore of the Salton Sea (Figure 2).

North of the Coachella Valley, and within the Little San Bernardino Mountains, is Joshua Tree National Monument which encompasses a mountain system that extends southeastward from Morongo Valley (787 m) and Yucca Valley (993 m) at the eastern face of the San Bernardino Mountains. The Little San Bernardino Mountains form a complex divide between the low-lying environments of the Colorado Desert and the moderately high basins and sinks of the Mojave Desert to the north.

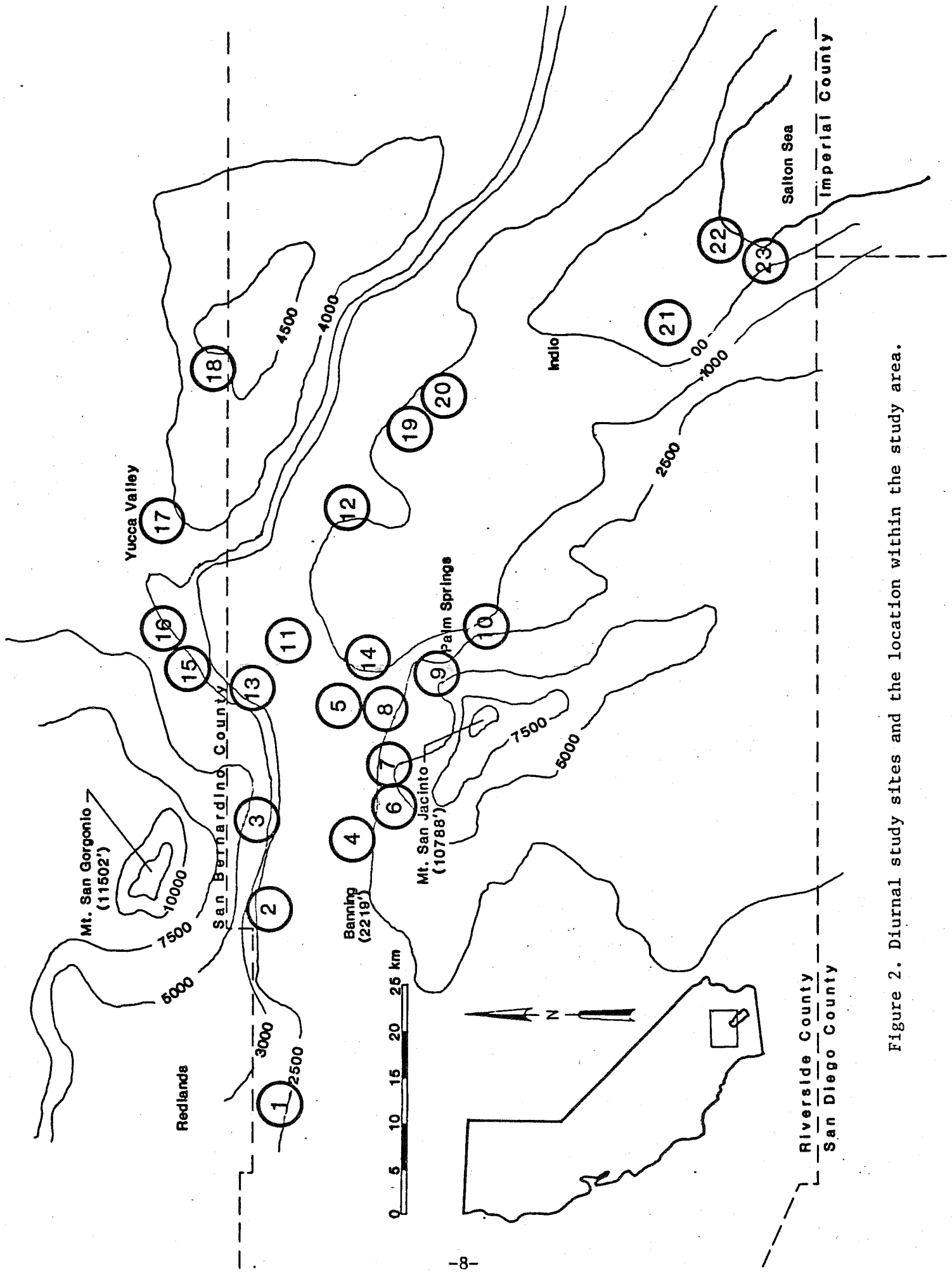


Figure 2. Diurnal study sites and the location within the study area.

Table 1.

KEY TO STUDY SITES LISTED IN FIGURE 2

1. San Timoteo Canyon
2. Banning Canyon
3. Millard Canyon and Kitching Peak
4. Cabazon
5. I-10 Rest Stop (Whitewater)
6. Valley Hi Park
7. Twin Pines Ranch
8. Snow Creek Canyon
9. Chino Canyon
10. Andreas and Palm Canyon
11. Devers Wind Turbine Site
12. Willow Hole
13. Whitewater Canyon
14. Whitewater Settling Ponds/mesquite thicket
15. Mission Creek
16. Morongo Valley
17. Yucca Valley
18. Joshua Tree National Monument
19. Thousand Palms Oasis
20. Pushawalla
21. Ave. 66 and Tyler Street
22. Whitewater Delta (North end Salton Sea)
23. Northwest Salton Sea

Weather and Climate

The climate of this region alternates between mild winters and hot, dry summers. The climate of most of the study area is strongly affected by the rain shadow cast by the San Jacinto and Santa Rosa Mountains. The majority of inland winter storms from the Pacific are blocked by these mountains, thereby creating a generally arid climate.

Desert conditions prevail in the San Gorgonio Pass, Coachella Valley, and southern Mojave, with high temperatures and low rainfall. The region's arid climate changes dramatically with an increase in elevation. From the floor of the Coachella Valley to the upper reaches of Mt. San Jacinto or Mt. San Gorgonio, the climate is temperate--warm summers alternate with cold, snowy winters. During the spring period when valley temperatures are mild, it is not uncommon to have snow falling in the mountain foothills. Because of the complexity of weather conditions in relation to elevation, specific descriptions of weather for all study sites is not included in this report.

Temperatures within the study area vary considerably; for example, temperatures at Palm Springs (148 m) range from a mean winter low of 4.4°C (40°F) (January) to a mean summer high of 42.2°C (108°F) (July), and the Santa Rosa Mountains (2,656 m) range from a mean winter low of -12°C (10°F) (January) to a mean summer high of 27.7°C (82°F) (July) (Aldrich and Meadows 1966). Rainfall within the regions also varies greatly. Average annual rainfall in Palm Springs is 16 cm (6.3 in.); the Santa Rosa Mountains' average annual rainfall is 50.8 cm (20.0 in.) (Aldrich and Meadows 1966).

With the dramatic changes in elevation within the study area, spring daytime temperatures vary considerably, averaging from 20°C-35°C, with nighttime temperatures averaging from 0-15°C. For fall, daytime temperatures average 26°C-42°C, with nighttime temperatures averaging from 10°C-20°C (Aldrich and Meadows 1966).

Two different types of storms resulting in precipitation characterize the study area. Winter-spring precipitation results from storms originating over the northern Pacific Ocean which can be quite extensive, bringing snowfall to higher elevations and rain and cold temperatures to lower elevations. However, most storm systems usually dissipate near the San Gorgonio Pass. Summer-fall storms are convective and originate to the south of the study area. The movement of these tropical air masses from south to north can bring heavy rainfall to the Coachella Valley and surrounding mountain slopes. In some years, these storms can produce enough rain to exceed the annual average rainfall, although these severe storms are a rare event.

The most prominent climatic feature of the WRSA is its unique wind flow pattern (Zambrano and Arcemont 1981). The San Gorgonio Pass is characterized by five basic wind flow patterns caused by existing topographical characteristics of the area and changing synoptic conditions. By far the most significant of these wind flow patterns is the strong westerly flow generated by cool coastal air being pulled into the hot lower deserts of Palm Springs through the San Gorgonio Pass. The pass reaches its maximum elevation of 690 m at Banning, and wind velocity increases as the elevation

of the pass floor drops to less than 180 m at Garnet (30 km east of Banning). Wind velocity peaks at Whitewater where the pass floor begins to downslope in a southeasterly direction to an elevation of around 60 m. The result is stronger winds on the south side of the pass than the north side, especially east of Whitewater. Winds from this westerly flow average 18 mph through most of the Palm Springs-Whitewater region with locally stronger areas on the floor of the pass and on foothill sites exposed to the west winds (Zambrano and Arcemont 1981).

Another basic westerly flow pattern occurs usually during spring with storm fronts moving northwest down the California coast through the Los Angeles Basin and San Gorgonio Pass to the desert. These prefrontal westerly flows going through the pass have recorded average daily wind velocities of 45 mph, with winds from Beaumont to Indio averaging in excess of 20 mph (Zambrano and Arcemont 1981).

A northeasterly wind flow, infrequent yet well known as Santa Ana winds, occurs as a result of a high pressure zone in the Great Basin region of Nevada-Utah. These winds do not usually follow the contour of the San Gorgonio Pass but pass over the San Bernardino Mountains into the southern California coast. The Santa Ana winds usually occur in the fall and winter, and the effects vary in magnitude throughout the study area. During this condition, winds to 35 mph will occur at Devers and Banning while winds at Whitewater peak at 12 mph (Zambrano and Arcemont 1981).

Easterly winds blow through the San Gorgonio Pass on occasion due to different synoptic weather conditions. Mild updrafts from the Coachella Valley, averaging below 10 mph, blow through the San Gorgonio Pass to the coastal areas from December to February when the temperature gradient between Beaumont and Palm Springs is low. When storms approach southern California from the west or southwest, east-southeasterly winds blow through the San Gorgonio Pass. In addition, hurricanes terminating to the south off the Baja Peninsula will cause strong easterly winds through the area (Zambrano and Arcemont 1981).

The final wind conditions occurring in the pass are the drainage flows caused from cold mountain air flowing down the contours into the desert. They are influenced by larger scale synoptic weather, especially high pressure buildups in the southwest. This flow in the late spring and early summer is a morning flow (Zambrano and Arcemont 1981).

Vegetation and Study Sites

Within the study area, climate changes abruptly with elevation, thereby creating a profound change in vegetation. Along with this are physical differences such as slope, substrate, and water supply that account for a unique assortment of vegetation.

In general, the study region is diverse in habitat types and involves three life zones: lower Sonoran, upper Sonoran, and transition. The lower Sonoran zone (0-1,000 m) encompasses the desert habitats from the floor of the Coachella Valley, San Geronio Pass, and portions of Morongo and Yucca Valleys. The most dominant plant species in the lower Sonoran zone is Creosote Bush Scrub. Many other plant communities are represented including fresh water marsh, desert microphyll woodland, desert oasis woodland, desert riparian woodland, desert wash scrub, mixed desert scrub, desert psammophytic scrub (desert dune sand plant), alkaline scrub, desert transition chaparral, and coastal sage scrub (Thorne 1976).

The upper Sonoran zone (1,000-1,800 m) in the study area can be extremely complex, depending on exposure and elevation. Plant communities include riparian woodland, inland sage scrub, southern oak woodland/grassland, chaparral and desert transition, chaparral, pinyon-juniper, and Joshua Tree woodland (Thorne 1976).

The transition zone (1,800-2,000 m) is a small portion of the study region encompassing small montane areas on the slopes of the San Jacinto and San Bernardino Mountains where coulter pines and bigcone douglas fir are represented (Thorne 1976).

Study sites were chosen to represent all dominant plant communities within the region. Twenty-four study sites were sampled in three major areas within and adjacent to the WRSA. The longitudes and latitudes of the study sites range from 116° 03' 03" to 117° 08' 03" and from 33° 28' 08" to 34° 05' 05", respectively. For analysis, we have grouped the study sites into three geographical regions. Twelve study sites are within the San Gorgonio Pass, seven within the Coachella Valley, four in the southern Mojave Desert, and one at the north shore of the Salton Sea (Figure 2, Table 1). Study sites vegetation, specific location, elevation, and site descriptions are listed in Table 2. These descriptions of the vegetative component represent a "qualitative" estimate of various habitat types which were censused and does not reflect the precise magnitude of each component within the study sites.

The size of study sites ranged from 8 to 625 hectares, the largest sampling area being the aquatic habitats of the Salton Sea (Table 3). This variation in the size of study sites was related to the patchiness of vegetation types studied within each region. Certain isolated habitats, such as desert oasis and riparian woodland, that are important to birds varied considerably in size (Table 2). The monthly frequency of sampling for all three seasons per site were relatively uniform (Table 3).

Table 2 . Vegetation of study sites.

Sampling station number	Name/Location	Site description
1.	<p>San Timoteo Canyon</p> <ul style="list-style-type: none"> - 9.4 km west of Beaumont. - elevation 610 m. - T2S, R2W, sections 25-28. - Riverside County 	<p>This station is the most westerly site within the study area and is subdivided into three subsites along a northwest-southeast oriented canyon opening into the west end of the San Gorgonio Pass.</p> <ol style="list-style-type: none"> 1. Fisherman's Retreat Ponds <p>The types of vegetation are 40% freshwater marsh, 20% inland sage scrub, 15% broad-leaved deciduous and evergreen woodland, 15% cultivated field and residence, and 10% disturbed grassland. Most of the area is artificially flooded but seasonal flooding does occur.</p> 2. San Timoteo Creek <p>The types of vegetation are 80% broad-leaved deciduous forest with a shrub understory, 15% inland sage scrub and 5% cultivated field. Intermittent surface water with seasonal flooding. Creek bed composed of sand bars, mud, intermittent gravel, and organic matter. Hard pack and soft earth, stream banks present on both sides of the creek bed approximately 6 to 10 m in height.</p> 3. Woodhouse Canyon Road <p>Vegetation types consist of 60% inland sage scrub, 30% broad leaved deciduous and evergreen woodland, 10% cultivated fields. During the growing season water is temporarily present.</p>
2.	<p>Banning Canyon</p> <ul style="list-style-type: none"> - 10.6 km north of Banning. 	<p>This site runs along the San Gorgonio River as it drains out of Banning Canyon into the San Gorgonio Pass. Types of vegetation include 50% broad-leaved deciduous forest, 35% chaparral with broad-leaved evergreen</p>

(Table 2. cont.)

Sampling station number	Name/Location	Site description
	- elevation 1,220-1400 m. - T2S, R1E, Sections 4, 5, 8, and 17. - Riverside County.	woodland, 15% needle-leaved evergreen forest. Open water present year-round with seasonal flooding. River bed substrate consists of sand bars, gravel, cobbles, boulders, mud, and organic matter. Small hardpack and soft-earth banks present. Canyon orientation is northwest-southeast at the lower elevation and east-west at the upper elevations. The site is at the south face of San Gorgonio Mountain in the San Bernardino Mountains.
3.	Millard Canyon Creek - 6.4 km north of Cabazon. - elevation 1,341 m. - T2E, R2S, sections 20 & 21. - Riverside County.	This site is in the south facing foothills of the San Bernardino Mountains. Types of vegetation include 70% broad-leaved deciduous and evergreen woodland, 30% chaparral. Sand, mud, organic material, gravel, and some boulders make up the creek substrate. Year round open water with seasonal flooding.
4.	Kitching Peak - 8.1 km north of Cabazon. - elevation 1,707 m. - T2E, R2S, section 21. - Riverside County.	In the San Bernardino Mountains; the vegetation types include 60% needle-leaved evergreen forest, 20% broad-leaved evergreen woodland, 15% chaparral, 5% broad-leaved deciduous woodland. Leaf litter on ground. Intermittent water. North-south oriented canyon.
5.	Whitewater Canyon - 15 km northwest of Palm	Along the Whitewater River this major northwest-southeast oriented canyon drains into the San Gorgonio Pass and has open water year round and seasonal flooding. The river bed substrate consists of sand, mud,

(Table 2 . cont.)

Sampling station number	Name/Location	Site description
	Springs.	gravel, boulders, and some organic matter. Types of vegetation include 85% broad-leaved deciduous and evergreen forest, 10% desert chaparral, 5% desert scrub. Historically known as a major rest stop for migratory birds along the southeast face of the San Bernardino Mountains and Mt. San Gorgonio.
	- Elevation 671 m.	
	- T2S, R3E, sections 15, 22, 23, 26, 27, and 35.	
	-Riverside County.	
6.	Cabazon Tailings	San Gorgonio River and ecotone along the north face at the base of the San Jacinto Mountains. Vegetation types include 20% decadent broad-leaved deciduous woodland, 70% semi-desert grassland/desert scrub, 10% desert microphyll woodland. Open water present year round with seasonal flooding. River bed substrate consists of sand, gravel, and some boulders. The hill above the river has numerous rocky outcrops and large boulders.
	- 1.5 km south of Cabazon.	
	- elevation 537 m.	
	- T3S, R3E, sections 17, 18, 20, and 21.	
	- Riverside County.	
7.	Valley Hi County Park	In the foothills of the San Jacinto Mountains; vegetation types include 60% broad-leaved evergreen woodland, 20% chaparral, 15% open grassland, 5% open water (ponds) with some understory present. Substrate generally covered with a mat of leaf litter.
	- 6.5 km southwest of Cabazon.	
	- elevation 1,103 m.	
	- T3S, R1E, sections 25, & 36.	
	- Riverside County.	
8.	Twin Pines Ranch	Hurley Flats, Brown and Twin Pines Creek in the foothills of the San Jacinto Mountains. Vegetation: 80% broad-leaved deciduous and ever-

(Table 2 . cont.)

Sampling station number	Name/Location	Site description
	- 5 km south of Cabazon. - elevation 1,049 m. - T3S, R2E, sections 32, 33, 28, and 29. - Riverside County.	green woodland, 15% chaparral, 5% cultivated disturbed grassland. Year round open water. Creekbed outcrops and boulders present on some hillsides
9.	Snow Creek Canyon/Village - 5.7 km south of junction I-10 and California State Hwy. 111. - elevation: upper canyon - 488-610 m. village - 400 m. - T3S, R3E, Sections 20, 21, 28, 32, and 33. - Riverside County.	Along the north face of and at the base of Mt. San Jacinto; this sampling station is divided into two subsites. 1. Snow Creek: In a north-south oriented canyon on a wide alluvial fan opening into the San Gorgonio Pass. Vegetation types include 55% broad-leaved deciduous and evergreen forest, 30% broad-leaved evergreen scrub, 10% chaparral, 5% desert scrub. Open, running water is present year round. The creek substrate is composed of gravel and large boulders with some sand: 2. Snow Creek Village: In the same canyon; vegetation types include 30% broad-leaved deciduous woodland, 50% exotic (ornamental) woodland, 20% desert scrub. Seasonally flooded, water not present year round.
10.	Interstate 10 rest stop - 2.8 km east of Junction I-10 and California State Hwy. 111. - elevation 366 m.	This site is near the center of the San Gorgonio Pass at the east end. Vegetation types consist of 25% tamarisk thicket, 40% cultivated fields, 35% desert scrub. Open water present seasonally and artificially.

(Table 2 . cont.)

Sampling station number	Name/Location	Site description
	- T3S, R3E, section 10	
	- Riverside County.	
11.	Whitewater Settling Ponds	Vegetation is almost non existent. Retains water most of the year except for summer months.
	- 8.0 km northwest of Palm Springs.	
	- elevation 335 m.	
	- T3S, R4E, sections 19, 20, and 29.	
	- Riverside County.	
12.	Mesquite thicket	Vegetation type consists of 80% desert microphyll woodland, and 20% desert succulent/scrub. There is an annual understory of grasses. No open water is present. The site is at the base of the northeast face of the San Jacinto Mountains.
	- 10.0 km northwest Palm Springs.	
	- elevation 335 m.	
	- T3S, R3E, Section 24.	
	- Riverside County.	
13.	Devers WTG	At the west end of the Coachella Valley. The vegetation types consist of 90% desert scrub, 10% disturbed desert; no open water.
	- 10.8 km northwest of Palm Springs.	

(Table 2 . cont.)

Sampling station number	Name/Location	Site description
	- elevation 342 m.	
	- T3S, R4E, Sections 4 and 5.	
	- Riverside County.	
14.	Chino Canyon	At the northeast face of the San Jacinto Mountains and Mt. San Jacinto. Vegetation types include 80% broad-leaved deciduous and evergreen woodland, 20% desert scrub. Year round water at site fed by spring. Dense understory. Rocky outcrops and boulders present on hillsides. Area was burned in 1977 summer wildfire.
	- 4 km west of Palm Springs.	
	- elevation 610 m.	
	- T4S, R4E, section 7.	
	- Riverside County.	
15.	Palm Canyon	At the east face of the San Jacinto mountains. Vegetation consists of 90% broad-leaved deciduous and evergreen forest, 5% desert microphyll woodland, 5% desert scrub. Open water year round with seasonal flooding. Canyon has steep cliff walls and large rocky outcrops and boulders on hillsides. Fire destroyed dense lush understory in summer 1980.
	- 4.6 km south of Palm Springs.	
	- elevation 244 m.	
	- T5S, R4E, section 3 & 14.	
	- Riverside County.	
16.	Willow Hole Oasis	Near the northwest side of Edom Hill in Seven Palms Valley. Vegetation types include 70% desert microphyll woodland, 20% desert oasis woodland, 10% desert scrub. Year round water; summer months not above surface; seasonal flooding.
	- 16.9 km north of Cathedral City.	

(Table 2 . cont.)

Sampling station number	Name/Location	Site description
	- elevation 231 m.	
	- T3S, R5E, Sections 21, 22, and 28.	
	- Riverside County	
17.	Thousand Palms	Vegetation types for both sites consist of 60% desert oasis woodland, 20% desert microphyll woodland, 10% broad-leaved deciduous woodland, and 10% desert scrub. Open water occurs at Thousand Palms Oasis and seasonal flooding occurs. The site is in the Indio Hills.
	- 5.4 km northeast of Thousand Palms	
	- elevation 171 m.	
	- T4S, R6E, sections 1 & 12.	
	- Riverside County.	
18.	Pushawalla Oasis	In the Indio Hills; the vegetation at this site consists of 60% desert oasis woodland, 20% desert microphyll woodland, 10% broad-leaved deciduous woodland, and 10% desert scrub. Seasonal flooding occurs; no open water present.
	- 10 km northeast of Thousand Palms.	
	- elevation 207 m.	
	- T4S, R7E, sections 17 & 18.	
	- Riverside County.	
19.	Avenue 66 and Tyler Street	Vegetation types include 40% desert oasis woodland, 30% desert microphyll woodland, 30% alkali sink scrub. Seasonally flooded. No open water present.
	- 11.9 km south of Coachella.	

(Table 2 . cont.)

Sampling station number	Name/Location	Site description
	- elevation -46 m below sea level.	
	- T7S, R8E, Section 8.	
	- Riverside County.	
20.	Mission Creek.	This sampling station is divided into two subsites: the Mission Creek area is an ecotone between the Mojave and Colorado Deserts. The lower canyon vegetation types are 70% broad-leaved deciduous woodland, 20% graminoid plant community, occasionally interrupted by less than 2 meter wide patches of open water, 10% desert scrub. The upper canyon vegetation is 50% broad-leaved deciduous woodland, 20% graminoid plant community, 10% chaparral and 10% pinyon-juniper woodland. This area has year round water, with seasonal flooding. The creek substrate is composed of coarse sediment and medium to large boulders.
	- 10.5 km west of Desert Hot Springs	
	- elevation: lower canyon - 732 m. upper canyon - 914 m.	
	- T2S, R3E, sections 2, 3, and 12.	
	- Riverside County.	
21.	Morongo Valley	Big Morongo Canyon in the northwest portion of the Little San Bernardino Mountains is an ecotone between the Mojave and Colorado Deserts. Vegetation types include 90% Broad-leaved deciduous and evergreen woodlands, 10% desert and juniper scrub. Water present year round with seasonal flooding. Canyon is northwest-southeast oriented. Historic migratory bird resting area.
	- 0.5 km east of Morongo Valley.	
	- elevation 732 m.	
	- T1S, R4E, sections 28, 33, and 34.	
	- San Bernardino County.	

(Table 2 . cont.)

Sampling station number	Name/Location	Site description
22.	Yucca Valley Golf Course	In the northwest portion of the Little San Bernardino Mountains; the vegetative types include 30% broad-leaved deciduous and evergreen woodland, 50% ornamental broad-leaved deciduous and evergreen woodland, 10% cultivated fields, 10% Joshua Tree Woodland. Open water present at ponds. Seasonal flooding occurs.
	- 1.3 km southwest of Yucca Valley.	
	- elevation 1,232 m.	
	- T1S, R5E, section 4.	
	- San Bernardino County.	
23.	Joshua Tree National Monument.	In Lost Horse Valley in the Little San Bernardino Mountains, 50% of this site is open water with some marsh vegetation on the edges of the ponds. Other vegetation types include 35% broad-leaved evergreen and needle-leaved evergreen woodland, and 15% Joshua Tree woodland.
	- 15 km southwest of Twenty-nine Palms.	
	- elevation 1,280 - 1,311 m.	
	- T1S, R8E, section 32;	
	T2S, R8E, sections 4, & 5.	
	- Riverside and San Bernardino Counties.	
24.	Salton Sea (north end)	Open water comprises 65% of the habitat with 15% marsh type vegetation. Other vegetation types include 10% alkali sink scrub, 5% cultivated fields, 5% broad-leaved evergreen woodland. Water year round in canals and seasonally flooded.
	- 22 km. southeast of Coachella.	
	- elevation -67 m below sea level.	

(Table 2 . cont.)

<u>Sampling station number</u>	Name/Location	Site description
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- T8S, R9E, sections 4, 5, 6, 15, and 16.

- Riverside County.

Table 3

AREA SAMPLED AND CENSUS FREQUENCY PER MONTH

Study Sites	Hectares	Fall 1979				Spring 1980			Fall 1980			
		Aug	Sept	Oct	Nov	Mar	Apr	May	Aug	Sept	Oct	Nov
San Timoteo Canyon	233	2	7	7	5	6	7	9	2	7	7	7
Banning Canyon	113	2	7	7	5	5	7	9	2	7	7	6
Millard Canyon- Kitching Peak	74	2	7	6	5	5	7	8	2	6	7	7
Cabazon	42	2	7	7	5	5	7	8	2	6	7	7
I-10 Rest Stop (Whitewater)	19	2	7	6	5	5	7	8	2	6	7	7
Valley Hi Park	61	2	7	7	4	5	7	8	2	6	7	7
Twin Pines Ranch	73	2	7	7	4	5	7	8	2	6	7	7
Snow Creek Canyon	90	2	7	7	4	5	7	8	2	6	7	7
Chino Canyon	21	2	7	7	5	5	7	9	2	7	7	6
Andreas-Palm Cyn	34	2	7	7	5	5	7	9	2	7	7	6
Devers WTG Site	8	2	7	7	4	5	7	8	2	6	7	7
Willow Hole	24	2	7	7	4	6	6	9	2	7	7	7
Whitewater Canyon	55	2	7	6	4	5	7	8	2	6	7	7
Whitewater Settling Ponds	32	-	-	-	-	5	7	8	2	7	6	7
Mesquite Thicket	18	-	-	-	-	5	7	8	2	7	6	7
Mission Creek	65	-	-	-	-	5	7	8	2	6	7	7
Morongo Valley	125	3	6	7	5	6	6	9	2	7	7	7
Yucca Valley	50	3	6	7	5	6	6	9	2	7	7	7
Joshua Tree N. M.	229	3	6	7	5	6	6	9	2	7	7	7
Thousand Palms Oasis	42	2	7	7	4	6	6	9	2	7	7	7
Pushawalla	36	2	7	7	4	6	6	9	2	7	7	7
Ave. 66 and Tyler Street	114	2	7	7	4	5	7	8	2	7	6	7
North end of Salton Sea	625	2	7	7	4	5	7	8	2	7	6	7

METHODS

Bird Censusing

Avian species composition and populations were collected at all 24 sites. The census data included here are from 22 August to 21 November 1979, 8 March to 31 May 1980, and 25 August to 30 November 1980. Bird censuses were conducted at each site once every fourth day during each study period. Two methods of bird censusing were employed during this study. The first was the modified Emlen (1971) variable-distance transect method. Censusing was done by one observer in the early morning during periods of peak bird activity. Bird detections were recorded at lateral distances up to 125 m, and the censused area included about 40 hectares from 1,600 m transects. Emlen transects were established at eight study sites where habitat was considered homogeneous, which is a prerequisite for this procedure. These were San Timoteo Canyon, Banning Canyon, Cabazon, Kitching Peak, Whitewater Canyon, Morongo Valley, Pushawalla Canyon, and 66th and Tyler Street (Figure 2).

The second method of censusing was not as rigid as the Emlen method. Censuses were conducted in the same manner each time by one observer systematically walking through each site recording all birds detected. This was done at all study sites including those mentioned above, which would take place after the early morning transect count. Length of time expended at each site was related to the size of each study area. Therefore, two small study sites could be sampled in one morning, while a large study

site would take an entire morning. Each site was sampled for approximately 4 hours (mean = 4.3 ± 1.2 SE) per day (mean per season = 88.5 hours ± 18.0 SE).

Censusing was also performed in the afternoon based on the assumption that certain species' activity patterns would increase during daylight hours, e.g. vulture, hawks, swifts, and swallows. Included in this reasoning is the view that certain birds perform migration throughout the day.

Analysis

From the Emlen transect results, we determined avian density for each transect. The density of each species was based on the number of individuals per 40 hectares (100 acres)--a standard unit used for avian studies. Season, monthly, and weekly avian densities were calculated for each study site.

The other census data collected from direct counts at each site have not been portrayed in birds/40 ha, rather these data are shown as birds per unit area. Although this is a relative abundance, these calculations reveal an index to population numbers.

The number of different species found at a given study site represented a measure of species richness. Bird species diversity (BSD) are computed from the equation $H' \text{ (BSD)} = -\sum P_i \log_e P_i$ based on the Shannon-Wiener model of information theory (Shannon and Weaver 1963) as it applies to biological parameters (MacArthur 1963). BSD is a measure of the number of species, as well as the proportion of total individuals belonging to each species.

RESULTS

All bird species recorded during this study and study sites and season in which they were observed are listed in Appendices A, B, C, and D. The bird species were classified into two categories: migrant and resident. Residents were determined by behavior activity in relation to breeding, habitat preference for breeding, the number of times the species was recorded on each census at each site, and breeding bird distribution literature. Migrants were determined in a similar fashion by breeding distribution of each species, time of season of each observation, habitat types observed in, and bird distribution literature.

Seasonality - Bird Density and Diversity

The results of the 1980 Emlen transect for eight study sites are shown in Table 4 and Figures 3, 4, 5, 6, and 7. Seasonal variations in both bird density and species richness is apparent in Figure 3. A significant correlation exists between average density and total number of species from the transect data at each site ($r=0.91$, $P<0.001$), indicating that areas with more species of birds tended to have higher overall densities of birds.

In terms of bird density, the spring 1980 mean had an overall higher number of birds/40 ha than fall 1980 (Figure 4). This was especially true for the six low-elevation sites within the San Gorgonio Pass, Coachella Valley, and Morongo Valley (mean density = 612 birds/40 ha $61 \pm SE$) where 65% were migrant birds. During spring at upper elevation sites in San Bernardino Mountain foothills, the mean density was 319 birds/40 ha $43 \pm SE$ of which 38% were considered migrants. Fall bird density for upper-elevation sites showed some differences, averaging 465 birds/40 ha $59 \pm SE$ of which 61% were migrants, while lower-elevation sites averaged 401 birds/40 ha $38 \pm SE$ of which 49% were migrants.

Table 4. Avian densities (abundance/40 hectares) at eight diurnal sites in spring/fall 1980.

Species	San Timoteo Canyon	Banning Canyon	Cabazon	Kitching Peak	Whitewater Canyon	Morongo Valley	Pushawalla Canyon	Ave. 66 & Tyler St.
Green-backed Heron	0/0	0/0	0/0	0/0	0/1.4	.4/0	0/0	0/0
Black-shouldered Kite	0/.1	0/0	0/0	0/0	0/0	0/0	0/0	0/0
Sharp-shinned Hawk	.1/.1	.2/	.8/.2	0/.8	0/0	0/.1	.1/.4	0/0
Cooper's Hawk	/1.3	.1/0	.2/.9	.3/0	1.3/0	2.6/1	0/0	.3/1.1
Red-shouldered Hawk	2.6/1.6	0/0	0/0	0/0	0/.3	.1/0	0/0	0/0
Red-tailed Hawk	.1/.1	.8/.1	.1/1.6	.9/.3	0/0	-/0	.7/.6	0/0
Ferruginous Hawk	0/-	0/0	0/0	0/0	0/0	0/0	0/0	0/0
American Kestrel	8.1/3.4	3.2/1.2	1.7/.8	0/.1	0/	.1/.1	1.7/.7	.1/.7
Merlin	0/.5	0/0	0/0	0/0	0/0	0/0	0/.3	0/0
Prairie Falcon	0/0	0/.4	0/0	0/0	0/0	0/0	-/-	0/0
Ring-necked Pheasant	1.2/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
Gambel's Quail	0/0	0/0	3.6/7.9	0/0	0/2.9	32.3/15.6	8.7/170.6	35.9/48.4
California Quail	1.6/38.3	13.9/18	20.5/89.6	.3/0	0/0	0/0	0/0	0/0
Mountain Quail	0/0	1/.6	.3/0	.1/6.7	0/0	0/0	0/0	0/0
Virginia Rail	0/.5	0/0	0/0	0/0	0/0	2/2.6	0/0	0/0
Sora	0/.4	0/0	0/0	0/0	0/0	0/0	0/0	0/0

(Table 4. cont.)

Species	San Timoteo Canyon	Banning Canyon	Cabazon	Kitching Peak	Whitewater Canyon	Morongo Valley	Pushawalla Canyon	Ave. 66 & Tyler St.
American Coot	.3/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
Killdeer	2/1.6	.1/0	0/0	0/0	0/0	0/.4	0/0	0/.1
Greater Yellowlegs	1.3/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
Spotted Sandpiper	.1/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
Band-tailed Pigeon	0/0	0/0	0/0	4.4/.3	0/0	0/0	0/0	0/0
Spotted Dove	.4/0	0/0	0/0	0/0	.4/1.1	0/0	0/0	0/0
White-winged Dove	0/0	0/0	0/0	0/0	0/0	0/0	0/0	1.1/0
Mourning Dove	29.5/12.6	4.1/2.1	29.8/16.2	1.1/0	0/3.5	4.4/.3	14.7/.8	133.7/.8
Common Ground-Dove	0/0	0/0	0/0	0/0	0/0	0/0	0/0	1.4/.8
Greater Roadrunner	.3/0	.3/0	1.6/.5	0/0	.6/3.2	.1/.4	.1/.4	2.4/.3
Common Barn Owl	2.2/.4	0/0	0/.8	0/0	0/0	0/.1	0/.4	.8/0
Great Horned Owl	0/0	0/0	0/0	.3/0	0/0	.5/.4	0/.1	0/1.7
Northern Pygmy Owl	.5/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
Burrowing Owl	0/0	0/0	0/.4	0/0	0/0	0/0	0/0	0/0
Spotted Owl	0/0	0/0	0/0	.8/0	0/0	0/0	0/0	0/0
Lesser Nighthawk	0/.1	0/0	.1/0	0/0	0/0	0/0	0/0	0/0

(Table 4 . cont.)

Species	San Timoteo Canyon	Banning Canyon	Cabazon	Kitching Peak	Whitewater Canyon	Morongó Valley	Pushawalla Canyon	Ave. 66 & Tyler St.
Common Poorwill	0/0	0/0	0/.4	0/0	0/0	0/0	0/0	0/0
White-throated Swift	0/0	0/0	0/0	0/0	.5/0	0/0	0/0	0/0
Black-chinned Hummingbird	3.1/.4	0/0	1/0	.8/0	2.3/.9	1.4/.4	.4/0	0/0
Anna's Hummingbird	12.4/14.6	12.3/12.9	9.2/12.7	5.7/3.3	3.6/13.6	10.5/2.6	.6/.6	5.1/1.7
Costa's Hummingbird	15.9/2.1	4.9/1	19.5/1	.5/0	12.2/0	15/.4	5.8/0	2.5/0
Rufous Hummingbird	0/0	0/.5	.4/2.2	0/0	0/.3	0/0	.4/0	0/0
Costa's/Black-chinned Hummingbird	0/0	0/1	0/0	0/0	0/0	0/0	0/0	.8/0
Belted Kingfisher	0/.4	0/0	0/0	0/0	1.2/.1	0/.4	0/0	0/0
Lewis Woodpecker	0/0	.1/0	0/0	0/0	0/0	0/0	0/0	0/0
Acorn Woodpecker	0/0	.4/1.2	0/0	8.2/9.9	0/0	0/0	0/0	0/0
Yellow-bellied Sapsucker	0/.8	0/0	0/0	0/1.9	0/0	.4/0	0/0	0/.8
Ladder-backed Woodpecker	0/0	0/0	2.5/0	0/0	0/0	1.1/0	0/3.3	23.4/6.8
Nuttall's Woodpecker	23.7/13.5	3.1/3.8	0/.4	3.7/3.9	1.7/3.1	0/5.9	0/0	0/0
Downy Woodpecker	1.4/.4	0/0	0/0	0/0	0/0	0/0	0/0	0/0

(Table 4 . cont.)

Species	San Timoteo	Banning Canyon	Cabazon	Kitching Peak	Whitwater Canyon	Morongo Valley	Pushawalla Canyon	Ave. 66 & Tyler St.
Hairy Woodpecker	0/.4	1.1/1	0/0	0/2.9	0/0	0/0	0/0	0/0
White-headed Woodpecker	0/0	0/0	0/0	.8/0	0/0	0/0	0/0	0/0
Northern Flicker	17.5/11.4	9.4/7.5	2.8/.4	2/1.3	.4/.5	1.6/2.5	0/.9	.5/2.3
Olive-sided Flycatcher	0/0	.5/0	1.5/0	1.1/0	.1/0	.6/0	1.3/0	0/0
Western Wood-Pewee	4.2/.6	2.7/.5	4.9/.6	1.1/0	13.2/1.4	7.8/2.2	7.1/0	2.5/0
Willow Flycatcher	.4/.4	.1/0	0/0	0/0	0/0	.4/.1	.4/0	0/0
Hammond's Flycatcher	0/0	0/0	.4/0	0/0	0/0	.7/0	0/0	0/0
Dusky Flycatcher	0/0	0/0	.4/0	0/0	0/.	.4/0	0/0	0/0
Gray Flycatcher	0/0	0/0	0/0	0/0	0/0	0/0	.4/0	0/0
Western Flycatcher	.4/0	.4/0	1.1/1.3	6.4/0	.4/0	6.8/0	1.5/0	1.7/0
Black Phoebe	3.1/11.3	4.4/3.8	6.4/6.3	0/0	5.7/7.5	3.5/4.8	0/0	0/0
Eastern Phoebe	0/0	0/0	0/0	0/0	0/.4	0/0	0/0	0/0
Say's Phoebe	.1/1.3	0/.1	.1/3.1	0/0	0/1.2	.8/0	.7/3.1	0/.8
Ash-throated Flycatcher	11.3/0	7.6/0	5.9/0	1.4/0	3.1/0	6.3/0	1.8/0	18.5/8.5
Cassin's Kingbird	0/0	0/0	0/0	0/0	0/0	.4/.1	0/0	0/0

(Table 4. cont.)

