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Birds of Pine Valley Mountain Region, Southwestern Utah

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Fig. 1. The south face of the Pine Valley Mountains with the Virgin River in the foreground. The altitudinal range is from 2500 to 10,324 feet with the life zones extending from Lower Sonoran to Hudsonian.

INTRODUCTION*

It has long been a practice among ornithologists to study the distribution, variation, and ecological relationships of birds in areas characterized by diverse physiographic features. Such studies are motivated usually by the desire to aid in finding solutions for the many problems concerning the distribution and variation of birds. Following this custom and with this objective in mind, the writer has attempted to make a contribution to our knowledge of the birds of western North America in general and those of Utah in particular by selecting the highly diversified southwestern part of the state for an avifaunistic study. The area chosen includes the Pine Valley Mountains, the Beaver Dam Mountains, the Beaver Dam Wash and the valleys of the Santa Clara and Virgin rivers. As such it corresponds essentially with the limits of Washington County, Utah.

This area was chosen for other reasons besides its great topographical diversity. There were already many known distinctions of the avifauna there. That is, many forms were known to occur in Utah only in this section. It was thought desirable to investigate further the peculiarities of the birds of this portion of the state, especially in the light of the ecological situation there. At the time of the launching of this project certain other areas of the state were being studied. A. C. Twomey (1942) of the Carnegie Museum of Pittsburg was studying the birds of the Uinta Basin of northeastern Utah. A. M. Woodbury, working with the Rainbow Bridge-Monument Valley expeditions was studying the birds of the Navajo country of southeastern Utah and northeastern Arizona. The results of van Rossem's study (1936b) of the Charleston Mountains of southern Nevada, and Linsdale's work (1938) on the Toyabe Mountains of the same state were available for comparison. It seemed that a study of the Pine Valley Mountain area would "tie in" nicely with these similar studies in the surrounding country and help to round out the picture of the distribution and geographic variation of the birds of the Great Basin and the Southwest.

The writer's field work extended over several years. Collecting stations and dates of collecting were as follows: June 10 to 28, 1938, Pine Valley Forest Service Camp, 3 miles east Pine Valley; April 30 to May 7, 1939, Danish Ranch, 5 miles northwest Leeds; December 16 to 21, 1939, St. George; May 11 to 18, 1940, Santa Clara Creek, 3 miles southwest St. George; May 3 to 5, 1941, west slope Beaver Dam Mountains, 5 miles north Utah-Arizona border; May 6 to 10, 1941, Eardley Ranch, Beaver Dam Wash, 8 miles north Utah-Arizona border; September 8 to 11, 1941, junction Santa Clara and Virgin rivers, 2 miles south St. George; September 12 to 17, 1941, Pine Valley Forest Service Camp, 3 miles east Pine Valley. In this field work the following students assisted at various times, and acknowledgment is hereby made of their help: Jack Berryman, Shirl Coleman, Dan Gardiner, Clifton Greenhalgh, Aaron Ross, Henry Setzer, and John Vasquez.

As a result of this collecting, 729 study skins were prepared. In addition to recording the data from these skins, I have included in this report the information pertaining to all the other birds from

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southwestern Utah in the Museum of Zoology at the University of Utah. These were collected mostly by Dr. A. M. Woodbury over a period of years and number 221, thus making a total of 950 study skins reported on. In the species accounts the skins are listed chronologically. Data pertaining to sex and dates are included as well as localities, thus making the record more complete and hence more useful. The accompanying map indicates not only the general topographic features of the area but also shows the locations of various towns and the several base camps.

I am indebted to Dr. Walter P. Cottam for information on the plants and ecology of the region and for the illustrations accompanying this report; to Mr. S. D. Durrant for help in the field work when we were joint leaders of certain trips that were sponsored by the University; to Dr. A. M. Woodbury for general information bearing on the region; to Dr. W. W. Newby for preparation of the accompanying map of Washington County, Utah; to Dr. Ralph V. Chamberlin, head of the Department of Biology at the University of Utah, for support of the study throughout its duration; and to all these gentlemen for criticism of the manuscript. As pertaining to the systematic studies I am indebted to Dr. Alden H. Miller of the California Museum of Vertebrate Zoology for the identification of and critical comment on many specimens, and for the loan of comparative material.

The first information on the avifauna of the region seems to have come as a result of the government-sponsored Wheeler Survey for 1872. The two naturalists of the expedition for that year, H. C. Yarrow and Henry W. Henshaw, met at a rendezvous camp at Toquerville in mid-October, after earlier field work in the northern and central part of the state. They then travelled southwest to St. George, north to Pine Valley, north and east to Harmony and then continued on to Salt Lake City. Data obtained on this excursion were incorporated with their other data and the whole published in the various reports by Yarrow and Henshaw (1874), and by Henshaw (1874*a*, 1874*b* and 1875) on the ornithology of the Wheeler Survey.

In connection with the Death Valley Expedition of the United States Biological Survey, field work took Dr. C. Hart Merriam and Vernon Bailey into the southwestern part of Utah during the spring of 1891. Previously, Vernon Bailey had made a trip into the Virgin Valley of southwestern Utah in the winter of 1888-1889. Merriam and Bailey came into Utah from Nevada and collected a few birds on the west slope of the Beaver Dam Mountains, and others along the lower Santa Clara Valley in the vicinity of St. George. From there, they journeyed north successively through Diamond Valley, Mountain Meadows, Pine Valley, Shoal Creek, the Escalante Desert and then westward into Nevada again. Their data were incorporated in the main report on the expedition by Fisher (1893).

