THREE BREEDING BIRD SURVEYS IN PINYON-JUNIPER, JOSHUA TREE, AND MOHAVE YUCCA-CHOLLA HABITATS ON THE EASTERN MOHAVE DESERT

and

DENSITIES AND DISTRIBUTION OF GRAY VIREOS IN EASTERN SAN BERNADINO COUNTY, CALIFORNIA

AUGUST AND SEPTEMBER, 1977

by

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for

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PINYON-JUNIPER WOODLAND. -- Location: California; San Bernardino Co., Mid Hills, about 0.5 mi. W (not E as in AB 30;1062-1063, 1976) of the entrance to Mid Hills Campground, and about 100 meters E of a poor dirt road that runs N to Cedar Canyon; SW ¼ of Sect. 13, T12N, R14E, Mid Hills Quadrangle, USGS. Continuity: New. Size: 9 ha=22.24 acres (square, 300 x 300 meters, paced) on a magnetic north compass grid. Description of Area: See AB 30;1062-1063,1976. Weather: A series of late cold fronts during the census period kept temperatures lower than normal. Temperatures during censuses varied from 40°-75°F. Skies were clear on the majority of census days. Significant amounts of precipitation fell during May 8-9. Coverage: April 16, 23; May 2, 10, 17, 22, 26; June 9;from 0500-0800 PST. Total man hours: 24. Census: Bewick's Wren, 2; Plain Titmouse, 1.5; Bushtit, 1.5; Scrub Jay, 1; Scott's Oriole, 1; House Finch, 1; Black-throated Sparrow, 1; White-throated Swift, +; Ladder-backed Woodpecker, +; Ash-throated Flycatcher, +; Crissal Thrasher, +; Blue-gray Gnatcatcher, +; Brown-headed Cowbird, +. Total: 13 species; 9 territorial males (100/Km^2, 40/100 acres). Remarks: Crissal Thrasher is a fairly common resident species in many habitats of this region. The single pair of Black-throated Sparrows restricted their activities to an area of the plot with few trees and dense Great Basin Sagebrush. One Bewick's Wren nest was found and Scrub Jay, Plain Titmouse and Crissal Thrasher were seen with juveniles freshly out of the nest. Bushtits were seen carrying nesting material. The Scott's Oriole was not in full adult plumage but sang vigourously and had a mate. White-throated Swifts were seen over the plot on four occasions and undoubtedly nest in nearby rocky crags. Cowbirds were seen flying low across the plot three times and totaled 3 males and 2 females. Average totals per census were determined for the following mammals: Antelope Ground Squirrel (Ammospermophilus leucurus), 0.9 (10/Km^2, 4/100 acres); Black-tailed Jackrabbit (Lepus californicus), 2 (22/Km^2, 9/100 acres);

Desert Cottontail (Sylvilagus auduboni), 1.4 (16/Km^2, 6/100 acres). Rock Squirrel (Citellus variegatus), Panamint Chipmunk (Eutamias panamintinus), and Black-tailed Deer (Odocoileus hemionus) were seen once. Numerous off-road vehicle tracks appeared on the plot between May 26 and June 9. -- STEVEN W. CARDIFF, California Desert Plan Program, Bureau of Land Management, 1695 Spruce, Riverside, Calif. 92507.