Species	San Timoteo Canyon	Banning Canyon	Cabazon	Kitching Peak	Whitewater Canyon	Morongo Valley	Pushawalla Canyon	Ave. 66 & Tyler St.
Western Kingbird	.9/0	.4/0	4.2/1.3	.3/0	.8/0	2.3/0	.2/0	0/0
Violet-green Swallow	.1/0	0/0	0/0	1.4/0	0/0	0/0	0/0	0/0
Northern Rough-winged Swallow	2.8/0	0/0	2.8/0	0/0	0/0	0/0	.8/0	0/0
Barn Swallow	0/0	0/0	0/0	0/0	0/0	0/0	0/.4	0/0
Steller's Jay	0/0	.2/.5	0/0	2.6/4.9	0/0	0/0	0/0	0/0
Scrub Jay	2.1/7.6	49.8/87.8	0/.3	1.9/5.3	1.7/6.3	1/7.1	.1/0	0/0
American Crow	5.7/.6	2.2/.8	.7/0	0/0	0/0	0/0	0/0	0/0
Common Raven	1.8/.6	0/0	1.6/.2	0/0	.8/.8	0/0	1.1/	0/0
Mountain Chickadee	0/.3	.1/7.8	0/0	28.1/35.9	.4/.6	0/14.	0/0	0/0
Plain Titmouse	9.8/5.5	14.4/14.3	0/0	4.1/6.1	.8/.3	0/1.3	0/0	0/.8
Verdin	0/0	0/0	0/0	0/0	0/.4	7.1/.6	10.7/7.6	85.1/54.3
Bushtit	41.4/46.7	25.3/32	2.6/0	5.8/.3	23.9/15.7	23/12.9	0/0	0/0
Red-breasted Nuthatch	0/0	0/0	0/0	.3/0	0/0	0/0	0/0	0/0
White-breasted Nuthatch	0/.8	-./2	0/0	1.9/13	0/.4	0/.3	0/0	0/0
Pygmy Nuthatch	0/0	0/.1	0/0	0/0	.8/0	0/0	0/0	0/0

(Table 4. cont.)

Species	San Timoteo Canyon	Banning Canyon	Cabazon	Kitching Peak	Whitewater Canyon	Morongo Valley	Pushawalla Canyon	Ave. 66 & Tyler St.
Brown Creeper	0/0	0/.4	0/0	3.9/21.3	0/0	0/1	0/0	0/0
Cactus Wren	0/0	0/0	12.1/7.2	0/0	.1/0	.9/0	6.6/11	32.7/36
Rock Wren	0/0	1.4/2.2	3.6/4	0/0	1.3/3.4	0/0	3/2.4	0/0
Canyon Wren	0/0	0/0	.1/.1	2.5/11.4	0/0	0/0	0/0	0/0
Bewick's Wren	79.5/40.7	11/28.2	4/31.6	2.6/8.3	21.1/24.1	40.6/14.9	4.2/6.7	65.1/38.5
House Wren	26.1/6.1	11/6.9	6.9/3.8	12.9/28	1.3/3.2	5.9/1.9	.7/0	0/1.7
Marsh Wren	0/0	0/0	0/0	0/0	0/.6	1.5/3.1	0/0	0/0
Golden-crowned Kinglet	0/0	0/0	0/0	0/.7	0/0	0/0	0/0	0/0
Ruby-crowned Kinglet	8.7/36.1	20.6/33.6	-/17.7	3.3/30.1	3.1/23.5	29.9/35.2	1.4/4.5	3.9/35.7
Blue-gray Gnatcatcher	0/0	.4/0	0/0	0/0	0/0	.9/0	0/.4	0/.8
Black-tailed Gnatcatcher	0/0	0/0	0/0	0/0	0/0	0/0	3.3/2.9	12.2/6.6
Western Bluebird	1.5/0	2.8/1.9	0/.4	6.9/1	0/1.9	0/5.9	0/3.2	0/0
Townsend's Solitaire	0/0	.1/0	0/0	0/1.7	0/0	0/0	0/.4	0/0
Swainson's Thrush	0/0	0/0	.6/0	0/0	.4/0	11.9/0	.8/0	0/0
Hermit Thrush	1.8/1.9	1.2/2.4	.4/0	0/1.4	2.7/3.3	3.5/5.8	0/.8	0/.5

(Table 4. cont.)

Species	San Timoteo Canyon	Banning Canyon	Cabazon	Kitching Peak	Whitewater Canyon	Morongo Valley	Pushawalla Canyon	Ave. 66 & Tyler ST.
American Robin	0/0	0/.1	0/0	0/.3	0/0	0/0	0/0	0/1.7
Wrentit	0/.9	17/15.6	-./6	0/0	0/0	0/0	0/0	0/0
Northern Mockingbird	.4/.5	2/5.7	3/0	0/0	.1/2.9	.9/0	.1/1.4	21.5/48.5
California Thrasher	2.8/2.8	3.8/6.4	2.9/0	0/0	2.5/5.6	6.2/2.6	0/0	0/0
Le Conte's Thrasher	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/.3
Water Pipit	0/.2	0/0	0/2.1	0/0	0/0	0/0	0/0	0/0
Cedar Waxwing	4.6/0	6/7.9	0/0	0/0	0/0	0/0	2.5/.8	0/0
Phainopepla	.1/0	.6/2.7	2.7/.1	0/0	.9/0	6.1/0	0/3.7	0/11.4
Loggerhead Shrike	0/1.9	0/1.8	3.3/1.8	0/0	0/2.3	0/-	.1/1.5	0/.6
European Starling	102.2/76.4	12/3.4	39.7/10.3	0/0	6.5/12.4	6.9/0	19.2/18.2	10/12.2
Bell's Vireo	0/0	0/0	0/0	0/0	.4/0	.1/0	0/0	0/0
Solitary Vireo	0/.4	.4/0	0/0	0/0	.8/0	0/.4	0/0	0/0
Hutton's Vireo	0/0	0/0	0/0	.3/0	0/0	0/0	0/0	0/0
Warbling Vireo	2.8/.3	2.2/0	1.3/0	0/0	4/.7	19.2/2.9	3.1/0	.8/0
Orange-crowned Warbler	1.3/10.1	2.2/0	.5/0	0/3.3	4.1/3.1	14.4/6.4	4.3/1.3	10/16.2

(Table 4. cont.)

Species	San Timoteo Canyon	Banning Canyon	Cabazon	Kitching Peak	Whitewater Canyon	Morongo Valley	Pushawalla Canyon	Ave. 66 & Tyler ST.
Nashville Warbler	.8/0	1.4/1.3	.4/.4	0/0	.1/.9	7.1/0	.4/.4	3.3/0
Lucy's Warbler	0/0	0/0	0/0	0/0	0/0	2.8/0	0/0	3/1.7
Yellow Warbler	8.4/.4	1.8/.4	.4/.4	0/0	5.4/1.7	19.6/.8	1.3/.4	1.7/0
Yellow-rumped Warbler	51.2/43.7	4.9/19.3	28.8/21.6	0/0	43.9/42.1	48.5/7.4	3.2/103.3	70.2/167.9
Black-throated Gray Warbler	0/.6	.4/1.9	0/2.9	0/1.1	1/1.7	0/1.8	.4/.4	0/0
Townsend's Warbler	0/0	0/0	0/0	0/8.3	0/0	1.7/1.7	.4/0	0/0
Palm Warbler	.4/0	0/0	0/0	0/0	0/0	0/0	0/0	.8/0
American Redstart	0/0	0/0	0/0	0/0	0/0	0/.4	0/0	0/0
MacGillivray's Warbler	.4/0	0/.8	.4/.4	0/0	.4/0	0/.4	2.1/0	0/0
Common Yellowthroat	.7/8.4	.4/1.3	0/0	0/0	0/2.9	.8/1.7	0/0	0/0
Wilson's Warbler	3.9/27.9	2.2/2.9	4.9/1.3	0/0	11.3/2.2	80.1/4.2	19.2/1.3	1.08/.8
Yellow-breasted Chat	1.1/0	0/0	0/0	0/0	0/0	0/.4	0/0	0/0
Summer Tanager	0/0	0/0	0/0	.8/0	.8/3	.2/.3	0/0	0/0
Western Tanager	.8/.4	3/4.2	2.2/0	8/2.8	2.7/.6	5.4/1	1.7/.1	1.7/0

(Table 4 cont.)

Species	San Timoteo Canyon	Banning Canyon	Cabazon	Kitching Peak	Whitewater Canyon	Morongo Valley	Pushawalla Canyon	Ave. 66 & Tyler ST.
Black-headed Grosbeak	6/0	5.3/3.7	2.2/0	8/2.8	2.7/.6	5.4/1	1.7/.1	1.7/0
Blue Grosbeak	1.8/0	0/0	0/0	0/0	0/0	0/0	0/0	3.3/0
Lazuli Bunting	2.7/0	15.4/.4	9.6/.1	.8/0	.1/1.7	.7/0	19.2/0	4.6/0
Green-tailed Towhee	0/0	.1/.4	0/.4	0/0	0/0	0/0	0/0	0/0
Rufous-sided Towhee	39.1/17.1	28.5/39.7	.4/.6	3.3/10	2.9/3	6.9/1.5	0/.4	0/.8
Brown Towhee	29.5/25.4	33.3/42.5	48.5/58.5	.3/1.1	9.2/7.7	3/3.2	0/0	0/0
Abert's Towhee	0/0	0/0	0/0	0/0	0/0	0/0	0/0	20.6/30.7
Rufous-crowned Sparrow	0/0	.8/0	.8/5	0/0	0/.1	0/0	0/0	0/0
Chipping Sparrow	0/0	.1/0	0/0	0/0	0/0	0/0	0/0	0/0
Black-chinned Sparrow	0/0	.1/0	5.4/0	0/0	0/0	0/0	0/0	0/0
Lark Sparrow	0/16.9	0/.4	11.4/22.2	0/0	0/0	0/0	0/0	0/0
Black-throated Sparrow	0/0	0/0	0/0	0/0	0/0	-.8	.6/4	0/0
Sage Sparrow	0/0	0/0	0/.1	0/0	0/.5	0/0	0/0	0/6.1
Savannah Sparrow	.3/.3	0/3.5	0/0	0/0	0/1.5	1.7/0	0/0	0/0
Fox Sparrow	0/0	0/.1	0/0	0/0	0/0	0/0	0/.4	0/0

(Table 4. cont.)

Species	San Timoteo Canyon	Banning Canyon	Cabazon	Kitching Peak	Whitewater Canyon	Morongo Valley	Pushawalla Canyon	Ave. 66 & Tyler St.
Song Sparrow	128.1/54.7	24.8/18.2	0/0	0/0	46.7/8.4	7.6/7.6	0/0	.3/0
Lincoln's Sparrow	1/4.9	.3/6	0/2.5	0/0	2.2/1.4	8.7/1.9	1.3/.8	0/0
Swamp Sparrow	0/0	0/0	0/0	0/0	0/0	0/.4	0/0	0/0
Golden-crowned Sparrow	0/0	5.5/3.9	0/0	0/5.8	.4/.1	2.9/.4	0/0	0/0
White-crowned Sparrow	20.2/78.8	5.6/113.2	6.1/130.4	0/16.7	23/9.3	8.2/25.2	6.6/2.5	5.8/15.2
Dark-eyed Junco	0/.4	20.3/10.2	13.5/13.3	38/49	0/.4	1.7/.4	0/0	0/0
Red-winged Blackbird	49.6/2.3	0/0	0/0	0/0	0/0	0/0	0/0	0/0
Tri-colored Blackbird	27.3/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
Western Meadowlark	1.7/.4	0/0	1.7/1.2	0/0	0/0	0/0	0/0	1.6/0
Yellow-headed Blackbird	.1/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
Brewer's Blackbird	15.5/8.9	.8/0	0/0	0/0	0/0	0/0	0/0	0/0
Brown-headed Cowbird	22.1/1.3	2.8/0	.1/0	0/0	3.6/0	2.8/0	0/0	25.2/.5
Hooded Oriole	0/0	0/0	1.3/0	0/0	3.5/0	0/0	0/0	.8/0

(Table 4. cont.)

Species	San Timoteo Canyon	Banning Canyon	Cabazon	Kitching Peak	Whitewater Canyon	Morongo Valley	Pushawalla Canyon	Ave. 66 & Tyler St.
Northern Oriole	5.1/0	8.7/0	5.7/0	.8/0	.9/1.4	5.5/0	0/0	16.8/0
Purple Finch	0/.4	10/4.4	0/0	1.2/0	.1/0	0/0	0/0	0/0
Cassin's Finch	0/0	0/.8	0/0	0/1.4	0/0	0/0	0/0	0/0
House Finch	68.7/249.6	3.1/7.6	24.2/40.1	0/0	19.6/5.8	15.3/5.8	108.4/118.8	42.5/48.6
Pine Siskin	.8/.8	.8/0	5.3/0	.3/.3	0/0	10.1/0	0/0	0/0
Lesser Goldfinch	121.8/90.5	15.9/9	41/16.1	13.9/10	31.4/.1	97.9/5.1	31.5/4.7	1.9/2.9
Lawrence's Goldfinch	5.5/7.1	0/12.8	2.1/1.3	2.2/0	0/0	2.1/0	.4/0	0/0
American Goldfinch	1.5/0	0/.1	0/.4	0/0	.1/0	0/0	0/0	0/0
House Sparrow	6.4/3.7	0/0	0/0	0/0	0/0	0/0	0/0	1.9/0

Density 1980

Diversity 1980

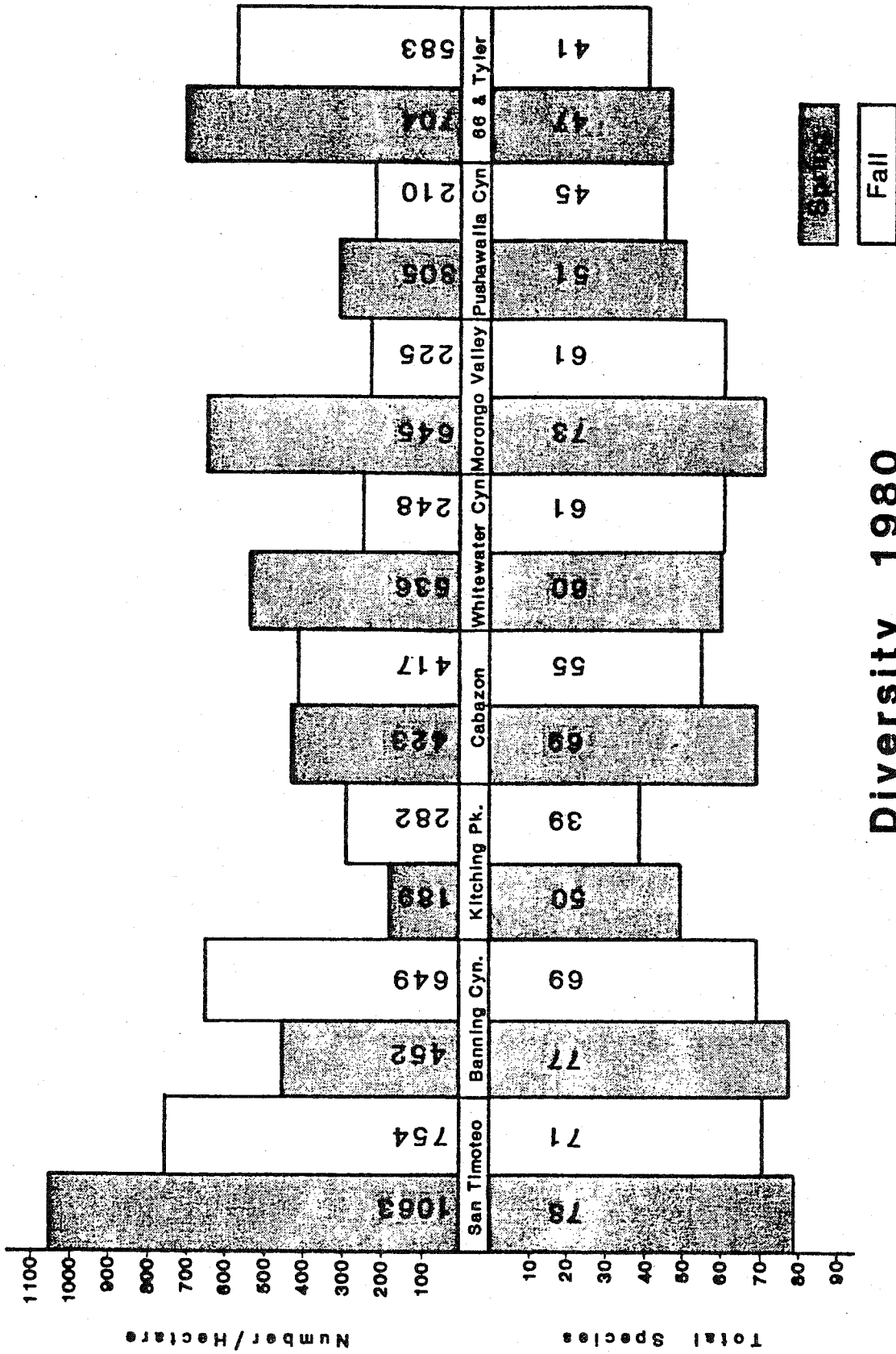


Figure 3. Species richness and birds per 40 ha for each transect site, spring-fall 1980

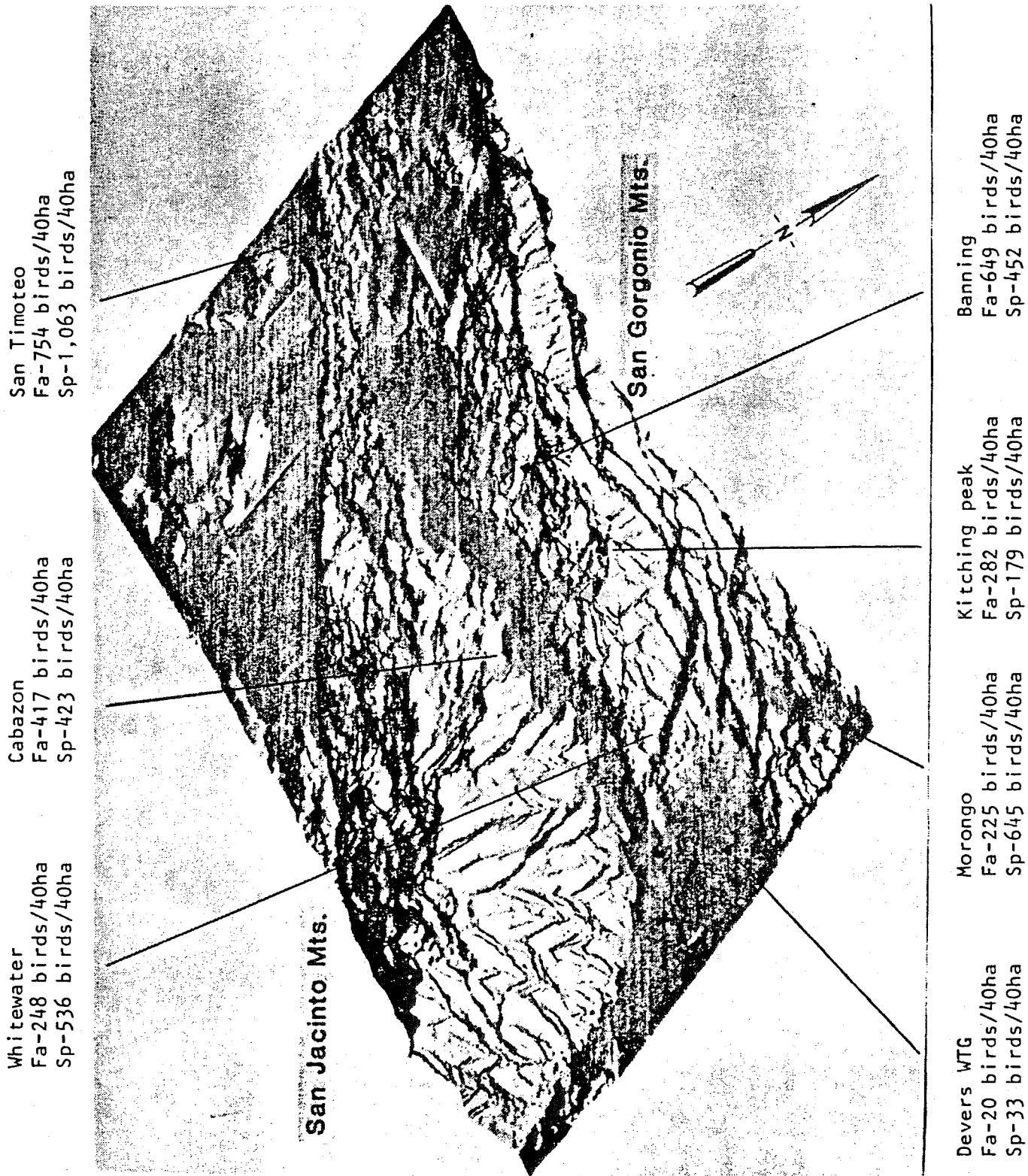


Figure 4. Computer simulated aerial view of the San Gorgonio Pass showing 1980 Bird densities/40 hectares for seven sites.

△ San Timoteo
 ▲ Banning
 ○ Cabazon
 ● Millard

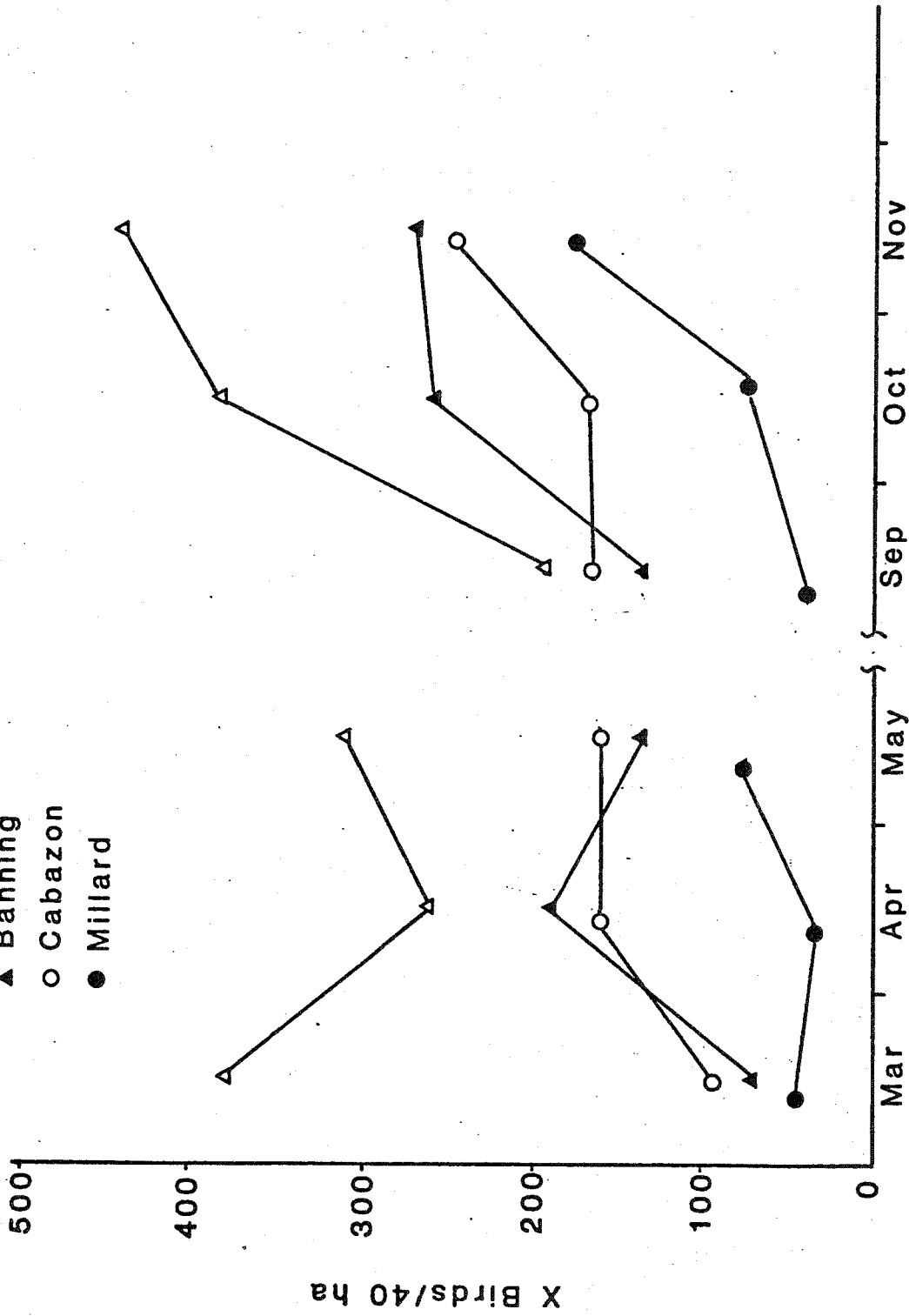


Figure 5. Mean number of birds/ 40ha at San Timoteo Canyon, Banning Canyon, Cabazon, and Millard Canyon.

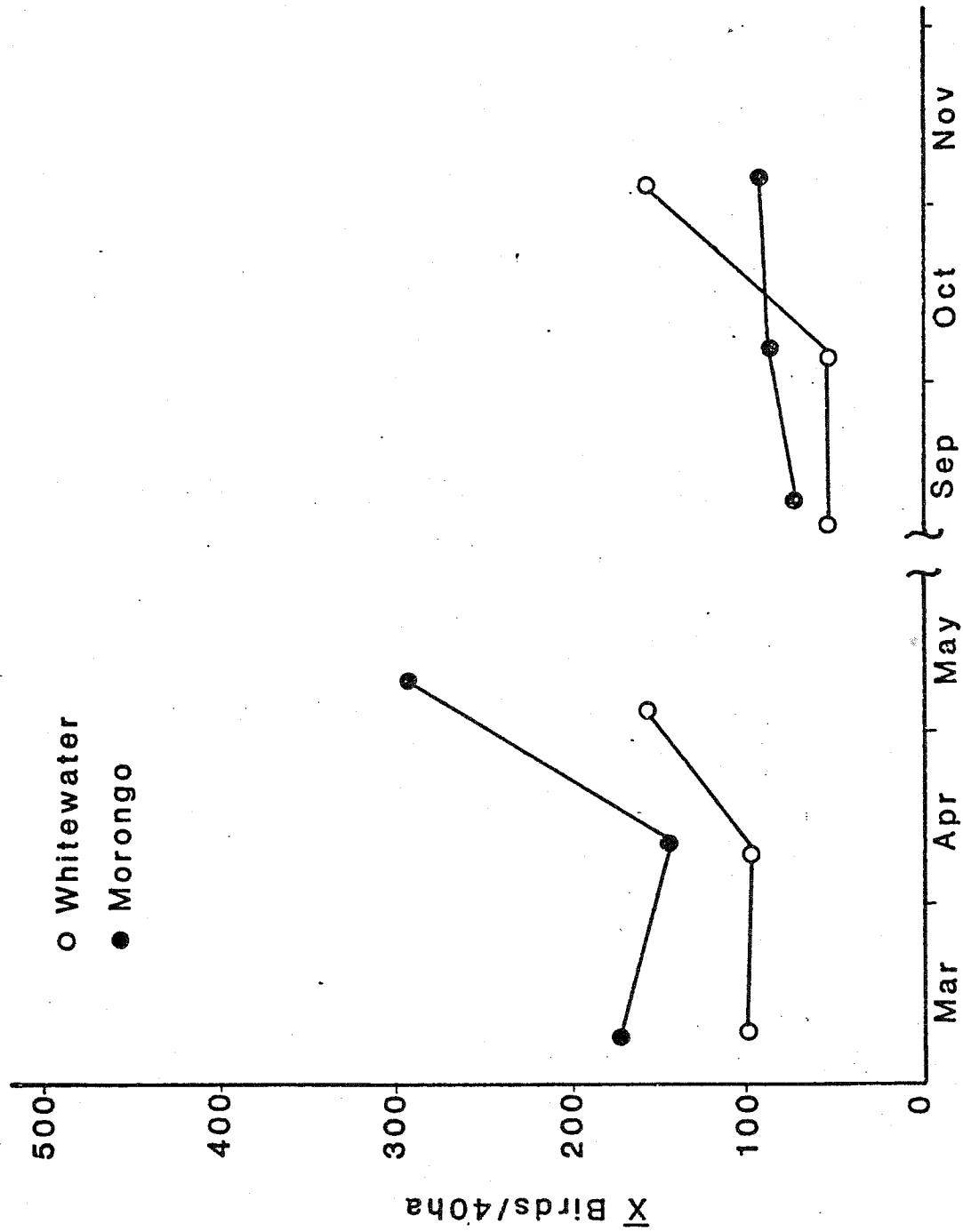


Figure 6. Mean number of birds/40 ha at Whitewater Canyon and Morongo Valley.

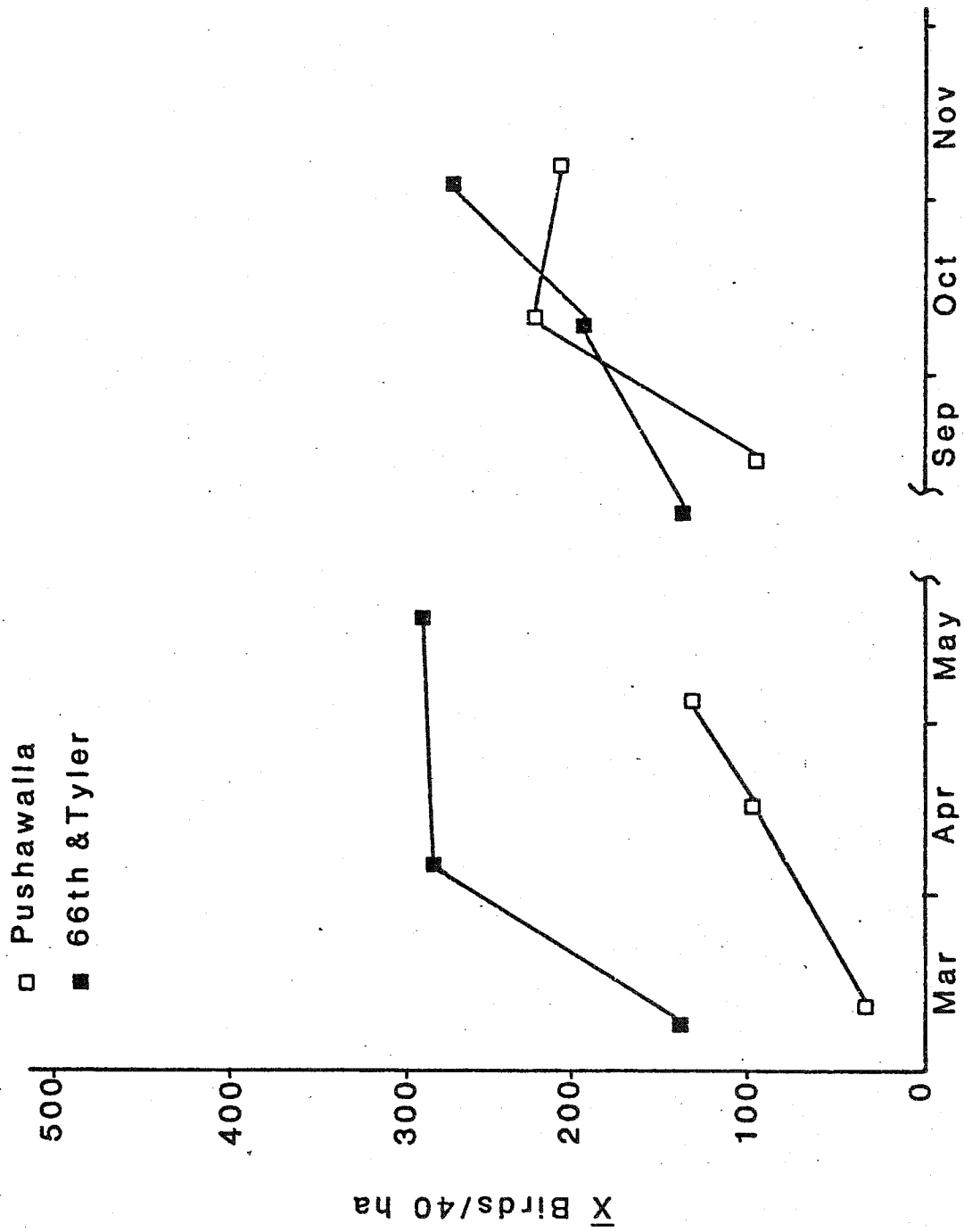


Figure 7. Mean number of birds/40 ha at Pushawalla Canyon and 66th & Tyler.

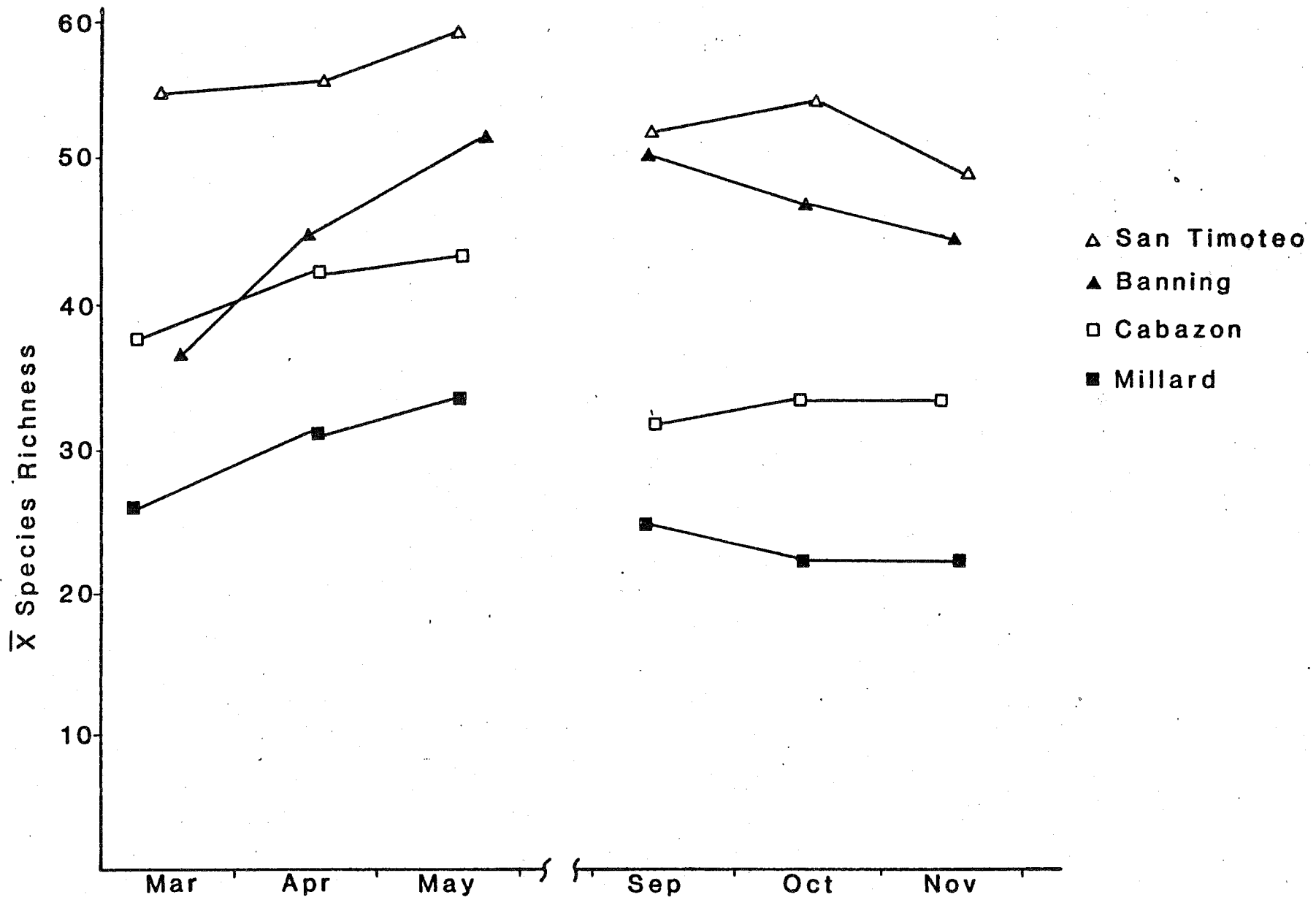


Figure 8. Mean number of species at San Timoteo Canyon, Banning Canyon, Cabazon, and Millard Canyon.