Reports of later years are as follows: Tanner (1927) presented notes on 81 species of birds collected in the Virgin River Valley. Presnall (1935*a*) compiled a list of birds of Zion National Park. Ross Hardy and Harold Higgins began making observations on the birds of the area in the autumn of 1938, and their data together with

that summarized from the literature have recently been published (Hardy and Higgins, 1940) as "An Annotated Check-List of the Birds of Washington County, Utah." Occasional short notes have appeared from time to time of late by various authors recording the occurrence of rare species or birds new to the area. These are all included in the bibliography. Inasmuch as Hardy and Higgins (*op. cit.*) have summarized the records in the literature, no reference is made to early records in this report except in a few special cases. Unless otherwise stated, all localities mentioned in the species accounts are in Washington County, Utah.

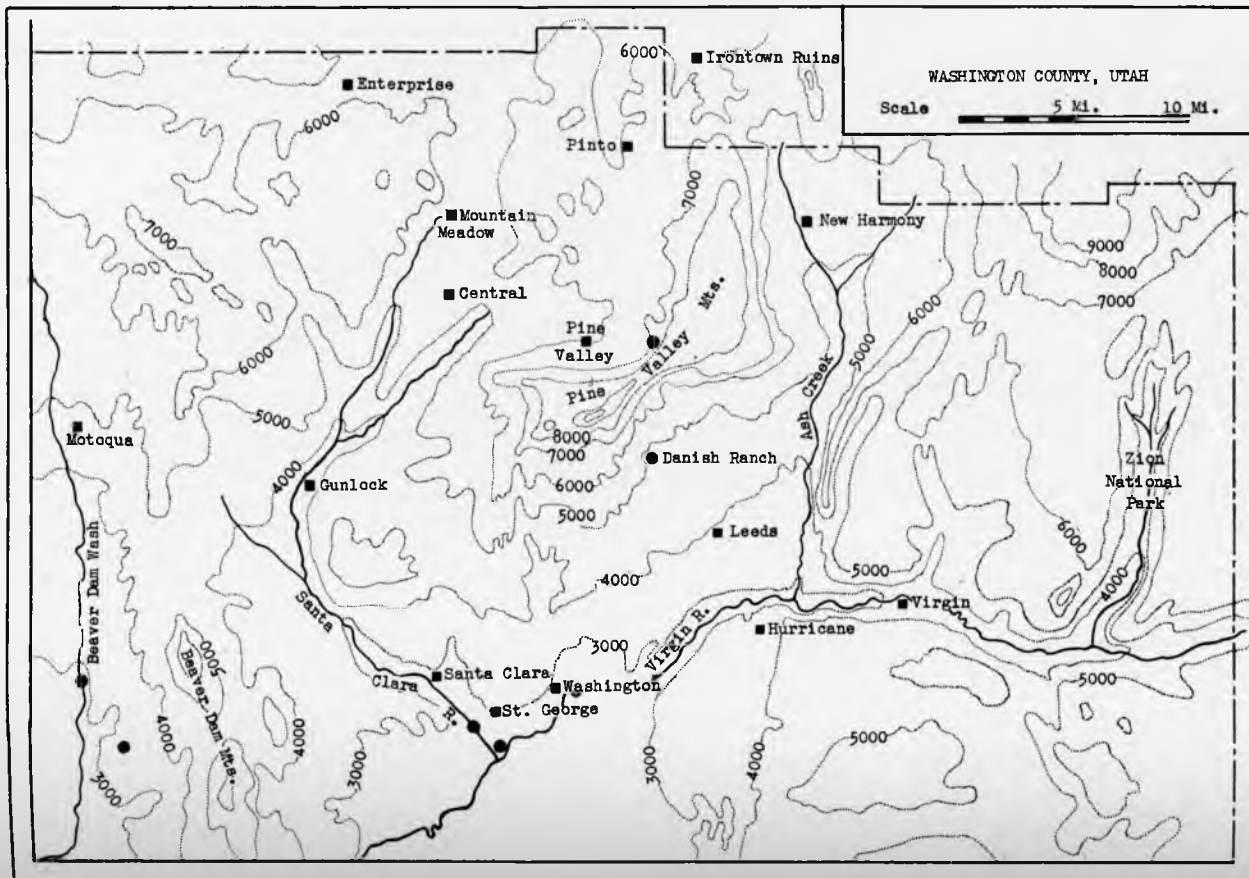
A combination of many factors seems to be operative either directly or indirectly in determining the presence or absence of birds in any given region. In order to provide a background for an understanding of the distribution of the birds of southwestern Utah, it seems desirable to present a broad picture of the topography of the region, the floristic features and avian habitats.

TOPOGRAPHY AND CLIMATE

The Pine Valley and Beaver Dam mountains are the southernmost mountains in Utah of a chain of prominent ranges that extend south and southwestward throughout the length of the state—a chain marking in general the eastern limits of the Great Basin and the western limits of a vast mountainous area and high plateau land which extends east to the Rocky Mountains. Thus, the area studied is adjacent to the high plateau country of central southern Utah. While the two mountain ranges included in the section are not true Great Basin ranges, nevertheless, they do skirt the southernmost extension of the Great Basin in Utah. Their north slopes drain into the Great Basin. Consequently, the area has close contact with that type of country. Furthermore, by way of the Virgin River, the area is associated with the Colorado River drainage and thus has a close relationship with the great Colorado Desert to the south. This physiographic position is important in interpreting the faunal relationships of the region which will be discussed in a later section.

The Pine Valley Mountains are more prominent than the Beaver Dam Mountains. The former reach an extreme elevation of 10,324 feet; the latter have a maximum elevation of about 7,200 feet. The general trend of both ranges is northeast and southwest, although at the southern portion of the Pine Valley Mountains there is a westward extension for a short distance. On the eastern and southern faces of the Pine Valley Mountains an abrupt face is presented. On the west and north sides there is a more gradual ascent. As a consequence, one encounters frequent canyons cutting back into the mountain mass from the west side. Also there are more foothills on the north and west sides than on the east and southern slopes.