JOSHUA TREE WOODLAND. -- Location: California; San Bernardino Co., 2 mi. N and 0.7 mi W of Cima. The southwest corner is at the BLM Bearing Tree for section 29, 20 meters E of Cima Rd., SW ¼ of Sect. 29, T14N, R14E, Mescal Range Quadrangle, USGS. Continuity: New. Size: 9 ha=22.24 acres (square, 300 x 300 meters, paced) on a magnetic north compass grid. Description of Area: See AB 30;1060-1061,1976. Weather: A series of late cold fronts during the census period dropped temperatures to abnormally low levels. Temperatures during censuses varied from 55°-75° F. Clear skies were recorded on the majority of census days. No precipitation recorded. Coverage: April 17, 22; May 4, 12, 20; June 2, 4, 10; from 0500-0800 PST. Total man hours: 24. Census: Black-throated Sparrow, 4.5 (50,20); Ladder-backed Woodpecker, 1; Ash-throated Flycatcher, 1; American Kestrel, +; Great Horned Owl, +; Common (Red-shafted) Flicker, +; Bewick's Wren, +; Bendire's Thrasher, +. Total: 8 species; 6.5 territorial males (72/Km^2, 29/100 acres). Visitors: Mourning Doves were seen on the plot three times, Cactus Wrens were heard outside the plot and House Finches were occasionally seen flying over the plot. However, none of these species gave indications of having a nesting territory within the plot boundaries. Remarks: Common Flickers were seen on the plot twice, one being a territorial male "Red-shafted" and the other being a female "Gilded". Both were found in the same area and may or may not have constituted a pair. Both forms are known to breed in the Cima Dome area and apparently hybridize to some extent. Bewick's Wren and Bendire's Thrasher, both vigourously singing males, were found only once and are probably of marginal occurance at this particular site, the wren preferring larger and denser shrubs and the thrasher requiring denser concentrations of cholla cactus. Scott's Oriole was inexplicably absent. One Ladder-backed Woodpecker nest with at least 1 young was found 10 m from the edge of the plot. Otherwise no nests or young were found.

Average totals per census were determined for the following mammals: Antelope Ground Squirrel (Ammospermophilus leucurus), 1.5 (17/Km^2, 7/100 acres); Black-tailed Jackrabbit (Lepus californicus), 0.9 (10/Km^2, 4/100 acres); Desert Cottontail (Sylvilagus auduboni), 1.1 (12/Km^2, 5/100 acres). Side-blotched Lizard (Uta stansburiana) had an average total of 8.4 (93/Km^2, 38/100 acres). Desert Spiny Lizard (Sceloporus magister) and Western Whiptail Lizard (Cnemidophorous tigris) were seen on several occasions. Ten cattle were on the plot on May 12. --- Steven W. Cardiff, California Desert Plan Program, Bureau of Land Management, 1695 Spruce, Riverside, Calif. 92507.

MOHAVE YUCCA-STAGHORN CHOLLA DESERT SCRUB.--Location: California; San Bernardino Co., SW edge of Lanfair Valley, 4.5 mi. S and 1 mi. E of intersection of Ivanpah and Cedar Canyon Rds. The plot roughly parallels Ivanpah Rd. and the SW corner is about 270 yards NW of where Ivanpah Rd. crosses Fenner Wash; NE¼ Sec. 5, T11N, R17E, Lanfair Valley Quadrangle, USGS; 35°04'N, 115°10'W. Continuity: New. Size: 20 ha = 49.4 acres (rectangular, 400 x 500 m, paced), the length running N-S on a magnetic N compass grid. Description of Plot: This is a unique habitat type of very limited distribution on the Mohave Desert of California; few areas have taller or denser stands of Mohave Yucca and Staghorn Cholla. Vegetation: One 264 pace toe-point transect was made to determine per cent cover and species composition. The substratum is composed of 11.7% small rocks ($<$ 2 in), 3.8% large rocks ($>$ 2 in), 58.3% bare ground, 13.3% dead plant litter, and 12.9% shrub stems and plant cover. Plant composition is 27.3% California Buckwheat (Eriogonum fasiculatum), 16% Cooper Goldenbush (Haplopappus cooperi), 9% Little-leaved Ratany (Krameria parvifolia), 8.3% Staghorn Cholla (Opuntia acanthocarpa), 8% Cottonthorn (Tetradymia axillaris), 7.2% Paperbag Bush (Salazaria mexicana), 7.2% Mohave Yucca (Yucca schidigera), 5.7% Darning Needle Cholla (O. ramosissima), 3.4% Cheesebush (Hymenoclea salsola), and 2.3% Catclaw (Acacia greggii). Other shrubs present in lesser amounts are: Burrobush (Ambrosia dumosa), Creosote Bush (Larrea tridentata), Purple Sage (Salvia dorrii), and Strawberry Hedgehog Cactus (Echinocereus engelmanii). The study site has a long history of livestock grazing, which has affected per cent cover and plant composition. Edge: A lightly traveled dirt road and small powerline parallel the study area 110 yards W. A large Acacia-Desert Willow wash runs NW-SE approx. 20 yards from the SW corner. A smaller wash passes N-S through the E half of the plot and an old narrow gauge railroad bed runs roughly N-S through the middle of the plot. Similar habitat surrounds the plot for short distances to the S and W and for longer distances to the N and E. Topography: Flat and slightly sloping upwards to the N. The several small to moderately large washes within the