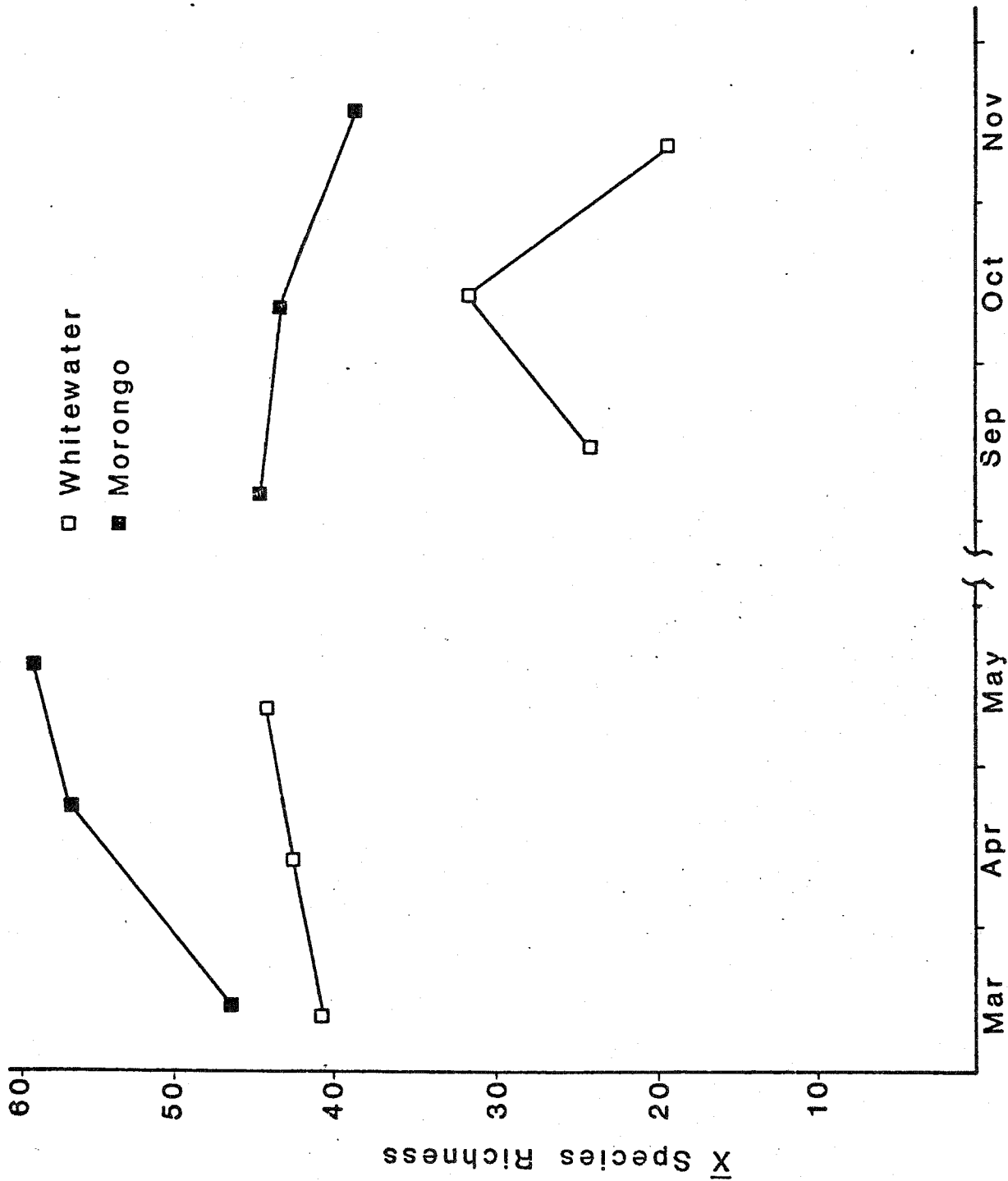


Figure 9. Mean number of species at Whitewater Canyon and Morongo Valley.

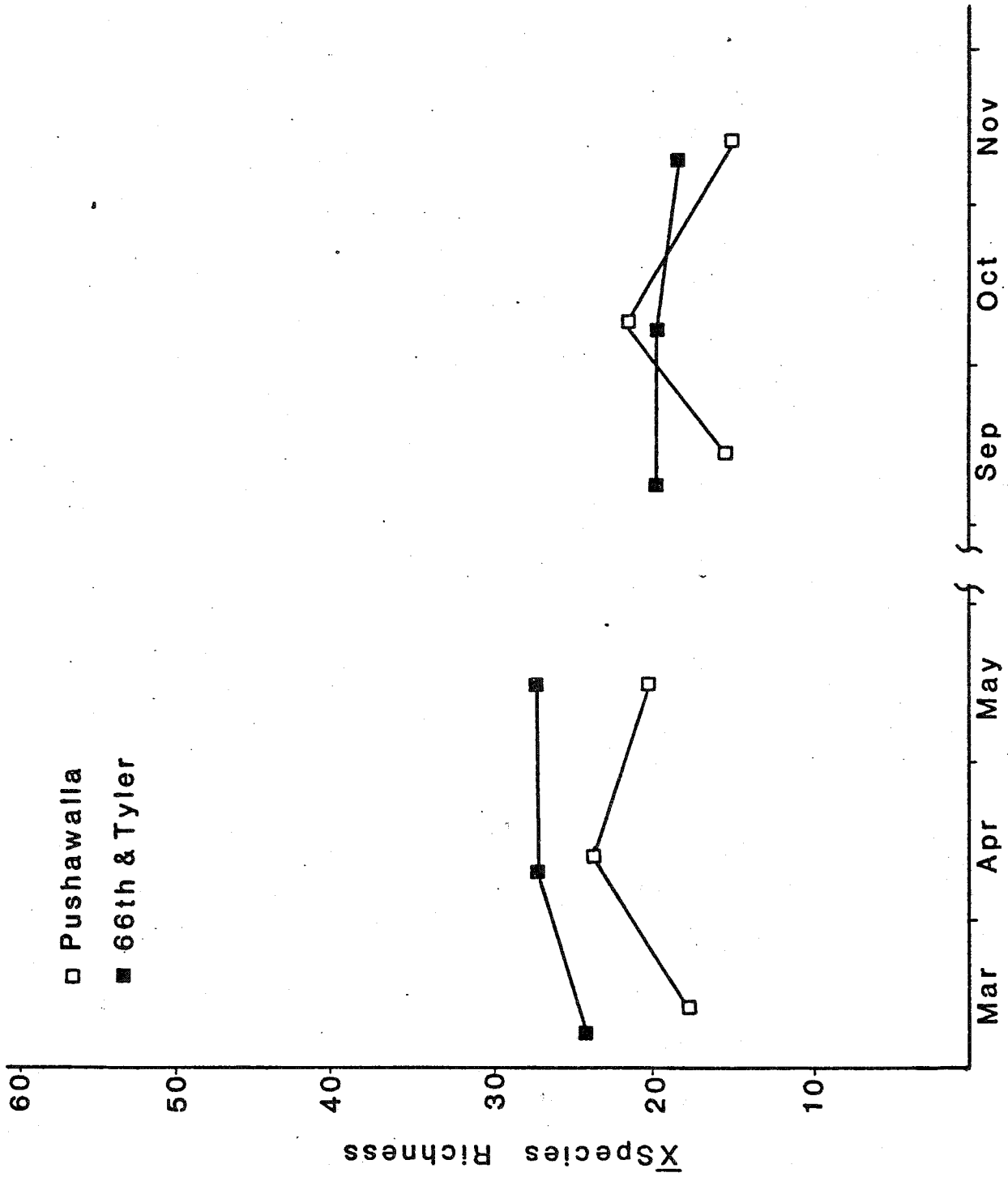


Figure 10. Mean number of species at Pushawalla Canyon and 66th & Tyler.

The average number of migrants was greatest in spring from mid-April to mid-May gradually declining to the lowest level at the end of May. During this period, San Timoteo Canyon and Morongo Valley had the highest mean weekly migrant bird densities (330 migrants/40 ha and 315 migrants/40 ha, respectively). The peak period at these sites was from 27 April to 19 May 1980. In fall, Banning Canyon, the upper-elevation site, and San Timoteo Canyon, the most westerly site, experienced the highest mean weekly migrant densities (168 migrants/40 ha $24 \pm$ SE and 122 migrants/40 ha $33 \pm$ SE, respectively). The peak period at these sites occurred from 25 September through 19 October 1980.

Overall, there were significantly more instances of peak migrant bird densities (i.e., the time of greatest abundance and BSD) occurring in April-May and lowest migrant densities (i.e., the smallest abundance and BSD) occurring in early September and in early to mid-November (student t-test, $P < 0.05$). On the average, riparian areas (San Timoteo Canyon, Whitewater Canyon, and Morongo Valley) were used by migrants more heavily in spring than in fall.

The monthly pattern of bird species richness (Figures 8, 9, and 10) was similar to that of bird densities. The lowest number of species was present in early fall and gradually increased to a peak in October. Species richness in spring was high with an increase throughout the period. Species richness was not significantly different ($P > 0.05$) between months.

Bird species density (BSD) was generally lowest in fall (September) and gradually increased thereafter (Table 5). BSD was relatively high in

spring (April-May) (Table 5) but was variable between months. The highest BSD occurred during the month of April resulting from the large number of migrants present at that time.

As shown from eastern deciduous forests (MacArthur 1963), BSD increased with area. During this study, species-area relationships (Figure 11) was highly significant ($P < 0.001$) regardless of month or season. Although BSD increased with expanded study site areas, certain habitats, such as riparian woodland, oasis woodland, and ecotones (merger between mixed desert/chaparral scrub, and riparian areas) exhibited the greatest increase in BSD.

In summary, there were significant temporal as well as spatial differences in bird community characteristics in the study area. Bird community attributes tended to be at highest levels in spring (April-May) and at their lowest level in fall (early September and November). There were also significant differences between sites, but these were not consistent in all areas.

Migrant vs. Resident Composition Between Three Regions for Spring and Fall

The study area was divided into three regions for comparison and analysis of species composition. These regions are San Gorgonio Pass, Coachella Valley, and Mojave Desert. The specific sites within each region are listed in Table 6.

A cumulative total of 306 species of birds was recorded in the study area during three seasons, fall 1979 and spring and fall 1980. Of the 306 species of birds recorded, 217 species occurred at the San Gorgonio sites (70% of the total). There were 262 species recorded at the Coachella

Table 5. COMPARISON OF MONTHLY BIRD SPECIES DIVERSITY (BSD)^a
AT TRANSECT SITES

Sites	March	April	May	Sept	Oct	Nov
San Timoteo Canyon	2.75	2.43	2.50	2.23	2.36	2.57
Banning Canyon	2.93	2.86	2.53	2.26	2.90	2.99
Cabazon	2.86	3.04	3.22	2.20	2.79	2.72
Millard Canyon/ Kitching Peak	2.66	2.04	2.22	2.40	2.53	2.32
Whitewater Canyon	2.97	2.99	3.35	2.67	2.81	2.07
Morongo Valley	2.97	3.18	3.24	2.01	2.21	2.79
Pushawalla Canyon	1.90	2.20	2.60	2.41	2.26	2.22
66th and Tyler	2.61	2.75	2.65	2.53	2.25	2.18

^aCalculated from the Shannon-Wiener function H'

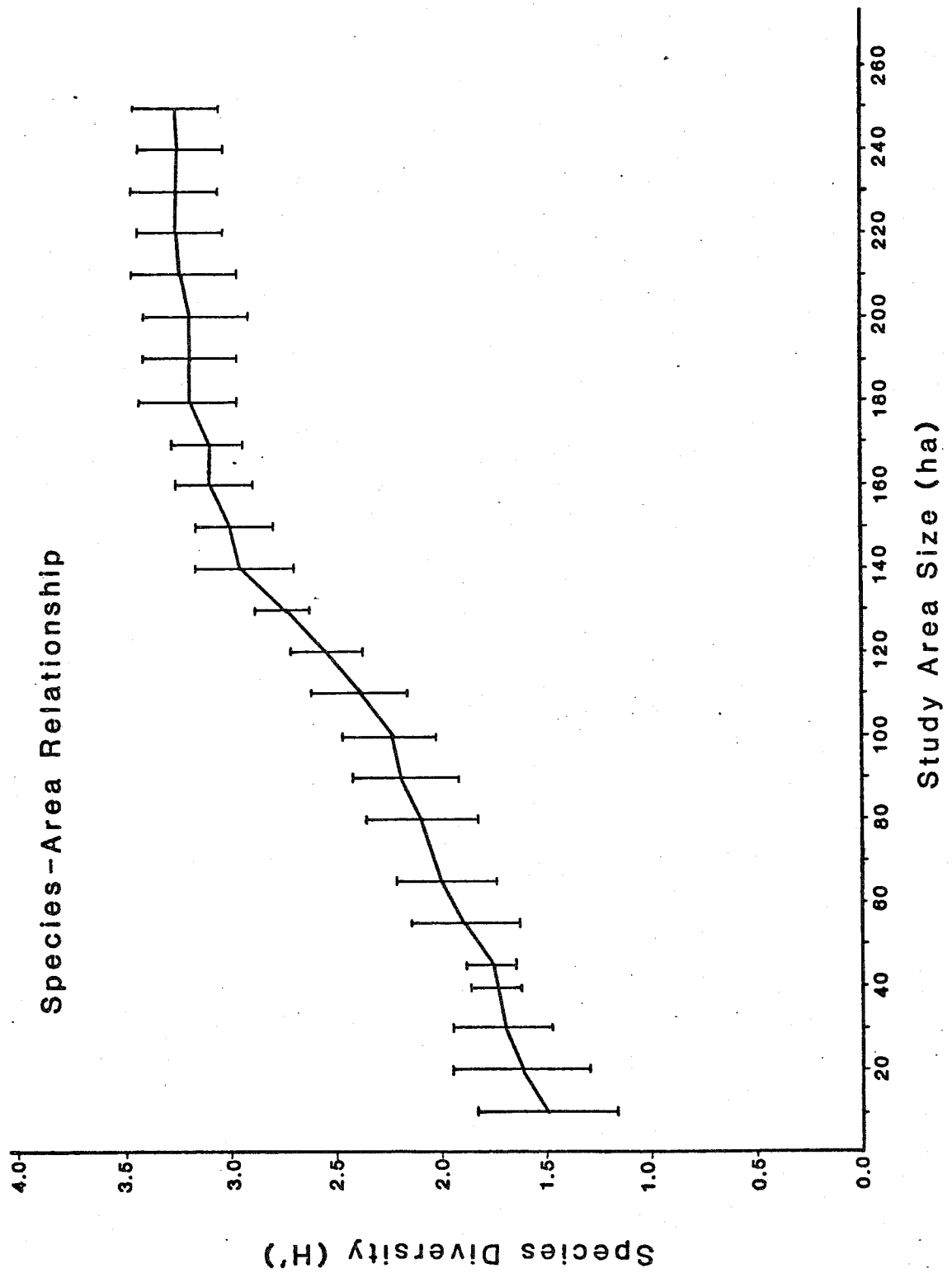


Figure 11. Mean \pm 2SE, bird species diversity in relation to the study area

Valley sites (85% of the total) and 198 species recorded at the Mojave Desert sites (64% of the total). The Salton Sea study site, located within the Coachella Valley region, is unique when compared to the other regions in relation to species composition. The Salton Sea provides extensive aquatic habitats (Table 2), thus, allowing for much greater species composition, mainly of waterbird species. Seventy-one waterbird species occurred at this study site constituting 27% of the species total for the Coachella Valley.

Migrant vs. resident bird species composition by site and season (Table 6) was relatively uniform for all regions. During fall 1979, in the San Gorgonio Pass, 58% of species were migrants and 42% were residents. Similarly, in fall 1980, 59% of species were migrants and 43% were residents. The proportion of migrants was slightly higher in spring 1980 when 62% of species were migrants and 38% were residents.

The use of the Coachella Valley by migrants was slightly higher when compared to the San Gorgonio Pass region. In fall 1979, 67% of species were migrants in this region, and 33% were residents. In spring 1980, 72% were migrants and 28% residents, while in fall 1980, 69% were migrants and 31% residents.

The Mojave Desert region had the highest migrant use and lowest proportion of residents. In both fall 1979 and 1980, species composition in this region was 75% migrants and 25% residents, while in spring 1980, 76% were migrants and 24% were residents.

The number of migrant species was greater than resident species at all sites (Table 6), and the migrant bird total for each site was significantly greater than the resident bird total ($P < 0.01$). However, the Coachella Valley and Mojave Desert had the highest migrant proportion to resident birds, while the San Gorgonio Pass had the lowest percentage of migrants to residents. This can be attributed to the larger number of resident birds occurring in the San Gorgonio Pass region. The chaparral and montane habitats in the San Gorgonio Pass contain a higher proportion of residents than the desert scrub habitats in the Coachella Valley and Mojave regions.

Table 6. Percent of migrant vs. resident species at each diurnal study site.

Region/Site	Fall 1979		Spring 1980		Fall 1980	
	migrant	resident	migrant	resident	migrant	resident
<u>San Gorgonio</u>						
San Timoteo Cyn.	65.0%	35.0%	62.7%	37.3%	62.4%	37.6%
Banning Cyn.	53.5%	46.5%	60.5%	39.5%	58.0%	42.0%
Millard Cyn. & Kitching Peak	51.6%	48.4%	55.4%	44.6%	50.5%	49.5%
Cabazon	51.6%	48.4%	65.2%	34.8%	53.0%	47.0%
I-10 Rest Stop	71.8%	28.2%	78.6%	21.4%	73.5%	26.5%
Valley Hi Park	55.9%	45.1%	51.3%	48.7%	51.3%	48.7%
Twin Pines Ranch	63.0%	37.0%	58.8%	41.2%	57.0%	43.0%
Snow Creek Cyn.	52.4%	47.6%	57.3%	42.7%	50.8%	49.2%
<u>Coachella Valley</u>						
Chino Cyn.	59.0%	41.0%	67.5%	32.5%	54.4%	45.6%
Andreas/Palm Cyns.	58.3%	41.7%	64.5%	35.5%	60.3%	39.7%
Devers WTG	55.6%	44.4%	73.0%	27.0%	70.6%	29.4%
Willow Hole Oasis	74.2%	25.8%	81.2%	18.8%	75.4%	24.6%
Whitewater Cyn.	68.9%	31.1%	71.2%	28.8%	71.0%	29.0%
Whitewater S.P.	---	---	90.8%	9.2%	89.8%	10.2%
Mission Creek	---	---	64.2%	35.8%	63.8%	36.2%
Thousand Palms	77.9%	22.1%	75.3%	24.7%	76.5%	23.5%
Pushawalla Cyn.	75.8%	25.2%	76.6%	23.4%	72.7%	27.3%
Av. 66 & Tyler St.	60.4%	40.6%	64.4%	35.6%	63.0%	37.0%
Salton Sea (north)	71.6%	28.4%	70.0%	30.0%	71.2%	28.8%
<u>Mojave Desert</u>						
Morongo Valley	70.9%	29.1%	72.5%	27.2%	72.1%	27.9%
Yucca Valley	78.7%	21.3%	79.9%	20.1%	82.2%	17.8%
Joshua Tree N.M.	77.3%	22.7%	73.3%	26.7%	72.7%	27.3%

Seasonal and Peak Periods of Migratory Bird Abundance

Similar to the migrant vs. resident bird analysis, for comparison, the analysis of seasonal and peak periods of migratory abundance is divided into three regions. In order to better indicate the magnitude of migration, these data are summarized for only a select number of common migratory species. The species selected are those that occurred regularly during migration within southern California and are not those more obscure, infrequent or rare visitors to the study region. The peak date of occurrence, peak number, and peak period of occurrence are given for each study region (San Gorgonio Pass, Coachella Valley, and Mojave Desert (Tables 7, 8, 9, 10, 11, and 12)).

Diurnally, migrant bird species were recorded throughout each census period (fall 1979, spring and fall 1980). Although the span of the migratory period showed some distinct contrasts among species, along with this there are variations in peak date, peak abundance, and peak period during season (Tables 7, 8, 9, 10, 11, and 12).

Significantly greater ($P < 0.01$) numbers of birds occurred in all regions in spring migration. The abundance of visiting species varied greatly. Some occurred in large numbers, but others have extremely low numbers, and several are represented by only a few occurrences. Most species occurred more commonly during spring than fall migration.

San Gorgonio Region

This region experienced greater numbers of migrants during spring migration than fall migration (Table 7). During fall, the peak abundances for most species in this region occurred at the most westerly study site, San Timoteo Canyon. In fall 1979, peak abundances for most species were greater than in fall 1980. The peak number for songbirds (flycatchers, vireos, and warblers) usually occurred at the upper-elevation sites, Banning Canyon, Twin Pines, Valley Hi, Millard Canyon, and Kitching Peak, while most other species were more uniformly distributed.

The spring period showed a more dramatic difference in use by migrants and peak occurrence than in the fall as shown in Table 7. This difference was most apparent among the low-elevation sites--Cabazon, I-10 Rest Stop (Whitewater), and Whitewater Canyon. Exceptional numbers of migrants occurred at these locations on 13, 21, 22, 25, and 26 March, 3, 15, 18, 24, 26, and 27 April, and 5, 9, and 16 May 1980 (Table 7). The early March periods resulted from large numbers of swallows and Western Kingbirds, which are early migrants.

Mojave Region

Similar to the San Gorgonio region, peak numbers of migrants were greater in spring in the Mojave region (Table 8). Fall 1979 had higher peak numbers than fall 1980, and both fall seasons had very protracted occurrences of migrants, with no substantial peak number days.

Table 7. SPAN OF MIGRATORY PERIOD OF SELECTED MIGRANTS

San Gorgonio Region

Species	Fall 1979			Spring 1980			Fall 1980		
	Peak Date	Peak #	Peak Period	Peak Date	Peak #	Peak Period	Peak Date	Peak #	Peak Period
Turkey Vulture	9-20	38	9-11 to 10-24	4-3	350	3-9 to 4-25	9-11	58	9-2 to 10-15
Vaux's Swift	9-11	24	9-6 to 9-24	4-24	60	4-19 to 5-17	9-8	4	9-4 to 9-27
Western Wood Pewee	9-2	6	8-28 to 9-20	5-12	14	4-24 to 5-26	8-2	5	9-2 to 9-16
Hammond's Flycatcher	--	--	--	4-16	7	4-11 to 5-5	9-13	4	9-2 to 10-2
Dusky Flycatcher	--	--	--	5-3	4	4-21 to 5-25	9-4	2	9-1 to 9-15
Western Flycatcher	9-2	5	8-29 to 9-30	4-26	10	4-19 to 5-27	9-11	6	9-2 to 9-16
Ash-throated Flycatcher	9-8	11	8-24 to 9-30	4-27	21	4-12 to 5-22	9-13	8	9-2 to 10-11
Western Kingbird	9-16	9	8-23 to 9-24	3-25	31	3-14 to 4-5	9-11	4	9-2 to 9-27
Tree Swallow	8-24	115	8-22 to 9-16	3-13	400	3-8 to 4-10	9-4	60	9-2 to 10-23
Violet-green Swallow	9-2	300	8-29 to 9-24	3-21	500	3-19 to 4-21	9-6	30	9-2 to 9-14
N. Rough-winged Swallow	9-22	30	8-22 to 9-11	3-22	75	3-11 to 5-2	9-4	18	9-3 to 9-18
Cliff Swallow	8-22	500	8-22 to 9-8	3-26	1000	3-14 to 4-18	9-3	100	9-3 to 9-12
Barn Swallow	9-12	55	8-30 to 10-1	4-21	300	3-28 to 5-1	9-20	24	9-5 to 9-20
Swainson's Thrush	--	--	--	5-30	3	5-21 to 5-30	9-21	2	9-21
Solitary Vireo	9-5	2	9-1 to 10-4	4-28	4	4-12 to 5-1	9-25	2	9-4 to 9-30
Warbling Vireo	9-11	8	9-3 to 9-24	4-27	12	3-28 to 5-9	9-4	3	9-6 to 10-4
Orange-crowned Warbler	9-15	17	9-4 to 10-11	4-18	26	3-9 to 5-4	9-26	14	9-1 to 10-14
Nashville Warbler	9-20	16	8-28 to 9-24	4-15	12	4-11 to 5-3	9-15	18	9-2 to 9-16

Species	Fall 1979			Spring 1980			Fall 1980		
	Peak Date	Peak #	Peak Period	Peak Date	Peak #	Peak Period	Peak Date	Peak #	Peak Period
Yellow Warbler	9-26	9	8-28 to 9-30	4-27	16	4-20 to 5-22	9-27	11	9-6 to 10-14
Black-Throated Gray Warbler	9-21	7	8-27 to 10-14	4-18	14	4-4 to 5-11	10-8	9	9-2 to 10-18
MacGillivray's Warbler	9-29	6	9-2 to 10-4	5-9	17	4-28 to 5-29	10-14	8	9-7 to 10-20
Wilson's Warbler	9-16	11	9-4 to 10-10	4-27	34	4-6 to 5-14	9-8	9	9-2 to 9-27
Western Tanager	9-12	19	9-4 to 10-10	4-24	10	4-15 to 5-20	9-14	13	9-1 to 10-2
Black-Head Grosbeak	9-15	6	9-4 to 10-15	4-24	19	4-6 to 5-20	9-20	8	9-4 to 9-15
Lazuli Bunting	9-9	16	9-2 to 10-4	5-2	36	4-20 to 5-20	9-8	8	9-2 to 9-17
Lincoln's Sparrow	9-25	21	9-18 to 10-20	3-28	40	3-21 to 5-30	10-4	4	9-18 to 10-20
Northern Oriole	9-10	8	9-4 to 10-15	4-20	14	3-30 to 5-22	9-8	6	9-2 to 10-14

Table 8.

SPAN OF MIGRATORY PERIOD OF SELECTED MIGRANTS

Mojave Region

Species	Fall 1979			Spring 1980			Fall 1979		
	Peak Date	Peak #	Peak Period	Peak Date	Peak #	Peak Period	Peak Date	Peak #	Peak Period
Turkey Vulture	9-17	20	9-10 to 10-20	4-9	200	3-15 to 4-10	9-28	14	9-6 to 10-4
Vaux's Swift	9-14	8	9-4 to 9-16	4-21	30	4-16 to 5-2	9-10	11	9-20 to 9-18
Western Wood Pewee	9-6	8	8-30 to 9-14	5-24	35	4-21 to 5-30	9-4	6	9-1 to 9-21
Hammond's Flycatcher	9-24	3	9-14 to 10-8	4-12	11	4-4 to 5-2	9-18	2	9-10 to 10-4
Dusky Flycatcher	9-4	2	--	5-1	6	4-27 to 5-20	9-8	3	9-8 to 9-14
Western Flycatcher	9-9	3	9-6 to 9-28	4-26	12	4-14 to 5-16	9-3	4	9-2 to 10-7
Ash-Throated Flycatcher	9-4	6	8-29 to 9-14	4-26	18	4-12 to 5-16	9-8	5	9-1 to 9-21
Western Kingbird	9-14	7	8-30 to 9-28	4-1	26	3-15 to 4-10	9-10	6	9-2 to 9-18
Tree Swallow	8-30	38	8-30 to 9-14	3-16	160	3-15 to 4-14	9-5	24	9-1 to 9-18
Violet-Green Swallow	8-30	150	8-30 to 9-28	3-24	300	3-21 to 4-14	9-5	24	9-1 to 9-18
N. Rough-Winged Swallow	8-30	24	8-30 to 9-28	3-28	61	3-21 to 5-1	9-5	15	9-1 to 9-18
Cliff Swallow	8-30	258	8-30 to 9-14	3-30	500	3-15 to 4-10	9-2	100	9-1 to 9-18
Barn Swallow	9-2	27	8-30 to 9-16	4-14	120	4-4 to 4-21	9-3	19	9-1 to 9-21
Swainson's Thrush	9-4	2	9-4	5-31	7	5-24 to 5-31	--	--	--
Solitary Vireo	9-9	4	9-6 to 9-28	4-26	11	4-10 to 5-16	9-12	2	9-5 to 9-28
Warbling Vireo	9-9	10	9-6 to 9-28	4-26	21	4-1 to 5-16	9-12	6	9-6 to 9-28

Species	Fall 1979			Spring 1980			Fall 1980		
	Peak Date	Peak #	Peak Period	Peak Date	Peak #	Peak Period	Peak Date	Peak #	Peak Period
Orange-Crowned Warbler	10-11	22	9-18 to 10-22	5-4	38	4-9 to 5-18	10-14	11	9-20 to 10-25
Nashville Warbler	9-22	4	9-15 to 10-14	4-26	17	4-9 to 5-10	9-17	7	9-10 to 9-30
Yellow Warbler	9-14	8	9-10 to 9-24	4-26	18	4-22 to 5-25	9-18	4	9-9 to 9-30
Black-Throated Gray Warbler	9-18	6	9-10 to 10-4	4-25	11	4-11 to 5-9	9-20	5	9-9 to 9-30
MacGillivray's Warbler	9-18	4	9-15 to 9-24	4-25	17	4-9 to 5-20	9-17	3	9-10 to 9-20
Wilson's Warbler	9-18	11	9-6 to 9-24	4-26	54	4-8 to 5-10	9-17	10	9-20 to 10-25
Western Tanager	9-14	14	9-10 to 10-4	4-26	29	4-17 to 5-20	9-12	8	9-9 to 9-30
Black-Headed Grosbeak	9-14	8	9-10 to 10-14	4-25	23	4-17 to 5-18	9-20	6	9-9 to 10-2
Lazuli Bunting	9-8	10	9-6 to 9-24	4-25	18	4-22 to 5-25	9-12	8	9-9 to 10-2
Lincoln's Sparrow	10-4	19	9-18 to 10-22	3-29	31	3-20 to 5-20	9-30	16	9-20 to 10-25
Northern Oriole	9-18	7	9-10 to 10-4	4-15	12	4-9 to 5-25	9-17	8	9-9 to 10-25

During the spring period, the peak occurrences for songbirds (passerines) was higher in this region than any other region. The most noticeable peaks occurred at the Morongo Valley site, a major desert oasis and an important attractant to migrants (Table 2). At this location, during spring, exceptional peak days were recorded on 29 March, 12, 14, 24, 25, and 26 April, and 1 and 24 May. Species involved in these peaks were flycatchers, thrushes, vireos, warblers, tanagers, grosbeaks, and sparrows. Peak dates and abundances in this region showed slight differences in relation to date when compared to San Gorgonio Pass and Coachella Valley regions. In most cases, the peak migration periods for species in the Mojave region occurred a few days later.

Coachella Valley Region

Again, as indicated in the above sections, the Coachella Valley region received the greater amount of migration in spring, rather than fall (Table 9). The fall periods were very uniform with similar peak numbers and dates of migrants. During spring, peak numbers of birds were recorded at many more study sites in this region than the other two regions (Table 9). The highest peak number of swifts and swallows occurred at the Devers wind turbine site and Willow Hole site. The Devers site had 1,500 Cliff Swallows, 350 Vaux's Swifts, 75 Violet-Green Swallows, and 38 Western Kingbirds, while the Willow Hole site had 750 Cliff Swallows, 350 Tree Swallows, 250 Barn Swallows, 160 Vaux's Swifts, and 49 Western Kingbirds. The peak dates were 12 and 26 March and 1, 4, 5, 21, and 22 April.

Table 9.

SPAN OF MIGRATORY PERIOD OF SELECTED MIGRANTS

Coachella Valley Region

Species	Fall 1979			Spring 1980			Fall 1980		
	Peak Date	Peak #	Peak Period	Peak Date	Peak #	Peak Period	Peak Date	Peak #	Peak Period
Turkey Vulture	9-13	14	9-4 to 10-13	4-9	450	3-26 to 4-29	9-14	110	9-2 to 10-29
Vaux's Swift	9-13	25	9-4 to 10-15	4-21	350	4-12 to 4-29	9-16	14	9-2 to 10-14
Western Wood Pewee	9-4	4	9-4 to 9-18	4-22	14	4-17 to 5-18	9-11	3	9-8 to 9-20
Hammond's Flycatcher	9-22	8	9-20 to 10-15	4-4	12	4-3 to 4-29	9-24	4	9-22 to 10-14
Dusky Flycatcher	--	--	--	4-23	3	4-25 to 5-26	9-11	2	9-11
Western Flycatcher	9-4	4	9-4 to 10-4	4-21	8	4-3 to 5-18	9-9	3	9-8 to 10-14
Ash-Throated Flycatcher	9-13	9	9-6 to 10-21	4-4	12	3-27 to 5-26	9-25	6	9-8 to 10-29
Western Kingbird	9-20	14	9-4 to 10-11	4-4	49	3-26 to 4-29	9-15	17	9-5 to 10-26
Tree Swallow	8-27	60	8-26 to 9-14	3-12	350	3-8 to 4-7	9-2	85	9-1 to 9-8
Violet-Green Swallow	8-30	115	8-27 to 9-18	4-1	75	3-22 to 4-18	9-2	18	9-1 to 10-14
Cliff Swallow	9-4	300	8-26 to 9-16	3-26	1500	3-20 to 4-7	9-2	500	9-1 to 9-28
Barn Swallow	9-2	15	8-23 to 10-11	4-4	250	3-26 to 5-18	9-11	36	9-2 to 10-2
Swainson's Thrush	9-5	3	9-5	5-25	4	5-20 to 5-29	9-15	2	9-15
Solitary Vireo	9-18	4	9-4 to 9-23	4-23	4	4-13 to 5-10	9-24	3	9-8 to 10-14
Warbling Vireo	9-18	8	9-6 to 10-21	4-23	13	3-20 to 5-10	9-20	13	9-8 to 10-26

Table 9. (cont.)

Species	Fall 1979			Spring 1980			Fall 1980		
	Peak Date	Peak #	Peak Period	Peak Date	Peak #	Peak Period	Peak Date	Peak #	Peak Period
Orange-Crowned Warbler	9-23	16	9-4 to 10-23	4-22	31	3-27 to 5-14	10-3	14	9-21 to 10-29
Nashville Warbler	9-18	6	9-4 to 9-21	4-23	21	4-13 to 5-10	9-24	5	9-18 to 10-4
Black-Throated Gray Warbler	9-27	9	9-13 to 10-21	4-18	14	4-13 to 4-30	10-2	6	9-9 to 10-25
MacGillivray's Warbler	9-22	4	9-17 to 10-21	4-27	8	4-17 to 5-26	9-18	5	9-15 to 10-13
Wilson's Warbler	9-19	12	9-17 to 10-21	4-23	37	4-13 to 5-23	9-29	14	9-15 to 10-25
Western Tanager	9-19	7	9-14 to 10-11	4-26	21	4-13 to 5-23	10-2	9	9-18 to 10-25
Black-Headed Grosbeak	9-15	6	9-9 to 10-21	4-23	22	4-13 to 5-26	9-29	5	9-15 to 10-24
Lazuli Bunting	9-13	5	9-10 to 9-23	5-10	47	4-17 to 5-18	9-15	9	9-6 to 9-29
Lincoln's Sparrow	10-10	11	9-23 to 10-23	3-31	26	3-22 to 4-30	10-21	5	9-18 to 11-5
Northern Oriole	9-5	4	9-5 to 10-23	3-22	9	3-22 to 5-18	9-18	6	9-6 to 10-13

The palm oasis (Thousand Palms) and foothill riparian sites (Palm-Andreas Canyon) experienced the greatest songbird migration within this region (Table 9). Flycatchers, warblers, tanagers, grosbeaks, and buntings were the groups with the highest peak abundance. Peak dates were from 4 April to 18 May.

The range of occurrence of migrants in spring in the Coachella Valley tends to be earlier than other areas studied. The peak dates generally coincide with other regions, but the first sighting of north-bound migrants in spring was usually in the Coachella Valley region. This is probably due in part to the funneling effect caused by topography on migrants exiting the Gulf of California.

Because of the presence of open water, the Salton Sea site, located within the Coachella Valley region, is unique among all sites studied, and therefore, a separate analysis of migration dates for this site is included. Although this site is some 51 km to the south of the WRSA, the routes of birds using the Salton Sea probably bisect the WRSA during spring and fall.

Tables 10, 11, and 12 give peak date, peak number, peak period, and observation period of waterbirds at the Salton Sea for fall 1979 and spring and fall 1980. Data on fall periods at the Salton Sea indicate that the peak abundance for most waterbird species range from mid-October to late November, which is much later than the usual fall passage of land migrants. In fall, pelicans (Pelicaniformes), waterfowl (Anseriformes), gulls,

Table 10.

Salton Sea Waterbirds
Fall 1979

<u>Species</u>	<u>Peak Date</u>	<u>Peak #</u>	<u>Peak Period</u>	<u>Observation Period</u>
Eared Grebe	10-30	850	10-8 to 11-21	9-2 to 11-21
Western Grebe	10-30	180	9-2 to 10-30	9-2 to 11-17
White Pelican	10-12	700	9-16 to 10-26	9-6 to 11-21
Double-crested Cormorant	9-2	4		9-2 to 10-30
Great Blue Heron	9-24	76		9-2 to 11-21
Green Heron	10-12	29	9-24 to 10-12	9-2 to 11-21
Cattle Egret	10-8	51	9-2 to 10-8	9-2 to 11-13
Great Egret	9-2	370	9-2 to 9-12	9-2 to 11-21
Snowy Egret	9-2	475	9-2 to 11-21	9-2 to 11-21
Black-crowned Nt. Heron	11-17	150	9-2 to 11-17	9-2 to 11-21
White-faced Ibis	11-17	93		9-11 to 11-21
Gadwall	11-17	7		9-16 to 11-17
Northern Pintail	10-30	840	10-17 to 10-30	9-2 to 11-21
Green-winged Teal	9-20	450		9-2 to 11-21
Cinnamon Teal	9-2	78	9-2 to 9-17	9-2 to 11-21
American Wigeon	10-30	250	10-30 to 11-13	9-2 to 11-21
Northern Shoveler	10-8	800		9-2 to 11-21
Redhead	11-13	3		9-24 to 11-13
Ring-necked Duck	10-30	3		10-30 to 11-17
Canvasback	11-17	4		9-11 to 11-17
Lesser Scaup	10-30	48	10-30 to 11-3	9-17 to 11-21
Ruddy Duck	10-30	2100	10-30 to 11-13	9-2 to 11-21
American Coot	10-30	2800		9-2 to 11-21
American Avocet	11-21	1340		9-2 to 11-21
Black-necked Stilt	9-6	340	9-6 to 9-11	9-2 to 11-21

Table 10.

<u>Species</u>	<u>Peak Date</u>	<u>Peak #</u>	<u>Peak Period</u>	<u>Observation Period</u>
Semipalmated Plover	9-24	5		9-11 to 9-24
Snowy Plover	9-6	2		
Killdeer	10-12	72	10-12 to 11-17	9-2 to 11-21
Black-bellied Plover	10-30	16	10-30 to 11-13	9-20 to 11-21
Marbled Godwit	11-4	133	10-17 to 11-4	9-2 to 11-21
Long-billed Curlew	9-17	12	9-6 to 9-17	9-6 to 10-26
Greater Yellowlegs	10-30	27	9-2 to 11-21	9-2 to 11-21
Willet	10-26	45	10-26	9-2 to 11-21
Spotted Sandpiper	9-16	8		9-2 to 11-17
Long-billed Dowitcher	11-21	158		9-2 to 11-21
Western Sandpiper	11-13	60		9-2 to 11-21
Least Sandpiper	10-30	220		9-2 to 11-21
Dunlin	10-8	7		10-7 to 11-17
Herring Gull	11-13	13	11-13 to 11-21	9-11 to 11-21
California Gull	9-2	500	9-2	9-2 to 11-21
Ring-billed Gull	10-12	1500	9-24 to 10-12	9-2 to 11-21
Bonapartes Gull	11-13	88	10-30 to 11-13	9-20 to 11-21
Forsters Tern	10-8	620	9-2 to 10-8	9-2 to 11-21
Caspian Tern	9-20	700	9-6 to 10-8	9-2 to 11-21
Black Tern	9-17	780	9-6 to 9-24	9-2 to 10-26
Black Skimmer	9-2	75	9-2	9-2 to 10-26

Table 11.