To the east the Pine Valley Mountains are separated from the Kolob Plateau by Ash Creek and Shirtz Creek. To the west of the Pine Valley Mountains there is a foothill type of country along the Santa Clara drainage. Still farther to the southwest lie the Beaver Dam Mountains, which slope gradually toward lower elevations on



Map of Washington County, southwestern Utah, showing general topography. Spots represent base camps where collections were made. Squares represent towns and locations mentioned in text.

either side with no pronounced canyons cutting back into them. The Beaver Dam Wash is at the west base of the Beaver Dam Mountains and extends south into Arizona joining the Virgin River near Littlefield.

As to drainage systems in southwestern Utah, the Virgin River has its headwaters on the Kolob Plateau or Terrace, passes through Zion Canyon which it has cut, flows southwesterly along the Virgin River Valley, and through a cut separating the Beaver Dam Mountains in Utah from the Virgin Range in Arizona. The Virgin River is a tributary of the Colorado River which it formerly entered, but now it flows into Lake Meade, formed as a consequence of Boulder Dam having been built across the Colorado River. The Virgin River, below the junction of its two forks receives as tributaries in Utah, North Creek, La Verkin Creek, Ash Creek and the Santa Clara Creek or River as it is variously called. Along the lower portion of Santa Clara Creek the country opens out and is known as the Lower Santa Clara Valley. Santa Clara Creek joins the Virgin River just south of St. George.

North of the Santa Clara drainage and north of the Pine Valley Mountains is situated the Escalante Desert, a former embayment of the Pleistocene Lake Bonneville. It is part of and continuous with the flat desert "Great Basin" type of country.

As an indication of climatic conditions in the lowland section, the following data pertain to St. George. Based on records over a period of twenty-five years, the mean annual precipitation there is 8.23 inches. The average annual temperature is 59° F. Thus, it is the hottest place in Utah. The mean date of the last killing frost in spring is April 19, the first in fall October 14. This leaves an average length of growing season between killing frosts of 178 days. The average and absolute hottest days in summer are 109° F. and 115° F. respectively. The average and absolute coldest days in winter are + 5° F. and - 11° F. respectively. In January, 1937, an unusual cold spell occurred when there was more than a week of subzero weather. On two days the temperature dropped to - 11° F. The previous low was - 4° F. recorded on three consecutive days in late December, 1909. The effect of the 1937 cold spell on the vegetation of the area has been discussed by W. P. Cottam (1937), Fosberg (1938) and Woodbury (1938).

FLORISTIC FEATURES OF THE REGION

Each kind of bird, as Grinnell (1914) has pointed out, requires in accordance with its inherent structural features, certain environmental conditions so that it can carry out its instinctive routine involving such items as feeding, resting and breeding. For these items birds are dependent largely upon plant associations. One of the most impressive floristic features of the Pine Valley Mountain region is the belting of vegetation. Starting at lower elevations one encounters a most distinctive belt, the so-called covillea belt. Its main component is *Larrea divaricata*, the creosote bush. This shrub is characteristic of the drier plains, mesas and hill sides, occurring extensively up to 3500 feet. Associated with the creosote bush is another low shrub which over-laps in places with the higher artemisia belt. This is the



Fig. 2. The Virgin River and its valley looking downstream from Washington. Note the muddy water and exposed sand bars, which attract many transient shore birds, the willow thickets along the river margins and the scattered cottonwood groves.



Fig. 3. View looking north across the Washington fields south of the Virgin River. The Pine Valley Mountains loom up in the background.

bur-sage (*Franseria dumosa*). Prominent in many places in the covillea belt and affording cover for birds are various species of *Baccharis*. Also in the covillea belt but along canyons or plains where there is a fairly high water table, are to be found such tree-like types as the screw-bean (*Strombocarpa odorata*), the mesquite (*Prosopis glandulosa*) and the desert willow (*Chilopsis linearis*). The acacia (*Acacia greggi*) occurs only over about ten square miles in the extreme southwestern corner of the state and even then very locally.

In the river bottoms of this lowland country a dense growth of vegetative cover is formed of cottonwoods (*Populus fremontii*), willows (*Salix exigua* and *S. goodingii*), the non-native tamarix (*Tamarix gallica*), ash (*Fraxinus coriacea*), arrow brush (*Pluchea sericea*), wild grape (*Vitis arizonica*), squawbush (*Rhus trilobata* and *R. utahensis*), and Fremont barberry (*Berberis fremontii*). The last named occurs extensively throughout the region, forming dense stands locally on open slopes and benchland. The Joshua tree (*Clistoyucca brevifolia*) extends into Utah along the Beaver Dam Wash and the west slope of the Beaver Dam Mountains and there is found in the upper part of the covillea belt, ranging up to the artemisia and juniper belts. The Joshua tree is closely associated with the bur-sage, previously mentioned, and one other shrub occurring in the region, namely, black-brush (*Coleogyne ramosissima*).

These latter two mark the transition between this southern desert shrub vegetation and the next belt above which is likewise a belt of shrubby growth called by Shantz (1925 : 16) the northern desert shrub type of vegetation. It is also known as the artemisia belt because of the various types of sagebrush (*Artemisia tridentata*, *A. spinescens*, *A. nova*). Associated shrubs are rabbit-brush (*Chrysothamnus puberulus*), shadscale (*Atriplex confertifolia*), mat saltbush (*Atriplex corrugata*) and gray molly (*Kochia vestita*). The presence of these various components and others of the desert shrub is determined largely by edaphic factors.

Next is the distinctive piñon- juniper forest made up of the piñon pine (*Pinus monophylla*) and two junipers (*Juniperus utahensis* and *J. scopulorum*). This has been termed the pygmy forest or pygmy conifers because of the relatively low habit of the the trees as compared to the taller coniferous forest of higher elevations. Extreme elevations of the forest in the region are 3200 feet and 7000 feet. The best stands range from approximately 5000 to 6000 feet. In many places this forest overlaps with the artemisia belt. It is thought that limited moisture is responsible, at least in part, for the stunted growth of these trees. This seems plausible when one notes that at the upper limits of the forest, the trees are considerably larger and more closely spaced than at lower elevations where annual precipitation is considerably less. In the higher limits of this forest the stands seem to be principally of piñon pines. At the lower limits the situation is reversed with mostly junipers prevailing.