plot show 10-15 ft of vertical relief below the general surface level; elevation 3630-3680 ft. The Hackberry Mountains and Vontrigger Hills lie approx. .5 mi. SW and SE, respectively, and the Bobcat Hills lie .5 mi. N. Water: The nearest surface water is at a stock watering trough 540 yards S of the plot. Weather: Clear during most censuses, overcast on June 8. Temperatures during counts ranged from 50°-75°F and averaged colder than usual due to a series of late cold fronts that moved through the area during May and early June. Significant precipitation fell during the second week of May and the count of May 14 was hampered by cold temperatures and strong winds. Coverage: April 24; May 3, 11, 14, 18, 25; June 3, 8; from 0500-0800 PST. Total man hours: 24. Census: Cactus Wren, 2.5; Gambel's Quail, 2; Black-throated Sparrow, 1.5; Roadrunner, 1; Costa's Hummingbird, 1; Ladder-backed Woodpecker, 1; Ash-throated Flycatcher, 1; Bendire's Thrasher, 1; Scott's Oriole, 1; American Kestrel, +; Mourning Dove, +; Say's Phoebe, +; Verdin, +; Black-tailed Gnatcatcher, +; House Finch, +. Total: 15 species; 12 territorial males (60/km^2, 24/100 acres). Remarks: No nests were found and no juvenile birds were observed except for one juvenile American Kestrel on June 3. It is possible that the unusually cold weather may have delayed nesting activity. Red-tailed Hawk, Screech Owl, Great Horned Owl, Poor-will, Lesser Nighthawk, Mockingbird, Phainopepla, Loggerhead Shrike, and Brown-headed Cowbird were found adjacent to the plot where most seemed to be restricted to the large wash S and W of the study area. Within the plot, Verdin and Black-tailed Gnatcatcher prefered the Acacia washes. Two pairs of Bendire's Thrasher had half a territory each within the plot. This is a species of very local distribution in California. Cattle were seen on the plot on May 14, 18, and 25. This study was sponsored by the Bureau of Land Management, California Desert Plan Program.--STEVEN W. CARDIFF, 2736 Court St., Rialto, Calif. 92376.

The Gray Vireo (Vireo vicinior) in eastern San Bernardino County, California

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ABSTRACT. This paper presents a review of the status of the Gray Vireo (Vireo vicinior) in the Clark, New York, Mid Hills, Providence, and Granite mountain ranges of northeastern San Bernardino County, California, with the addition of new information on habitat and distribution gathered during spring and summer of 1977. Breeding Gray Vireos were found to occur on the north and southeastern sides of the southern portion of the Clark Mountain Range, southern and eastern New York Mountains, northern Mid Hills, and extreme northern Providence Mountains. The New York Mountains-Mid Hills area appears to comprise the center of abundance for the species but even here the distribution of breeding territories is disjunct and localized and densities are consistently very low, except in one area of the eastern New York Mountains where up to eight pairs per square mile were recorded. The breeding distribution appears to be restricted to a narrow elevational range along the lower edge of the pinyon-juniper plant community. Within this zone, Gray Vireos seem to prefer areas with numerous large shrubs such as desert almond (Prunus fasciculata), Anderson thornbush (Lycium andersonii), silktassel bush (Garrya flavescens), and scrub oak (Quercus turbinella). It was found that parasitism by Brown-headed Cowbirds (Molothrus ater) may limit Gray Vireo occurence in areas where livestock grazing enhances cowbird populations.