Salton Sea WaterbirdsSpring 1980

<u>Species</u>	<u>Peak Date</u>	<u>Peak #</u>	<u>Peak Period</u>	<u>Observation Period</u>
Eared Grebe	3-10	7000	3-10 to 4-20	3-10 to 6-3
Western Grebe	4-20	800	3-15 to 4-20	3-10 to 6-3
White Pelican	4-10	1300	3-28 to 4-10	3-10 to 6-3
Double-crested Cormorant	3-15	205		3-10 to 6-3
Great Blue Heron	3-19	36	3-19 to 4-24	3-10 to 6-3
Green Heron	4-6	23	4-6 to 5-12	3-15 to 6-3
Cattle Egret	3-10	27		3-10 to 6-3
Great Egret	4-20	325	4-20 to 5-21	3-10 to 6-3
Snowy Egret	6-3	280		3-10 to 6-3
Black-crowned Nt. Heron	6-3	195		3-15 to 6-3
White-faced Ibis	4-28	18	4-28 to 6-3	3-10 to 6-3
Gadwall	4-28	12	4-24 to 4-28	3-10 to 6-3
Northern Pintail	3-28	100	3-28 to 4-24	3-10 to 6-3
Green-winged Teal	4-15	300	4-6 to 4-15	3-10 to 5-16
Cinnamon Teal	4-24	160	4-6 to 4-24	3-10 to 6-3
American Wigeon	4-10	4	4-10 to 5-16	3-19 to 6-3
Northern Shoveler	3-15	2050	3-15 to 4-6	3-10 to 6-3
Redhead	4-10	26	4-10	3-10 to 6-3
Ring-necked Duck	3-19	24	3-19	3-16 to 5-30
Canvasback	3-19	13	3-10 to 3-28	3-10 to 6-3
Lesser Scaup	3-10	590	3-10	3-10 to 6-3
Ruddy Duck	3-23	7800	3-10 to 3-23	3-10 to 6-3
Red-breasted Merganser	4-24	50	4-24 to 5-8	3-23 to 6-3

Table 11. (cont.)

<u>Species</u>	<u>Peak Date</u>	<u>Peak #</u>	<u>Peak Period</u>	<u>Observation Period</u>
American Coot	4-20	2600	3-15 to 4-24	3-10 to 6-3
American Avocet	4-20	580	4-10 to 5-16	3-15 to 6-3
Black-necked Stilt	4-24	265	4-24	3-10 to 6-3
Semipalmated Plover	4-24	78	4-24 to 5-12	4-15 to 6-3
Snowy Plover	5-12	30		4-10 to 5-26
Killdeer	5-12	24		3-10 to 6-3
Black-bellied Plover	3-19	440	3-19	3-10 to 6-3
Marbled Godwit	4-28	41	4-28 to 5-8	3-10 to 5-12
Long-billed Curlew	4-20	9		4-6 to 6-3
Whimbrel	5-12	4600	5-12	3-28 to 5-30
Greater Yellowlegs	3-23	6		3-10 to 5-21
Willet	5-16	11		3-10 to 5-16
Spotted Sandpiper	5-12	16	5-12 to 5-16	3-15 to 6-3
Ruddy Turnstone	5-12	48		3-10 to 5-16
Long-billed Dowitcher	4-24	360		3-10 to 5-16
Red Knot	5-12	225	4-28 to 5-12	3-19 to 5-30
Western Sandpiper	5-12	460	4-10 to 5-12	3-19 to 5-30
Least Sandpiper	3-28	300	3-28	3-19 to 5-30
Dunlin	5-12	330		4-10 to 6-3
Wilson's Phalarope	5-8	50		5-8 to 5-26
Northern Phalarope	5-12	750		4-10 to 5-16
Herring Gull	4-24	17	4-6 to 4-24	3-15 to 5-16
California Gull	3-28	200	3-28 to 4-20	3-10 to 6-3
Ring-billed Gull	4-24	740	3-10 to 4-24	3-10 to 6-3
Bonaparte's Gull	6-3	210		4-10 to 6-3

Table 11. (cont.)

<u>Species</u>	<u>Peak Date</u>	<u>Peak #</u>	<u>Peak Period</u>	<u>Observation Period</u>
Forster's Tern	4-28	225	4-28	3-10 to 6-3
Caspian Tern	4-6	260	4-6 to 5-12	3-15 to 6-3
Black Tern	5-12	500		4-20 to 5-30
Black Skimmer	4-24	30	4-24 to 5-9	4-10 to 6-3

Table 12.

Salton Sea Waterbirds
Fall 1980

<u>Species</u>	<u>Peak Date</u>	<u>Peak #</u>	<u>Peak Period</u>	<u>Observation Period</u>
Eared Grebe	11-23	2900	11-23 to 12-1	9-3 to 12-1
Western Grebe	11-23	260		9-17 to 12-1
White Pelican	10-17	2000	10-5 to 10-17	9-12 to 12-1
Double-crested Cormorant	9-12	31		9-3 to 12-1
Great Blue Heron	11-10	82		9-3 to 12-1
Green Heron	9-3	27		9-3 to 12-1
Cattle Egret	9-3	190	9-3 to 9-21	9-3 to 12-1
Great Egret	9-17	160		9-3 to 12-1
Snowy Egret	9-30	355		9-3 to 12-1
Black-crowned Nt. Heron	11-28	325		9-3 to 12-1
White-faced Ibis	11-14	44	11- 4 to 11-28	9-17 to 12-1
Gadwall	9-30	8		9-30 to 12-1
Northern Pintail	11-4	1330	10-17 to 11-19	9-3 to 12-1
Green-winged Teal	9-12	200		9-12 to 12-1
Cinnamon Teal	10-9	37		9-18 to 11-28
American Wigeon	10-24	185		9-17 to 12-1
Northern Shoveler	10-5	780	10-5 to 11-10	9-12 to 12-1
Redhead	12-1	118		9-30 to 12-1
Ring-necked Duck	12-1	56		10-9 to 12-1
Canvasback	10-23	113		9-3 to 12-1
Lesser Scaup	12-1	60		9-3 to 12-1
Ruddy Duck	12-1	2750		9-3 to 12-1
Red-breasted Merganser	12-1	7		11-5 to 12-1
American Coot	10-5	1600		9-3 to 12-1
American Avocet	11-19	880	11-10 to 11-28	9-3 to 12-1
Black-necked Stilt	9-17	500	9-17 to 9-26	9-3 to 12-1

Table 12. (cont.)

<u>Species</u>	<u>Peak Date</u>	<u>Peak #</u>	<u>Peak Period</u>	<u>Observation Period</u>
Snowy Plover		7	10-5 to 12-1	9-12 to 12-1
Killdeer	11-5	78		9-3 to 12-1
Black-bellied Plover	11-28	43	10-5 to 12-1	9-12 to 12-1
Marbled Godwit	11-28	78	11-28	9-12 to 12-1
Greater Yellowlegs	12-1	23		9-3 to 12-1
Willet	11-19	70	11-19 to 12-1	9-3 to 12-1
Spotted Sandpiper	9-17	6	9-3 to 10-5	9-3 to 11-10
Long-billed Dowitcher	10-17	325		9-3 to 12-1
Western Sandpiper	10-9	170	9-17 to 10-17	9-3 to 12-1
Least Sandpiper	10-5	300	10-5 to 11-10	9-3 to 12-1
Dunlin	10-23	16	10-17 to 10-23	9-17 to 12-1
Wilson's Phalarope	9-17	220	9-17	9-17
Northern Phalarope	9-17	1400	9-17	9-17 to 11-5
Herring Gull	11-28	35	11-10 to 11-28	9-12 to 12-1
California Gull	11-28	140	9-17 to 11-28	9-3 to 12-1
Ring-billed Gull	9-30	5100	9-30	9-3 to 12-1
Bonaparte's Gull	11-28	160	10-27 to 12-1	10-5 to 12-1
Forster's Tern	9-12	390	9-12 to 10-27	9-3 to 12-1
Caspian Tern	9-17	300	9-12 to 11-14	9-3 to 12-1
Black Tern	9-17	2000	9-3 to 9-30	9-3 to 11-19
Black Skimmer	11-28	6		11-28 to 12-1

and terns (Charadriiformes) make up the group with the greatest overall peak abundances. Some noteworthy abundances are: 2,000 White Pelicans (17 October 1980), 2,100 Ruddy Ducks (30 October 1979), 2,750 Ruddy Ducks (1 December 1980), 1,340 Northern Pintail (4 November 1980), 800 Northern Shovelers (8 October 1979), 1,500 Ring-billed Gulls (12 October 1979), 5,100 Ring-billed Gulls (30 September 1980), and 2,000 Black Terns (17 September 1980) (Tables 10 and 12).

The spring study period differed slightly from fall, with grebes (Podicipediformes), waterfowl (Anseriformes) and shorebirds (Charadriiformes) having the greatest peak abundance. Examples of these exceptional numbers include 7,000 Eared Grebes (10 March 1980), 440 Black-bellied Plovers (19 March 1980), 4,600 Whimbrel (12 May 1980), 7,800 Ruddy Ducks (23 March 1980), 2,050 Northern Shoveler (15 March 1980), and 590 Lesser Scaup (10 March 1980) (Table 11).

Comparison of fall to spring migration was quite different. Fall landbird migration and waterbird migration was protracted, occurring over several months as indicated by the peak periods of occurrence (Tables 9, 10, and 12). Spring passage of landbird and waterbird migrants tended to be more wave-like, with large numbers occurring in a relatively short period from late Spring to early May.

Differences in Avian Relative Abundance Between Site and Season

Significant differences occurred in avian relative abundance between sites and between spring and fall seasons (Table 13). Increases over fall in bird abundance was observed during spring at all low-elevation sites with the highest abundance occurring at San Timoteo Canyon, $2,533 \pm 287$ SE, Morongo Valley, $1,753 \pm 402$ SE, and the Salton Sea, $5,918 \pm 887$ SE.

An overall increase in avian relative abundance occurred at the four high-elevation sites in fall (Table 13). However, the lowest observed abundance was also recorded in the fall season, with 21 ± 12 SE and 12 ± 16 SE individuals recorded at Devers wind turbine site, a low elevation site. The highest mean relative abundance, excluding the Salton Sea, was the westerly site, San Timoteo Canyon.

Of the four study sites (I-10 Rest Stop, Devers WTG, Willow Hole, and Whitewater Settling Ponds) within the WRSA, the highest relative abundance occurred at Willow Hole (Table 13). The abundance data for the WRSA sites indicates that, during spring and fall, the highest bird abundance occurred at Willow Hole (612 ± 129 SE, for spring and 379 ± 64 SE during fall). The lowest abundance for spring and fall occurred at the Devers WTG site with 45 ± 98 SE for spring and 12 ± 16 SE for fall.

Because of broad differences in types of habitats and density and diversity of vegetation at each site, the bird abundance data for each site is for the purpose of seasonal change and not absolute numbers. Caution should be taken when making site to site comparisons.

Table 13.

Mean Bird Abundance Per (Km²) for All Sites and Season
(± 2 standard error)

Region/Site	Fall 1979	Spring 1980	Fall 1980
<u>San Gorgonio</u>			
San Timoteo Canyon	1358 ± 388	2533 ± 287	1736 ± 546
Banning Canyon	621 ± 214	408 ± 198	713 ± 224
Millard Canyon- Kitching Peak	482 ± 304	167 ± 84	394 ± 129
Cabazon	281 ± 96	814 ± 303	411 ± 162
I-10 Rest Stop	176 ± 32	321 ± 119	334 ± 134
Valley Hi Park	398 ± 58	379 ± 74	479 ± 219
Twin Pines Ranch	599 ± 101	421 ± 126	603 ± 305
Snow Creek	279 ± 54	452 ± 102	330 ± 97
<u>Coachella Valley</u>			
Chino Canyon	401 ± 81	679 ± 229	351 ± 67
Palm-Andreas Canyon	518 ± 39	912 ± 310	402 ± 147
Devers WTG	21 ± 12	45 ± 98	12 ± 16
Willow Hole	379 ± 64	621 ± 129	256 ± 93
Whitewater Canyon	482 ± 124	814 ± 399	519 ± 114
Whitewater Settling Ponds	--	134 ± 84	71 ± 65
Mission Creek	--	701 ± 281	301 ± 133
Thousand Palms	402 ± 42	714 ± 119	521 ± 179
Pushawalla Canyon	212 ± 24	398 ± 54	169 ± 92
Ave. 66th and Tyler	390 ± 69	701 ± 189	479 ± 74
Salton Sea (north)	4714 ± 425	5918 ± 887	4221 ± 984
<u>Mojave</u>			
Morongo Valley	601 ± 64	1753 ± 402	912 ± 271
Yucca Valley	499 ± 74	764 ± 114	389 ± 66
Joshua Tree N. M.	324 ± 118	614 ± 293	509 ± 88

Diurnal Movement of Migrant Birds

We collected information on birds performing diurnal migration within the region during our normal censusing periods. These data include species composition and flight directions of each bird seen to the nearest 45° compass direction point. From our observations (n = 294), the greatest majority of movement occurred in spring (n = 241) with the lowest number of sightings in fall (n = 53).

Table 14 lists bird species observed migrating during diurnal periods. These observations were primarily in the Coachella Valley and San Gorgonio Pass. From these observations, three routes of movement were identified: Thousand Palms-Willow Hole axis (300°-340°), Devers-Whitewater axis (270°-330°), and I-10 Rest Stop-Cabazon axis (260°-280°).

Several factors influence the direction of migration in the Coachella Valley and San Gorgonio Pass. Physical factors, such as wind and topography, can affect the direction of migration (McCrary et al. 1983). Another factor that influences migration within the Coachella Valley is the San Andreas earthquake fault which bisects the valley from northwest to southeast. Along this fault, ground waters percolate to the surface, thereby creating seeps and springs which have produced palm oasis woodlands and associated mesquite thickets. This broad fault line is a major route for diurnal migrating birds.

Table 14.

SPECIES OBSERVED WITHIN OR NEAR
THE WIND RESOURCE STUDY AREA PERFORMING DIURNAL MIGRATION

American White Pelican (<i>Pelecanus erythrorhynchos</i>)	Black-bellied Plover (<i>Pluvialis squatarola</i>)
Double-crested Cormorant (<i>Phalacrocorax auritus</i>)	Killdeer (<i>Charadrius vociferus</i>)
Great Blue Heron (<i>Ardea nerodias</i>)	Black-necked Stilt (<i>Himantopus mexicanus</i>)
Snowy Egret (<i>Egretta thula</i>)	American Avocet (<i>Recurvirostra americana</i>)
Cattle Egret (<i>Bubulcus ibis</i>)	Greater Yellowlegs (<i>Tringa melanoleuca</i>)
Canada Goose (<i>Branta canadensis</i>)	Whimbrel (<i>Numenius phaeopus</i>)
Northern Pintail (<i>Anas acuta</i>)	Long-billed Curlew (<i>Numenius americanus</i>)
American Wigeon (<i>Anas americana</i>)	Least Sandpiper (<i>Calidris minutilla</i>)
Lesser Scaup (<i>Aythya affinis</i>)	Long-billed Dowitcher (<i>Limnodromus scalopaceus</i>)
Turkey Vulture (<i>Cathartes aura</i>)	Ring-billed Gull (<i>Larus delawarensis</i>)
Northern Harrier (<i>Circus cyaneus</i>)	California Gull (<i>Larus californicus</i>)
Cooper's Hawk (<i>Accipiter cooperii</i>)	Herring Gull (<i>Larus argentatus</i>)
Sharp-shinned Hawk (<i>Accipiter striatus</i>)	Vaux's Swift (<i>Chaetura vauxi</i>)
Red-tailed Hawk (<i>Buteo jamaicensis</i>)	Belted Kingfisher (<i>Ceryle alcyon</i>)
American Kestrel (<i>Falco sparverius</i>)	Northern Flicker (<i>Colaptes auratus</i>)
Sandhill Crane (<i>Grus canadensis</i>)	Western Kingbird (<i>Tyrannus verticalis</i>)

Table 14. Cont.

Tree Swallow
(*Tachycineta bicolor*)

Violet-green Swallow
(*Tachycineta thalassina*)

Northern Rough-winged Swallow
(*Stelgidopteryx serripennis*)

Cliff Swallow
(*Hirundo pyrrhonota*)

Barn Swallow
(*Hirundo rustica*)

Water Pipit
(*Anthus spinoletta*)

Cedar Waxwing
(*Bombycilla cedrorum*)

Red-winged Blackbird
(*Agelaius phoeniceus*)

Brewer's Blackbird
(*Euphagus cyanocephalus*)

Brown-headed Cowbird
(*Molothrus ater*)

Pine Siskin
(*Carduelis pinus*)

Lesser Goldfinch
(*Carduelis psaltria*)

Lawrence's Goldfinch
(*Carduelis lawrencei*)

American Goldfinch
(*Carduelis tristis*)

Rare and Endangered Species

Six rare or endangered bird species occurred in the study area during censusing (Table 15). Four of the species, Brown Pelican, Peregrine Falcon, Yuma Clapper Rail, and California Black Rail, only occurred at the Salton Sea study site. A Bald Eagle was observed in late March 1980 at the upper portion of Banning Canyon, San Bernardino Mountains. This bird was presumed to be a late migrant departing from a local high-mountain wintering area.

The Least Bell's Vireo was observed as a breeding bird at five study sites: Whitewater Canyon, Morongo Valley, Willow Hole, Palm-Andreas Canyon, and Chino Canyon. Table 16 lists localities and numbers of individuals present in spring 1980. Only at Willow Hole was the Least Bell's Vireo recorded during fall.

TABLE 15.

A List of Rare and Endangered Bird Species seen
during the Diurnal Study

SPECIES	STATUS ¹
Brown Pelican (<u>Pelican occidentalis californicus</u>)	FE, CE
Bald Eagle (<u>Haliaeetus leucocephalus leucocephalus</u>)	FE, CE
Peregrine Falcon (<u>Falco peregrinus anatum</u>)	FE, CE
Yuma Clapper Rail (<u>Rallus longirostris yumanesis</u>)	FE, CR
California Black Rail (<u>Latterallus jamaicensis coturniculus</u>)	CR
Least Bell's Vireo (<u>Vireo belli pusillus</u>)	CE

- 1 FE = federally endangered
 CE = California endangered
 CR = California rare

Table 16. Breeding Locality of Least Bell's Vireo During 1980

Location	Period of Observation ^a	# of Individuals	Within WRSA
Whitewater Canyon	6 April 1980	2	Yes
Morongo Valley	8 April 1980	3	No
Willow Hole	4 April 1980	1	Yes
Andreas Canyon	1 April 1980	3	No (just adjacent within 6 km)
Palm Canyon	7 April 1980	2	No (just adjacent within 6 km)
Chino Canyon	5 April 1980	4	No (but within 3 km)

^aAll birds observed through the end of the spring census period.

DISCUSSION

Although general information exists on bird migration in southern California (Grinnell and Miller 1944 and Garrett and Dunn 1981), we found little comparative material concerning migratory chronology utilization or abundance estimates for fall and spring bird migration within the San Gorgonio Pass, Coachella Valley, and southern Mojave Desert. A number of authors have suggested that these areas are extensively used by migratory birds (Cooke 1925; Cogswell 1978; Howell 1923; Miller 1951; Small 1975); however, only recently have actual estimates of nocturnal migratory rates become available (McCrary et al. 1981 and McCrary et al. 1983). These studies report on nocturnal bird migration exclusively and do not discuss patterns of diurnal avian utilization, abundance, and species diversity in the San Gorgonio Pass, Coachella Valley, and southern Mojave Desert.

The results of this study indicate that prior assumptions on bird migration patterns within California may not be accurate. Studies of migration from the central California coast indicate that fall migration is greater in both species and numbers than spring (Ralph 1971 and Stewart et al. 1974). However, this does not appear to be the situation in the San Gorgonio Pass, Coachella Valley, and the southern Mojave Desert. In these regions, the abundance of spring migrants was greater than those in fall. Furthermore, in most cases, spring arrival dates of migrants in this study were earlier than on the coast. This pattern seems to support the suggestion that migrants, exiting the west coast of Mexico, enter the

interior portion of California before reaching the coast (Howell 1923). The results of this study for fall indicate a decrease in the number of migrants in the interior, which seems to support the assumption that fall migration is more concentrated along the coast.

During this study, changes in migrant abundance from spring to fall were noted in relation to elevation. At low-elevation study sites, 65% of individuals were migrants in spring while 38% were migrants in fall. Conversely, at high elevation sites, 49% of individuals were migrants in spring while 61% were migrants in fall. This shift indicates that a greater percentage of migrants are using mountainous regions in fall and not lowland sites. The shift in utilization from lower sites in spring to higher sites in fall is probably most directly related to seasonal differences in habitat quality. During spring, the desert regions are highly productive; while in fall, higher temperatures and drier conditions produce a much harsher environment for migratory birds. In comparison, upper elevation sites during fall experience milder temperatures and offer more diverse habitat types and greater resource abundance.

Because of complex climatic patterns, vegetation types vary greatly in the San Gorgonio Pass, Coachella Valley, and southern Mojave Desert (Thorne 1976). This diversity in vegetation types produces differences in utilization patterns among both migratory and resident birds. The lowest number of migratory and resident birds occurred at study sites chiefly composed of creosote bush scrub habitat because of this habitat's relatively

simple structure, while the highest bird abundances occurred at riparian woodland/oasis sites—a much more complex habitat type. A similar relationship between habitat complexity and avian densities has also been noted in Arizona (Balda 1975).

During this study, the importance of this region to birds is shown by the fact that 306 of the 535 species of birds known to occur in California (Jehl 1980) were recorded in this study. Also, the migrant and resident avifauna density and diversity magnitudes are comparable and in some cases higher than those of other regions of the United States. Certain habitats within this region are some of the most unique in the United States. The Salton Sea's many diverse aquatic habitats offer abundant resources thereby attracting some of the largest concentrations of waterbird species in the southwest. Along with this are the seasonally productive riparian woodlands and desert oasis sites that offer islands of diverse plant assemblages that are attractants to migrant birds within the low-profile homogeneous stands of creosote bush scrub. Thus, the pronounced diversity of available habitats and the alignment of the area with the west coast of Mexico make the WRSA and surrounding regions a major route for bird migration in the western United States.

CONCLUSIONS

From the spring and fall data presented within this report, it is evident that the San Gorgonio Pass, Coachella Valley, and southern Mojave Desert are heavily utilized by birds. Previous nocturnal bird research in this area also support this view (McCrary et al. 1981 and McCrary et al. 1983). The complex habitat types within these three regions support a diverse and abundant avifauna.

Seasonal variation in both bird density and species richness is substantial, although sites with more species have higher bird densities. During the spring season, there were higher bird densities and greater species richness than in the fall season. The average number of migrants was highest in spring, during mid-April to mid-May, and lowest during fall. Elevational differences were also noted among seasons, with spring having higher bird densities at low-elevational sites and fall having higher densities at high-elevational sites. The highest average weekly migrant bird density during spring occurred at San Timoteo Canyon and Morongo Valley from 27 April to 19 May 1980. In fall, the highest weekly average of bird densities occurred at an upper-elevation site, Banning Canyon, and the most westerly site, San Timoteo Canyon.

Within all three study regions, habitat quality had a major influence on bird density and diversity. As the size of the study site increased, so did the bird species diversity and species richness. Along with this

was the fact that these bird community characteristics (i.e. diversity, species richness, and density) were higher in spring than fall.

Of the approximately 535 species of birds that have been recorded in California, 306 of these were observed during this study, with 217 species in San Geronio Pass, 262 species in the Coachella Valley, and 198 in the southern Mojave Desert. A greater percentage of migrant birds vs. resident birds were recorded in all areas. During the spring season, the Coachella Valley and southern Mojave Desert areas had the highest proportion of migrant birds.

Within the WRSA, the Willow Hole study site had the greatest bird abundance and species number, while Devers WTC had the lowest for both seasons. Because the greatest percentage of habitat in the WRSA is low-profile desert scrub (Creosote Bush Scrub), bird density and diversity was generally the lowest of all study sites.

Generally, migration occurred throughout both spring and fall periods, with spring recording the highest peak occurrence. This peak occurred during mid-April to mid-May. During fall, the peaks were usually in late September to mid-October. Within these seasons, patterns of migration were wave-like in spring and more protracted in fall.

In the WRSA, one endangered species, the Least Bell's Vireo, was recorded as a breeding bird. The breeding localities were Willow Hole and Whitewater Canyon. Three adjacent sites within close proximity of the WRSA were also breeding localities for this endangered species—Chino, Andreas, and Palm Canyons.

RECOMMENDATIONS

As indicated from the results of this study, the WRSA and adjacent areas are heavily used by migratory birds. Within the WRSA itself, bird density and diversity in relation to loafing and breeding sites are generally low because of the large homogeneous stands of Creosote Bush Scrub. However, adjacent to the WRSA, there are significant habitats selected by birds during migration for loafing and feeding sites. These habitats also support diverse breeding bird species.

The data contained within this report cannot be used to predict the possible number of avian collisions within the WRSA from season to season. Only nocturnal research conducted by McCrary et al. (McCrary et al. 1981 and McCrary et al. 1983) can be used to formulate these predictions. Instead, these diurnal observations were conducted to complement nocturnal research. By evaluating diurnal information on seasonal trends in species composition, abundance, and peak migratory periods, you can better understand the potential effects of the WTC park on birds. Along with this seasonality information on migratory species, results of this study help in defining high-use areas for migrants as well as resident birds. Therefore, we make the following recommendations:

- 1) Within the WRSA there are four (and possibly more) isolated patches of habitat (desert oasis) that attract a concentration of birds during migration. They are Willow Hole oasis, White-water Canyon, Whitewater Settling Ponds, and the ornamental planting of vegetation around the periphery of I-10 Rest Stop

(Whitewater). These areas plus the highly-productive riparian habitats should be protected from WTG development and isolated by a buffer zone of at least 500 m. This buffer zone should be sufficient to allow birds to make appropriate flight behavior adjustments to avoid collision with wind turbine generators.

- 2) Because Willow Hole oasis and Whitewater Canyon provide nesting habitat for the endangered Least Bell's Vireo, a 500-m buffer zone should be established around these sites. This would prevent possible encroachment and destruction of these existing critical habitats.

- 3) Recreational facilities are expanding at an increasing rate in the Coachella Valley including the WRSA. These developments, golf courses, lakes, parks, and green belts offer similar situations, as does a native oasis, by attracting a concentration of migrating birds. Evaluation of each facility should be done before planning and placement of WTG's near these areas. If high avian utilization is identified, a 500-m buffer zone should be required.

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SPECIES LIST FOR SCE BIRD MIGRATION PROJECT

<u>COMMON NAME</u>	<u>SCIENTIFIC NAME</u>
Common Loon	<u>Gavia immer</u>
Horned Grebe	<u>Podiceps auritus</u>
Eared Grebe	<u>Podiceps nigricollis</u>
Western Grebe	<u>Aechmophorus occidentalis</u>
Pied-billed Grebe	<u>Podilymbus podiceps</u>
White Pelican	<u>Pelecanus erythrorhynchos</u>
Brown Pelican	<u>Pelecanus occidentalis</u>
Blue-footed Booby	<u>Sula nebouxii</u>
Double-crested Cormorant	<u>Phalacrocorax auritus</u>
Magnificent Frigatebird	<u>Fregata magnificens</u>
Great Blue Heron	<u>Ardea herodias</u>
Green Heron	<u>Butorides striatus</u>
Cattle Egret	<u>Bubulcas ibis</u>
Great Egret	<u>Casmerodius albus</u>
Snowy Egret	<u>Egretta thula</u>
Black-crowned Night Heron	<u>Nycticorax nycticorax</u>
Least Bittern	<u>Ixobrychus exilis</u>
American Bittern	<u>Botaurus lentiginosus</u>
Wood Stork	<u>Mycteria americana</u>
White-faced Ibis	<u>Plegadis chihi</u>
Canada Goose	<u>Branta canadensis</u>
Brant	<u>Branta bernicla</u>
White-fronted Goose	<u>Anser albifrons</u>
Snow Goose	<u>Chen caerulescens</u>

<u>COMMON NAME</u>	<u>SCIENTIFIC NAME</u>
Mallard	<u>Anas platyrhynchos</u>
Gadwall	<u>Anas strepera</u>
Pintail	<u>Anas acuta</u>
Green-winged Teal	<u>Anas crecca</u>
Blue-winged Teal	<u>Anas discors</u>
Cinnamon Teal	<u>Anas cyanoptera</u>
European Wigeon	<u>Anas penelope</u>
American Wigeon	<u>Anas americana</u>
Northern Shoveler	<u>Anas clypeata</u>
Wood Duck	<u>Aix sponsa</u>
Redhead	<u>Aythya americana</u>
Ring-necked Duck	<u>Aythya collaris</u>
Canvasback	<u>Aythya valisineria</u>
Greater Scaup	<u>Aythya marila</u>
Lesser Scaup	<u>Aythya affinis</u>
Common Goldeneye	<u>Bucephala clangula</u>
Bufflehead	<u>Bucephala albeola</u>
White-winged Scoter	<u>Melanitta deglandi</u>
Ruddy Duck	<u>Oxyura jamaicensis</u>
Hooded Merganser	<u>Lophodytes cucullatus</u>
Common Merganser	<u>Mergus merganser</u>
Red-breasted Merganser	<u>Mergus serrator</u>
Turkey Vulture	<u>Cathartes aura</u>
White-tailed Kite	<u>Elanus leucurus</u>
Sharp-shinned Hawk	<u>Accipiter striatus</u>

Appendix A. (cont.)

COMMON NAME

SCIENTIFIC NAME

Cooper's Hawk	<u>Accipiter cooperii</u>
Red-tailed Hawk	<u>Buteo jamaicensis</u>
Red-shouldered Hawk	<u>Buteo lineatus</u>
Broad-winged Hawk	<u>Buteo platypterus</u>
Swainson's Hawk	<u>Buteo swainsoni</u>
Ferruginous Hawk	<u>Buteo regalis</u>
Golden Eagle	<u>Aquila chrysaetos</u>
Bald Eagle	<u>Haliaeetus leucocephalus</u>
Marsh Hawk	<u>Circus cyaneus</u>
Osprey	<u>Pandion haliaetus</u>
Prairie Falcon	<u>Falco mexicanus</u>
Peregrine Falcon	<u>Falco peregrinus</u>
Merlin	<u>Falco columarius</u>
American Kestrel	<u>Falco sparverius</u>
California Quail	<u>Lophortyx californicus</u>
Gambel's Quail	<u>Lophortyx gambelii</u>
Mountain Quail	<u>Oreortyx pictus</u>
Ring-necked Pheasant	<u>Phasianus colchicus</u>
Clapper Rail	<u>Rallus longirostris</u>
Virginia Rail	<u>Rallus limicola</u>
Sora	<u>Porzana carolina</u>
Common Gallinule	<u>Gallinula chloropus</u>
American Coot	<u>Fulica americana</u>
Semipalmated Plover	<u>Charadrius semipalmatus</u>
Snowy Plover	<u>Charadrius alexandrinus</u>

Appendix A. (cont.)

COMMON NAME

SCIENTIFIC NAME

Killdeer	<u>Charadrius vociferus</u>
Mountain Plover	<u>Charadrius montanus</u>
American Golden Plover	<u>Pluvialis dominica</u>
Black-bellied Plover	<u>Pluvialis squatarola</u>
Ruddy Turnstone	<u>Arenaria interpres</u>
Black Turnstone	<u>Arenaria melanocephala</u>
Common Snipe	<u>Capella gallinago</u>
Long-billed Curlew	<u>Numenius americanus</u>
Whimbrel	<u>Numenius phaeopus</u>
Spotted Sandpiper	<u>Actitus macularis</u>
Solitary Sandpiper	<u>Tringa solitaria</u>
Greater Yellowlegs	<u>Tringa melanoleucus</u>
Lesser Yellowlegs	<u>Tringa flavipes</u>
Willet	<u>Catoptrophorus semipalmatus</u>
Red Knot	<u>Calidris canutus</u>
Sanderling	<u>Calidris alba</u>
Western Sandpiper	<u>Calidris mauri</u>
Least Sandpiper	<u>Calidris minutilla</u>
Dunlin	<u>Calidris alpina</u>
Stilt Sandpiper	<u>Micropalama himantopus</u>
Short-billed Dowitcher	<u>Limnodromus griseus</u>
Long-billed Dowitcher	<u>Limnodromus scolopaceus</u>
Marbled Godwit	<u>Limosa fedoa</u>
American Avocet	<u>Recurvirostra americana</u>
Black-necked Stilt	<u>Himantopus Mexicanus</u>

<u>COMMON NAME</u>	<u>SCIENTIFIC NAME</u>
Wilson's Phalarope	<u>Steganopus tricolor</u>
Northern Phalarope	<u>Lobipes lobatus</u>
Parasitic Jaeger	<u>Stercorarius parasiticus</u>
Herring Gull	<u>Larus argentatus</u>
California Gull	<u>Larus californicus</u>
Ring-billed Gull	<u>Larus delewarensis</u>
Mew Gull	<u>Larus canus</u>
Laughing Gull	<u>Larus atricilla</u>
Franklin's Gull	<u>Larus pipixcan</u>
Bonaparte's Gull	<u>Larus philadelphia</u>
Blacklegged Kittiwake	<u>Rissa tridactyla</u>
Sabine's Gull	<u>Xema sabini</u>
Gull-billed Tern	<u>Gelochelidon nilotica</u>
Forster's Tern	<u>Sterna forsteri</u>
Common Tern	<u>Sterna hirundo</u>
Caspian Tern	<u>Sterna caspia</u>
Black Tern	<u>Chlidonias niger</u>
Black Skimmer	<u>Rynchops niger</u>
Band-tailed Pigeon	<u>Columba fasciata</u>
White-winged Dove	<u>Zenaida asiatica</u>
Mourning Dove	<u>Zenaida macroura</u>
Spotted Dove	<u>Streptopelia chinensis</u>
Ground Dove	<u>Columbina passerina</u>
Greater Roadrunner	<u>Geococcyx californianus</u>
Barn Owl	<u>Tyto alba</u>

Appendix A. (cont.)

<u>COMMON NAME</u>	<u>SCIENTIFIC NAME</u>
Screech Owl	<u>Otus asio</u>
Great Horned Owl	<u>Bubo virginianus</u>
Pygmy Owl	<u>Glaucidium gnoma</u>
Burrowing Owl	<u>Athene cunicularia</u>
Spotted Owl	<u>Strix occidentalis</u>
Long-eared Owl	<u>Asio otus</u>
Short-eared Owl	<u>Asio flammeus</u>
Poor-will	<u>Phalaenoptilus nuttallii</u>
Lesser Nighthawk	<u>Chordeiles acutipennis</u>
Black Swift	<u>Cypseloides niger</u>
Vaux's Swift	<u>Chaetura vauxi</u>
White-throated Swift	<u>Aeronautes saxatalis</u>
Black-chinned Hummingbird	<u>Archilochus alexandri</u>
Costa's Hummingbird	<u>Calypte costae</u>
Anna's Hummingbird	<u>Calypte anna</u>
Rufous Hummingbird	<u>Selasphorus rufus</u>
Calliope Hummingbird	<u>Stellula calliope</u>
Broad-billed Hummingbird	<u>Cynanthus latirostris</u>
Belted Kingfisher	<u>Megaceryle alcyon</u>
Common Flicker	<u>Colaptes auratus</u>
Acorn Woodpecker	<u>Melanerpes formicivorus</u>
Lewis' Woodpecker	<u>Melanerpes lewis</u>
Yellow-bellied Sapsucker	<u>Sphyrapicus varius</u>
Red-breasted Sapsucker	<u>Sphyrapicus ruber</u>
Hairy Woodpecker	<u>Picoides villosus</u>

Appendix A. (cont.)

COMMON NAME

SCIENTIFIC NAME

Downy Woodpecker	<u>Picoides pubescens</u>
Ladder-backed Woodpecker	<u>Picoides scalaris</u>
Nuttall's Woodpecker	<u>Picoides nuttallii</u>
White-headed Woodpecker	<u>Picoides albolarvatus</u>
Western Kingbird	<u>Tyrannus verticalis</u>
Cassin's Kingbird	<u>Tyrannus vociferans</u>
Wied's Crested Flycatcher	<u>Myiarchus tyrannulus</u>
Ash-throated Flycatcher	<u>Myiarchus cinerascens</u>
Eastern Phoebe	<u>Sayornis phoebe</u>
Black Phoebe	<u>Sayornis nigricans</u>
Say's Phoebe	<u>Sayornis saya</u>
Willow Flycatcher	<u>Empidonax traillii</u>
Hammond's Flycatcher	<u>Empidonax hammondi</u>
Dusky Flycatcher	<u>Empidonax oberholseri</u>
Gray Flycatcher	<u>Empidonax wrightii</u>
Western Flycatcher	<u>Empidonax difficilis</u>
Western Wood Pewee	<u>Contopus sordidulus</u>
Olive-sided Flycatcher	<u>Nuttallornis borealis</u>
Vermilion Flycatcher	<u>Pyrocephalus rubinus</u>
Horned Lark	<u>Eremophila alpestris</u>
Violet-green Swallow	<u>Tachycineta thalassina</u>
Tree Swallow	<u>Iridoprocne bicolor</u>
Bank Swallow	<u>Riparia riparia</u>
Rough-winged Swallow	<u>Stelgidopteryx ruficollis</u>

COMMON NAME

SCIENTIFIC NAME

Barn Swallow	<u>Hirundo rustica</u>
Cliff Swallow	<u>Petrochelidon pyrrhonota</u>
Purple Martin	<u>Progne subis</u>
Steller's Jay	<u>Cyanocitta stelleri</u>
Scrub Jay	<u>Aphelocoma coerulescens</u>
Northern Raven	<u>Corvus corax</u>
Common Crow	<u>Corvus brachyrhynchos</u>
Pinon Jay	<u>Gymnorbinus cyanocephalus</u>
Mountain Chickadee	<u>Parus gambeli</u>
Plain Titmouse	<u>Parus inornatus</u>
Verdin	<u>Auriparus flaviceps</u>
Bushtit	<u>Psaltriparus minimus</u>
White-breasted Nuthatch	<u>Sitta carolinensis</u>
Red-breasted Nuthatch	<u>Sitta candensis</u>
Pygmy Nuthatch	<u>Sitta pygmea</u>
Brown Creeper	<u>Certhia familiaris</u>
Wrentit	<u>Chamaea fasciata</u>
Dipper	<u>Cinclus mexicanus</u>
House Wren	<u>Troglodytes aedon</u>
Winter Wren	<u>Troglodytes troglodytes</u>
Bewick's Wren	<u>Thryomanes bewickii</u>
Cactus Wren	<u>Campylorhynchus brunneicapillus</u>
Marsh Wren	<u>Cistothorus palustris</u>
Canon Wren	<u>Catherpes mexicanus</u>
Rock Wren	<u>Salpinctes obsoletus</u>

Appendix A. (cont.)