The pygmy forest is not continuous throughout the region and in the intervening areas are to be found sage, cliff rose (*Cowania stansburyana*), service berry (*Amelanchier alnifolia*), and at higher elevations bordering on the next belt above are stands of mountain mahogany (*Cercocarpus ledifolius*).



Fig. 4. Santa Clara bench with the red cliffs in the background. Here the junipers reached their lowest elevation at about 3200 feet. Among the breeding birds found on this bench were road-runners, western gnatcatchers, Nevada shrikes, Brewer sparrows and desert black-throated sparrows.



Fig. 5. A view of the creosote bush or covillea belt of southwestern Utah. Birds occurring in the belt during the breeding season were the Costa hummingbird, ash-throated flycatcher, Arizona verdin, Nevada shrike and desert black-throated sparrow.

Above the pygmy forest is a belt of yellow pine (*Pinus ponderosa*). Sampson (1925:24) indicates the altitudinal limits as being 6200 feet to 7600 feet which corresponds closely with our findings. The distribution of the yellow pines is rather spotty, allowing for growths of scrub oak (*Quercus gambelii*). Sampson (*op. cit.* p. 28) calls this belt the yellow pine and oak brush belt because of the extensive growth of the oak. In the intervening areas between the stands of yellow pine and even extending lower into the pygmy forest belt are also to be found other conspicuous shrub types such as antelope-brush (*Purshia tridentata*), squaw-apple (*Peraphyllum ramosissimum*), manzanita (*Arctostaphylos platyphylla* and *A. pungens*), mountain lilac (*Ceanothus gregii*) and service berry (*Amalanchier utahensis*). Many types of herbs form a sparse covering for the forest floor. Along upper stream courses in the yellow pine belt, especially in canyons, a stream-side thicket or canyon bottom vegetation is made up of birches (*Betula fontinalis*), alders (*Alnus tenuifolia*) and choke cherry (*Prunus melanocarpa*). Along lower stretches of the streams are dense stands of narrow leafed cottonwoods (*Populus angustifolia*). About the highest elevation for the cottonwoods is 7000 feet. Above that, this deciduous stream-side tree was replaced by its relative, the aspen (*Populus tremuloides*), although the latter is not entirely a streamside or a canyon bottom inhabitant. Also along the streams as they flow into open country is a dense stream-side thicket of willows (*Salix lutea* and *S. bebbiana*) with occasional hawthorns (*Crataegus rivularis*).

Above the yellow pine belt there occur stands of blue spruce (*Picea pungens*), white fir (*Abies concolor*), and aspen. This aspen-spruce-fir belt is rich in bird life. Altitudinal limitations are about 8000 feet to 9500 feet. The aspens seem to be most abundant in canyon floors along stream courses, but the largest are on the edges of wet meadows around 8500 feet.

Overlapping with the blue spruces and white firs at their upper limits are Englemann spruces (*Picea engelmanni*) and alpine firs (*Abies lasiocarpa*). This upper spruce-fir zone starts around 9500 feet and extends to the summit of the Pine Valley Mountains, at 10,324 feet. Douglas firs (*Pseudotsuga taxifolia*) are fairly common in the Pine Valley Mountains occurring in the aspen-spruce-fir belt primarily but also extending up to the tops of the mountains and thus occurring in the Englemann spruce-alpine fir belt. Covering the more rocky areas at high elevations the limber pine (*Pinus flexilis*) occurs. The fox-tail pine (*Pinus aristata*) likewise occurs sparsely in the Pine Valley Mountains.

To summarize these vegetative features, the great range of altitude in the region with accompanying climatic and temperature change has made for considerable floristic diversity which takes the form of belts of many related plant associations representing, for the most part, climax vegetative types. These belts occur one above the other but with considerable overlapping between. For that reason the altitudinal limitations given are but approximations. Expressing this plant distribution in terms of life zones, the range is from Lower Sonoran up to Hudsonian. Extremes beyond these are not present,



Fig. 6. Benchland along the Beaver Dam Wash in the Lower Sonoran zone. Cactus wrens used the cholla cactus bushes as nesting sites.



Fig. 7. West slope of the Beaver Dam Mountains, about 3500 feet, in the Joshua tree belt. In such a habitat the cactus woodpecker and Scott oriole were found.

for no Arctic-Alpine features are present, nor are there any extreme Lower Sonoran plant types present such as one finds in Sonora, Mexico, southern Arizona and the Lower Colorado Valley. Rather, in Utah one finds the "higher" types of the Lower Sonoran zone. In brief, the altitudinal range of the Lower Sonoran in Utah is from 2000 to 3500 feet. The best plant indicators are acacia, mesquite, screwbean, desert-willow, creosote bush and bur-sage. The Upper Sonoran zone embraces the lowlands and foothills from roughly 3500 feet up as high as 6500 feet and thus includes the sagebrush and piñon juniper forest. Next comes the Transition zone between 6500 and 8000 feet, characterized by such plants as the Gambel oak and western yellow pine and along stream courses the narrow leafed cottonwoods and the birches. The Canadian zone is rather distinctive between 8000 feet and 9500 feet where stands of white firs, blue spruces and aspens occur. The Hudsonian zone is rather poorly represented but ranges between the limits of 9500 and 10,324 feet. Plant indicators are the Englemann spruce and alpine fir.