INTRODUCTION

In California, the Gray Vireo (Vireo vicinior) is a summer resident of very local and irregular occurence in chaparral and pinyon-juniper plant associations. The distribution -from the Peninsular ranges of San Diego County north along the western fringe of the Colorado and Mohave Deserts (San Jacinto, San Bernardino, and San Gabriel Mountains) to the southern Sierra Nevada (Walker Pass) and thence northeastward to some of the larger southern Great Basin ranges (Grapevine, Inyo, and Panamint Mountains) and eastward to several ranges of northeasern San Bernardino County (Grinnell and Miller, 1944; Miller, 1946). This paper deals with Gray Vireo occurence in San Bernardino County.

The Clark Mountain Range, New York Mountains, Mid Hills, Providence Mountains, and Granite Mountains of northeastern San Bernardino County have extensive areas

above 5000 ft which support large tracts of pinyon-juniper woodland. Plant composition varies considerably among the five areas. Gray Vireos have consistently been found in certain portions of this region since first being discovered there in 1938 (Johnson, Bryant, and Miller, 1948). With the Gray Vireo declining in some areas where it was previously common, such as the San Jacinto and San Gabriel Mountains (Grinnell and Swarth, 1913; E.A.Cardiff, S. Goldwasser, pers. comm.), an effort was made during spring and summer 1977 to gather more information on the distribution, breeding densities, and habitat preferences of this species in this unique area of the Mohave Desert and to investigate the possibilities of a correlation between the distribution of livestock grazing and the impact of Brown-headed Cowbird (Molothrus ater) nest parasitism on the Gray Vireo.

MATERIALS AND METHODS

All field work was conducted between 22 April and 11 July 1977, the period during which Gray Vireos are restricted to their breeding territories and the males are most vocal and conspicuous (apparently only males sing, Grinnell and Swarth, 1913). Field techniques consisted of walking through areas of potential Gray Vireo habitat while watching for individuals with 7x35 or 10x50 binoculars and listening for singing males. When a Gray Vireo was located, time was usually spent following the bird in the hope of locating a nest. Any Brown-headed Cowbirds were also noted. On several occasions a tape-recording of a male Gray Vireo's song was played back in areas of potential habitat. However, it was found that when Gray Vireos were present, they were easily located without the tape and therefore use of the recording did not play a significant role in this study.

Study Area (see Fig. 1 for general locations)

Clark Mountain Range. The main (southern) portion of the range has a roughly circular base (five mile diameter) and rises to an elevation of 7929 ft. The mountain is entirely covered with pinyon (Pinus monophylla)-juniper (Juniperus osteosperma) woodland which is considerably denser on the north and east sides

than on the south and west and this is generally true in the other ranges of the study area. The woodland extends downward to an elevation of approximately 5200 ft on the north side and 5600 on the south. There is a large stand of white fir (Abies concolor) on steep north-facing slopes at about 7000 ft immediately north of the highest peak (Miller, 1940). Access to Clark Mountain is restricted to a few roads leading to various points at the base.

Clark Mountain was visited on one occasion: 0430-1000 on 21 May from the north base to the white firs (Fig. 2a).

New York Mountains. The main portion (southeastern half) has a roughly elliptical base which is approximately eight miles long (east-west) and seven miles wide (north-south). The highest point is New York Peak at 7532 ft. The range is covered with fairly dense pinyon-juniper woodland which extends downward to an elevation of approximately 4400 ft on the north side and 5500 ft on the south. A small stand of white fir is located at about 7200 ft immediately northwest of New York Peak (Hendrikson and Prigge, 1975). The range is fairly accessible from the south but is steep and difficult to approach from the north.

The New York Mountains were visited on thirteen occasions: 1030-1400 on 2 May, 1100-1600 on 26 May, and 1400-1500 on 18 June in the Fourth of July Canyon area; 1530-1730 on 2 May, 0800-0930 on 14 May, 1100-1530 on 18 May, 0730-1130 on 22 May, 1130-1700 on 25 May, and 1230-1530 on 9 July in Caruther's Canyon; 1030-1330 on 30 May in Sagamore Canyon; 1500-1930 on 29 May, 0630-0930 on 30 May, 1800-1900 on 19 June, and 0530-0800 on 20 June in the Keystone Canyon area; 0800-1330 on 20 June from Keystone Canyon to the white fir stand and back (Fig. 2b-c).