<u>COMMON NAME</u>	<u>SCIENTIFIC NAME</u>
Northern Mockingbird	<u>Nimus polyglottos</u>
Brown Thrasher	<u>Toxostoma rufum</u>
Bendire's Thrasher	<u>Toxostoma bendirei</u>
California Thrasher	<u>Toxostoma redivivum</u>
Crissal Thrasher	<u>Toxostoma dorsale</u>
Le Conte's Thrasher	<u>Toxostoma lecontei</u>
Sage Thrasher	<u>Oreoscoptes montanus</u>
American Robin	<u>Turdus migratorius</u>
Varied Thrush	<u>Ixoreus naevius</u>
Hermit Thrush	<u>Catharus guttata</u>
Swainson's Thrush	<u>Catharus ustalata</u>
Western Bluebird	<u>Sialia mexicana</u>
Mountain Bluebird	<u>Sialia currucoides</u>
Townsend's Solitaire	<u>Myadestes townsendi</u>
Blue-gray Gnatcatcher	<u>Polioptila caerulea</u>
Black-tailed Gnatcatcher	<u>Polioptila melanura</u>
Golden-crowned Kinglet	<u>Regulus satrapa</u>
Ruby-crowned Kinglet	<u>Regulus calendula</u>
Water Pipit	<u>Anthus spinoletta</u>
Cedar Waxwing	<u>Bombycilla cedrorum</u>
Phainopepla	<u>Phainopepla nitens</u>
Loggerhead Shrike	<u>Lanius ludovicianus</u>
European Starling	<u>Sturnus vulgaris</u>
Hutton's Vireo	<u>Vireo huttoni</u>
Bell's Vireo	<u>Vireo bellii</u>

Appendix A. (cont.)

<u>COMMON NAME</u>	<u>SCIENTIFIC NAME</u>
Gray Vireo	<u>Vireo vicinior</u>
Yellow-throated Vireo	<u>Vireo flavifrons</u>
Solitary Vireo	<u>Vireo solitarius</u>
Warbling Vireo	<u>Vireo gilvus</u>
Black-and-white Warbler	<u>Mniotilta varia</u>
Golden-Winged Warbler	<u>Vermivora chrysoptera</u>
Tennessee Warbler	<u>Vermivora peregrina</u>
Orange-crowned Warbler	<u>Vermivora celata</u>
Nashville Warbler	<u>Vermivora ruficapilla</u>
Virginia's Warbler	<u>Vermivora virginiae</u>
Lucy's Warbler	<u>Vermivora luciae</u>
Northern Parula	<u>Parula americana</u>
Yellow Warbler	<u>Dendroica petechia</u>
Magnolia Warbler	<u>Dendroica magnolia</u>
Black-throated Blue Warbler	<u>Dendroica caerulescens</u>
Yellow-rumped Warbler	<u>Dendroica coronata</u>
Black-throated Gray Warbler	<u>Dendroica nigrescens</u>
Townsend's Warbler	<u>Dendroica townsendi</u>
Black-throated Green Warbler	<u>Dendroica virens</u>
Hermit Warbler	<u>Dendroica occidentalis</u>
Blackburnian Warbler	<u>Dendroica fusca</u>
Chestnut-sided Warbler	<u>Dendroica pensylvanica</u>
Blackpoll Warbler	<u>Dendroica striata</u>
Palm Warbler	<u>Dendroica palmarum</u>
Ovenbird	<u>Seiurus aurocapillus</u>

<u>COMMON NAME</u>	<u>SCIENTIFIC NAME</u>
Northern Waterthrush	<u>Seiurus noveboracensis</u>
MacGillivray's Warbler	<u>Oporornis tolmiei</u>
Common Yellowthroat	<u>Geothlyps trichas</u>
Yellow-breasted Chat	<u>Icteria virens</u>
Wilson's Warbler	<u>Wilsonia pusilla</u>
Canada Warbler	<u>Wilsonia canadensis</u>
American Redstart	<u>Setophaga ruticilla</u>
House Sparrow	<u>Passer domesticus</u>
Western Meadowlark	<u>Sturnella neglecta</u>
Yellow-headed Blackbird	<u>Xanthocephalus xanthocephalus</u>
Red-winged Blackbird	<u>Agelaius phoeniceus</u>
Tricolored Blackbird	<u>Agelaius tricolor</u>
Orchard Oriole	<u>Icterus spurius</u>
Hooded Oriole	<u>Icterus cucullatus</u>
Scott's Oriole	<u>Icterus parisorum</u>
Northern Oriole	<u>Icterus galbula</u>
Brewer's Blackbird	<u>Euphagus cyanocephalus</u>
Great-tailed Grackle	<u>Quiscalus mexicanus</u>
Brown-headed Cowbird	<u>Molothrus ater</u>
Western Tanager	<u>Piranga ludoviciana</u>
Summer Tanager	<u>Piranga rubra</u>
Rose-breasted Grosbeak	<u>Pheucticus ludovicianus</u>
Black-headed Grosbeak	<u>Pheucticus melanocephalus</u>
Blue Grosbeak	<u>Guiraca caerulea</u>
Indigo Bunting	<u>Passerina cyanea</u>
Lazuli Bunting	<u>Passerina amoena</u>

Appendix A. (cont.)

<u>COMMON NAME</u>	<u>SCIENTIFIC NAME</u>
Purple Finch	<u>Carpodacus purpureus</u>
Cassin's Finch	<u>Carpodacus cassinii</u>
House Finch	<u>Carpodacus mexicanus</u>
Pine Siskin	<u>Carduelis pinus</u>
American Goldfinch	<u>Carduelis tristis</u>
Lesser Goldfinch	<u>Carduelis psaltria</u>
Lawrence's Goldfinch	<u>Carduelis lawrencei</u>
Red Crossbill	<u>Loxia curvirostra</u>
Green-tailed Towhee	<u>Pipilo chlorura</u>
Rufous-sided Towhee	<u>Pipilo erythrophthalmus</u>
Brown Towhee	<u>Pipilo fuscus</u>
Abert's Towhee	<u>Pipilo aberti</u>
Savannah Sparrow	<u>Passerculus sandwichensis</u>
Vesper Sparrow	<u>Poocetes gramineus</u>
Lark Sparrow	<u>Chondestes grammacus</u>
Rufous-crowned Sparrow	<u>Aimophila ruficeps</u>
Black-throated Sparrow	<u>Amphispiza bilineata</u>
Sage Sparrow	<u>Amphispiza belli</u>
Dark-eyed Junco	<u>Junco hyemalis</u>
Gray-headed Junco	<u>Junco caniceps</u>
Chipping Sparrow	<u>Spizella passerina</u>
Clay-colored Sparrow	<u>Spizella pallida</u>
Brewer's Sparrow	<u>Spizella breweri</u>
Black-chinned Sparrow	<u>Spizella atrogularis</u>
Harris' Sparrow	<u>Zonotrichia querula</u>

Appendix A. (cont.)

COMMON NAME

SCIENTIFIC NAME

White-crowned Sparrow

Zonotrichia leucophrys

Golden-crowned Sparrow

Zonotrichia atricapilla

White-throated Sparrow

Zonotrichia albicollis

Fox Sparrow

Passerella iliaca

Lincoln's Sparrow

Melospiza lincolni

Swamp Sparrow

Melospiza georgiana

Song Sparrow

Melospiza melodia

Appendix B. Species occurrence at each study site.

SPECIES	SITE																								
	San Timoteo Cyn.	Banning Cyn.	Cabazon	Twin Pines Ranch	Valley Hi Park	Millard Cyn.	Kitching Peak	Snow Creek Cyn.	I-10 Rest Stop	White Water Cyn.	Morongo Valley	Joshua Tree Nat'l Mon.	Yucca Valley	Mission Creek	Devers Wind Turbine	Willow Hole	Thousand Palm Oasis	Pushawalla Cyn.	Andreas & Palm Cyn.	Chino Cyn.	Ave. 66 & Tyler	Salton Sea, north end	White Water Settling Ponds	Mesquite Thicket	
Common Loon																									
Horned Grebe																									
Eared Grebe	●																								
Western Grebe																									
Pied-billed Grebe	●	●																							
White Pelican																									
Brown Pelican																									
Blue-footed Booby																									
Double-crested Cormorant																									
Magnificent Frigatebird																									
Great Blue Heron	●	●		●	●																				
Green Heron	●																								
Cattle Egret																									
Great Egret																									
Snowy Egret																									
Black-crowned Night Heron	●																								
Least Bittern	●																								
American Bittern	●																								
Wood Stork																									
White-faced Ibis																									
Canada Goose					●																				
Branl																									
White-fronted Goose																									
Snow Goose																									
Millard	●	●																							

SPECIES	San Timoteo Cyn.	Banning Cyn.	Cabazon	Twin Pines Ranch	Valley Hi Park	Millard Cyn.	Kitching Peak	Snow Creek Cyn.	I-10 Rest Stop	White Water Cyn.	Morongo Valley	Joshua Tree Nat'l Mon.	Yucca Valley	Mission Creek	Devers Wind Turbine	Willow Hole	Thousand Palm Oasis	Pushawalla Cyn.	Andreas & Palm Cyn.	Chino Cyn.	Ave. 66 & Tyler	Salton Sea, north end	White Water Settling Ponds	Mesquite Thicket	
Gadwall	●												●										●	●	
Pintail	●											●	●				●						●	●	●
Green-winged Teal	●	●		●	●			●				●	●				●						●	●	●
Blue-winged Teal	●							●					●										●	●	●
Cinnamon Teal	●							●				●	●				●						●	●	●
European Wigeon													●												
American Wigeon	●				●					●	●	●	●				●						●	●	●
Northern Shoveler	●							●	●				●								●		●	●	●
Wood Duck	●																								
Redhead	●																						●	●	●
Ring-necked Duck	●											●											●	●	●
Canvasback	●																						●	●	●
Greater Scaup																							●	●	●
Lesser Scaup	●																						●	●	●
Common Goldeneye																							●	●	●
Bufflehead												●	●										●	●	●
White-winged Scoter																							●	●	●
Ruddy Duck	●										●	●	●										●	●	●
Hooded Merganser	●																						●	●	●
Common Merganser													●											●	●
Red-breasted Merganser	●		●																				●	●	●
Turkey Vulture	●	●	●	●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
White-tailed Kite	●	●		●	●			●															●	●	●
Sharp-shinned Hawk	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Cooper's Hawk	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Appendix B. (cont.)

SPECIES	SITE																								
	San Timoteo Cyn.	Banning Cyn.	Cabazon	Twin Pines Ranch	Valley Hi Park	Millard Cyn.	Kitching Peak	Snow Creek Cyn.	I-10 Rest Stop	White Water Cyn.	Morongo Valley	Joshua Tree Nat'l Mon.	Yucca Valley	Mission Creek	Devers Wind Turbine	Willow Hole	Thousand Palm Oasis	Pushawalla Cyn.	Andreas & Palm Cyn.	Chino Cyn.	Ave. 66 & Tyler	Salton Sea, north end	White Water Settling Ponds	Mesquite Thicket	
Red-tailed Hawk	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Red-shouldered Hawk	●	●		●	●	●		●	●	●	●		●	●		●		●	●	●			●		
Broad-winged Hawk												●													
Swainson's Hawk	●			●								●				●		●					●		
Ferruginous Hawk	●	●									●														
Golden Eagle	●	●	●	●	●	●		●		●	●	●		●	●	●	●	●		●				●	
Bald Eagle		●																							●
Marsh Hawk	●	●	●	●	●				●		●	●				●	●	●				●	●	●	
Osprey	●	●			●	●													●				●		●
Prairie Falcon	●	●	●	●	●	●		●	●	●	●	●	●		●	●	●	●	●			●	●	●	
Peregrine Falcon																						●	●		
Merlin											●														
American Kestrel	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
California Quail	●	●	●	●	●	●	●	●		●				●											●
Gambel's Quail			●					●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Mountain Quail		●	●	●	●	●	●	●		●	●			●											●
Ring-necked Pheasant	●																								
Clapper Rail																								●	
Virginia Rail	●										●	●	●	●			●				●		●		
Sora	●							●		●	●	●	●	●			●				●		●		
Common Gallinule	●							●															●		
American Coot	●			●						●	●	●	●	●			●					●	●	●	●
American Avocet	●												●			●						●	●		
Black-necked Stilt								●				●	●									●	●	●	
Senipalmated Plover												●	●										●		

Appendix B. (cont.)

SPECIES	San Timoteo Cyn.	Banning Cyn.	Cabazon	Twin Pines Ranch	Valley Hi Park	Millard Cyn.	Kitching Peak	Snow Creek Cyn.	I-10 Rest Stop	White Water Cyn.	Morongo Valley	Joshua Tree Nat'l Mon.	Yucca Valley	Mission Creek	Devers Wind Turbine	Willow Hole	Thousand Palm Oasis	Pushawalla Cyn.	Andreas & Palm Cyn.	Chino Cyn.	Ave. 66 & Tyler	Sallon Sea, north end	White Water Settling Ponds	Mesquite Thicket	
Snowy Plover																									
Killdeer	●	●		●	●				●	●	●	●	●	●		●	●	●	●		●	●	●		
Mountain Plover																									
American Golden Plover																									
Black-bellied Plover																									
Marbled Godwit																									
Long-billed Curlew																						●	●	●	
Whimbrel									●													●	●	●	
Greater Yellowlegs	●		●	●					●								●						●	●	
Lesser Yellowlegs									●														●	●	
Solitary Sandpiper		●	●	●									●										●	●	
Willet																							●	●	
Spotted Sandpiper	●	●		●					●	●	●	●	●				●						●	●	
Ruddy Turnstone																							●	●	
Black Turnstone																							●	●	
Common Snipe	●			●	●	●		●	●		●	●	●	●			●		●				●	●	
Short-billed Dowitcher																							●	●	
Long-billed Dowitcher	●								●				●										●	●	
Red Knot																							●	●	
Sanderling																							●	●	
Western Sandpiper																							●	●	
Least Sandpiper											●	●		●			●						●	●	
Dunlin																							●	●	
Skill Sandpiper																							●	●	
Wilson's Phalarope																							●	●	

SPECIES	San Timoteo Cyn.	Banning Cyn.	Cabazon	Twin Pines Ranch	Valley Hi Park	Millard Cyn.	Kitching Peak	Snow Creek Cyn.	I-10 Rest Stop	White Water Cyn.	Morongo Valley	Joshua Tree Nat'l Mon.	Yucca Valley	Mission Creek	Devers Wind Turbine	Willow Hole	Thousand Palm Oasis	Pushawalla Cyn.	Andreas & Palm Cyn.	Chino Cyn.	Ave. 66 & Tyler	Salton Sea, north end	White Water Settling Ponds	Mesquite Thicket
Northern Phalarope																							●	
Parasitic Jaeger																							●	
Herring Gull																							●	
California Gull	●	●																				●	●	●
Ring-billed Gull					●																	●	●	●
Mew Gull																							●	
Laughing Gull																							●	
Franklin's Gull																							●	
Bonaparte's Gull																							●	●
Black-legged Kittiwake																							●	
Sabine's Gull																							●	
Gull-billed Tern																							●	
Forsler's Tern																							●	
Common Tern																							●	
Caspian Tern	●																					●	●	
Black Tern																						●	●	
Black Skimmer																							●	
Band-tailed Pigeon	●	●		●		●	●	●	●	●			●											
White-winged Dove	●								●	●	●	●	●				●	●		●		●	●	●
Mourning Dove	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Spotted Dove	●		●	●				●	●	●	●						●	●	●			●	●	●
Ground Dove		●											●						●		●	●	●	●
Greater Roadrunner	●	●	●	●		●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Barn Owl	●	●	●	●	●			●			●		●				●	●				●	●	
Screech Owl		●									●				●					●				

Appendix B. (cont.)

SPECIES	SITE																								
	San Timoteo Cyn.	Banning Cyn.	Cabazon	Twin Pines Ranch	Valley Hi Park	Millard Cyn.	Kitching Peak	Snow Creek Cyn.	I-10 Rest Stop	White Water Cyn.	Morongo Valley	Joshua Tree Nat'l Mon.	Yucca Valley	Mission Creek	Devers Wind Turbine	Willow Hole	Thousand Palm Oasis	Pushawalla Cyn.	Andreas & Palm Cyn.	Chino Cyn.	Ave. 66 & Tyler	Sallon Sea, north end	White Water Selling Ponds	Mesquite Thicket	
Great Horned Owl	●	●		●	●	●	●	●		●	●	●	●	●		●	●	●	●	●	●	●	●		
Pygmy Owl							●																		
Burrowing Owl			●					●	●									●					●		
Spotted Owl							●																		
Long-eared Owl											●					●						●			
Short-eared Owl			●									●													
Poor-will		●	●			●	●				●	●				●		●					●		●
Lesser Nighthawk	●	●	●								●	●						●					●		●
Black Swift																				●					
Vaux's Swift	●	●	●	●			●	●	●	●	●	●		●		●	●	●	●	●	●	●	●	●	●
White-throated Swift	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Black-chinned Hummingbird	●	●	●	●	●	●	●	●		●	●	●	●	●		●	●	●	●	●	●	●	●		
Costa's Hummingbird	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●	●	●	●	●
Anna's Hummingbird	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●	●	●	●	●
Rufous Hummingbird	●	●	●			●		●		●	●	●	●				●	●	●	●	●	●		●	
Calliope Hummingbird				●							●			●								●			
Broad-billed Hummingbird			●																						
Belted Kingfisher	●	●	●	●	●	●		●	●	●	●	●	●		●		●	●	●			●	●		
Common Flicker	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Acorn Woodpecker	●	●		●	●	●																			
Lewis' Woodpecker	●	●		●		●								●											
Yellow-bellied Sapsucker	●	●		●	●	●	●	●	●	●	●	●	●				●	●	●						
Hairy Woodpecker	●	●		●	●	●	●	●			●				●						●				
Downy Woodpecker	●	●		●	●																				
Ladder-backed Woodpecker			●					●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Appendix B. (cont.)

SPECIES	San Timoleo Cyn.	Banning Cyn.	Cabazon	Twin Pines Ranch	Valley Hi Park	Millard Cyn.	Kilchig Peak	Snow Creek Cyn.	I-10 Rest Stop	White Water Cyn.	Morongo Valley	Joshua Tree Nat'l Mon.	Yucca Valley	Mission Creek	Devers Wind Turbine	Willow Hole	Thousand Palm Oasis	Pushawalla Cyn.	Andreas & Palm Cyn.	Chino Cyn.	Ave. 66 & Tyler	Salton Sea, north end	White Water Settling Ponds	Mesquite Thicket
• Nuttall's Woodpecker	●	●	●	●	●	●	●	●		●	●		●	●						●				
White-headed Woodpecker		●		●			●																	
Western Kingbird	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Cassin's Kingbird	●			●							●		●	●										
Wied's Crested Flycatcher											●										●			
Ash-throated Flycatcher	●	●	●	●	●	●	●	●		●	●	●	●	●		●	●	●	●	●	●	●	●	●
Eastern Phoebe										●														
Black Phoebe	●	●	●	●	●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Say's Phoebe	●	●	●	●	●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Willow Flycatcher	●	●	●					●		●	●	●	●	●		●	●	●	●					●
Hammond's Flycatcher		●	●	●		●		●		●	●	●	●	●		●	●		●	●	●	●		
Dusky Flycatcher			●	●				●		●	●	●	●	●		●	●		●	●				
Gray Flycatcher					●				●	●							●			●				●
Western Flycatcher	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●	●	●	●
Western Wood Pewee	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●	●	●	●
Olive-sided Flycatcher	●	●	●	●	●	●	●	●	●	●	●		●	●		●	●	●	●	●	●			●
Vermilion Flycatcher											●													
Horned Lark	●	●	●	●				●	●		●	●		●	●		●	●			●	●	●	●
Violet-green Swallow	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	
Tree Swallow	●	●		●	●	●	●	●	●	●		●	●		●	●	●	●		●		●	●	
Bank Swallow										●				●								●		
Rough-winged Swallow	●	●	●	●	●			●	●	●	●	●	●		●	●	●	●	●	●	●	●	●	●
Barn Swallow	●	●		●	●			●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Cliff Swallow	●	●	●	●	●			●	●	●	●	●		●	●	●	●				●	●	●	
Purple Martin				●	●																			

Appendix B. (cont.)

SPECIES	SITE																								
	San Timoleo Cyn.	Banning Cyn.	Cabazon	Twin Pines Ranch	Valley Hi Park	Millard Cyn.	Kitching Peak	Snow Creek Cyn.	I-10 Rest Stop	White Water Cyn.	Morongo Valley	Joshua Tree Nat'l Mon.	Yucca Valley	Mission Creek	Devers Wind Turbine	Willow Hole	Thousand Palm Oasis	Pushawalla Cyn.	Andreas & Palm Cyn.	Chino Cyn.	Ave. 66 & Tyler	Salton Sea, north end	White Water Settling Ponds	Mesquite Thicket	
Steller's Jay		●		●	●	●	●	●																	
Scrub Jay	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●				●					●
Northern Raven	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Common Crow	●	●	●	●	●	●	●	●	●	●															
Pinon Jay												●													
Mountain Chickadee	●	●		●	●	●	●	●		●	●	●	●	●		●									●
Plain Titmouse	●	●	●	●	●	●	●	●		●	●	●	●	●					●						
Verdin			●					●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Bushlit	●	●	●	●	●	●	●	●	●	●	●	●	●	●					●	●			●		●
White-breasted Nuthatch	●	●		●	●	●	●			●	●	●	●	●					●						
Red-breasted Nuthatch		●		●		●	●					●	●												
Pygmy Nuthatch		●					●																		
Brown Creeper	●	●		●	●	●	●				●														
Wrentit	●	●	●	●	●	●	●	●		●				●					●	●					
Dipper		●	●	●		●		●											●						
House Wren	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●	●	●	●	●
Bewick's Wren	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Cactus Wren	●	●	●					●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Marsh Wren	●	●			●				●	●	●	●	●	●		●	●	●	●	●			●		
Canon Wren		●	●			●	●	●		●	●	●							●	●					●
Rock Wren	●	●	●	●		●	●	●	●	●	●	●		●	●	●		●	●	●	●			●	●
Mockingbrd	●	●	●	●	●	●		●	●	●	●	●	●	●		●	●	●	●	●	●	●	●	●	●
Brown Thrasher																●									
Bendire's Thrasher									●																
California Thrasher	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●			●	●					

Appendix B. (cont.)

SPECIES	SITE																								
	San Timoteo Cyn.	Banning Cyn.	Cabazon	Twin Pines Ranch	Valley III Park	Millard Cyn.	Kitching Peak	Snow Creek Cyn.	I-10 Rest Stop	White Water Cyn.	Morongo Valley	Joshua Tree Nat'l Mon.	Yucca Valley	Mission Creek	Devers Wind Turbine	Willow Hole	Thousand Palm Oasis	Pushawalla Cyn.	Andreas & Palm Cyn.	Chino Cyn.	Ave. 66 & Tyler	Salton Sea, north end	White Water Settling Ponds	Mesquite Thicket	
Le Conte's Thrasher												●			●		●	●							
Crissal Thrasher											●						●					●	●		
Sage Thrasher			●										●										●		
American Robin	●	●		●	●	●	●	●	●	●	●	●	●				●		●	●	●	●			
Varied Thrush							●				●		●												
Hermut Thrush	●	●	●	●	●	●	●	●		●	●	●	●	●		●	●	●	●	●	●	●			
Swainson's Thrush	●	●	●	●		●		●	●	●	●	●	●	●		●		●	●	●	●	●			
Western Bluebird	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●	●		●
Mountain Bluebird		●		●							●														
Townsend's Solitaire		●				●	●					●		●				●	●						●
Blue-gray Gnatcatcher	●	●	●	●	●	●		●	●	●	●	●		●	●	●	●	●	●	●	●	●			●
Black-tailed Gnatcatcher										●	●	●	●	●	●	●	●	●	●	●		●	●		●
Golden-crowned Kinglet						●				●		●													
Ruby-crowned Kinglet	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●
Water Pipit	●	●	●	●	●	●			●	●	●	●	●			●	●		●		●		●	●	
Cedar Waxwing	●	●		●	●	●		●	●	●	●	●	●	●			●	●	●		●				
Phainopepla	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●	●	●	●	●
Loggerhead Shrike	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
European Starling	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●		●	●	●	●
Hutton's Vireo	●	●		●	●	●	●																		
Bell's Vireo										●	●					●	●		●		●				
Gray Vireo												●													
Yellow-throated Vireo				●																					
Solitary Vireo	●	●		●		●				●	●	●					●		●	●	●	●			●
Warbling Vireo	●	●	●	●	●	●		●	●	●	●	●		●		●	●	●	●	●	●	●			●

Appendix B. (cont.)

SPECIES	SITE	San Timoteo Cyn.	Banning Cyn.	Cabazon	Twin Pines Ranch	Valley Hi Park	Millard Cyn.	Kitching Peak	Snow Creek Cyn.	I-10 Rest Stop	White Water Cyn.	Morongo Valley	Joshua Tree Nat'l Mon.	Yucca Valley	Mission Creek	Devers Wind Turbine	Willow Hole	Thousand Palm Oasis	Pushawalla Cyn.	Andreas & Palm Cyn.	Chino Cyn.	Ave. 66 & Tyler	Salton Sea, north end	White Water Settling Ponds	Mesquite Thicket
Black-and-white Warbler		●			●							●													
Golden-winged Warbler																		●							
Tennessee Warbler		●												●						●					
Orange-crowned Warbler		●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●	●	●	●
Nashville Warbler		●	●	●	●	●	●		●	●	●	●	●	●	●		●	●	●	●	●	●	●		●
Virginia's Warbler													●												
Lucy's Warbler									●		●	●					●			●		●			
Northern Parula																									●
Yellow Warbler		●	●	●	●	●	●		●	●	●	●	●	●	●		●	●	●	●	●	●	●	●	●
Magnolia Warbler											●														
Black-throated Blue Warbler							●					●													
Yellow-rumped Warbler		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Black-throated Gray Warbler		●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●	●		●
Townsend's Warbler		●	●		●	●	●	●	●	●	●	●	●	●			●	●	●	●	●	●			●
Black-throated Green Warbler														●											
Hermit Warbler					●							●	●					●							
Blackburnian Warbler											●	●													
Chestnut-sided Warbler																			●						
Blackpoll Warbler											●														
Palm Warbler		●																							
Ovenbird					●																				
Northern Waterthrush		●																							
MacGillivray's Warbler		●	●	●	●	●	●		●	●	●	●	●	●	●		●	●	●	●	●	●	●	●	●
Yellowthroat		●	●		●	●	●		●	●	●	●	●	●	●		●	●	●	●	●	●	●	●	●
Yellow-breasted Chat		●	●								●	●			●		●	●		●	●	●	●	●	●

Appendix B. (cont.)

SPECIES	San Timoteo Cyn.	Banning Cyn.	Cabazon	Twin Pines Ranch	Valley Hi Park	Millard Cyn.	Kitching Peak	Snow Creek Cyn.	I-10 Rest Stop	White Water Cyn.	Morongo Valley	Joshua Tree Nat'l Mon.	Yucca Valley	Mission Creek	Devers Wind Turbine	Willow Hole	Thousand Palm Oasis	Pushawalla Cyn.	Andreas & Palm Cyn.	Chino Cyn.	Ave. 66 & Tyler	Salton Sea, north end	White Water Settling Ponds	Mesquite Thicket
Wilson's Warbler	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●	●	●	●
Canada Warbler																	●							
American Redstart		●			●					●	●	●					●				●			●
House Sparrow	●	●	●	●		●		●	●	●	●		●				●	●					●	●
Western Meadowlark	●	●	●	●	●				●	●	●		●	●	●	●	●	●	●	●		●	●	●
Yellow-headed Blackbird	●								●		●					●						●	●	
Red-winged Blackbird	●			●		●			●	●	●	●	●	●		●	●					●	●	●
Tricolored Blackbird	●																							
Orchard Oriole											●													
Hooded Oriole	●	●	●			●		●	●	●	●	●	●	●		●	●	●	●	●	●	●	●	●
Scott's Oriole	●							●			●	●	●	●				●	●	●	●			
Northern Oriole	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●	●	●	●
Brewer's Blackbird	●	●	●	●	●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Great-tailed Grackle																							●	
Brown-headed Cowbird	●	●	●	●	●	●		●	●	●	●	●	●			●	●	●	●	●	●	●	●	●
Western Tanager	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●	●		●
Summer Tanager										●	●		●	●					●	●	●			
Rose-breasted Grosbeak										●		●		●										
Black-headed Grosbeak	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●	●	●	●
Blue Grosbeak	●	●									●						●					●	●	
Indigo Bunting									●	●	●		●					●		●	●	●		
Lazuli Bunting	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●	●		●
Purple Finch	●	●		●	●	●	●			●	●	●	●	●				●	●	●				
Cassin's Finch		●				●																		
House Finch	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Appendix B. (cont.)

SPECIES	SITE																							
	San Timoteo Cyn.	Banning Cyn.	Cabazon	Twin Pines Ranch	Valley HI Park	Millard Cyn.	Kitching Peak	Snow Creek Cyn.	I-10 Rest Stop	White Water Cyn.	Morongo Valley	Joshua Tree Nat'l Mon.	Yucca Valley	Mission Creek	Devers Wind Turbine	Willow Hole	Thousand Palm Oasis	Pushawalla Cyn.	Andreas & Palm Cyn.	Chino Cyn.	Ave. 66 & Tyler	Salton Sea, north end	White Water Settling Ponds	Mesquite Thicket
Pine Siskin	●	●	●	●	●	●	●	●		●	●	●	●	●			●		●				●	
American Goldfinch	●	●	●	●					●	●	●		●			●	●		●		●			
Lesser Goldfinch	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Lawrence Goldfinch	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●	●		
Red Crossbill													●											
Green-tailed Towhee	●	●	●	●		●		●			●	●	●	●		●	●		●	●	●			
Rufous-sided Towhee	●	●	●	●	●	●	●	●	●	●	●	●	●	●					●	●	●			
Brown Towhee	●	●	●	●	●	●	●	●	●	●	●	●	●	●					●	●				●
Abert's Towhee																					●	●		
Savannah Sparrow	●	●	●	●					●	●	●	●	●	●	●	●	●	●		●	●	●	●	●
Vesper Sparrow	●										●													
Lark Sparrow	●	●	●	●	●	●		●	●	●	●		●				●				●	●		●
Rufous-crowned Sparrow	●	●	●	●	●	●		●		●				●					●					
Black-throated Sparrow			●			●		●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●
Sage Sparrow			●		●	●				●	●	●	●		●	●	●	●	●	●	●	●	●	●
Dark-eyed Junco	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●				●
Gray-headed Junco		●		●	●	●			●	●	●	●	●											
Chipping Sparrow	●	●	●	●	●	●		●	●	●	●	●	●	●		●	●	●			●	●		●
Clay-colored Sparrow	●											●												
Brewer's Sparrow	●		●	●				●	●	●	●	●	●	●	●	●	●	●					●	●
Black-chinned Sparrow	●	●	●	●	●	●	●	●			●	●		●					●	●				
Harris' Sparrow												●												
White-crowned Sparrow	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Golden-crowned Sparrow	●	●	●	●	●	●	●	●	●	●	●	●	●	●			●		●	●		●		●
White-throated Sparrow											●		●											

Appendix C. Breeding species recorded for each study site.

SPECIES	SITE																									
	San Timoteo Cyn.	Banning Cyn.	Cabazon	Twin Pines Ranch	Valley Hi Park	Millard Cyn.	Snow Creek Cyn.	I-10 Rest Stop	White Water Cyn.	Morongo Valley	Joshua Tree Nat'l Mon.	Yucca Valley	Devers Wind Turbine	Willow Hole	Thousand Palms Oasis	Pushawalla Cyn.	Andreas Cyn./Palm Cyn.	Chino Cyn.	Ave. 66 & Tyler	Salton Sea, north end	Mission Creek	Whitewater Settling Ponds	Mesquite Thicket			
Eared Grebe																										
Western Grebe																										
Pied-billed Grebe	●										●															
Great Blue Heron																										
Green Heron																										
Cattle Egret																										
Great Egret																										
Snowy Egret																										
Black-cr. Night-Heron																										
Least Bittern	●																									
White-faced Ibis																										
Ruddy Duck																										
Turkey Vulture											●															
White-tailed Kite	●																									
Sharp-shinned Hawk						●																				
Cooper's Hawk	●			●	●		●		●	●		●					●									
Red-tailed Hawk	●	●	●	●	●	●	●		●	●	●	●			●	●	●	●								
Red-shouldered Hawk	●	●		●	●	●																				
Golden Eagle	●								●		●															●
Prairie Falcon							●		●		●	●						●								
American Kestrel	●	●	●	●	●	●	●		●	●	●	●			●	●	●	●	●			●				
California Quail	●	●	●	●	●	●	●		●							●						●				
Gambel's Quail									●	●	●	●		●	●	●	●	●	●	●	●	●	●	●	●	●
Mountain Quail		●	●	●	●	●				●																
Ring-necked Pheasant	●																									

Appendix C. (cont.)

SPECIES	SITE	San Timoteo Cyn.	Banning Cyn.	Cabazon	Twin Pines Ranch	Valley Hi Park	Millard Cyn.	Snow Creek Cyn.	I-10 Rest Stop	White Water Cyn.	Morongo Valley	Joshua Tree Nat'l Mon.	Yucca Valley	Devers Wind Turbine	Willow Hole	Thousand Palms Oasis	Pushawalla Cyn.	Andreas Cyn./Palm Cyn.	Chino Cyn.	Ave. 66 & Tyler	Salton Sea, north end	Mission Creek	Whitewater Settling Ponds	Mesquite Thicket
Chukar											●													
Clapper Rail																						●		
Virginia Rail											●											●	●	
Sora		●																				●		
Common Gallinule		●																				●		
American Coot		●										●										●		
American Avocet																						●		
Black-necked Stilt																						●		
Killdeer		●											●			●						●		●
Gull-billed Tern																								
Forster's Tern																						●		
Caspian Tern																						●		
Black Skimmer																						●		
Band-tailed Pigeon			●				●																	
Rock Dove		●																						
White-winged Dove																					●	●		
Mourning Dove		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Spotted Dove		●								●	●													
Common Ground-Dove																●		●			●	●		
Greater Roadrunner		●		●			●	●	●	●	●		●		●	●	●	●	●	●	●	●	●	●
Barn Owl		●					●			●	●	●	●				●	●	●		●	●	●	●
Common Screech-Owl							●				●						●	●			●		●	
Great Horned Owl		●	●	●	●	●	●	●		●	●	●	●			●	●	●	●	●	●	●	●	●
Pygmy Owl							●																	
Burrowing Owl		●		●					●	●				●	●	●	●				●	●		●

Appendix C. (cont.)

SPECIES	SITE	San Timoteo Cyn.	Banning Cyn.	Cabazon	Twin Pines Ranch	Valley Hi Park	Millard Cyn.	Snow Creek Cyn.	I-10 Rest Stop	White Water Cyn.	Morongo Valley	Joshua Tree Nat'l Mon.	Yucca Valley	Devers Wind Turbine	Willow Hole	Thousand Palms Oasis	Pushawalla Cyn.	Andreas Cyn./Palm Cyn.	Chino Cyn.	Ave. 66 & Tyler	Salton Sea, north end	Mission Creek	Whitewater Settling Ponds	Mesquite Thicket
Spotted Owl							●																	
Long-eared Owl											●		●											
Common Poorwill			●					●					●						●					
Lesser Nighthawk															●					●	●			
White-throated Swift		●		●			●	●		●		●					●	●	●				●	●
Black-chinned Hummingbird		●	●	●	●		●	●		●	●		●										●	
Costa's Hummingbird		●		●				●	●	●	●	●	●		●	●	●	●	●	●	●		●	●
Anna's Hummingbird		●	●		●	●	●	●		●	●		●										●	
Common Flicker		●	●		●	●	●	●		●													●	
Acorn Woodpecker		●	●		●	●	●																	
Yellow-bellied Sapsucker							●																	
Hairy Woodpecker			●		●	●	●																●	
Ladder-backed Woodpecker											●	●	●								●	●	●	●
Nuttall's Woodpecker		●	●		●	●	●	●		●	●		●						●				●	
White-haired Woodpecker			●																					
Western Kingbird		●	●	●	●	●	●	●	●	●	●	●	●			●	●	●		●			●	
Cassin's Kingbird		●									●		●											
Wied's Crested Flycatcher											●													
Ash-throated Flycatcher		●	●	●	●		●	●		●	●	●	●			●			●				●	●
Black Phoebe		●	●	●	●	●	●	●		●	●	●	●			●		●	●			●	●	
Say's Phoebe												●			●	●						●	●	
Western Flycatcher		●	●		●		●				●												●	
Western Wood-Pewee			●		●		●																	
Olive-sided Flycatcher			●																					
Vermilion Flycatcher											●													

Appendix C. (cont.)

SPECIES	San Timoteo Cyn.	Banning Cyn.	Cabazon	Twin Pines Ranch	Valley Hi Park	Millard Cyn.	Snow Creek Cyn.	I-10 Rest Stop	White Water Cyn.	Morongo Valley	Joshua Tree Nat'l Mon.	Yucca Valley	Devers Wind Turbine	Willow Hole	Thousand Palms Oasis	Pushawalla Cyn.	Andreas Cyn./Palm Cyn.	Chino Cyn.	Ave. 66 & Tyler	Salton Sea, north end	Mission Creek	Whitewater Settling Ponds	Mesquite Thicket	
Horned Lark								●					●		●	●					●		●	
Violet-green Swallow		●		●	●	●																		
Rough-winged Swallow	●	●	●						●						●						●			
Barn Swallow	●	●		●	●				●	●														
Cliff Swallow	●	●																						
Steller's Jay		●				●																		
Scrub Jay	●	●		●	●	●	●		●	●	●	●										●		
Northern Raven	●	●	●	●	●	●	●		●		●				●	●	●					●		●
Common Crow	●	●	●	●	●	●		●																
Mountain Chickadee		●			●	●																		
Plain Titmouse	●	●		●	●	●	●		●	●	●													
Verdin							●	●	●	●	●		●	●	●	●	●		●	●				●
Bushitit	●	●		●	●	●	●		●	●	●						●	●				●		
White-breasted Nuthatch		●		●		●																		
Brown Creeper		●				●																		
Wrenlit	●	●		●	●	●																	●	
North American Dipper		●		●			●																	
House Wren	●	●		●	●	●	●		●	●								●				●		
Bewick's Wren	●	●	●	●	●	●	●		●	●	●			●			●	●	●	●		●		●
Cactus Wren			●				●	●	●	●	●	●	●	●	●	●	●		●	●	●	●		●
Marsh Wren	●									●											●	●		
Canyon Wren		●	●			●	●		●		●						●	●				●		
Rock Wren	●	●	●			●	●		●	●	●		●	●	●	●	●	●				●	●	●
Northern Mockingbird	●	●	●	●	●	●	●		●	●	●	●			●		●	●	●	●	●	●		●
California Thrasher	●	●	●	●	●	●	●		●	●	●							●				●		

Appendix C. (cont.)