HABITATS AND AVIAN INHABITANTS

The aquatic habitat with refinements such as rain pools, ponds, lakes, reservoirs, streams, and rivers is responsible in large part for the abundance of the avifauna of the region. Not only does the water and the accompanying vegetation attract a few permanently resident or summer resident species such as the Anthony green heron, black-crowned night heron, killdeer, kingfisher, and dipper, but the river systems also serve as a factor in seasonally attracting transient shore and water birds. The great majority of the shore and water birds known from Utah have been reported from Washington County as indicated by the accompanying check-list of birds from the area. That even playa lakes, which are occasionally formed, attract great numbers of migrant shore birds is shown by Tanner (1941) who lists several species and their approximate numbers observed on one such lake formed after a period of unusually heavy precipitation in the spring of 1941. No large, natural, mountain lakes are present in the region, although a few reservoirs have been constructed which temporarily attract some aquatic birds.

Another influence of the waterways on bird distribution is the promotion of an extensive river bottom vegetative growth which might well be considered a distinctive habitat of the region. Certainly, the deciduous woodland along the lower stretches of the Santa Clara and Virgin rivers possesses one of the most varied and abundant bird populations of the region. The component plants of the river bottoms have been previously listed. They harbor during the breeding season such birds as the Gambel quail, barn owl, Grand Canyon screech owl, western horned owl, red-shafted flicker, Arkansas kingbird, black phoebe, Little flycatcher, vermilion flycatcher, Arizona vireo, Lucy warbler, Rocky Mountain yellow warbler, long-tailed chat, Bullock



Fig. 8. Sagebrush and junipers near Mountain Meadows, 6500 feet. Birds breeding in the sagebrush areas were sage hens, sage thrashers, vesper sparrows, northern sage sparrows and Brewer sparrows.



Fig. 9. Pygmy forest of pinon pines and junipers with sagebrush in intervening areas. This is the type locality of the gray titmouse. Species confined to the pygmy forest during the breeding season are the gray flycatcher, gray titmouse, lead-colored bush tit, pinon jay and black-throated gray warbler. Photographed June 14, 1938.

oriole, Arizona hooded oriole, dwarf cowbird, Rocky Mountain black-headed grosbeak, western blue grosbeak, green-backed goldfinch, and Abert towhee. In the winter there is replacement of some of these kinds by numerous other species, mostly fringillids that come into the lowlands as winter visitants.

Overflows from the river systems together with springs and seepage areas make for some marsh habitat in this desert country. In such areas the usual sedges, tules, and cattails prevail, and one is impressed with their lush growth. In association with these marsh areas one finds such permanent residents or summer residents as the black-crowned night heron, western least bittern, coot, Virginia rail, sora rail, western marsh wren, western yellow throat, redwing blackbird, yellow-headed blackbird and Virgin River song sparrow.

In the more or less open country of the lowlands, a number of species of birds exist that are not restricted to any one of the many plant associations there. These are in part birds of the soaring type, such as turkey vulture, western red-tailed hawk, Swainson hawk and ferruginous rough-leg hawk. Also found in this open country are such species as the mourning dove, California cuckoo, roadrunner, black-chinned hummingbird, ash-throated flycatcher, western crow, Arizona verdin, desert wren, western mockingbird, phainopepla, Nevada shrike, western meadowlark, desert house finch, western vesper sparrow, desert black-throated sparrow, Brewer sparrow and doubtless others. This open country habitat includes the meadow, prairie and grassland associations or habitats of some authors, as well as the foothill and benchland habitats of others.

On the west slope of the Beaver Dam Mountains a rather distinctive avian habitat was encountered consisting of Joshua trees, cholla cactus, black brush, and creosote bush. In such an association occur typically the following breeding birds: Gambel quail, Costa hummingbird, ash-throated flycatcher, northern cactus wren, Leconte thrasher, crissal thrasher, Nevada shrike, Scott oriole, gray vireo, green-tailed towhee, desert black-throated sparrow, and Brewer sparrow.

In the higher and more northern portions of the region extensive stands of sagebrush make up a distinctive habitat. Nearly always associated with this floristic cover were sage hens, sage thrashers, vesper sparrows, lark sparrows, sage sparrows and Brewer sparrows.

Along the water courses of the higher country, the stream-side thicket was the favorite place for Rocky Mountain yellow warblers, lazuli buntings and mountain song sparrows. Often extending back from the thicket were meadows frequented by Brewer blackbirds and redwing blackbirds which occasionally come to the willow thickets.

Another of the distinctive associations and habitats of the region was the juniper-piñon pine or pygmy forest which had many avian inhabitants. Several species were strictly confined to this one habitat during the breeding season. They include the gray flycatcher, gray titmouse, lead-colored bush tit, piñon jay, and black-throated gray warbler. Types of birds found in the pygmy forest more frequently than in any other habitat but not invariably there were the Say phoebe, western gnatcatcher, chipping sparrow and Woodhouse jay.



Fig. 10. Typical stream and yellow pine forest of the Pine Valley Mountains at 7500 feet. Among the breeding birds encountered in such a habitat were western wood peewees, Rocky Mountain nuthatches, black-eared nuthatches, western robins, Rocky Mountain black-headed grosbeaks, and gray-headed juncos.



Fig. 11 The village of Pine Valley with part of the Pine Valley Mountains in the background. Habitats shown include cultivated fields, stream side thickets, cottonwoods, sagebrush, juniper-pinon forest on the lower mountain slopes and a spruce-fir forest above.

Where the pygmy forest blends with mountain ash, scrub oak and service berry, were to be found the gray and plumbeous vireos, the Virginia warbler, Macgillivray warbler, Rocky Mountain orange-crowned warbler, and desert black-chinned sparrow.

Extensive stands of mountain mahogany form a conspicuous habitat in some sections, and there were commonly found the Rocky Mountain black-headed grosbeak, spurred towhee, green-tailed towhee and chipping sparrow.

The yellow pine forest had such constant bird associates as the gray-headed junco, western wood peewees, black-eared nuthatches, Rocky Mountain nuthatches and chestnut-backed bluebirds.

Aspen groves were favorite places for the red-naped sapsuckers, hairy woodpeckers, Wright flycatchers, Audubon hermit thrushes and Audubon warblers.