Mid Hills. The Mid Hills consist of series of high plateaus and ranges of hills, most of which is above 5000 ft, lying between the New York Mountains to the north and the Providence Mountains to the south. The are about twelve miles in length, tending north and south, and between one and six miles in width. There is a steep escarpment along the west face while the east side slopes more gently. Pinyon-

juniper woodland occurs on the steep slopes of the escarpment, on much of the plateau area (especially on the northern half of the Mid Hills), and on the slopes of some of the larger hills and mountains. Most of the area is easily accessible.

The Mid Hills were visited on twelve occasions: 0500-0800 on 2, 10, 17, 22, 26 May and 9 June .5 mile west of Mid Hills Campground; 1200-1430 on 11 May, 1000-1100 on 14 May, 1130-1330 on 17 May, 1800-1830 on 21 May, and 1115-1200 on 29 May in the Cedar Canyon area; 1100-1400 on 20 May in the Live Oak Spring Canyon area; 1500-1900 on 20 May in Cottonwood Canyon (Fig. 2c).

Providence Mountains. The Providence Mountains are about eighteen miles in length (north-south) and five miles in width (east-west). The highest peak is at 7048 ft. Much of the area above 5000 ft is covered with pinyon-juniper woodland. The western face is extremely rugged, steep, and hard to approach. Access is slightly better on the north, south and east sides where a few roads lead to the base.

The Providence Mountains were visited on one occasion: 1500-1900 on 10 July and 0600-0800 on 11 July in the upper Wildhorse Canyon area (Fig. 2d).

Granite Mountains. This range has a roughly circular base, about nine miles in diameter, with the highest peak rising to 6786 ft. The range is very rocky and large granite boulders cover much of the area. Pinyon-juniper woodland is primarily restricted to north-facing slopes above 4500 ft and also occurs high up on the south sides of some of the taller peaks; it does not occur in the western third of the range. The Granite Mountains are probably the most isolated of the five ranges due to the rocky terrain and lack of roads.

The Granite Mountains were visited on three occasions: 1300-1600 on 22 April, 1100-1400 on 14 May, and 0630-0800 on 9 July in the Cottonwood Spring area (Fig. 2e).

Vegetation

The dominant shrub composition of the five areas varies considerably with the exception of vegetation found in sandy, low-elevation washes and canyon bot-

toms around the bases of the mountain blocks. The major shrubs of these dry watercourses are fairly consistent between ranges and are usually a mixture of desert almond (Prunus fasciculata), Anderson thornbush (Lycium andersonii), and rabbitbrush (Chrysothamnus nauseosus).

Within the pinyon-juniper belt, big sagebrush (Artemisia tridentata)is a conspicuous member of the shrub cover on all five ranges. On Clark Mountain, silktassel bush (Garrya flavescens) is a common shrub in the lower portions of the pinyon-juniper woodland and becomes quite dense in places. The New York Mountains have large amounts of scrub oak (Quercus turbinella) associated with the pinyon-juniper belt. The northern Mid Hills also have significant amounts of scrub oak owing to their proximity to the New York Mountains. The southern Mid Hills, Providence Mountains, and Granite Mountains are rather similar in their lack of tall shrub species and contrast sharply with the other ranges in this respect. The commonest shrubs in these three areas are big sagebrush and bitterbrush (Purshia tridentata).

RESULTS

Gray Vireo

All past specimen and sight records within the study area along with those observations made during this study are shown in Table 1. Figure 3 shows the distribution of records over the study area.

Clark Mountain Range. Eleven records, between 17 May and 21 June (Fig. 3a). One specimen and eight sight records from the north side of the mountain, between 5200 and 6400 ft. All were in pinyon-juniper woodland but other habitat data is limited. One pair was observed in a wash with desert almond and big sagebrush. Two other observations are of males from areas with silktassel bush and big sagebrush. There are two specimens from the southeast side at 5800 and 6300 ft.