SPECIES	SITE																								
	San Timoteo Cyn.	Banning Cyn.	Cabazon	Twin Pines Ranch	Valley Hi Park	Millard Cyn.	Snow Creek Cyn.	I-10 Rest Stop	White Water Cyn.	Morongo Valley	Joshua Tree Nat'l Mon.	Yucca Valley	Devers Wind Turbine	Willow Hole	Thousand Palms Oasis	Pushawalla Cyn.	Andreas Cyn., Palm Cyn.	Chino Cyn.	Ave. 66 & Tyler	Salton Sea, north end	Mission Creek	Whitewater Settling Ponds	Mesquite Thicket		
Le Conte's Thrasher											●				●	●									
Crissal Thrasher																				●	●				
American Robin		●				●																			
Western Bluebird		●		●	●	●																			
Blue-gray Gnatcatcher		●					●		●	●	●						●	●					●		
Black-tailed Gnatcatcher														●	●	●				●	●			●	
Phainopepla		●	●	●			●		●	●	●				●	●	●	●	●	●	●	●	●	●	●
Loggerhead Shrike	●	●	●	●	●	●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
European Starling	●	●	●	●	●	●	●	●	●	●	●	●			●	●	●			●	●	●			
Hutton's Vireo		●			●	●																			
Bell's Vireo									●	●				●			●	●							
Warbling Vireo		●		●	●	●	●																●		
Orange-crowned Warbler		●		●	●	●																	●		
Lucy's Warbler										●										●					
Yellow Warbler						●			●														●		
Black-throated Gray Warbler		●			●						●												●		
Common Yellowthroat	●								●	●					●								●		
Yellow-breasted Chat										●													●		
House Sparrow	●		●	●				●	●	●		●			●					●	●			●	
Western Meadowlark	●		●	●				●		●										●	●				
Yellow-headed Blackbird	●																					●			
Red-winged Blackbird	●									●		●										●			
Tricolored Blackbird	●																								
Hooded Oriole	●	●					●	●	●	●	●	●			●	●	●	●	●	●	●				
Scott's Oriole											●	●					●								

Appendix C. (cont.)

SPECIES	SITE																							
	San Timoteo Cyn.	Banning Cyn.	Cahazon	Twin Pines Ranch	Valley Hi Park	Millard Cyn.	Snow Creek Cyn.	I-10 Rest Stop	White Water Cyn.	Morongo Valley	Joshua Tree Nat'l Mon.	Yucca Valley	Devers Wind Turbine	Willow Hole	Thousand Palms Oasis	Pushawalla Cyn.	Andreas Cyn./Palm Cyn.	Chino Cyn.	Ave. 66 & Tyler	Sallon Sea, north end	Mission Creek	Whitewater Settling Ponds	Mesquite Thicket	
Northern Oriole	●	●		●	●	●	●		●	●		●					●	●				●		
Brewer's Blackbird	●	●	●	●	●			●	●			●									●			
Brown-headed Cowbird	●	●	●	●	●	●			●	●		●					●	●	●	●	●	●		
Summer Tanager									●	●		●					●					●		
Black-headed Grosbeak	●	●		●	●	●																		
Blue Grosbeak										●									●	●				
Lazuli Bunting	●	●	●	●	●	●	●			●										●	●		●	
Purple Finch		●				●																		
House Finch	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●	●	●	●	●	●
American Goldfinch																								
Lesser Goldfinch	●	●	●	●	●	●	●		●	●	●	●			●		●	●				●		
Lawrence's Goldfinch		●			●	●																		
Rufous-sided Towhee	●	●		●	●	●	●		●	●	●											●		
Brown Towhee	●	●	●	●	●	●	●		●	●							●	●				●		
Abert's Towhee																			●	●				
Lark Sparrow	●	●		●	●																			
Rufous-crowned Sparrow	●	●	●	●	●	●	●		●													●		
Black-throated Sparrow							●	●	●	●	●	●	●	●	●	●	●							●
Sage Sparrow			●								●		●	●	●						●			
Dark-eyed Junco		●		●	●	●																		
Chipping Sparrow		●			●	●																		
Brewer's Sparrow											●													
Black-chinned Sparrow		●	●	●	●	●	●		●	●												●		
Song Sparrow	●	●		●		●			●	●											●	●		

Appendix D. Seasonal occurrence of bird species for each study site.

San Timoteo Canyon

<u>Bird Species</u>	<u>Fall 1979</u>	<u>Spring 1980</u>	<u>Fall 1980</u>
Sharp-shinned Hawk	X	X	X
Cooper's Hawk	X	X	X
Red-tailed Hawk	X	X	X
Red-shouldered Hawk	X	X	X
Swainson's Hawk		X	
Rough-legged Hawk	X		
Ferruginous Hawk	X		X
Golden Eagle	X	X	X
Northern Harrier	X	X	X
Osprey	X		X
Prairie Falcon			X
American Kestrel	X	X	X
California Quail	X	X	X
Ring-necked Pheasant	X	X	
Virginia Rail	X	X	X
Sora	X	X	X
Common Gallinule	X	X	X
American Coot	X	X	X
American Avocet	X		X
Killdeer	X	X	X
Greater Yellowlegs		X	
Spotted Sandpiper	X		
Common Snipe	X	X	X
Long-billed Dowitcher	X		
California Gull	X		
Caspian Tern	X		

Appendix D. (cont.)

San Timoteo Canyon

<u>Bird Species</u>	<u>Fall 1979</u>	<u>Spring 1980</u>	<u>Fall 1980</u>
Band-tailed Pigeon		X	
Rock Dove	X	X	X
White-winged Dove	X		
Mourning Dove	X	X	X
Spotted Dove	X	X	X
Greater Roadrunner	X	X	X
Barn Owl	X	X	X
Great Horned Owl	X	X	X
Lesser Nighthawk	X	X	X
Vaux's Swift	X	X	X
White-throated Swift	X	X	
Black-chinned Hummingbird	X	X	X
Costa's Hummingbird	X	X	X
Anna's Hummingbird	X	X	X
Rufous Hummingbird	X		X
Belted Kingfisher	X	X	X
Common Flicker	X	X	X
Acorn Woodpecker	X	X	X
Lewis' Woodpecker			X
Yellow-bellied Sapsucker	X		X
Hairy Woodpecker		X	X
Downy Woodpecker	X	X	X
Nuttall's Woodpecker	X	X	X
Western Kingbird	X	X	X
Cassin's Kingbird		X	

Appendix D. (cont.)

San Timoteo Canyon

<u>Bird Species</u>	<u>Fall 1979</u>	<u>Spring 1980</u>	<u>Fall 1980</u>
Ash-throated Flycatcher	X	X	X
Black Phoebe	X	X	X
Say's Phoebe	X	X	X
Willow Flycatcher			X
Western Flycatcher	X	X	
Western Wood Pewee	X	X	X
Olive-sided Flycatcher		X	
Horned Lark	X	X	X
Violet-green Swallow	X	X	X
Tree Swallow	X	X	X
Rough-winged Swallow	X	X	X
Barn Swallow	X	X	X
Cliff Swallow	X	X	X
Scrub Jay	X	X	X
Northern Raven	X	X	X
Common Crow	X	X	X
Mountain Chickadee			X
Plain Titmouse		X	X
Bushtit	X	X	X
White-breasted Nuthatch			X
Brown Creeper	X		X
Wrentit	X	X	X
House Wren	X	X	X
Bewick's Wren	X	X	X

Appendix D. (cont.)

San Timoteo Canyon

<u>Bird Species</u>	<u>Fall 1979</u>	<u>Spring 1980</u>	<u>Fall 1980</u>
Cactus Wren	X		
Marsh Wren	X	X	X
Rock Wren	X		
Mockingbird	X	X	X
California Thrasher	X	X	X
American Robin			X
Hermit Thrush	X	X	X
Swainson's Thrush		X	
Western Bluebird	X	X	X
Blue-gray Gnatcatcher	X	X	X
Ruby-crowned Kinglet	X	X	X
Water Pipit	X	X	X
Cedar Waxwing	X	X	X
Phainopepla	X	X	X
Loggerhead Shrike	X	X	X
Starling	X	X	X
Hutton's Vireo		X	
Solitary Vireo			X
Warbling Vireo	X	X	X
Black-and-White Warbler	X		
Tennessee Warbler	X		
Orange-crowned Warbler	X	X	X
Nashville Warbler	X	X	X
Yellow Warbler	X	X	X
Magnolia Warbler	X		

Appendix D. (cont.)

San Timoteo Canyon

<u>Bird Species</u>	<u>Fall 1979</u>	<u>Spring 1980</u>	<u>Fall 1980</u>
Yellow-rumped Warbler	X	X	X
Black-throated Gray Warbler	X	X	X
Townsend's Warbler	X		
Palm Warbler		X	
Northern Waterthrush	X		
MacGillivray's Warbler	X	X	
Common Yellowthroat	X	X	X
Yellow-breasted Chat	X	X	
Wilson's Warbler	X	X	X
House Sparrow	X	X	X
Western Meadowlark	X	X	X
Yellow-headed Blackbird	X	X	X
Red-winged Blackbird	X	X	X
Tri-colored Blackbird	X	X	X
Hooded Oriole		X	X
Scott's Oriole		X	
Northern Oriole	X	X	
Brewer's Blackbird	X	X	X
Brown-headed Cowbird	X	X	X
Western Tanager	X	X	X
Black-headed Grosbeak	X	X	
Blue Grosbeak	X	X	X
Lazuli Bunting	X	X	X
Purple Finch	X		X

Appendix D. (cont.)

San Timoteo Canyon

<u>Bird Species</u>	<u>Fall 1979</u>	<u>Spring 1980</u>	<u>Fall 1980</u>
House Finch	X	X	X
Pine Siskin	X	X	X
American Goldfinch	X	X	X
Lesser Goldfinch	X	X	X
Lawrence's Goldfinch	X	X	X
Green-tailed Towhee	X		
Rufous-sided Towhee	X	X	X
Brown Towhee	X	X	X
Savannah Sparrow	X	X	X
Vesper Sparrow			X
Lark Sparrow	X	X	X
Rufous-crowned Sparrow	X		
Slate-colored Junco		X	
Dark-eyed Junco	X	X	X
Chipping Sparrow	X	X	X
Clay-colored Sparrow	X		
Brewer's Sparrow	X		X
Black-chinned Sparrow		X	
White-crowned Sparrow	X	X	X
Golden-crowned Sparrow	X	X	X
Lincoln's Sparrow	X	X	X
Song Sparrow	X	X	X

BIRD SPECIES LIST FOR BANNING CANYON

<u>Bird Species</u>	<u>Fall 1979</u>	<u>Spring 1980</u>	<u>Fall 1980</u>
Great Blue Heron		X	
Mallard	X		
Green-winged Teal	X		
Turkey Vulture		X	X
White-tailed Kite			X
Goshawk		X	
Sharp-shinned Hawk	X	X	X
Cooper's Hawk	X	X	X
Red-tailed Hawk	X	X	X
Red-shouldered Hawk	X	X	X
Ferruginous Hawk	X		X
Golden Eagle	X	X	X
Bald Eagle		X	
Northern Harrier	X		X
Osprey		X	X
Prairie Falcon			X
American Kestrel	X	X	X
California Quail	X	X	X
Mountain Quail	X	X	X
Killdeer		X	
Solitary Sandpiper		X	
Spotted Sandpiper		X	
California Gull		X	
Band-tailed Pigeon	X	X	X
Mourning Dove	X	X	X

Appendix D. (cont.)

Banning Canyon

<u>Bird Species</u>	<u>Fall 1979</u>	<u>Spring 1980</u>	<u>Fall 1980</u>
Ground Dove	X		
Greater Roadrunner	X	X	X
Barn Owl	X	X	X
Screech Owl		X	
Great Horned Owl	X	X	X
Common Poorwill		X	X
Lesser Nighthawk		X	
Vaux's Swift	X	X	X
White-throated Swift	X	X	X
Black-chinned Hummingbird	X	X	X
Costa's Hummingbird	X	X	X
Anna's Hummingbird	X	X	X
Rufous Hummingbird	X	X	X
Belted Kingfisher		X	X
Common Flicker	X	X	X
Acorn Woodpecker	X	X	X
Lewis' Woodpecker		X	X
Yellow-bellied Sapsucker	X	X	X
Hairy Woodpecker	X	X	X
Downy Woodpecker		X	X
Nuttall's Woodpecker	X	X	X
White-headed Wood- pecker	X	X	X
Western Kingbird		X	X
Ash-throated Flycatcher	X	X	

Appendix D. (cont.)

Banning Canyon

<u>Bird Species</u>	<u>Fall 1979</u>	<u>Spring 1980</u>	<u>Fall 1980</u>
Black Phoebe	X	X	X
Say's Phoebe	X		X
Willow Flycatcher		X	
Hammond's Flycatcher		X	X
Western Flycatcher	X	X	X
Western Wood Pewee		X	X
Olive-sided Flycatcher		X	X
Horned Lark	X		
Violet-green Swallow	X	X	X
Tree Swallow		X	X
Rough-winged Swallow	X	X	X
Earn Swallow		X	
Cliff Swallow		X	X
Steller's Jay	X	X	X
Scrub Jay	X	X	X
Northern Raven	X	X	X
Common Crow	X	X	X
Mountain Chickadee	X	X	X
Plain Titmouse	X	X	X
Bushtit	X	X	X
White-breasted Nuthatch	X	X	X
Red-breasted Nuthatch		X	
Pygmy Nuthatch			X
Brown Creeper	X		X
Wrentit	X	X	X

Appendix D. (cont.)

Banning Canyon

<u>Bird Species</u>	<u>Fall 1979</u>	<u>Spring 1980</u>	<u>Fall 1980</u>
North American Dipper	X		X
House Wren	X	X	X
Bewick's Wren	X	X	X
Cactus Wren	X	X	
Canyon Wren	X		
Rock Wren	X	X	X
Northern Mockingbird	X	X	X
California Thrasher	X	X	X
American Robin	X	X	X
Hermit Thrush	X	X	X
Swainson's Thrush		X	
Western Bluebird	X	X	X
Mountain Bluebird	X		
Townsend's Solitaire	X	X	X
Blue-gray Gnatcatcher	X	X	
Ruby-crowned Kinglet	X	X	X
Water Pipit	X		
Cedar Waxwing	X	X	X
Phainopepla	X	X	X
Loggerhead Shrike	X	X	X
European Starling	X	X	X
Hutton's Vireo	X	X	X
Solitary Vireo		X	
Warbling Vireo	X	X	X
Orange-crowned Warbler	X	X	X
Nashville Warbler	X	X	X

Banning Canyon

<u>Bird Species</u>	<u>Fall 1979</u>	<u>Spring 1980</u>	<u>Fall 1980</u>
Yellow Warbler	X	X	X
Yellow-rumped Warbler	X	X	X
Black-throated Gray Warbler	X	X	X
Townsend's Warbler	X	X	X
Hermit Warbler		X	
MacGillivray's Warbler	X	X	X
Common Yellowthroat		X	X
Yellow-breasted Chat	X		
Wilson's Warbler	X	X	X
American Redstart			X
House Sparrow		X	
Western Meadowlark	X	X	X
Hooded Oriole		X	
Northern Oriole		X	
Brewer's Blackbird	X	X	X
Brown-headed Cowbird		X	X
Western Tanager	X	X	X
Black-headed Grosbeak	X	X	X
Blue Grosbeak			X
Lazuli Bunting		X	X
Purple Finch	X	X	X
Cassin's Finch		X	X
House Finch	X	X	X
Pine Siskin	X	X	X
American Goldfinch	X		X
Lesser Goldfinch	X	X	X

Appendix D. (cont.)

Banning Canyon

<u>Bird Species</u>	<u>Fall 1979</u>	<u>Spring 1980</u>	<u>Fall 1980</u>
Lawrence's Goldfinch	X	X	X
Green-tailed Towhee	X	X	X
Rufous-sided Towhee	X	X	X
Brown Towhee	X	X	X
Savannah Sparrow	X		X
Lark Sparrow	X		X
Rufous-crowned Sparrow	X	X	X
Dark-eyed Junco	X	X	X
Gray-headed Junco			X
Chipping Sparrow	X	X	X
Black-chinned Sparrow		X	
White-crowned Sparrow	X	X	X
Golden-crowned Sparrow	X	X	X
Fox Sparrow	X		X
Lincoln's Sparrow	X	X	X
Song Sparrow	X	X	X

BIRD SPECIES LIST FOR MILLARD CANYON

<u>Bird Species</u>	<u>Fall 1979</u>	<u>Spring 1980</u>	<u>Fall 1980</u>
Sharp-shinned Hawk	X	X	X
Cooper's Hawk	X	X	X
Red-tailed Hawk	X	X	X
Red-shouldered Hawk	X		X
Golden Eagle	X		X
Osprey		X	
Prairie Falcon			X
American Kestrel	X	X	X
California Quail	X	X	X
Mountain Quail	X	X	X
Common Snipe			X
Band-tailed Pigeon	X	X	X
Mourning Dove	X	X	X
Greater Roadrunner	X	X	X
Great Horned Owl	X	X	X
Poor-will			X
White-throated Swift		X	
Black-chinned Hummingbird	X	X	X
Costa's Hummingbird	X	X	X
Anna's Hummingbird	X	X	X
Rufous Humingbird		X	X
Belted Kingfisher	X	X	
Common Flicker	X	X	X
Acorn Woodpecker	X	X	X
Lewis' Woodpecker	X		

Appendix D. (cont.)

Millard Canyon

<u>Bird Species</u>	<u>Fall 1979</u>	<u>Spring 1980</u>	<u>Fall 1980</u>
Red-breasted Sapsucker	X		X
Yellow-bellied Sapsucker			X
Hairy Woodpecker	X	X	X
Nuttall's Woodpecker	X	X	X
Western Kingbird		X	
Ash-throated Flycatcher	X	X	
Black Phoebe	X	X	X
Say's Phoebe	X		X
Hammond's Flycatcher		X	X
Western Flycatcher		X	X
Western Wood Pewee	X	X	X
Olive-sided Flycatcher		X	X
Violet-green Swallow	X	X	X
Tree Swallow			X
Steller's Jay	X		X
Scrub Jay	X	X	X
Northern Raven	X	X	X
Common Crow	X	X	X
Mountain Chickadee	X		X
Plain Titmouse	X	X	X
Bushtit	X	X	X
White-breasted Nuthatch	X		X
Red-breasted Nuthatch	X		
Brown Creeper	X		X
Wrentit	X	X	X

Appendix D. (cont.)

Millard Canyon

<u>Bird Species</u>	<u>Fall 1979</u>	<u>Spring 1980</u>	<u>Fall 1980</u>
North American Dipper			X
House Wren	X	X	X
Winter Wren			X
Bewick's Wren	X	X	X
Canyon Wren	X		X
Rock Wren	X	X	
Mockingbird	X	X	X
California Thrasher	X	X	X
American Robin	X	X	X
Hermit Thrush	X	X	X
Western Bluebird	X	X	X
Townsend's Solitaire		X	X
Blue-gray Gnatcatcher	X	X	
Golden-crowned Kinglet	X		X
Ruby-crowned Kinglet	X	X	X
Water Pipit	X		
Cedar Waxwing	X	X	X
Phainopepla	X	X	X
Loggerhead Shrike	X	X	X
Starling	X	X	X
Hutton's Vireo	X		X
Solitary Vireo	X		
Warbling Vireo	X	X	X
Orange-crowned Warbler	X	X	X
Nashville Warbler	X	X	X

Appendix D. (cont.)

Millard Canyon

<u>Bird Species</u>	<u>Fall 1979</u>	<u>Spring 1980</u>	<u>Fall 1980</u>
Yellow Warbler	X	X	X
Black-throated Blue Warbler			X
Yellow-rumped Warbler	X	X	X
Black-throated Gray Warbler	X	X	X
Townsend's Warbler			X
MacGillivray's Warbler	X		
Common Yellowthroat	X		
Wilson's Warbler	X	X	X
House Sparrow		X	
Red-winged Blackbird		X	
Hooded Oriole		X	
Northern Oriole	X	X	
Brewer's Blackbird		X	
Brown-headed Cowbird		X	
Western Tanager	X	X	X
Black-headed Grosbeak	X	X	X
Lazuli Bunting	X	X	X
Purple Finch	X	X	X
Cassin's Finch		X	
House Finch	X	X	X
Pine Siskin	X	X	X
Lesser Goldfinch	X	X	X
Lawrence's Goldfinch	X	X	X
Green-tailed Towhee	X		X
Rufous-sided Towhee	X	X	X

Appendix D. (cont.)

Millard Canyon

<u>Bird Species</u>	<u>Fall 1979</u>	<u>Spring 1980</u>	<u>Fall 1980</u>
Brown Towhee	X	X	X
Lark Sparrow	X	X	X
Rufous-crowned Sparrow			X
Black-throated Sparrow			X
Sage Sparrow	X		
Slate-colored Junco	X	X	X
Dark-eyed Junco	X	X	X
Gray-headed Junco	X	X	
Chipping Sparrow	X		X
Black-chinned Sparrow		X	
White-crowned Sparrow	X	X	X
Golden-crowned Sparrow	X	X	X
Fox Sparrow	X	X	X
Lincoln's Sparrow	X		X
Song Sparrow	X	X	X

BIRD SPECIES LIST FOR KITCHING PEAK

<u>Bird Species</u>	<u>Fall 1979</u>	<u>Spring 1980</u>	<u>Fall 1980</u>
Turkey Vulture		X	
Sharp-shinned Hawk	X	X	
Cooper's Hawk		X	X
Red-tailed Hawk	X	X	X
Golden Eagle		X	
American Kestrel	X		
California Quail		X	
Mountain Quail	X	X	X
Band-tailed Pigeon	X	X	
Mourning Dove	X	X	
Great Horned Owl	X	X	
Pigmy Owl	X	X	
Spotted Owl	X	X	
Poor-will	X	X	
Vaux's Swift	X		
White-throated Swift	X	X	
Black-chinned Hummingbird		X	
Costa's Hummingbird		X	
Anna's Hummingbird	X	X	
Common Flicker	X	X	X
Acorn Woodpecker	X	X	X
Yellow-bellied Sapsucker	X		
Hairy Woodpecker	X	X	X
Nuttall's Woodpecker	X	X	X

Kitching Peak

<u>Bird Species</u>	<u>Fall 1979</u>	<u>Spring 1980</u>	<u>Fall 1980</u>
White-headed Woodpecker	X	X	
Western Kingbird		X	
Ash-throated Flycatcher		X	
Western Flycatcher		X	
Western Wood Pewee	X	X	
Olive-sided Flycatcher	X	X	
Violet-green Swallow		X	
Tree Swallow	X	X	
Steller's Jay	X	X	
Scrub Jay	X	X	X
Northern Raven	X	X	X
Common Crow		X	
Mountain Chickadee	X	X	X
Plain Titmouse	X	X	X
Bushtit	X	X	X
White-breasted Nuthatch	X	X	X
Red-breasted Nuthatch	X	X	
Pigmy Nuthatch	X	X	
Brown Creeper	X	X	X
Wrentit	X	X	X
House Wren	X	X	X
Bewick's Wren	X	X	X
Canyon Wren	X	X	X
Rock Wren	X		X
California Thrasher	X	X	

Appendix D. (cont.)

Kitching Peak

<u>Bird Species</u>	<u>Fall 1979</u>	<u>Spring 1980</u>	<u>Fall 1980</u>
Varied Thrush	X		
Hermit Thrush	X	X	
Western Bluebird	X	X	X
Townsend's Solitaire	X		X
Ruby-crowned Kinglet	X	X	X
Phainopepla	X		
Loggerhead Shrike	X		
Starling	X	X	
Hutton's Vireo	X	X	
Orange-crowned Warbler	X		
Yellow-rumped Warbler	X	X	X
Black-throated Gray Warbler	X		X
Townsend's Warbler		X	X
Wilson's Warbler	X		
Northern Oriole		X	
Western Tanager	X	X	
Black-headed Grosbeak	X	X	
Lazuli Bunting		X	
Purple Finch	X	X	
House Finch	X	X	
Pine Siskin		X	
Lesser Goldfinch	X	X	X
Lawrence's Goldfinch	X	X	
Rufous-sided Towhee	X	X	X
Brown Towhee	X	X	X

Appendix D. (cont.)

Kitching Peak

<u>Bird Species</u>	<u>Fall 1979</u>	<u>Spring 1980</u>	<u>Fall 1980</u>
Dark-eyed Junco	X	X	X
Black-chinned Sparrow		X	
White-crowned Sparrow	X	X	X
Golden-crowned Sparrow	X	X	X
Song Sparrow	X		

BIRD SPECIES LIST FOR CABAZON

<u>Bird Species</u>	<u>Fall 1979</u>	<u>Spring 1980</u>	<u>Fall 1980</u>
Red-breasted Merganser		X	
Turkey Vulture		X	
Sharp-shinned Hawk	X	X	X
Cooper's Hawk	X	X	X
Red-tailed Hawk	X	X	X
Golden Eagle		X	
Northern Harrier		X	X
Prairie Falcon	X	X	X
American Kestrel	X	X	X
California Quail	X	X	X
Gambel's Quail	X	X	X
Mountain Quail		X	
Greater Yellowlegs	X		
Solitary Sandpiper	X		
Mourning Dove	X	X	X
Spotted Dove		X	
Greater Roadrunner	X	X	X
Barn Owl	X		X
Burrowing Owl	X		X
Short-eared Owl			X
Poor-will			X
Lesser Nighthawk	X	X	
Vaux's Swift		X	X
White-throated Swift	X	X	X

Appendix D. (cont.)

Cabazon

<u>Bird Species</u>	<u>Fall 1979</u>	<u>Spring 1980</u>	<u>Fall 1980</u>
Black-chinned Hummingbird	X	X	X
Costa's Hummingbird	X	X	X
Anna's Hummingbird	X	X	X
Rufous Hummingbird	X	X	X
Broad-billed Hummingbird	X		
Belted Kingfisher		X	
Common Flicker	X	X	X
Ladder-backed Woodpecker	X	X	X
Nuttall's Woodpecker		X	X
Western Kingbird	X	X	
Asi-throated Flycatcher		X	
Black Phoebe	X	X	X
Say's Phoebe	X	X	X
Willow Flycatcher	X		
Hammond's Flycatcher		X	
Dusky Flycatcher		X	
Western Flycatcher		X	X
Western Wood Pewee		X	X
Olive-sided Flycatcher		X	
Horned Lark	X		
Violet-green Swallow	X	X	X
Rough-winged Swallow		X	
Cliff Swallow		X	



Appendix D. (cont.)

Cabazon

<u>Bird Species</u>	<u>Fall 1979</u>	<u>Spring 1980</u>	<u>Fall 1980</u>
Scrub Jay	X	X	X
Northern Raven	X	X	X
Common Crow	X	X	
Plain Titmouse	X		
Verdin			X
Bushtit	X	X	
Wrentit	X	X	X
North American Dipper	X		
House Wren	X	X	X
Winter Wren		X	
Bewick's Wren	X	X	X
Cactus Wren	X	X	X
Canyon Wren	X	X	X
Rock Wren	X	X	X
Mockingbird	X	X	X
California Thrasher	X	X	X
Sage Thrasher	X		
Hermit Thrush		X	
Swainson's Thrush		X	
Western Bluebird		X	
Blue-gray Gnatcatcher	X		
Ruby-crowned Kinglet	X	X	X
Water Pipit	X		X
Phainopepla	X	X	X
Loggerhead Shrike	X	X	X

Cabazon

<u>Bird Species</u>	<u>Fall 1979</u>	<u>Spring 1980</u>	<u>Fall 1980</u>
Starling	X	X	X
Warbling Vireo		X	
Orange-crowned Warbler	X	X	
Nashville Warbler	X	X	X
Yellow Warbler		X	X
Yellow-rumped Warbler	X	X	X
Black-throated Gray Warbler			X
MacGillivray's Warbler		X	X
Wilson's Warbler	X	X	X
House Sparrow	X		
Western Meadowlark	X	X	X
Hooded Oriole		X	
Northern Oriole		X	
Brewer's Blackbird	X	X	X
Brown-headed Cowbird		X	
Western Tanager	X	X	
Black-headed Grosbeak		X	X
Lazuli Bunting		X	X
House Finch	X	X	X
Pine Siskin		X	
American Goldfinch			X
Lesser Goldfinch	X	X	X
Lawrence's Goldfinch		X	X
Green-tailed Towhee	X		X
Rufous-sided Towhee	X	X	X

Appendix D. (cont.)

Cabazon

<u>Bird Species</u>	<u>Fall 1979</u>	<u>Spring 1980</u>	<u>Fall 1980</u>
Brown Towhee	X	X	X
Savannah Sparrow	X	X	
Lark Sparrow	X	X	X
Rufous-crowned Sparrow	X	X	X
Black-throated Sparrow	X	X	X
Sage Sparrow	X		X
Slate-colored Junco		X	X
Dark-eyed Junco	X	X	X
Chipping Sparrow	X	X	
Brewer's Sparrow		X	
Black-chinned Sparrow		X	
White-crowned Sparrow	X	X	X
Golden-crowned Sparrow	X	X	
Lincoln's Sparrow	X	X	X
Song Sparrow		X	

BIRD SPECIES LIST FOR VALLEY HI PARK

<u>Bird Species</u>	<u>Fall 1979</u>	<u>Spring 1980</u>	<u>Fall 1980</u>
Great Blue Heron	X		X
Green-winged Teal			X
American Wigeon	X		
Turkey Vulture	X	X	X
White-tailed Kite			X
Sharp-shinned Hawk	X	X	X
Cooper's Hawk	X	X	X
Red-tailed Hawk	X	X	X
Red-shouldered Hawk	X	X	X
Golden Eagle			X
Northern Harrier	X		X
Osprey		X	
Prairie Falcon	X		
American Kestrel	X	X	X
California Quail	X	X	X
Mountain Quail	X	X	X
Killdeer		X	
Common Snipe			X
Ring-billed Gull		X	
Band-tailed Pigeon		X	
Mourning Dove	X	X	X
Barn Owl			X
Great Horned Owl	X		X
White-throated Swift	X	X	
Black-chinned Hummingbird		X	

Valley Hi Park

<u>Bird Species</u>	<u>Fall 1979</u>	<u>Spring 1980</u>	<u>Fall 1980</u>
Costa's Hummingbird	X		
Anna's Hummingbird	X	X	X
Belted Kingfisher	X	X	X
Common Flicker	X	X	X
Acorn Woodpecker	X	X	X
Yellow-bellied Sapsucker	X		X
Hairy Woodpecker	X		X
Downey Woodpecker			X
Nuttall's Woodpecker	X	X	X
Western Kingbird		X	
Ash-throated Kingbird		X	
Black Phoebe	X	X	X
Say's Phoebe	X	X	X
Gray Flycatcher	X		
Western Flycatcher		X	
Western Wood Pewee		X	X
Olive-sided Flycatcher		X	
Violet-green Swallow	X	X	X
Tree Swallow			X
Rough-winged Swallow	X	X	
Barn Swallow	X		X
Cliff Swallow	X		
Purple Martin	X	X	
Steller's Jay	X		
Scrub Jay	X	X	X

Appendix D. (cont.)

Valley Hi Park

<u>Bird Species</u>	<u>Fall 1979</u>	<u>Spring 1980</u>	<u>Fall 1980</u>
Northern Raven	X	X	X
Common Crow	X	X	X
Mountain Chickadee	X	X	X
Plain Titmouse	X	X	X
Bushtit	X	X	X
White-breasted Nuthatch	X		X
Brown Creeper	X		X
Wrentit	X	X	X
House Wren	X	X	X
Bewick's Wren	X	X	X
Marsh Wren			X
Northern Mockingbird		X	X
California Thrasher	X	X	X
American Robin	X	X	X
Hermit Thrush	X	X	X
Western Bluebird	X	X	X
Blue-gray Gnatcatcher		X	X
Ruby-crowned Kinglet	X	X	X
Water Pipit	X		
Cedar Waxwing	X		
Phainopepla	X		
Loggerhead Shrike	X		
European Starling	X	X	X
Hutton's Vireo	X	X	X
Warbling Vireo		X	
Orange-crowned Warbler	X		X

Appendix D. (cont.)

Valley Fi Park

<u>Bird Species</u>	<u>Fall 1979</u>	<u>Spring 1980</u>	<u>Fall 1980</u>
Nashville Warbler			X
Yellow Warbler			X
Yellow-rumped Warbler	X	X	X
Black-throated Gray Warbler	X	X	X
Townsend's Warbler			X
MacGillivray's Warbler	X		
Common Yellowthroat	X		
Wilson's Warbler	X	X	X
American Redstart	X		
Western Meadowlark	X	X	
Northern Oriole		X	
Brewer's Blackbird	X	X	X
Brown-headed Cowbird		X	
Western Tanager	X	X	
Black-headed Grosbeak	X	X	X
Lazuli Bunting		X	
Purple Finch	X		
House Finch	X	X	X
Pine Siskin	X	X	
Lesser Goldfinch	X	X	X
Lawrence's Goldfinch	X	X	X
Rufous-sided Towhee	X	X	X
Brown Towhee	X	X	X
Savannah Sparrow	X	X	X
Lark Sparrow	X	X	X

Valley Hi Park

<u>Bird Species</u>	<u>Fall 1979</u>	<u>Spring 1980</u>	<u>Fall 1980</u>
Rufous-crowned Sparrow		X	
Sage Sparrow	X		X
Dark-eyed Junco	X	X	X
Gray-headed Junco	X		
Chipping Sparrow	X	X	X
Black-chinned Sparrow		X	
White-crowned Sparrow	X	X	X
Golden-crowned Sparrow	X	X	X
Fox Sparrow	X		X
Lincoln's Sparrow	X	X	X
Song Sparrow	X	X	X

BIRD SPECIES LIST FOR TWIN PINES RANCH

<u>Bird Species</u>	<u>Fall 1979</u>	<u>Spring 1980</u>	<u>Fall 1980</u>
Great Blue Heron	X		
Canada Goose			X
Green-winged Teal	X		
Turkey Vulture		X	
White-tailed Kite			X
Sharp-shinned Hawk	X	X	X
Cooper's Hawk	X	X	X
Red-tailed Hawk	X	X	X
Red-shouldered Hawk	X	X	X
Swainson's Hawk	X		
Golden Eagle	X	X	X
Northern Harrier			X
Prairie Falcon	X		X
American Kestrel	X	X	X
California Quail	X	X	X
Mountain Quail	X	X	
American Coot			X
Killdeer	X		
Greater Yellowlegs		X	
Solitary Sandpiper			X
Spotted Sandpiper	X		
Common Snipe	X		
Band-tailed Pigeon	X	X	X
Mourning Dove	X	X	X
Spotted Dove	X		
Greater Roadrunner		X	X

Twin Pines Ranch

<u>Bird Species</u>	<u>Fall 1979</u>	<u>Spring 1980</u>	<u>Fall 1980</u>
Barn Owl		X	X
Great Horned Owl	X		
Vaux's Swift	X	X	X
White-throated Swift	X	X	X
Black-chinned Hummingbird	X	X	
Costa's Hummingbird		X	
Anna's Hummingbird	X	X	X
Calliope Hummingbird		X	
Belted Kingfisher	X		X
Common Flicker	X	X	X
Acorn Woodpecker	X	X	X
Lewis' Woodpecker			X
Yellow-bellied Sapsucker	X		X
Hairy Woodpecker	X	X	X
Downy Woodpecker	X		
Nuttall's Woodpecker	X	X	X
White-headed Wood- pecker	X	X	X
Western Kingbird		X	X
Cassin's Kingbird		X	
Ash-throated Flycatcher		X	
Black Phoebe	X	X	X
Say's Phoebe	X	X	X
Hammond's Flycatcher		X	
Dusky Flycatcher	X	X	

Twin Pines Ranch

<u>Bird Species</u>	<u>Fall 1979</u>	<u>Spring 1980</u>	<u>Fall 1980</u>
Western Flycatcher	X	X	X
Western Wood Pewee	X	X	X
Olive-sided Flycatcher		X	
Horned Lark	X		
Violet-green Swallow	X	X	X
Tree Swallow			X
Rough-winged Swallow	X	X	
Barn Swallow	X		X
Cliff Swallow	X		
Purple Martin		X	
Steller's Jay	X		
Scrub Jay	X	X	X
Northern Raven	X	X	X
Common Crow	X	X	X
Mountain Chickadee	X	X	X
Plain Titmouse	X	X	X
Bushtit	X	X	X
White-breasted Nuthatch		X	X
Red-breasted Nuthatch	X		
Brown Creeper	X	X	X
Wrentit	X	X	X
North American Dipper	X		
House Wren	X	X	X
Bewick's Wren	X	X	X
Rock Wren	X	X	X

Twin Pines Ranch

<u>Bird Species</u>	<u>Fall 1979</u>	<u>Spring 1980</u>	<u>Fall 1980</u>
Northern Mockingbird	X	X	X
California Thrasher	X	X	X
American Robin		X	X
Hermit Thrush	X	X	X
Swainson's Thrush			X
Western Bluebird	X	X	X
Mountain Bluebird			X
Blue-gray Gnatcatcher	X		
Ruby-crowned Kinglet	X	X	X
Water Pipit	X		X
Cedar Waxwing	X	X	X
Phainopepla	X	X	X
Loggerhead Shrike	X	X	X
European Starling	X	X	X
Hutton's Vireo	X		
Solitary Vireo		X	
Warbling Vireo	X	X	X
Black-and-white Warbler	X		
Orange-crowned Warbler	X	X	X
Nashville Warbler	X	X	
Yellow Warbler	X	X	X
Yellow-rumped Warbler	X	X	X
Black-throated Gray Warbler	X	X	X
Townsend's Warbler	X	X	X

Appendix D. (cont.)