The spruce-fir coniferous forest probably had more avian inhabitants than any other habitat except the river-bottom thicket. The birds found frequenting such a coniferous environment were the goshawk, Cooper hawk, dusky grouse, band-tailed pigeon, great horned owl, calliope hummingbird, red-shafted flicker, white-breasted woodpecker, alpine three-toed woodpecker, Hammond flycatcher, olive-sided flycatcher, pallid Steller jay, Clark nutcracker, Inyo chickadee, Rocky Mountain nuthatch, red-breasted nuthatch, black-eared nuthatch, Rocky Mountain creeper, western robin, Townsend solitaire, western golden-crowned kinglet, western ruby-crowned kinglet, Audubon warbler, Grace warbler, western tanager, Cassin purple finch, northern pine siskin, and gray-headed junco.

In this region as elsewhere, one finds associated with rocky conditions the white-throated swift, rock wren and canyon wren.

AVIFAUNAL POSITION OF THE REGION

The richness of the avifauna of Washington County, Utah, is to be accounted for largely on the basis of its being a meeting ground of several avifaunas. A projection of the southern desert conditions extends along the Virgin River into Utah, and, therefore, in the Santa Clara and Virgin River valleys and associated fringe areas we find many representatives of the avifauna of the southern desert biotic area. These are as follows: Anthony green heron (*Butorides virescens anthonyi*), Gambel quail (*Lophortyx gambeli gambeli*), road-runner (*Geococcyx californianus*), western horned owl (*Bubo virginianus pallescens*), Texas night-hawk (*Chordeiles acutipennis texensis*), Costa hummingbird (*Calypte costae*), white-breasted woodpecker (*Dryobates villosus leucothorectis*), Yuma ladder-backed woodpecker (*Dryobates scalaris yumanensis*), Cassin kingbird (*Tyrannus vociferans*), northern black phoebe (*Sayornis nigricans semiatra*), Vermilion flycatcher (*Pyrocephalus rubinus mexicanus*), pallid Steller jay (*Cyanocitta stelleri percontatrix*), Arizona verdin (*Auriparus*



Fig. 12. The lower limits of the spruce-fir forest of the Pine Valley Mountains at 8000 feet. The vegetative belt below the conifers consisted mostly of Gambel oaks but in addition maples, mountain mahogany and manzanita.



Fig. 13. Whipple Meadow, 8500 feet, Pine Valley Mountains. The forest in the background consists of aspens, spruces and firs. Some common breeding birds found here were broad-tailed hummingbirds, pallid Steller jays, Inyo chickadees, Audubon warblers, western warbling vireos, and gray-headed juncos. Photographed June 26, 1938.

flaviceps acaciarum), northern cactus wren (*Heleodytes brunnei-capillus couesi*), Leconte thrasher (*Toxostoma lecontei lecontei*), crissal thrasher (*Toxostoma dorsale dorsale*), phainopepla (*Phainopepla nitens lepida*), Arizona vireo (*Vireo belli arizonae*), gray vireo (*Vireo vicinior*), Lucy warbler (*Vermivora luciae*), tule yellowthroat (*Geothlypis trichas scirpicola*), Grace warbler (*Dendroica graciae graciae*), Arizona hooded oriole (*Icterus cucullatus nelsoni*), Scott oriole (*Icterus parisorum*), dwarf cowbird (*Molothrus ater obscurus*), western blue grosbeak, (*Guiraca caerulea interfusa*), Abert towhee (*Pipilo aberti*), and the Virgin River song sparrow (*Melospiza melodia fallax*).

To the northward in Washington County adjacent to the Escalante Desert, one encounters the Great Basin avifauna. Representatives are as follows: sage hen (*Centrocercus urophasianus*), gray flycatcher (*Empidonax griseus*), Woodhouse jay (*Aphelocoma californica woodhousei*), American magpie (*Pica pica hudsonia*), American Raven (*Corvus corax sinuatus*), piñon jay (*Gymnorhinus cyanocephalus*), Inyo chickadee (*Parus gambelli inyoensis*), gray titmouse (*Parus inornatus ridgwayi*), lead-colored bush-tit (*Psaltriparus minimus plumbeus*), sage thrasher (*Oreoscoptes montanus*), black-throated gray warbler (*Dendroica nigrescens*), western yellow-throat (*Geothlypis trichas occidentalis*), Nevada cowbird (*Molothrus ater artemisiae*), western vesper sparrow (*Pooecetes gramineus confinis*), northern sage sparrow (*Amphispiza nevadensis nevadensis*), and mountain song sparrow (*Melospiza melodia montana*).

In the Pine Valley Mountains are a number of geographically variable birds that are similar to or have closest relationships with the Rocky Mountain populations. These are the dusky grouse (*Dendragapus obscurus obscurus*), Montana horned owl (*Bubo virginianus occidentalis*), Rocky Mountain pygmy owl (*Glaucidium gnoma pinicola*), Batchelder woodpecker (*Picoides tridactylus dorsalis*), Rocky Mountain nuthatch (*Sitta carolinensis nelsoni*), black-eared nuthatch (*Sitta pygmaea melanotis*), Audubon hermit thrush (*Hylocichla guttata auduboni*), Rocky Mountain orange-crowned warbler (*Vermivora celata orestera*), Rocky Mountain Audubon warbler (*Dendroica auduboni memorabilis*), Rocky Mountain black-headed grosbeak (*Hedymeles melanocephalus melanocephalus*) and the spurred towhee (*Pipilo maculatus montanus*).

The mixing of faunal derivatives of the region can be explained to some extent on the basis of the intermediate physiographic position of the area as previously noted. While the Rocky Mountain and Great Basin influence seems to be strongly impressed, it is significant that southern and southwestern forms are so well represented. For some of these races of the southern group listed, it means a great extension of range northward. That there should be distinctive avifaunas in the Virgin River Valley and the Great Basin portions of the section, is consistent with the life zone situation. In the river valley, Lower Sonoran conditions prevail; in the Great Basin the Upper Sonoran Zone is present.