New York Mountains. Nineteen sight records between 2 May and 1 August (Fig. 3b-c). All records come from large canyons on the south and east sides of the

range. Fifteen records come from the steep hillsides of the Keystone Canyon-Live Oak Canyon area between 5500 and 6100 ft where at least eight singing males were counted during this study within an area of about one square mile. Scrub oak is particularly common at this locality and it is a fairly large area of uniform habitat.

Four records come from open brushy washes with desert almond, Anderson thornbush, rabbitbrush and scattered pinyon-juniper between 5320 and 5570 ft. near the entrances of Keystone, Caruther's, and Fourth of July Canyons. The other two records include one male on a steep hillside covered with pinyon-juniper and scatered scrub oak at 6000 ft near Fourth of July Canyon and a pair in similar habitat at 5600 ft in Sagamore Canyon. It is interesting to note that while Gray Vireos may be present at one locality, they may be completely absent from nearby locations with similar habitat. One example is the Fourth of July Canyon area where Gray Vireos were not found in the main canyon while two territories were located only .5 mile to the west in very similar habitat.

Mid Hills. Nine specimens and seven sight records between 3 May and 29 May (Fig. 3c). Ten of the records are from the immediate vicinity of Cedar Canyon from 5000 to 5320 ft. One record is of a nest and four eggs taken on 29 May. There is little habitat data for the Cedar Canyon records. One singing male was in pinyon-juniper woodland in a steep side canyon while another pair was found in an open, sandy wash with large amounts of desert almond, Anderson thornbush, rabbitbrush, and scattered clumps of barberry (Berberis haematocarpa).

Three records are of specimens taken "two miles north of Cedar Canyon" at 5500 ft and have no other habitat or location data. There are three records from the northeastern escarpment which include two observations of a pair at 5100 ft in a canyon with pinyon-juniper on the hillsides and desert almond in the sandy canyon bottom, and a singing male at Cottonwood Canyon, 5320 ft, on moderately steep slopes covered with dense pinyon-juniper and scattered scrub oak.

Providence Mountains. Three records (Fig. 3d-f). Two specimens from Quail

Spring, at the southern end of the range, from 3900 ft on 19 May and from 3700 ft on 10 September. The third record is that of a singing male on the south side of Macedonia Canyon at 4920 ft in pinyon-juniper and Anderson thornbush. This locality is at the northern extremity to the Providence.

Granite Mountains. There are no known records of Gray Vireo for this range and I found no evidence of the species during my limited searching there.

Brown-headed Cowbird

An analysis of records from the five ranges (Table 2) shows that there are eighteen spring and early summer observations, which include six specimens and eleven sight records. Thirteen records come from the Mid Hills, two from the Granite Mountains, and one each for the New York Mountains, Providence Mountains, and Clark Mountain Range (Fig. 3). At least thirteen records are from areas with pinyon-juniper woodland and in three instances the cowbirds were directly associated with range cattle. Adult cowbirds have been observed within the study area from 2 May to 9 June and elevations ranged from 4360 to 6200 ft. There is one record of a fully developed juvenile being fed by a pair of Blue-gray Gnatcatchers (Polioptila caerulea) at the northern end of the Providence Mountains on 11 July.

DISCUSSION

Singing male Gray Vireos can be found on territory within the study region by 2 May, indicating that spring migrants probably enter the area during late April. Elsewhere in southern California, spring migrants have been recorded from 24 March to 11 May (Cooke, 1909; McCaskie, 1963, 1964, 1969; Small, 1962). The 19 May record from the southern end of the Providence Mountains (Quail Spring) is at an unlikely breeding locality and probably involves a late spring migrant.

Lack of information makes impossible any accurate statements about the nesting sequence in the study area. However, twenty-five sets of Gray Vireo eggs taken from the San Bernardino and San Gabriel Mountains and examined by the author show extreme dates of 5 May and 4 July, with twenty-two of the sets falling

within the period mid-May to mid-June. The 28 May egg date from the Mid Hills indicates that the same pattern may apply to Gray Vireos in the study area. There are no records of juveniles or immatures.