Twin Pines Ranch

<u>Bird Species</u>	<u>Fall 1979</u>	<u>Spring 1980</u>	<u>Fall 1980</u>
Hermit Warbler	X	X	
Ovenbird	X		
MacGillivray's Warbler	X		
Common Yellowthroat			X
Wilson's Warbler	X	X	X
House Sparrow	X	X	X
Western Meadowlark	X	X	
Red-winged Blackbird	X		
Northern Oriole		X	X
Brewer's Blackbird	X	X	X
Brown-headed Cowbird	X	X	X
Western Tanager	X	X	X
Black-headed Grosbeak	X	X	X
Lazuli Bunting	X	X	
Purple Finch	X	X	X
House Finch	X	X	X
Pine Siskin	X	X	
American Goldfinch	X	X	X
Lesser Goldfinch	X	X	X
Lawrence's Goldfinch	X	X	X
Green-tailed Towhee	X		X
Rufous-sided Towhee	X	X	X
Brown Towhee	X	X	X
Savannah Sparrow	X	X	
Lark Sparrow	X	X	X
Rufous-crowned Sparrow	X	X	X

Twin Pines Ranch

<u>Bird Species</u>	<u>Fall 1979</u>	<u>Spring 1980</u>	<u>Fall 1980</u>
Dark-eyed Junco	X	X	X
Gray-headed Junco	X		
Chipping Sparrow	X	X	X
Brewer's Sparrow	X		
Black-chinned Sparrow		X	
White-crowned Sparrow	X	X	X
Golden-crowned Sparrow	X	X	X
Fox Sparrow	X		X
Lincoln's Sparrow	X	X	X
Song Sparrow	X	X	X

BIRD SPECIES LIST FOR SNOW CREEK

<u>Bird Species</u>	<u>Fall 1979</u>	<u>Spring 1980</u>	<u>Fall 1980</u>
Turkey Vulture		X	
Sharp-shinned Hawk	X	X	X
Cooper's Hawk	X		X
Red-tailed Hawk	X	X	X
Red-shouldered Hawk	X		
Golden Eagle	X	X	X
Prairie Falcon	X		
American Kestrel	X	X	X
California Quail	X	X	X
Gambel's Quail	X	X	X
Mountain Quail		X	
Common Snipe	X		
Band-tailed Pigeon	X		
Mourning Dove	X	X	X
Spotted Dove	X		
Greater Roadrunner	X	X	X
Great Horned Owl	X		
Burrowing Owl	X		
Vaux's Swift		X	X
White-throated Swift	X	X	X
Black-chinned Hummingbird	X	X	X
Costa's Hummingbird	X	X	X
Anna's Hummingbird	X	X	X
Rufous Hummingbird	X		X
Belted Kingfisher	X	X	X

Appendix D. (cont.)

Snow Creek

<u>Bird Species</u>	<u>Fall 1979</u>	<u>Spring 1980</u>	<u>Fall 1980</u>
Common Flicker	X	X	X
Yellow-bellied Sapsucker	X	X	
Hairy Woodpecker	X		
Ladder-backed Woodpecker	X	X	X
Nuttall's Woodpecker	X	X	X
Western Kingbird	X	X	
Ash-throated Flycatcher	X	X	
Black Phoebe	X	X	X
Say's Phoebe	X		X
Willow Flycatcher		X	
Hammond's Flycatcher		X	
Dusky Flycatcher		X	
Western Flycatcher		X	
Western Wood Pewee		X	
Olive-sided Flycatcher	X	X	
Horned Lark			X
Violet-green Swallow	X	X	X
Tree Swallow		X	
Rough-winged Swallow		X	
Barn Swallow		X	
Cliff Swallow	X	X	
Steller's Jay		X	
Scrub Jay	X	X	X
Northern Raven	X	X	X
Common Crow	X		X

Appendix D. (cont.)

Snow Creek

<u>Bird Species</u>	<u>Fall 1979</u>	<u>Spring 1980</u>	<u>Fall 1980</u>
Mountain Chickadee	X		X
Plain Titmouse	X	X	X
Verdin	X	X	X
Bushtit	X	X	X
Wrentit		X	X
North American Dipper	X	X	X
House Wren	X	X	X
Bewick's Wren	X	X	X
Cactus Wren	X	X	X
Canyon Wren	X	X	X
Rock Wren	X	X	X
Mockingbird	X	X	X
California Thrasher	X	X	X
American Robin	X		X
Hermit Thrush	X	X	X
Swainson's Thrush		X	
Western Bluebird	X	X	X
Blue-gray Gnatcatcher	X	X	
Ruby-crowned Kinglet	X	X	X
Cedar Waxwing	X		X
Phainopepla		X	
Loggerhead Shrike	X	X	X
Starling		X	
Warbling Vireo	X	X	X
Orange-crowned Warbler	X	X	X
Nashville Warbler	X	X	X

Appendix D. (cont.)

Snow Creek

<u>Bird Species</u>	<u>Fall 1979</u>	<u>Spring 1980</u>	<u>Fall 1980</u>
Yellow Warbler	X	X	
Yellow-rumped Warbler	X	X	X
Black-throated Gray Warbler	X	X	X
Townsend's Warbler		X	
MacGillivray's Warbler		X	X
Wilson's Warbler	X	X	X
House Sparrow	X		
Hooded Oriole		X	
Scott's Oriole		X	
Northern Oriole	X	X	
Brewer's Blackbird	X		X
Brown-headed Cowbird		X	
Western Tanager		X	
Black-headed Grosbeak	X	X	X
Lazuli Bunting		X	X
House Finch	X	X	X
Pine Siskin	X	X	
Lesser Goldfinch	X	X	X
Lawrence's Goldfinch	X		
Green-tailed Towhee	X		X
Rufous-sided Towhee	X	X	X
Brown Towhee	X	X	X
Lark Sparrow	X		
Rufous-crowned Sparrow	X	X	X

Appendix D. (cont.)

Snow Creek

<u>Bird Species</u>	<u>Fall 1979</u>	<u>Spring 1980</u>	<u>Fall 1980</u>
Black-throated Sparrow	X	X	X
Dark-eyed Junco	X	X	X
Chipping Sparrow		X	X
Brewer's Sparrow		X	
Black-chinned Sparrow		X	
White-crowned Sparrow	X	X	X
Golden-crowned Sparrow	X	X	X
Fox Sparrow			X
Lincoln's Sparrow	X	X	
Song Sparrow	X	X	

BIRD SPECIES LIST FOR I 10 RESTSTOP

<u>Bird Species</u>	<u>Fall 1979</u>	<u>Spring 1980</u>	<u>Fall 1980</u>
Pied-billed Grebe			X
Great Blue Heron	X		
Cattle Egret	X		
Black-crowned Night Heron		X	
Mallard	X		
Blue-winged Teal		X	
Cinnamon Teal	X	X	
Northern Shoveler			X
Turkey Vulture		X	
White-tailed Kite			X
Sharp-shinned Hawk	X		X
Cooper's Hawk	X		X
Red-tailed Hawk	X	X	X
Red-shouldered Hawk			X
Northern Harrier			X
Prairie Falcon			X
American Kestrel	X	X	X
Gambel's Quail	X	X	
Sora			X
Common Gallinule		X	
Black-necked Stilt	X		
Killdeer	X	X	X
Whimbrel		X	
Greater Yellowlegs			X
Lesser Yellowlegs		X	

I 10 Reststop

<u>Bird Species</u>	<u>Fall 1979</u>	<u>Spring 1980</u>	<u>Fall 1980</u>
Spotted Sandpiper		X	
Common Snipe			X
Long-billed Dowitcher	X	X	
Rock Dove	X	X	X
White-winged Dove	X		
Mourning Dove	X	X	X
Spotted Dove	X		
Greater Roadrunner		X	X
Barn Owl	X	X	X
Burrowing Owl		X	
Vaux's Swift		X	X
White-throated Swift		X	
Costa's Hummingbird		X	
Anna's Hummingbird	X	X	X
Belted Kingfisher		X	
Common Flicker	X	X	X
Yellow-bellied Sapsucker	X		X
Western Kingbird		X	X
Black Phoebe	X	X	X
Say's Phoebe	X		X
Gray Flycatcher		X	
Western Flycatcher		X	
Western Wood Pewee		X	
Olive-sided Flycatcher		X	
Horned Lark		X	X
Violet-green Swallow	X	X	X

I 10 Reststop

<u>Bird Species</u>	<u>Fall 1979</u>	<u>Spring 1980</u>	<u>Fall 1980</u>
Tree Swallow		X	
Rough-winged Swallow	X	X	
Barn Swallow	X	X	X
Cliff Swallow		X	
Scrub Jay	X		
Northern Raven	X	X	X
Common Crow	X	X	X
Verdin	X	X	X
Bushtit		X	
House Wren			X
Bewick's Wren	X	X	X
Cactus Wren	X		X
Marsh Wren	X	X	X
Rock Wren	X	X	X
Mockingbird	X		X
Bendire's Thrasher		X	
California Thrasher	X	X	
American Robin			X
Swainson's Thrush		X	
Western Bluebird		X	X
Blue-gray Gnatcatcher	X		X
Ruby-crowned Kinglet	X	X	X
Water Pipit	X	X	X
Cedar Waxwing	X		
Phainopepla	X	X	X
Loggerhead Shrike	X	X	X

I 10 Reststop

<u>Bird Species</u>	<u>Fall 1979</u>	<u>Spring 1980</u>	<u>Fall 1980</u>
Starling	X	X	X
Warbling Vireo		X	
Orange-crowned Warbler	X	X	X
Nashville Warbler		X	X
Lucy's Warbler	X		
Yellow Warbler	X	X	
Yellow-rumped Warbler	X	X	X
Black-throated Gray Warbler	X	X	X
Townsend's Warbler	X	X	
MacGillivray's Warbler		X	
Common Yellowthroat	X	X	X
Wilson's Warbler		X	X
House Sparrow	X	X	X
Western Meadowlark	X	X	X
Yellow-headed Blackbird	X		
Red-winged Blackbird	X	X	
Hooded Oriole		X	
Northern Oriole		X	
Brewer's Blackbird	X	X	X
Brown-headed Cowbird	X		X
Western Tanager		X	
Black-headed Grosbeak		X	
Indigo Bunting			X
Lazuli Bunting		X	X
House Finch	X	X	X

I 10 Reststop

<u>Bird Species</u>	<u>Fall 1979</u>	<u>Spring 1980</u>	<u>Fall 1980</u>
American Goldfinch	X		
Lesser Goldfinch	X	X	X
Lawrence's Goldfinch	X	X	X
Rufous-sided Towhee	X		X
Brown Towhee	X	X	
Savannah Sparrow	X	X	X
Lark Sparrow	X	X	X
Black-throated Sparrow		X	
Dark-eyed Junco		X	
Gray-headed Junco	X		
Chipping Sparrow	X	X	X
Brewer's Sparrow	X		X
White-crowned Sparrow	X	X	X
Golden-crowned Sparrow	X		X
Lincoln's Sparrow	X	X	X
Song Sparrow	X	X	

BIRD SPECIES LIST FOR WHITEWATER CANYON

<u>Bird Species</u>	<u>Fall 1979</u>	<u>Spring 1980</u>	<u>Fall 1980</u>
Green Heron	X	X	X
American Wigeon	X		
Northern Shoveler			X
Turkey Vulture		X	
Sharp-shinned Hawk	X	X	X
Cooper's Hawk	X	X	X
Red-tailed Hawk	X	X	X
Red-shouldered Hawk	X	X	X
Golden Eagle	X	X	X
Prairie Falcon	X	X	X
American Kestrel	X	X	X
California Quail	X	X	X
Gambel's Quail	X	X	X
Mountain Quail		X	
American Coot	X	X	
Killdeer		X	X
Spotted Sandpiper		X	X
Band-tailed Pigeon	X	X	
White-winged Dove		X	
Mourning Dove	X	X	X
Spotted Dove	X	X	X
Greater Roadrunner	X	X	X
Great Horned Owl	X		X
Vaux's Swift	X	X	X
White-throated Swift	X	X	X

Whitewater Canyon

<u>Bird Species</u>	<u>Fall 1979</u>	<u>Spring 1980</u>	<u>Fall 1980</u>
Black-chinned Hummingbird	X	X	X
Costa's Hummingbird	X	X	X
Anna's Hummingbird	X	X	X
Rufous Hummingbird	X	X	X
Belted Kingfisher	X	X	X
Common Flicker	X		X
Yellow-bellied Sapsucker	X	X	X
Ladder-backed Woodpecker	X	X	X
Nuttall's Woodpecker	X	X	X
Western Kingbird	X	X	X
Ash-throated Flycatcher		X	
Eastern Phoebe			X
Black Phoebe	X	X	X
Say's Phoebe	X		X
Willow Flycatcher	X	X	X
Hammond's Flycatcher		X	
Dusky Flycatcher		X	X
Gray Flycatcher		X	
Western Flycatcher	X	X	
Western Wood Pewee	X	X	X
Olive-sided Flycatcher		X	
Violet-green Swallow	X	X	X
Tree Swallow		X	

Appendix D. (cont.)

Whitewater Canyon

<u>Bird Species</u>	<u>Fall 1979</u>	<u>Spring 1980</u>	<u>Fall 1980</u>
Bank Swallow			X
Rough-winged Swallow	X		X
Barn Swallow		X	X
Cliff Swallow		X	X
Scrub Jay	X	X	X
Northern Raven	X	X	X
Common Crow		X	
Mountain Chickadee	X	X	X
Plain Titmouse	X	X	X
Verdin	X	X	X
Bushtit	X	X	X
White-breasted Nuthatch		X	X
Wrentit	X	X	X
House Wren	X	X	X
Bewick's Wren	X	X	X
Cactus Wren	X	X	X
Marsh Wren	X		X
Canyon Wren	X		X
Rock Wren	X	X	X
Mockingbird	X	X	X
California Thrasher	X	X	X
American Robin	X	X	X
Hermit Thrush	X	X	X
Swainson's Thrush	X	X	
Western Bluebird	X	X	X

Whitewater Canyon

<u>Bird Species</u>	<u>Fall 1979</u>	<u>Spring 1980</u>	<u>Fall 1980</u>
Blue-gray Gnatcatcher	X	X	X
Black-tailed Gnatcatcher		X	
Golden-crowned Kinglet			X
Ruby-crowned Kinglet	X	X	X
Water Pipit	X		X
Cedar Waxwing	X	X	X
Phainopepla	X	X	X
Loggerhead Shrike	X	X	X
Starling	X	X	X
Bell's Vireo		X	
Solitary Vireo	X	X	X
Warbling Vireo	X	X	X
Orange-crowned Warbler	X	X	X
Nashville Warbler	X	X	X
Lucy's Warbler		X	
Yellow Warbler	X	X	X
Magnolia Warbler	X		
Yellow-rumped Warbler	X	X	X
Black-throated Gray Warbler	X	X	X
Townsend's Warbler		X	
Blackburnian Warbler			X
Blackpoll Warbler	X		
MacGillivray's Warbler	X	X	X
Common Yellowthroat	X	X	X

Appendix D. (cont.)

Whitewater Canyon

<u>Bird species</u>	<u>Fall 1979</u>	<u>Spring 1980</u>	<u>Fall 1980</u>
Yellow-breasted Chat	X	X	X
Wilson's Warbler	X	X	X
American Redstart	X		
House Sparrow	X	X	X
Western Meadowlark	X		X
Red-winged Blackbird	X		
Hooded Oriole	X	X	
Northern Oriole	X	X	X
Brewer's Blackbird	X		X
Brown-headed Cowbird	X	X	X
Western Tanager	X	X	X
Summer Tanager	X	X	X
Rose-breasted Grosbeak			X
Black-headed Grosbeak	X	X	X
Indigo Bunting	X	X	
Lazuli Bunting	X	X	X
Purple Finch	X	X	X
House Finch	X	X	X
Pine Siskin	X	X	
American Goldfinch		X	
Lesser Goldfinch	X	X	X
Lawrence's Goldfinch	X	X	X
Rufous-sided Towhee	X	X	X
Brown Towhee	X	X	X
Savannah Sparrow	X		X
Lark Sparrow	X	X	X

Appendix D. (cont.)

Whitewater Canyon

<u>Bird Species</u>	<u>Fall 1979</u>	<u>Spring 1980</u>	<u>Fall 1980</u>
Rufous-crowned Sparrow	X		X
Black-throated Sparrow	X	X	X
Sage Sparrow			X
Slate-colored Junco	X		X
Dark eyed Junco	X	X	X
Gray-headed Junco	X		
Chipping Sparrow	X	X	X
Brewer's Sparrow	X		X
White-crowned Sparrow	X	X	X
Golden-crowned Sparrow	X	X	X
Lincoln's Sparrow	X	X	X
Song Sparrow	X	X	X

BIRD SPECIES LIST FOR WHITEWATER SETTLING PONDS

<u>Bird Species</u>	<u>Spring 1980</u>	<u>Fall 1980</u>
Common Loon	X	
Eared Grebe	X	X
Western Grebe		X
Pied-billed Grebe	X	X
Double-crested Cormorant		X
Snowy Egret		X
Canada Goose		X
Brant	X	
Mallard		X
Gadwall	X	
Northern Pintail		X
Green-winged Teal	X	X
Blue-winged Teal	X	
Cinnamon Teal	X	X
American Wigeon		X
Northern Shoveler		X
Redhead		X
Ring-necked Duck		X
Canvasback		X
Lesser Scaup	X	X
Common Goldeneye		X
Bufflehead	X	X
Ruddy Duck	X	X
Common Merganser		X
Red-breasted Merganser	X	
Sharp-shinned Hawk		X

Whitewater Settling Ponds

<u>Bird Species</u>	<u>Spring 1980</u>	<u>Fall 1980</u>
Red-tailed Hawk	X	X
Northern Harrier		X
Prairie Falcon	X	X
American Kestrel		X
American Coot	X	X
Black-necked Stilt	X	
Killdeer	X	X
Greater Yellowlegs	X	
Lesser Yellowlegs	X	
Spotted Sandpiper	X	X
Common Snipe	X	
Long-billed Dowitcher	X	
Western Sandpiper	X	X
Least Sandpiper	X	X
Dunlin	X	
Wilson's Phalarope	X	
California Gull	X	X
Ring-billed Gull	X	X
Bonaparte's Gull	X	
Mourning Dove	X	X
Greater Roadrunner		X
White-throated Swift	X	
Anna's Hummingbird	X	
Rufous Hummingbird	X	
Western Kingbird	X	
Say's Phoebe		X

Whitewater Settling Ponds

<u>Bird Species</u>	<u>Spring 1980</u>	<u>Fall 1980</u>
Horned Lark	X	X
Tree Swallow	X	X
Rough-winged Swallow	X	
Barn Swallow	X	X
Cliff Swallow	X	
Northern Raven	X	X
Bewick's Wren	X	
Rock Wren		X
Water Pipit	X	X
Phainopepla	X	
Loggerhead Shrike	X	X
Starling		X
Yellow-rumped Warbler	X	X
Red-winged Blackbird	X	
Northern Oriole	X	
Brewer's Blackbird	X	X
Brown-headed Cowbird		X
House Finch	X	X
Pine Siskin	X	
Lesser Goldfinch	X	
Savannah Sparrow		X
Black-throated Sparrow	X	
Brewer's Sparrow	X	
White-crowned Sparrow	X	X

BIRD SPECIES LIST FOR MESQUITE THICKET

<u>Bird Species</u>	<u>Spring 1980</u>	<u>Fall 1980</u>
Sharp-shinned Hawk	X	X
Cooper's Hawk	X	X
Red-tailed Hawk	X	X
Golden Eagle	X	
Osprey	X	
American Kestrel	X	X
California Quail	X	
Gambel's Quail	X	X
Ring-billed Gull	X	
White-winged Dove	X	
Mourning Dove	X	
Spotted Dove		X
Ground Dove		X
Greater Roadrunner	X	X
Poor-will	X	
Lesser Nighthawk	X	
Vaux's Swift	X	
White-throated Swift	X	
Costa's Hummingbird	X	X
Anna's Hummingbird	X	X
Common Flicker	X	X
Ladder-backed Woodpecker	X	
Western Kingbird	X	
Ash-throated Flycatcher	X	
Black Phoebe	X	
Say's Phoebe	X	X

Appendix D. (cont.)

Mesquite Thicket

<u>Bird Species</u>	<u>Spring 1980</u>	<u>Fall 1980</u>
Willow Flycatcher		X
Gray Flycatcher	X	
Western Wood Pewee	X	
Olive-sided Flycatcher	X	
Horned Lark		X
Scrub Jay		X
Northern Raven	X	X
Mountain Chickadee		X
Verdin	X	X
Bushtit	X	
House Wren	X	
Bewick's Wren	X	X
Cactus Wren	X	X
Canyon Wren	X	X
Rock Wren	X	X
Northern Mockingbird	X	X
Western Bluebird	X	
Townsend's Solitaire	X	
Blue-gray Gnatcatcher	X	X
Black-tailed Gnatcatcher	X	X
Ruby-crowned Kinglet		X
Phainopepla	X	X
Loggerhead Shrike	X	X
Starling	X	X
Solitary Vireo	X	
Warbling Vireo	X	

Appendix D. (cont.)

Mesquite Thicket

<u>Bird Species</u>	<u>Spring 1980</u>	<u>Fall 1980</u>
Orange-crowned Warbler	X	X
Nashville Warbler	X	
Northern Parula	X	
Yellow Warbler	X	
Yellow-rumped Warbler	X	X
Black-throated Gray Warbler	X	X
Townsend's Warbler	X	
MacGillivray's Warbler	X	
Wilson's Warbler	X	
American Redstart	X	
House Sparrow		X
Western Meadowlark	X	
Hooded Oriole	X	
Northern Oriole	X	
Brewer's Blackbird		X
Western Tanager	X	
Black-headed Grosbeak	X	
Lazuli Bunting	X	
House Finch	X	X
Lesser Goldfinch	X	X
Brown Towhee		X
Lark Sparrow		X
Black-throated Sparrow	X	X
Dark-eyed Junco		X
Chipping Sparrow	X	
Brewer's Sparrow	X	

Appendix D. (cont.)

Mesquite Thicket

<u>Bird Species</u>	<u>Spring 1980</u>	<u>Fall 1980</u>
White-crowned Sparrow	X	X
Golden-crowned Sparrow	X	
Fox Sparrow		X
Lincoln's Sparrow	X	

BIRD SPECIES LIST FOR DEVERS
(wind turbine site)

<u>Bird Species</u>	<u>Fall 1979</u>	<u>Spring 1980</u>	<u>Fall 1980</u>
Turkey Vulture		X	
Sharp-shinned Hawk			X
Cooper's Hawk	X		X
Red-tailed Hawk	X	X	X
Golden Eagle	X	X	X
Prairie Falcon			X
American Kestrel	X	X	X
Gambel's Quail		X	X
Mourning Dove	X	X	
Greater Roadrunner	X	X	X
White-throated Swift		X	X
Belted Kingfisher		X	
Common Flicker			X
Ladder-backed Woodpecker			X
Western Kingbird		X	
Black Phoebe			X
Say's Phoebe	X	X	X
Horned Lark	X	X	X
Violet-green Swallow		X	X
Tree Swallow		X	
Rough-winged Swallow		X	
Barn Swallow		X	X
Cliff Swallow		X	
Common Raven	X	X	X
Verdin			X

Appendix D. (cont.)

Devers

<u>Bird Species</u>	<u>Fall 1979</u>	<u>Spring 1980</u>	<u>Fall 1980</u>
Bewick's Wren			X
Cactus Wren		X	X
Rock Wren	X		X
Le Conte's Thrasher		X	X
Western Bluebird			X
Blue-gray Gnatcatcher	X		
Black-tailed Gnatcatcher			X
Ruby-crowned Kinglet			X
Loggerhead Shrike	X	X	X
Starling		X	X
Yellow-rumped Warbler	X		
Western Meadowlark	X		X
Brewer's Blackbird			X
House Finch			X
Lesser Goldfinch		X	
Savannah Sparrow	X	X	
Black-throated Sparrow	X	X	X
Sage Sparrow			X
Brewer's Sparrow	X	X	X
White-crowned Sparrow	X	X	X

BIRD SPECIES LIST FOR CHINO CANYON

<u>Bird Species</u>	<u>Spring 1980</u>	<u>Fall 1980</u>
Sharp-shinned Hawk		X
Cooper's Hawk	X	X
Red-tailed Hawk	X	X
Red-shouldered Hawk		X
Golden Eagle	X	
American Kestrel	X	X
Gambel's Quail	X	X
Virginia Rail	X	X
Mourning Dove	X	X
Greater Roadrunner	X	X
Great Horned Owl		X
Vaux's Swift	X	
White-throated Swift	X	X
Black-chinned Hummingbird	X	
Costa's Hummingbird	X	X
Anna's Hummingbird	X	X
Rufous Hummingbird	X	
Common Flicker	X	X
Hairy Woodpecker		X
Ladder-backed Woodpecker	X	X
Nuttall's Woodpecker	X	X
Western Kingbird	X	X
Ash-throated Flycatcher	X	
Black Phoebe	X	X

BIRD SPECIES LIST FOR CHINO CANYON

<u>Bird Species</u>	<u>Spring 1980</u>	<u>Fall 1980</u>
Sharp-shinned Hawk		X
Cooper's Hawk	X	X
Red-tailed Hawk	X	X
Red-shouldered Hawk		X
Golden Eagle	X	
American Kestrel	X	X
Gambel's Quail	X	X
Virginia Rail	X	X
Mourning Dove	X	X
Greater Roadrunner	X	X
Great Horned Owl		X
Vaux's Swift	X	
White-throated Swift	X	X
Black-chinned Hummingbird	X	
Costa's Hummingbird	X	X
Anna's Hummingbird	X	X
Rufous Hummingbird	X	
Common Flicker	X	X
Hairy Woodpecker		X
Ladder-backed Woodpecker	X	X
Nuttall's Woodpecker	X	X
Western Kingbird	X	X
Ash-throated Flycatcher	X	
Black Phoebe	X	X
Say's Phoebe		X

Chino Canyon

<u>Bird Species</u>	<u>Spring 1980</u>	<u>Fall 1980</u>
Hammond's Flycatcher	X	
Dusky Flycatcher	X	
Gray Flycatcher	X	
Western Flycatcher	X	
Western Wood Pewee	X	
Olive-sided Flycatcher	X	
Violet-green Swallow	X	X
Tree Swallow	X	X
Rough-Winged Swallow	X	
Barn Swallow		X
Scrub Jay	X	X
Northern Raven	X	X
Verdin	X	X
Bushtit	X	X
Wrentit		X
House Wren	X	X
Bewick's Wren	X	X
Cactus Wren	X	X
Canon Wren	X	X
Rock Wren	X	X
Northern Mockingbird	X	X
California Thrasher	X	X
American Robin		X
Hermit Thrush	X	X
Swainson's Thrush	X	
Western Bluebird		X

Chino Canyon

<u>Bird Species</u>	<u>Spring 1980</u>	<u>Fall 1980</u>
Blue-gray Gnatcatcher	X	
Ruby-crowned Kinglet	X	X
Phainopepla	X	X
Loggerhead Shrike	X	X
Bell's Vireo	X	
Solitary Vireo	X	
Warbling Vireo	X	
Orange-crowned Warbler	X	X
Nashville Warbler	X	
Yellow Warbler	X	
Yellow-rumped Warbler	X	X
Black-throated Gray Warbler	X	
Townsend's Warbler	X	
MacGillivray's Warbler	X	
Common Yellowthroat	X	
Yellow-breasted Chat	X	
Wilson's Warbler	X	X
Hooded Oriole	X	X
Scott's Oriole	X	X
Northern Oriole	X	X
Western Tanager	X	X
Black-headed Grosbeak	X	X
Indigo Bunting	X	
Lazuli Bunting	X	X
House Finch	X	X

Chino Canyon

<u>Bird Species</u>	<u>Spring 1980</u>	<u>Fall 1980</u>
Lesser Goldfinch	X	X
Lawrence's Goldfinch	X	
Green-tailed Towhee	X	
Rufous-sided Towhee	X	X
Brown Towhee	X	X
Savannah Sparrow	X	
Black-throated Sparrow	X	X
Black-chinned Sparrow	X	
White-crowned Sparrow	X	X
Golden-crowned Sparrow	X	X
Lincoln's Sparrow	X	X
Song Sparrow	X	X

BIRD SPECIES LIST FOR PALM/ANDREAS CANYONS

<u>Bird Species</u>	<u>Fall 1979</u>	<u>Spring 1980</u>	<u>Fall 1980</u>
Great Blue Heron			X
Sharp-shinned Hawk	X	X	X
Cooper's Hawk	X	X	X
Red-tailed Hawk	X	X	X
Red-shouldered Hawk	X	X	X
Prairie Falcon			X
American Kestrel	X	X	X
Gambel's Quail	X	X	X
Killdeer			X
Common Snipe	X		X
White-winged Dove		X	
Mourning Dove	X	X	X
Ground Dove	X		
Greater Roadrunner	X	X	X
Common Screech Owl		X	
Great Horned Owl	X	X	X
Black Swift		X	
Vaux's Swift		X	
White-throated Swift	X	X	X
Black-chinned Hummingbird	X	X	X
Costa's Hummingbird	X	X	X
Anna's Hummingbird	X	X	X
Rufous Hummingbird		X	
Belted Kingfisher			X
Common Flicker	X	X	X

Palm/Andreas Canyons

<u>Bird Species</u>	<u>Fall 1979</u>	<u>Spring 1980</u>	<u>Fall 1980</u>
Yellow-bellied Sapsucker	X		
Ladder-backed Woodpecker	X	X	X
Western Kingbird		X	
Ash-throated Flycatcher	X	X	X
Black Phoebe	X	X	X
Say's Phoebe	X	X	X
Willow Flycatcher	X	X	
Hammond's Flycatcher	X	X	X
Dusky Flycatcher		X	
Western Flycatcher	X	X	X
Western Wood Pewee	X	X	X
Olive-sided Flycatcher		X	
Violet-green Swallow	X	X	X
Rough-winged Swallow	X	X	X
Barn Swallow		X	X
Northern Raven	X	X	X
Plain Titmouse			X
Verdin	X	X	X
Bushtit	X	X	X
White-breasted Nuthatch		X	
Wrentit		X	X
Dipper	X	X	X
House Wren	X	X	X
Bewick's Wren	X	X	X

Appendix D. (cont.)

Palm/Andreas Canyons

<u>Bird Species</u>	<u>Fall 1979</u>	<u>Spring 1980</u>	<u>Fall 1980</u>
Cactus Wren	X	X	X
Canyon Wren	X	X	X
Rock Wren	X	X	X
Northern Mockingbird	X	X	X
California Thrasher			X
American Robin	X		X
Hermit Thrush	X	X	X
Swainson's Thrush		X	
Western Bluebird	X	X	X
Townsend's Solitaire		X	X
Blue-gray Gnatcatcher	X	X	X
Black-tailed Gnatcatcher	X	X	X
Ruby-crowned Kinglet	X	X	X
Water Pipit			X
Cedar Waxwing		X	X
Phainopepla	X	X	X
Loggerhead Shrike	X	X	X
European Starling	X	X	X
Bell's Vireo	X	X	X
Solitary Vireo		X	X
Warbling Vireo	X	X	X
Tennessee Warbler	X		
Orange-crowned Warbler	X	X	X
Nashville Warbler	X	X	X
Lucy's Warbler	X	X	

Palm/Andreas Canyons

<u>Bird Species</u>	<u>Fall 1979</u>	<u>Spring 1980</u>	<u>Fall 1980</u>
Yellow Warbler	X	X	X
Yellow-rumped Warbler	X	X	X
Black-throated Gray Warbler	X	X	X
Townsend's Warbler		X	
MacGillivray's Warbler	X	X	
Common Yellowthroat		X	
Yellow-breasted Chat		X	X
Wilson's Warbler	X	X	X
Western Meadowlark			X
Hooded Oriole	X	X	X
Scott's Oriole	X	X	X
Northern Oriole	X	X	X
Brewer's Blackbird	X		X
Brown-headed Cowbird		X	
Western Tanager	X	X	X
Summer Tanager	X	X	X
Black-headed Grosbeak	X	X	X
Lazuli Bunting	X	X	X
Purple Finch		X	
House Finch	X	X	X
Pine Siskin	X		
American Goldfinch	X		

Appendix D. (cont.)

Palm/Andreas Canyons

<u>Bird Species</u>	<u>Fall 1979</u>	<u>Spring 1980</u>	<u>Fall 1980</u>
Lesser Goldfinch	X	X	X
Lawrence's Goldfinch		X	
Green-tailed Towhee		X	
Rufous-sided Towhee	X	X	X
Brown Towhee	X	X	X
Rufous-crowned Sparrow	X		X
Black-throated Sparrow	X	X	X
Sage Sparrow			X
Dark-eyed Junco	X	X	X
Black-chinned Sparrow		X	
White-crowned Sparrow	X	X	X
Golden-crowned Sparrow	X	X	
Lincoln's Sparrow	X	X	X
Song Sparrow	X	X	X

BIRD SPECIES LIST FOR WILLOW HOLE

<u>Bird Species</u>	<u>Fall 1979</u>	<u>Spring 1980</u>	<u>Fall 1980</u>
Black-crowned Night Heron		X	
Turkey Vulture		X	
Sharp-shinned Hawk		X	X
Cooper's Hawk	X	X	X
Red-tailed Hawk	X	X	X
Red-shouldered Hawk			X
Swainson's Hawk		X	
Golden Eagle	X	X	X
Marsh Hawk	X	X	X
Prairie Falcon	X	X	X
American Kestrel	X	X	X
Gambel's Quail	X	X	X
American Avocet	X		
Killdeer	X	X	X
White-winged Dove		X	
Mourning Dove	X	X	X
Spotted Dove		X	
Greater Roadrunner	X	X	X
Barn Owl	X		
Great Horned Owl	X		
Burrowing Owl			X
Long-eared Owl		X	
Poor-will			X
Vaux's Swift	X	X	X
White-throated Swift		X	

Willow Hole

<u>Bird Species</u>	<u>Fall 1979</u>	<u>Spring 1980</u>	<u>Fall 1980</u>
Black-chinned Hummingbird		X	
Costa's Hummingbird	X	X	X
Anna's Hummingbird	X	X	X
Common Flicker	X	X	X
Ladder-backed Woodpecker	X	X	
Western Kingbird	X	X	X
Ash-throated Flycatcher	X	X	X
Black Phoebe	X	X	X
Say's Phoebe	X	X	X
Willow Flycatcher		X	
Hammond's Flycatcher		X	
Dusky Flycatcher		X	
Western Flycatcher	X	X	X
Western Wood Pewee	X	X	
Olive-sided Flycatcher		X	
Violet-green Swallow	X	X	X
Tree Swallow		X	
Rough-winged Swallow		X	
Barn Swallow		X	X
Cliff Swallow		X	
Northern Raven	X	X	X
Mountain Chickadee			X
Verdin	X	X	
House Wren	X	X	X
Bewick's Wren	X	X	X

Willow Hole

<u>Bird Species</u>	<u>Fall 1979</u>	<u>Spring 1980</u>	<u>Fall 1980</u>
Cactus Wren	X	X	X
Marsh Wren	X	X	X
Rock Wren	X		X
Mockingbird	X	X	X
Brown Thrasher	X	X	
Crissal Thrasher			X
Hermit Thrush		X	
Swainson's Thrush		X	
Blue-gray Gnatcatcher	X	X	X
Black-tailed Gnatcatcher	X	X	X
Ruby-crowned Kinglet	X	X	X
Water Pipit			X
Phainopepla	X	X	X
Loggerhead Shrike	X		X
Starling	X	X	X
Bell's Vireo	X	X	X
Warbling Vireo		X	
Orange-crowned Warbler	X	X	X
Nashville Warbler	X	X	X
Lucy's Warbler		X	
Yellow Warbler	X	X	
Yellow-rumped Warbler	X	X	X
Black-throated Gray Warbler		X	
Townsend's Warbler	X	X	

Appendix D. (cont.)

Willow Hole

<u>Bird Species</u>	<u>Fall 1979</u>	<u>Spring 1980</u>	<u>Fall 1980</u>
MacGillivray's Warbler	X	X	X
Common Yellowthroat		X	X
Yellow-breasted Chat		X	
Wilson's Warbler	X	X	X
Western Meadowlark	X	X	X
Yellow-headed Blackbird	X	X	X
Red-winged Blackbird		X	X
Hooded Oriole	X	X	
Northern Oriole		X	
Brewer's Blackbird	X	X	X
Brown-headed Cowbird		X	X
Western Tanager		X	
Black-headed Grosbeak		X	
Lazuli Bunting		X	
House Finch	X	X	X
American Goldfinch	X		
Lesser Goldfinch	X	X	X
Lawrence's Goldfinch			X
Green-tailed Towhee		X	
Savannah Sparrow	X		X
Black-throated Sparrow	X	X	X
Sage Sparrow	X		X
Dark-eyed Junco	X		X
Chipping Sparrow		X	X
Brewer's Sparrow		X	X
White-crowned Sparrow	X	X	X

Willow Hole

<u>Bird Species</u>	<u>Fall 1979</u>	<u>Spring 1980</u>	<u>Fall 1980</u>
Fox Sparrow			X
Lincoln Sparrow	X	X	X
Song Sparrow	X		

BIRD SPECIES LIST FOR THOUSAND PALMS OASIS

<u>Bird Species</u>	<u>Fall 1979</u>	<u>Spring 1980</u>	<u>Fall 1980</u>
Great Blue Heron	X		
Green Heron		X	X
Cattle Egret			X
American Bittern		X	X
Canada Goose			X
Pintail			X
Green-winged Teal			X
Cinnamon Teal	X		X
American Wigeon			X
Turkey Vulture		X	X
Sharp-shinned Hawk	X		X
Cooper's Hawk	X	X	X
Red-tailed Hawk	X	X	X
Golden Eagle	X		X
Northern Harrier	X	X	
Prairie Falcon	X	X	X
Merlin	X		
American Kestrel	X	X	X
Gambel's Quail	X	X	X
Virginia Rail	X	X	X
Sora	X		
American Coot	X		X
American Avocet			X
Killdeer	X	X	X
Marbled Godwit		X	

Thousand Palms Oasis

<u>Bird Species</u>	<u>Fall 1979</u>	<u>Spring 1980</u>	<u>Fall 1980</u>
Greater Yellowlegs		X	
Spotted Sandpiper		X	X
Common Snipe	X	X	X
Western Sandpiper		X	
White-winged Dove		X	
Mourning Dove	X	X	X
Spotted Dove	X	X	
Greater Roadrunner	X	X	X
Barn Owl	X		X
Great Horned Owl	X	X	X
Vaux's Swift	X	X	X
White-throated Swift	X	X	X
Black-chinned Hummingbird	X	X	
Costa's Hummingbird	X	X	X
Anna's Hummingbird	X	X	X
Rufous Hummingbird	X		
Belted Kingfisher	X	X	X
Common Flicker	X	X	X
Yellow-bellied Sapsucker	X		
Ladder-backed Woodpecker	X	X	X
Western Kingbird		X	X
Cassin's Kingbird			X
Ash-throated Flycatcher	X	X	
Black Phoebe	X	X	X
Say's Phoebe	X	X	X

Appendix D. (cont.)