CHECK-LIST OF THE BIRDS OF WASHINGTON COUNTY, UTAH

Inasmuch as the species accounts do not constitute a complete summary of all the birds known from southwestern Utah, the following check-list has been compiled from the writer's data and the literature. Included for each kind is its status as well as now known to the writer. Some forms are listed as permanent residents for the region because they are summer residents in the mountains and winter visitants in the lowlands. Some of the transient shore birds and water birds occasionally winter over along the Virgin River, but even so they are primarily through-migrants. Future field work in the region will no doubt change present concepts of the status of several forms. This will probably be true especially of many shore birds and water birds here listed as transients but which may breed in small numbers along the Virgin River.

The list totals two hundred fifty-four kinds of which sixty-eight or 27% are permanent residents, ninety-three or 37%, are summer residents, twenty-three or about 9% are winter visitants, sixty-three or 25% are transients and six are accidental. These figures can only be approximate on account of the meager information concerning many of the kinds. The terminal bibliography contains citations to all publications known to the writer pertaining to the birds of the region. Sequence of the kinds in this list is that of the Check-list of North American Birds (4th ed., 1931) of the American Ornithologists' Union.

<i>Scientific Name</i>	<i>Common Name</i>	<i>Status</i>
<i>Gavia immer elasson</i> Bishop	Lesser Loon	Transient
<i>Colymbus nigricollis californicus</i> (Heerman)	Eared Grebe	Transient
<i>Podilymbus podiceps podiceps</i> (Linnaeus)	Pied-billed Grebe	Transient
<i>Pelecanus erythrorhynchos</i> Gmelin	White Pelican	Transient
<i>Phalacrocorax auritus auritus</i> (Lesson)	Double-crested Cormorant	Transient
<i>Ardea herodias treganzai</i> Court	Treganza Heron	Transient
<i>Casmerodias albus egretta</i> (Gmelin)	American Egret	Transient
<i>Egretta thula brewsteri</i> Thayer and Bangs	Brewster Egret	Transient
<i>Butorides virescens anthonyi</i> (Mearns)	Anthony Green Heron	Summer Resident
<i>Nycticorax nycticorax</i> <i>hoactli</i> (Gmelin)	Black-crowned Night Heron	Summer Resident
<i>Botaurus lentiginosus</i> (Montagu)	American Bittern	Transient
<i>Ixobrychus exilis hesperis</i> Dickey and van Rossem	Western Least Bittern	Summer Resident
<i>Mycteria americana</i> Linnaeus	Wood Ibis	Transient

<i>Scientific Name</i>	<i>Common Name</i>	<i>Status</i>
<i>Plegadis guarauna</i> Linnaeus	White-faced Glossy Ibis	Transient
<i>Cygnus columbianus</i> (Ord)	Whistling Swan	Transient
<i>Branta canadensis canadensis</i> (Linnaeus)	Common Canada Goose	Transient
<i>Anser albifrons albifrons</i> (Scopoli)	White-fronted Goose	Transient
<i>Chen hyperborea hyperborea</i> Pallas	Lesser Snow Goose	Transient
<i>Anas platyrhynchos platyrhynchos</i> Linnaeus	Common Mallard	Transient
<i>Chaulelasmus streperus</i> (Linnaeus)	Gadwall	Transient
<i>Mareca americana</i> (Gmelin)	Baldpate	Transient
<i>Dafila acuta tzitzihoa</i> (Vieillot)	American Pintail	Transient
<i>Nettion carolinense</i> (Gmelin)	Green-winged Teal	Transient
<i>Querquedula discors</i> (Linnaeus)	Blue-winged Teal	Transient
<i>Querquedula cyanoptera</i> (Vieillot)	Cinnamon Teal	Permanent Resident
<i>Spatula clypeata</i> (Linnaeus)	Shoveller	Transient
<i>Nyroca americana</i> (Eyton)	Redhead	Transient
<i>Nyroca collaris</i> (Donovan)	Ring-necked Duck	Transient
<i>Nyroca valisineria</i> (Wilson)	Canvas-back	Transient
<i>Nyroca affinis</i> (Eyton)	Lesser Scaup Duck	Transient
<i>Glaucionetta clangula americana</i> (Bonaparte)	American Golden-eye	Transient
<i>Glaucionetta islandica</i> (Gmelin)	Barrow Golden-eye	Transient
<i>Charitonetta albeola</i> (Linnaeus)	Buffle-head	Transient
<i>Erismatura jamaicensis rubida</i> (Wilson)	Ruddy Duck	Transient
<i>Mergus merganser americanus</i> Cassin	American Merganser	Transient
<i>Mergus serrator</i> Linnaeus	Red-breasted Merganser	Transient
<i>Cathartes aura teter</i> Friedmann	Western Turkey Vulture	Permanent Resident
<i>Astur atricapillus atricapillus</i> (Wilson)	Eastern Goshawk	Permanent Resident
<i>Accipiter striatus velox</i> (Wilson)	Sharp-shinned Hawk	Permanent Resident
<i>Accipiter cooperi</i> Swainson	Cooper Hawk	Permanent Resident
<i>Buteo jamaicensis calurus</i> Cassin	Western Red-tailed Hawk	Permanent Resident
<i>Buteo swainsoni</i> Bonaparte	Swainson Hawk	Summer Resident