There is a single record of a fall migrant for the study area: 10 September at Quail Spring. It is unclear when Gray Vireos depart the area and individuals observed in the New York Mountains on 29 July and 1 August are most likely post-breeding wanderers, birds raising a second brood, or birds making a second nesting attempt after an initial failure (Bent, 1950).

From the data presented earlier (Table 1, Fig. 3), the following statements can be advanced. Although vegetation data is scarce for Gray Vireo records prior to 1970, it is nonetheless apparent that as a breeding species the Gray Vireo is restricted to areas with a relatively diverse shrub cover at and immediately within the lower edge of pinyon-juniper woodland, between 4900 and 6400 ft. Desert almond, Anderson thornbush, silktassel bush, and scrub oak are the preferred shrubs, and desert almond-Anderson thornbush washes, pinyon-juniper-silktassel bush, and pinyon-juniper-scrub oak are the favored plant communities. Breeding Gray Vireos are almost invariably associated with one of these and seem to be absent from pinyon-juniper woodland with big sagebrush as the main shrub cover. Johnson, 1972, had similar findings in southern Nevada. These habitat requirements may explain the possible absence of Gray Vireos from the Granite Mountains where there is little or no scrub oak or other large shrubs associated with the pinyon-juniper woodland.

As noted earlier, the Gray Vireo shows a rather patchy distribution in the New York Mountains and the entire study area in general. Explanations could include such factors as extremely specific habitat requirements, which would require much more detailed studies of Gray Vireo habitat and diet, or low population levels in which case cowbird parasitism could be a cause.

Gray Vireos were found at very low density in all areas except the Keystone Canyon-Live Oak Canyon area of the New York Mountains. What appears to be a denser population at this locality might partially be the result of having a larger

parcel of suitable habitat available, while other breeding localities are mostly confined to washes and small canyons where habitat is more limited. There are only three other records of more than one Gray Vireo territory in the same vicinity. One pair of territories on Clark Mountain was about .25 mile apart (1975) and three singing males there in 1977 were also within .25 mile of each other. The other pair of territories was about .75 mile apart near Fourth of July Canyon, New York Mountains. I feel there is too little density information to draw any conclusions. High densities reported in the San Jacinto Mountains (Grinnell and Swarth, 1913) and in southern Nevada (Johnson, 1972) were in more diverse shrub communities and cannot be used for comparison here.

Regarding the cowbird-Gray Vireo-livestock grazing problem, it can be seen that the cowbird occupies a zone much the same as that which the Gray Vireo inhabits in its elevational and habitat aspects. There is only a single record of the cowbird for Clark Mountain and this was at 6700 ft at the lower edge of the white firs where Gray Vireos are not known to occur. There is some grazing in the Clark Mountain area but most of it is restricted to areas below the edge of the pinyon-juniper belt and cattle probably penetrate the range of the Gray Vireo infrequently. There is also very little grazing in the Keystone Canyon area of the New York Mountains and there is but a single record of the cowbird from this area, a male at 6200 ft. The north side of Clark Mountain and the Keystone Canyon area both have relatively large Gray Vireo populations, few cowbird records and only light grazing impact as compared with most other Gray Vireo breeding locations where there are many more cowbird records, much heavier grazing and considerably lower Gray Vireo populations.

Lack of nest records makes it impossible to compare cowbird parasitism rates from different localities within the study area. However, the following example gives some idea of the impact cowbirds can have on a vulnerable species which is conspicuous in its nesting habits (Bent, 1950). Out of twenty-five sets of Gray Vireo eggs taken between 1908 and 1950 from the north sides of the

San Bernardino and San Gabriel Mountains, ten had been vitimized by cowbirds. All of the parasitized nests were taken between 19 May and 11 June. A 45% nest failure rate can be estimated if it is assumed that all parasitized nests were unsuccessful in raising any vireos and if three sets taken in late June and early July are excluded as second nestings (which are probably fairly safe from cowbird parasitism at these late dates). There was some livestock grazing in these areas but details are unknown (E.A.Cardiff, pers. comm.). Additional information on Gray Vireo nesting success and cowbird ditribution in relation to grazing patterns is needed to confirm or disprove the above theories but these observations lend support to the possibility of a Gray Vireo-cowbird-grazing correlation.