Thousand Palms Oasis

<u>Bird Species</u>	<u>Fall 1979</u>	<u>Spring 1980</u>	<u>Fall 1980</u>
Willow Flycatcher	X	X	X
Hammond's Flycatcher		X	
Dusky Flycatcher		X	
Gray Flycatcher	X		X
Western Flycatcher	X	X	X
Western Wood Pewee	X	X	
Olive-sided Flycatcher		X	
Horned Lark	X		
Violet-green Swallow		X	X
Tree Swallow			X
Rough-winged Swallow		X	X
Barn Swallow	X	X	X
Cliff Swallow		X	
Northern Raven	X	X	X
Common Crow		X	
Verdin	X	X	X
Bushtit	X		X
House Wren	X	X	X
Bewick's Wren	X	X	X
Cactus Wren	X	X	X
Marsh Wren	X	X	X
Northern Mockingbird	X	X	X
LeConte's Thrasher	X	X	
Crissal Thrasher	X		

Thousand Palms Oasis

<u>Bird Species</u>	<u>Fall 1979</u>	<u>Spring 1980</u>	<u>Fall 1980</u>
American Robin	X		X
Hermit Thrush	X	X	X
Swainson's Thrush		X	
Western Bluebird	X		X
Townsend's Solitaire			X
Blue-gray Gnatcatcher	X	X	X
Black-tailed Gnatcatcher	X	X	X
Ruby-crowned Kinglet	X	X	X
Water Pipit	X		
Cedar Waxwing	X		X
Phainopepla	X	X	X
Loggerhead Shrike	X		X
European Starling	X	X	X
Bell's Vireo	X		
Solitary Vireo	X	X	
Warbling Vireo		X	
Golden-winged Warbler			X
Orange-crowned Warbler	X	X	X
Nashville Warbler	X	X	X
Yellow Warbler	X	X	X
Yellow-rumped Warbler	X	X	X
Black-throated Gray Warbler	X	X	X
Townsend's Warbler	X	X	

Appendix D. (cont.)

Thousand Palms Oasis

<u>Bird Species</u>	<u>Fall 1979</u>	<u>Spring 1980</u>	<u>Fall 1980</u>
Hermit Warbler	X	X	
Palm Warbler		X	
MacGillivray's Warbler	X	X	X
Common Yellowthroat	X	X	X
Yellow-breasted Chat	X	X	X
Wilson's Warbler	X	X	X
Canada Warbler	X		
American Redstart		X	
House Sparrow	X	X	X
Western Meadowlark	X		X
Red-winged Blackbird	X		X
Hooded Oriole	X	X	
Northern Oriole	X	X	X
Brewer's Blackbird	X	X	
Brown-headed Cowbird		X	
Western Tanager		X	
Black-headed Grosbeak	X	X	X
Blue Grosbeak	X		
Lazuli Bunting	X	X	X
Purple Finch	X		
House Finch	X	X	X
Pine Siskin	X	X	
American Goldfinch	X	X	
Lesser Goldfinch	X	X	X
Lawrence's Goldfinch	X		
Green-tailed Towhee			X

Thousand Palms Oasis

<u>Bird Species</u>	<u>Fall 1979</u>	<u>Spring 1980</u>	<u>Fall 1980</u>
Rufous-sided Towhee	X		X
Brown Towhee			X
Savannah Sparrow	X	X	X
Lark Sparrow	X		X
Black-throated Sparrow	X	X	X
Sage Sparrow	X		X
Dark-eyed Junco	X		X
Chipping Sparrow	X		X
Brewer's Sparrow	X		X
White-crowned Sparrow	X	X	X
Golden-crowned Sparrow	X	X	
Lincoln's Sparrow	X	X	X
Swamp Sparrow	X		
Song Sparrow	X	X	

BIRD SPECIES LIST FOR PUSHAWALLA CANYON

<u>Bird Species</u>	<u>Fall 1979</u>	<u>Spring 1980</u>	<u>Fall 1980</u>
Turkey Vulture		X	
Sharp-shinned Hawk	X	X	X
Cooper's Hawk	X		X
Red-tailed Hawk	X	X	X
Red-shouldered Hawk		X	
Swainson's Hawk			X
Golden Eagle	X		X
Northern Harrier	X		
Osprey		X	
Prairie Falcon	X	X	X
American Kestrel	X	X	X
Gambel's Quail	X	X	X
Killdeer	X		
Rock Dove		X	
Mourning Dove	X	X	X
Spotted Dove	X		
Greater Roadrunner	X	X	X
Barn Owl	X		X
Great Horned Owl	X		X
Burrowing Owl	X		
Poor-will		X	
Lesser Nighthawk		X	X
Vaux's Swift			X
White-throated Swift	X	X	X
Black-chinned Hummingbird		X	
Costa's Hummingbird		X	

Pushawalla Canyon

<u>Bird Species</u>	<u>Fall 1979</u>	<u>Spring 1980</u>	<u>Fall 1980</u>
Anna's Hummingbird	X	X	X
Rufous Hummingbird		X	
Belted Kingfisher	X		
Common Flicker	X		X
Yellow-bellied Sapsucker	X		
Ladder-backed Woodpecker	X	X	X
Western Kingbird		X	
Ash-throated Flycatcher		X	
Black Phoebe	X		
Say's Phoebe	X	X	X
Willow Flycatcher		X	
Gray Flycatcher		X	
Western Flycatcher		X	
Western Wood Pewee		X	
Olive-sided Flycatcher		X	
Horned Lark	X		
Tree Swallow		X	
Rough-winged Swallow		X	
Barn Swallow	X	X	X
Northern Raven	X	X	X
Verdin	X	X	X
House Wren	X	X	
Bewick's Wren	X	X	X
Cactus Wren	X	X	X
Marsh Wren	X		

Appendix D. (cont.)

Pushawalla Canyon

<u>Bird Species</u>	<u>Fall 1979</u>	<u>Spring 1980</u>	<u>Fall 1980</u>
Rock Wren	X	X	X
Mockingbird	X	X	X
LeConte's Thrasher	X		
Hermit Thrush			X
Swainson's Thrush		X	
Western Bluebird			X
Townsend's Solitaire			X
Blue-gray Gnatcatcher	X		X
Black-tailed Gnatcatcher	X	X	X
Ruby-crowned Kinglet	X	X	X
Cedar Waxwing	X	X	X
Phainopepla	X	X	X
Loggerhead Shrike	X	X	X
Starling	X	X	X
Warbling Vireo		X	
Orange-crowned Warbler	X	X	X
Nashville Warbler	X	X	X
Yellow Warbler		X	X
Yellow-rumped Warbler	X	X	X
Black-throated Gray Warbler	X	X	X
Townsend's Warbler		X	
Chestnut-sided Warbler			X
MacGillivray's Warbler		X	
Common Yellowthroat	X		

Pushawalla Canyon

<u>Bird Species</u>	<u>Fall 1979</u>	<u>Spring 1980</u>	<u>Fall 1980</u>
Wilson's Warbler	X	X	X
House Finch	X		
Western Meadowlark	X		
Scott's Oriole			X
Brewer's Blackbird	X	X	
Western Tanager		X	X
Black-headed Grosbeak		X	X
Indigo Bunting	X		
Lazuli Bunting		X	
Purple Finch	X		
House Finch	X	X	X
Lesser Goldfinch	X	X	X
Lawrence's Goldfinch		X	
Savannah Sparrow	X	X	
Black-throated Sparrow	X	X	X
Sage Sparrow			X
Dark-eyed Junco	X		X
Chipping Sparrow	X		
Brewer's Sparrow	X		
White-crowned Sparrow	X	X	X
Fox Sparrow			X
Lincoln's Sparrow	X	X	X
Song Sparrow	X		

BIRD SPECIES LIST FOR MISSION CREEK

<u>Bird Species</u>	<u>Fall 1979</u>	<u>Spring 1980</u>	<u>Fall 1980</u>
Green Heron		X	
Mallard			X
Turkey Vulture			X
Sharp-shinned Hawk		X	X
Cooper's Hawk		X	X
Red-tailed Hawk		X	X
Red-shouldered Hawk			X
Golden Eagle		X	X
American Kestrel		X	X
California Quail		X	X
Gambel's Quail		X	X
Mountain Quail		X	
Virginia Rail		X	X
Sora			X
American Coot			X
Killdeer			X
Common Snipe		X	X
Least Sandpiper		X	
Mourning Dove		X	X
Greater Roadrunner		X	X
Screech Owl		X	
Great Horned Owl			X
Vaux's Swift		X	X
White-throated Swift		X	

Mission Creek

<u>Bird Species</u>	<u>Fall 1979</u>	<u>Spring 1980</u>	<u>Fall 1980</u>
Black-chinned Hummingbird		X	
Costa's Hummingbird		X	
Anna's Hummingbird		X	X
Calliope Hummingbird		X	
Common Flicker		X	X
Lewis's Woodpecker			X
Hairy Woodpecker			X
Ladder-backed Woodpecker		X	X
Nuttall's Woodpecker		X	X
Western Kingbird		X	
Cassin's Kingbird		X	
Ash-throated Flycatcher		X	X
Black Phoebe		X	X
Say's Phoebe		X	X
Willow Flycatcher		X	X
Hammond's Flycatcher		X	
Dusky Flycatcher			X
Western Flycatcher		X	X
Western Wood Pewee		X	X
Olive-sided Flycatcher		X	
Horned Lark			X
Violet-green Swallow		X	X
Bank Swallow		X	
Barn Swallow		X	X

Appendix D. (cont.)

Mission Creek

<u>Bird Species</u>	<u>Fall 1979</u>	<u>Spring 1980</u>	<u>Fall 1980</u>
Cliff Swallow		X	
Scrub Jay		X	X
Northern Raven		X	X
Mountain Chickadee		X	X
Plain Titmouse		X	X
Verdin		X	X
Bushtit		X	X
White-breasted Nuthatch			X
Wrentit		X	X
House Wren		X	X
Bewick's Wren		X	X
Cactus Wren		X	X
Marsh Wren			X
Rock Wren		X	X
Mockingbird		X	X
California Thrasher		X	X
Hermit Thrush		X	X
Swainson's Thrush		X	
Western Bluebird		X	X
Townsend's Solitaire			X
Blue-gray Gnatcatcher		X	X
Black-tailed Gnatcatcher		X	
Ruby-crowned Kinglet		X	X
Cedar Waxwing		X	X
Phainopepla		X	X

Mission Creek

<u>Bird Species</u>	<u>Fall 1979</u>	<u>Spring 1980</u>	<u>Fall 1980</u>
Loggerhead Shrike		X	X
Warbling Vireo		X	X
Orange-crowned Warbler		X	X
Nashville Warbler		X	X
Yellow Warbler		X	X
Yellow-rumped Warbler		X	X
Black-throated Gray Warbler			X
MacGillivray's Warbler		X	X
Common Yellowthroat		X	X
Yellow-breasted Chat		X	X
Wilson's Warbler		X	X
Western Meadowlark			X
Red-winged Blackbird			X
Hooded Oriole		X	
Scott's Oriole		X	
Northern Oriole		X	X
Brewer's Blackbird		X	X
Western Tanager		X	X
Summer Tanager		X	X
Rose-breasted Grosbeak		X	X
Black-headed Grosbeak		X	X
Lazuli Bunting		X	
Purple Finch		X	
House Finch		X	X
Pine Siskin		X	

Appendix D. (cont.)

Mission Creek

<u>Bird Species</u>	<u>Fall 1979</u>	<u>Spring 1980</u>	<u>Fall 1980</u>
Lesser Goldfinch		X	X
Lawrence's Goldfinch		X	
Green-tailed Towhee			X
Rufous-sided Towhee		X	X
Brown Towhee		X	X
Savannah Sparrow			X
Rufous-crowned Sparrow			X
Black-throated Sparrow		X	X
Dark-eyed Junco		X	X
Chipping Sparrow		X	X
Brewer's Sparrow			X
Black-chinned Sparrow		X	
White-crowned Sparrow		X	X
Golden-crowned Sparrow		X	X
Fox Sparrow			X
Lincoln's Sparrow		X	X
Song Sparrow		X	X

BIRD SPECIES LIST FOR MORONGO VALLEY

<u>Bird Species</u>	<u>Fall 1979</u>	<u>Spring 1980</u>	<u>Fall 1980</u>
Pied-billed Grebe			X
White Pelican		X	X
Green Heron		X	
American Bittern	X		
American Wigeon	X		
Ruddy Duck	X		
Turkey Vulture	X	X	X
Sharp-shinned Hawk	X	X	X
Cooper's Hawk	X	X	X
Red-tailed Hawk	X	X	X
Red-shouldered Hawk	X	X	X
Ferruginous Hawk	X		
Golden Eagle	X	X	X
Northern Harrier			X
Prairie Falcon	X		X
Merlin		X	
American Kestrel	X	X	X
Gambel's Quail	X	X	X
Mountain Quail		X	
Virginia Rail	X	X	X
Sora		X	
American Coot	X		X
Killdeer	X	X	X
Spotted Sandpiper		X	
Common Snipe	X	X	X

Appendix D. (cont.)

Morongo Valley

<u>Bird Species</u>	<u>Fall 1979</u>	<u>Spring 1980</u>	<u>Fall 1980</u>
Least Sandpiper		X	
White-winged Dove		X	
Mourning Dove	X	X	X
Spotted Dove	X		X
Greater Roadrunner	X	X	X
Barn Owl	X	X	X
Common Screech Owl		X	
Great Horned Owl	X	X	X
Long-eared Owl		X	
Poor-will	X		
Lesser Nighthawk		X	
Vaux's Swift	X	X	X
White-throated Swift	X	X	X
Black-chinned Hummingbird	X	X	X
Costa's Hummingbird	X	X	X
Anna's Hummingbird	X	X	X
Rufous Hummingbird	X	X	X
Calliope Hummingbird		X	
Belted Kingfisher	X		X
Common Flicker	X	X	X
Yellow-bellied Sapsucker	X	X	X
Hairy Woodpecker			X
Ladder-backed Woodpecker	X	X	X

Morongo Valley

<u>Bird Species</u>	<u>Fall 1979</u>	<u>Spring 1980</u>	<u>Fall 1980</u>
Nuttall's Woodpecker	X	X	X
Western Kingbird	X	X	X
Cassin's Kingbird	X	X	X
Wied's Crested Flycatcher		X	
Ash-throated Flycatcher	X	X	X
Black Phoebe	X	X	X
Say's Phoebe	X	X	X
Willow Flycatcher	X	X	X
Hammond's Flycatcher	X	X	X
Dusky Flycatcher		X	
Western Flycatcher	X	X	X
Western Wood Pewee	X	X	X
Olive-sided Flycatcher		X	X
Vermilion Flycatcher	X	X	X
Horned Lark			X
Violet-green Swallow	X	X	X
Rough-winged Swallow		X	X
Barn Swallow	X	X	X
Cliff Swallow		X	
Scrub Jay	X	X	X
Northern Raven	X	X	X
Mountain Chickadee	X		X
Plain Titmouse		X	X
Verdin	X	X	X
Bushtit	X	X	X

Morongo Valley

<u>Bird Species</u>	<u>Fall 1979</u>	<u>Spring 1980</u>	<u>Fall 1980</u>
White-breasted Nuthatch	X		X
Brown Creeper			X
House Wren	X	X	X
Bewick's Wren	X	X	X
Cactus Wren	X	X	X
Marsh Wren	X	X	X
Canyon Wren			X
Rock Wren	X	X	X
Northern Mockingbird	X	X	X
California Thrasher	X	X	X
American Robin	X	X	X
Varied Thrush	X	X	
Hermit Thrush	X	X	X
Swainson's Thrush		X	
Western Bluebird		X	X
Mountain Bluebird			X
Blue-gray Gnatcatcher	X	X	X
Black-tailed Gnatcatcher	X	X	
Ruby-crowned Kinglet	X	X	X
Water Pipit	X		X
Cedar Waxwing	X	X	X
Phainopepla	X	X	X
Loggerhead Shrike	X	X	X
European Starling	X	X	X

Appendix D. (cont.)

Morongo Valley

<u>Bird Species</u>	<u>Fall 1979</u>	<u>Spring 1980</u>	<u>Fall 1980</u>
Bell's Vireo	X	X	
Solitary Vireo	X	X	X
Warbling Vireo	X	X	X
Black-and-white Warbler	X	X	
Orange-crowned Warbler	X	X	
Nashville Warbler	X	X	X
Lucy's Warbler	X	X	
Yellow Warbler	X	X	X
Black-throated Blue Warbler	X		
Yellow-rumped Warbler	X	X	X
Black-throated Gray Warbler	X	X	X
Townsend's Warbler	X	X	X
Hermit Warbler		X	
Blackburnian Warbler	X		
MacGillivray's Warbler	X	X	X
Common Yellowthroat	X	X	X
Yellow-breasted Chat	X	X	X
Wilson's Warbler	X	X	X
American Redstart	X		X
House Sparrow	X	X	X
Western Meadowlark	X	X	X
Yellow-headed Blackbird		X	

Appendix D. (cont.)

Morongo Valley

<u>Bird Species</u>	<u>Fall 1979</u>	<u>Spring 1980</u>	<u>Fall 1980</u>
Red-winged Blackbird	X	X	X
Orchard Oriole	X		
Hooded Oriole	X	X	X
Scott's Oriole			X
Northern Oriole	X	X	X
Brewer's Blackbird	X	X	X
Brown-headed Cowbird	X	X	X
Western Tanager	X	X	X
Summer Tanager	X	X	X
Black-headed Grosbeak	X	X	X
Blue Grosbeak	X	X	X
Indigo Bunting	X	X	
Lazuli Bunting	X	X	X
Purple Finch	X		
House Finch	X	X	X
Pine Siskin	X	X	
American Goldfinch	X	X	
Lesser Goldfinch	X	X	X
Lawrence's Goldfinch	X	X	X
Green-tailed Towhee	X		X
Rufous-sided Towhee	X	X	X
Brown Towhee	X	X	X
Savannah Sparrow	X	X	X
Vesper Sparrow	X		X
Lark Sparrow	X		X

Morongo Valley

<u>Bird Species</u>	<u>Fall 1979</u>	<u>Spring 1980</u>	<u>Fall 1980</u>
Black-throated Sparrow	X	X	X
Sage Sparrow			X
Dark-eyed Junco	X	X	X
Gray-headed Junco	X	X	
Chipping Sparrow	X	X	X
Brewer's Sparrow	X		X
Black-chinned Sparrow		X	
White-crowned Sparrow	X	X	X
Golden-crowned Sparrow	X	X	X
White-throated Sparrow	X		
Fox Sparrow	X		
Lincoln's Sparrow	X	X	X
Swamp Sparrow			X
Song Sparrow	X	X	X

BIRD SPECIES LIST FOR YUCCA VALLEY GOLF COURSE

<u>Bird Species</u>	<u>Fall 1979</u>	<u>Spring 1980</u>	<u>Fall 1980</u>
Pied-billed Grebe		X	X
Great Blue Heron	X		X
Green Heron		X	X
Great Egret		X	
Snowy Egret	X		X
American Bittern		X	X
Canada Goose			X
Mallard	X	X	X
Gadwall	X		X
Northern Pintail	X		
Green-winged Teal	X	X	X
Blue-winged Teal		X	
Cinnamon Teal	X	X	
American Wigeon	X		X
Northern Shoveler			X
Bufflehead	X		X
Ruddy Duck			X
Common Merganser			X
Turkey Vulture	X	X	X
Sharp-shinned Hawk	X	X	X
Cooper's Hawk	X	X	X
Red-tailed Hawk	X	X	X
Red-shouldered Hawk	X	X	
Prairie Falcon		X	
American Kestrel	X	X	X

Appendix D. (cont.)

Yucca Valley Golf Course

<u>Bird Species</u>	<u>Fall 1979</u>	<u>Spring 1980</u>	<u>Fall 1980</u>
Gambel's Quail	X	X	X
Virginia Rail	X		X
Sora	X		X
American Coot		X	X
American Avocet			X
Black-necked Stilt	X		
Killdeer	X	X	X
Solitary Sandpiper			X
Spotted Sandpiper	X	X	X
Common Snipe	X	X	
Long-billed Dowitcher		X	
Band-tailed Pigeon	X		
Rock Dove		X	
White-winged Dove		X	X
Mourning Dove	X	X	X
Ground Dove			X
Greater Roadrunner		X	X
Barn Owl	X		
Great Horned Owl	X	X	X
White-throated Swift		X	X
Black-chinned Hummingbird	X		
Costa's Hummingbird	X	X	X
Anna's Hummingbird	X	X	X
Rufous Hummingbird	X		
Belted Kingfisher	X	X	X
Common Flicker	X	X	X

Appendix D. (cont.)

Yucca Valley Golf Course

<u>Bird Species</u>	<u>Fall 1979</u>	<u>Spring 1980</u>	<u>Fall 1980</u>
Yellow-bellied Sapsucker		X	X
Ladder-backed Woodpecker	X	X	X
Nuttall's Woodpecker		X	X
Western Kingbird		X	X
Cassin's Kingbird		X	
Ash-throated Flycatcher		X	
Black Phoebe	X	X	X
Say's Phoebe	X	X	X
Willow Flycatcher	X		X
Hammond's Flycatcher	X	X	
Dusky Flycatcher		X	
Western Flycatcher		X	X
Western Wood Pewee	X	X	X
Olive-sided Flycatcher		X	
Violet-green Swallow		X	X
Tree Swallow	X		X
Rough-winged Swallow		X	X
Barn Swallow	X	X	X
Scrub Jay	X	X	
Common Raven	X	X	X
Mountain Chickadee			X
Plain Titmouse		X	X
Verdin	X	X	
Bushtit			X
White-breasted Nuthatch		X	X

Yucca Valley Golf Course

<u>Bird Species</u>	<u>Fall 1979</u>	<u>Spring 1980</u>	<u>Fall 1980</u>
Red-breasted Nuthatch	X	X	X
House Wren	X	X	
Bewick's Wren	X	X	X
Cactus Wren	X	X	X
Marsh Wren			X
Mockingbird	X	X	X
California Thrasher		X	
Sage Thrasher		X	
American Robin	X	X	X
Varied Thrush	X		X
Hermit Thrush	X	X	X
Swainson's Thrush	X		X
Western Bluebird		X	X
Black-tailed Gnatcatcher	X		
Ruby-crowned Kinglet	X	X	X
Water pipit	X		X
Cedar Waxwing	X	X	X
Phainopepla		X	
Loggerhead Shrike		X	X
Starling	X	X	X
Warbling Vireo	X	X	X
Tennessee Warbler	X		
Orange-crowned Warbler	X	X	X
Nashville Warbler	X		X
Yellow Warbler	X	X	X

Appendix D. (cont.)

Yucca Valley Golf Course

<u>Bird Species</u>	<u>Fall 1979</u>	<u>Spring 1980</u>	<u>Fall 1980</u>
Yellow-rumped Warbler	X	X	X
Black-throated Gray Warbler	X		X
Townsend's Warbler	X	X	X
MacGillivray's Warbler	X	X	X
Common Yellowthroat	X	X	X
Wilson's Warbler	X	X	X
House Sparrow	X	X	X
Western Meadowlark	X	X	X
Red-winged Blackbird	X		X
Hooded Oriole		X	
Scott's Oriole		X	
Northern Oriole		X	
Brewer's Blackbird	X	X	X
Brown-headed Cowbird	X	X	X
Western Tanager	X	X	X
Summer Tanager		X	X
Black-headed Grosbeak			X
Indigo Bunting	X		
Lazuli Bunting	X	X	X
Purple Finch	X	X	
House Finch	X	X	X
Pine Siskin	X	X	
American Goldfinch		X	
Lesser Goldfinch	X	X	X
Lawrence's Goldfinch		X	X

Yucca Valley Golf Course

<u>Bird Species</u>	<u>Fall 1979</u>	<u>Spring 1980</u>	<u>Fall 1980</u>
Red Crossbill		X	
Green-tailed Towhee			X
Brown Towhee		X	
Savannah Sparrow	X	X	X
Lark Sparrow	X		X
Black-throated Sparrow		X	X
Sage Sparrow	X		
Slate-colored Junco	X	X	X
Dark-eyed Junco	X	X	X
Gray-headed Junco			X
Chipping Sparrow	X	X	X
Clay-colored Sparrow	X		
Brewer's Sparrow	X	X	X
Harris' Sparrow		X	
White-crowned Sparrow	X	X	X
Golden-crowned Sparrow	X	X	X
White-throated Sparrow	X		
Fox Sparrow	X		X
Lincoln's Sparrow	X	X	X
Song Sparrow			X

BIRD SPECIES LIST FOR JOSHUA TREE NATIONAL MONUMENT

<u>Bird Species</u>	<u>Fall 1979</u>	<u>Spring 1980</u>	<u>Fall 1980</u>
Pied-billed Grebe	X	X	X
Great Egret	X		
American Bittern		X	
Mallard	X	X	X
Northern Pintail	X		X
Green-winged Teal	X		X
Cinnamon Teal	X	X	X
American Wigeon	X		X
Ring-necked Duck	X		X
Bufflehead	X		
Ruddy Duck	X	X	X
Turkey Vulture	X	X	X
Sharp-shinned Hawk	X	X	X
Cooper's Hawk	X	X	X
Red-tailed Hawk	X	X	X
Broad-winged Hawk	X		
Swainson's Hawk	X		
Golden Eagle		X	X
Northern Harrier	X		X
Prairie Falcon	X	X	X
American Kestrel	X	X	X
Gambel's Quail	X	X	X
Virginia Rail	X		
Sora	X	X	X
American Coot	X	X	X

Joshua Tree National Monument

<u>Bird Species</u>	<u>Fall 1979</u>	<u>Spring 1980</u>	<u>Fall 1980</u>
Black-necked Stilt	X		
Killdeer	X	X	X
Spotted Sandpiper	X	X	X
Common Snipe	X	X	X
Least Sandpiper	X	X	X
White-winged Dove		X	
Mourning Dove	X	X	X
Greater Roadrunner	X	X	X
Great Horned Owl	X	X	X
Short-eared Owl	X		
Lesser Nighthawk		X	
Vaux's Swift	X	X	X
White-throated Swift	X	X	X
Black-chinned Hummingbird	X	X	X
Costa's Hummingbird	X	X	X
Anna's Hummingbird	X	X	X
Rufous Hummingbird	X	X	X
Belted Kingfisher	X	X	X
Common Flicker	X	X	X
Yellow-bellied Sapsucker	X	X	X
Ladder-backed Woodpecker	X	X	X
Western Kingbird	X	X	X
Ash-throated Flycatcher	X	X	X

Appendix D. (cont.)

Joshua Tree National Monument

<u>Bird Species</u>	<u>Fall 1979</u>	<u>Spring 1980</u>	<u>Fall 1980</u>
Black Phoebe	X	X	X
Say's Phoebe	X	X	X
Willow Flycatcher	X	X	X
Hammond's Flycatcher	X	X	X
Dusky Flycatcher		X	
Western Flycatcher	X	X	X
Western Wood Pewee	X	X	X
Horned Lark	X	X	X
Violet-Green Swallow	X	X	X
Tree Swallow		X	
Rough-winged Swallow	X	X	X
Barn Swallow	X	X	X
Cliff Swallow	X	X	X
Scrub Jay	X	X	X
Northern Raven	X	X	X
Pinyon Jay	X		
Mountain Chickadee		X	X
Plain Titmouse	X	X	X
Verdin	X	X	X
Bushtit	X	X	X
White-breasted Nuthatch			X
Red-breasted Nuthatch	X		
House Wren	X	X	X
Bewick's Wren	X	X	X
Cactus Wren	X	X	X
Marsh Wren		X	X

Appendix D. (cont.)

Joshua Tree National Monument

<u>Bird Species</u>	<u>Fall 1979</u>	<u>Spring 1980</u>	<u>Fall 1980</u>
Canyon Wren	X	X	X
Rock Wren	X	X	X
Northern Mockingbird	X	X	X
California Thrasher	X	X	X
LeConte's Thrasher			X
American Robin	X		X
Hermit Thrush	X	X	X
Swainson's Thrush		X	
Western Bluebird	X	X	X
Townsend's Solitaire	X		X
Blue-gray Gnatcatcher	X	X	X
Black-tailed Gnatcatcher	X	X	
Golden-crowned Kinglet	X		
Ruby-crowned Kinglet	X	X	X
Water Pipit	X	X	X
Cedar Waxwing		X	
Phainopepla	X	X	X
Loggerhead Shrike	X	X	X
European Starling		X	
Gray Vireo		X	
Solitary Vireo	X	X	X
Warbling Vireo	X	X	X
Orange-crowned Warbler	X	X	X
Nashville Warbler	X	X	X
Virginia's Warbler		X	

Appendix D. (cont.)

Joshua Tree National Monument

<u>Bird Species</u>	<u>Fall 1979</u>	<u>Spring 1980</u>	<u>Fall 1980</u>
Yellow Warbler	X	X	X
Yellow-rumped Warbler	X	X	X
Black-throated Gray Warbler	X	X	X
Townsend's Warbler	X	X	X
Hermit Warbler		X	
MacGillivray's Warbler	X	X	X
Common Yellowthroat	X	X	X
Wilson's Warbler	X	X	X
American Redstart	X		
Red-winged Blackbird	X		X
Hooded Oriole	X	X	X
Scott's Oriole		X	
Northern Oriole	X	X	X
Brewer's Blackbird		X	
Brown-headed Cowbird	X	X	X
Western Tanager	X	X	X
Red-breasted Grosbeak			X
Black-headed Grosbeak	X	X	X
Lazuli Bunting	X	X	X
Purple Finch	X	X	X
House Finch	X	X	X
Pine Siskin	X	X	X
Lesser Goldfinch	X	X	X
Lawrence's Goldfinch		X	
Green-tailed Towhee	X	X	X

Joshua Tree National Monument

<u>Bird Species</u>	<u>Fall 1979</u>	<u>Spring 1980</u>	<u>Fall 1980</u>
Rufous-sided Towhee	X	X	X
Brown Towhee	X	X	X
Savannah Sparrow	X		X
Black-throated Sparrow	X	X	X
Sage Sparrow	X	X	X
Dark-eyed Junco	X	X	X
Gray-headed Junco	X	X	
Chipping Sparrow	X	X	X
Brewer's Sparrow	X	X	X
Black-chinned Sparrow		X	
White-crowned Sparrow	X	X	X
Golden-crowned Sparrow	X	X	X
Fox Sparrow	X		X
Lincoln's Sparrow	X	X	X

BIRD SPECIES LIST FOR SALTON SEA
(Northwest End)

<u>Bird Species</u>	<u>Fall 1979</u>	<u>Spring 1980</u>	<u>Fall 1980</u>
Common Loon	X		
Horned Grebe		X	
Eared Grebe	X	X	X
Western Grebe	X	X	X
Pied-billed Grebe	X	X	X
White Pelican	X	X	X
Brown Pelican	X		X
Blue-footed Booby			X
Double-crested Cormorant	X	X	X
Magnificent Frigate- bird	X		
Great Blue Heron	X	X	X
Green Heron	X	X	X
Cattle Egret	X	X	X
Great Egret	X	X	X
Snowy Egret	X	X	X
Black-crowned Night Heron	X	X	X
Least Bittern	X	X	X
American Bittern	X	X	X
Wood Stork		X	
White-faced Ibis	X	X	X
Canada Goose			X
White-fronted Goose			X
Snow Goose		X	X

Appendix D. (cont.)

Salton Sea

<u>Bird Species</u>	<u>Fall 1979</u>	<u>Spring 1980</u>	<u>Fall 1980</u>
Mallard	X	X	X
Gadwall	X	X	X
Pintail	X	X	X
Green-winged Teal	X	X	X
Blue-winged Teal	X	X	X
Cinnamon Teal	X	X	X
American Wigeon	X	X	X
Northern Shoveler	X	X	X
Redhead	X	X	X
Ring-necked Duck	X	X	X
Canvasback	X	X	X
Greater Scaup			X
Lesser Scaup	X	X	X
Common Goldeneye		X	X
Bufflehead	X	X	X
White-winged Scoter			X
Ruddy Duck	X		X
Hooded Merganser			X
Red-breasted Merganser	X	X	X
Turkey Vulture	X		
Sharp-shinned Hawk			X
Cooper's Hawk	X	X	X
Red-tailed Hawk	X		X
Red-shouldered Hawk			X
Swainson's Hawk			X
Northern Harrier	X	X	X

Appendix D. (cont.)

Salton Sea

<u>Bird Species</u>	<u>Fall 1979</u>	<u>Spring 1980</u>	<u>Fall 1980</u>
Osprey	X	X	X
Prairie Falcon			X
Peregrine Falcon		X	
American Kestrel	X	X	X
Gambel's Quail	X	X	X
Clapper Rail	X		X
Virginia Rail	X	X	X
Sora	X	X	X
Common Gallinule	X	X	X
American Coot	X	X	X
American Avocet	X	X	X
Black-necked Stilt	X	X	X
Semipalmated Plover	X	X	X
Snowy Plover	X	X	X
Killdeer	X	X	X
Mountain Plover	X		
American Golden Plover			X
Black-bellied Plover	X	X	X
Marbled Godwit	X	X	X
Long-billed Curlew	X	X	X
Whimbrel		X	
Greater Yellowlegs	X	X	X
Lesser Yellowlegs	X	X	X
Solitary Sandpiper	X		X
Willet	X	X	X
Spotted Sandpiper	X	X	X

Salton Sea

<u>Bird Species</u>	<u>Fall 1979</u>	<u>Spring 1980</u>	<u>Fall 1980</u>
Ruddy Turnstone		X	
Black Turnstone		X	
Common Snipe	X	X	X
Short-billed Dowitcher	X	X	X
Long-billed Dowitcher	X	X	X
Red Knot		X	
Sanderling	X	X	X
Western Sandpiper	X	X	X
Least Sandpiper	X	X	X
Baird's Sandpiper	X		
Dunlin	X	X	X
Stilt Sandpiper	X	X	
Wilson's Phalarope	X	X	X
Northern Phalarope	X	X	X
Parasitic Jaeger	X		X
Herring Gull	X	X	X
California Gull	X	X	X
Ring-billed Gull	X	X	X
Laughing Gull	X		X
Franklin's Gull	X	X	
Bonaparte's Gull	X	X	X
Black-legged Kittiwake			X
Sabine's Gull			X
Gull-billed Tern	X	X	
Forster's Tern	X	X	X
Common Tern	X	X	X

Appendix D. (cont.)

Salton Sea

<u>Bird Species</u>	<u>Fall 1979</u>	<u>Spring 1980</u>	<u>Fall 1980</u>
Caspian Tern	X	X	X
Black Tern	X	X	X
Black Skimmer	X	X	X
Rock Dove			X
White-winged Dove	X	X	X
Mourning Dove	X	X	X
Spotted Dove	X		
Ground Dove	X	X	X
Roadrunner	X	X	X
Great Horned Owl	X		X
Burrowing Owl	X		
Poor-will	X		
Lesser Nighthawk		X	
Vaux's Swift		X	
White-throated Swift		X	X
Costa's Hummingbird		X	
Anna's Hummingbird		X	X
Belted Kingfisher	X	X	X
Common Flicker	X		X
Ladder-backed Woodpecker	X	X	X
Western Kingbird	X	X	X
Ash-throated Flycatcher	X	X	X
Black Phoebe	X	X	X
Say's Phoebe	X	X	X
Western Flycatcher	X		

Appendix D. (cont.)

Salton Sea

<u>Bird Species</u>	<u>Fall 1979</u>	<u>Spring 1980</u>	<u>Fall 1980</u>
Western Wood Pewee		X	
Horned Lark	X	X	X
Violet-green Swallow	X	X	X
Tree Swallow	X	X	X
Bank Swallow	X	X	X
Rough-winged Swallow	X	X	X
Barn Swallow	X	X	X
Cliff Swallow	X	X	
Northern Raven	X	X	X
Verdin	X	X	X
Bushtit		X	X
House Wren	X	X	X
Bewick's Wren	X	X	X
Cactus Wren	X	X	X
Marsh Wren	X	X	X
Rock Wren			X
Mockingbird	X	X	X
Crissal Thrasher	X	X	X
Sage Thrasher	X		X
Western Bluebird			X
Black-tailed Gnat-catcher	X	X	X
Ruby-crowned Kinglet	X		X
Water Pipit	X	X	X
Cedar Waxwing	X		
Phainopepla	X	X	X

Appendix D. (cont.)

Salton Sea

<u>Bird Species</u>	<u>Fall 1979</u>	<u>Spring 1980</u>	<u>Fall 1980</u>
Loggerhead Shrike	X	X	X
Starling	X	X	X
Orange-crowned Warbler	X	X	X
Yellow Warbler	X	X	
Yellow-rumped Warbler	X	X	X
Common Yellowthroat	X	X	X
Yellow-breasted Chat		X	
Wilson's Warbler		X	
House Sparrow	X	X	X
Western Meadowlark	X	X	X
Yellow-headed Blackbird	X	X	X
Hooded Oriole	X	X	
Northern Oriole	X	X	
Brewer's Blackbird	X	X	X
Great-tailed Grackle	X	X	X
Brown-headed Cowbird	X	X	X
Blue Grosbeak	X	X	
House Finch	X	X	X
Pine Siskin	X		
Lesser Goldfinch	X	X	X
Abert's Towhee	X	X	X
Savannah Sparrow	X	X	X
Lark Sparrow	X	X	X
Black-throated Sparrow	X		

Appendix D. (cont.)

Salton Sea

<u>Bird Species</u>	<u>Fall 1979</u>	<u>Spring 1980</u>	<u>Fall 1980</u>
Sage Sparrow	X		X
Chipping Sparrow		X	
White-throated Sparrow	X	X	X
Golden-crowned Sparrow	X		
Lincoln's Sparrow	X	X	X
Song Sparrow	X	X	X