It is obvious that much of the area included in this study has not been adequately covered and many areas which have been searched need to be rechecked. This and other deficiencies make this report far from complete and it is hoped that future work can be conducted to correct these deficiencies and give us a more complete understanding of the Gray Vireo in all respects.

ACKNOWLEDGEMENTS

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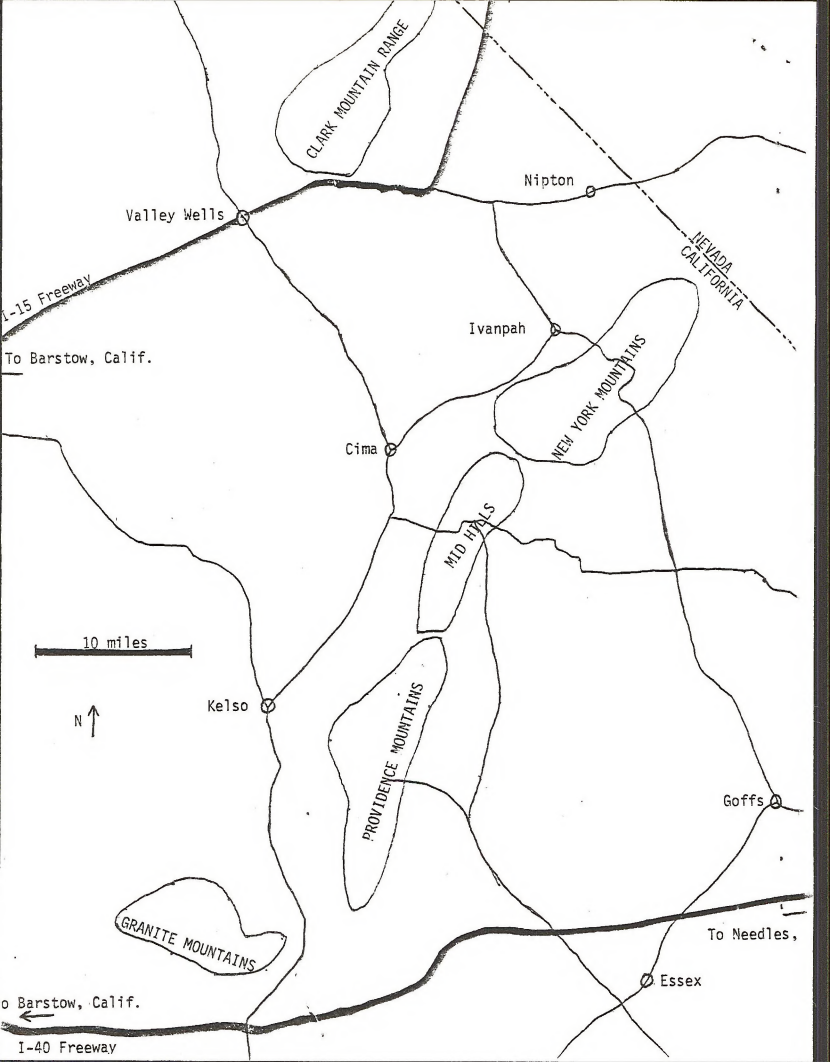
Figure 1. Map showing general locations of the five ranges in the study area.


CLARK MOUNTAIN RANGE
Nipton
Valley Wells
NEVADA
CALIFORNIA
I-15 Freeway
To Barstow, Calif.
Ivanpah
NEW YORK MOUNTAINS
Cima
MID HILLS
10 miles
N
Kelso
PROVIDENCE MOUNTAINS
Goffs
GRANITE MOUNTAINS
To Needles,
Essex
o Barstow, Calif.
I-40 Freeway