<i>Scientific Name</i>	<i>Common Name</i>	<i>Status</i>
<i>Buteo regalis</i> (Gray)	Ferruginous Rough-leg	Permanent Resident
<i>Aquila chrysaetos canadensis</i> (Linnaeus)	Golden Eagle	Permanent Resident
<i>Haliaeetus leucocephalus</i> <i>leucocephalus</i> (Linnaeus)	Southern Bald Eagle	Permanent Resident
<i>Circus hudsonius</i> (Linnaeus)	Marsh Hawk	Permanent Resident
<i>Pandion haliaetus carolinensis</i> (Gmelin)	Osprey	Transient
<i>Falco mexicanus</i> Schlegel	Prairie Falcon	Permanent Resident
<i>Falco peregrinus anatum</i> Bonaparte	Duck Hawk	Permanent Resident
<i>Falco columbarius bendirei</i> Swann	Western Pigeon Hawk	Permanent Resident
<i>Falco sparverius sparverius</i> Linnaeus	Eastern Sparrow Hawk	Permanent Resident
<i>Dendragapus obscurus</i> <i>obscurus</i> (Say)	Dusky Grouse	Permanent Resident
<i>Centrocercus urophasianus</i> (Bonaparte)	Sage Hen	Permanent Resident
<i>Perdix perdix perdix</i> (Linnaeus)	European Partridge	Introduced (Probably no survivors)
<i>Lophortyx gambelii gambelii</i> Gambel	Gambel Quail	Permanent Resident
<i>Phasianus colchicus torquatus</i> Gmelin	Ring-necked Pheasant	Introduced (Permanent Resident)
<i>Grus canadensis tabida</i> (Peters)	Sandhill Crane	Transient
<i>Rallus limicola limicola</i> Vieillot	Virginia Rail	Summer Resident
<i>Porzana carolina</i> (Linnaeus)	Sora Rail	Summer Resident
<i>Fulica americana americana</i> Gmelin	American Coot	Summer Resident
<i>Charadrius vociferus vociferus</i> Linnaeus	Killdeer	Permanent Resident
<i>Capella delicata</i> (Ord)	Wilson Snipe	Permanent Resident
<i>Numenius americanus</i> <i>americanus</i> Bechstein	Long-billed Curlew	Transient
<i>Actitis macularia</i> (Linnaeus)	Spotted Sandpiper	Summer Resident
<i>Catoptrophorus semipalmatus</i> <i>inornatus</i> (Brewster)	Western Willet	Transient
<i>Totanus melanoleucus</i> (Gmelin)	Greater Yellow-legs	Transient
<i>Totanus flavipes</i> (Gmelin)	Lesser Yellow-legs	Transient
<i>Pisobia minutilla</i> (Vieillot)	Least Sandpiper	Transient
<i>Ereunetes maurii</i> Cabanis	Western Sandpiper	Transient
<i>Recurvirostra americana</i> Gmelin	Avocet	Transient
<i>Himantopus mexicanus</i> (Müller)	Black-necked Stilt	Transient

<i>Scientific Name</i>	<i>Common Name</i>	<i>Status</i>
<i>Phalaropus fulicarius</i> (Linnaeus)	Red Phalarope	Transient
<i>Lobipes lobatus</i> (Linnaeus)	Northern Phalarope	Transient
<i>Larus delawarensis</i> Ord	Ring-billed Gull	Transient
<i>Larus pipixcan</i> Wagler	Franklin Gull	Transient
<i>Columba fasciata fasciata</i> Say	Band-tailed Pigeon	Summer Resident
<i>Zenaidura macroura margin- ella</i> (Woodhouse)	Western Mourning Dove	Summer Resident
<i>Coccyzus americanus occi- dentalis</i> Ridgway	California Cuckoo	Summer Resident
<i>Geococcyx californianus</i> (Lesson)	Road-runner	Permanent Resident
<i>Tyto alba pratincola</i> (Bonaparte)	Barn Owl	Summer Resident
<i>Otus asio mychophilus</i> Oberholser	Grand Canyon Screech Owl	Permanent Resident
<i>Otus flammeolus</i> (Kaup)	Flammulated Screech Owl	Permanent Resident
<i>Bubo virginianus occidentalis</i> Stone	Montana Horned Owl	Permanent Resident
<i>Bubo virginianus lagophonus</i> (Oberholser)	Northwestern Horned Owl	Transient
<i>Bubo virginianus pallescens</i> Stone	Western Horned Owl	Permanent Resident
<i>Glaucidium gnoma pinicola</i> Nelson	Rocky Mountain Pygmy Owl	Permanent Resident
<i>Speotyto cunicularia</i> <i>hypugaea</i> (Bonaparte)	Western Burrowing Owl	Summer Resident
<i>Asio wilsonianus</i> (Lesson)	Long-eared Owl	Summer Resident
<i>Asio flammeus flammeus</i> (Pontoppidan)	Short-eared Owl	Transient
<i>Cryptoglaux acadica acadica</i> (Gmelin)	Saw-whet Owl	Permanent Resident
<i>Phalaenoptilus nuttallii</i> <i>nuttallii</i> (Audubon)	Nuttall Poor-will	Summer Resident
<i>Chordeiles minor howelli</i> Oberholser	Howell Nighthawk	Transient
<i>Chordeiles minor henryi</i> Cassin	Western Night Hawk	Summer Resident
<i>Chordeiles acutipennis texen- sis</i> Lawrence	Texas Nighthawk	Summer Resident
<i>Aeronautes saxatalis</i> <i>saxatalis</i> (Woodhouse)	White-throated Swift	Summer Resident
<i>Archilochus alexandri</i> (Bourcier and Mulsant)	Black-chinned Hummingbird	Summer Resident
<i>Calypte costae</i> (Bourcier)	Costa Hummingbird	Summer Resident
<i>Selasphorus platycercus</i> <i>platycercus</i> (Swainson)	Broad-tailed Hummingbird	Summer Resident

<i>Scientific Name</i>	<i>Common Name</i>	<i>Status</i>
<i>Stellula calliope</i> (Gould)	Calliope Hummingbird	Summer Resident
<i>Megaceryle alcyon caurina</i> (Grinnell)	Western Belted Kingfisher	Summer Resident
<i>Colaptes auratus</i> (Linnaeus)	Yellow-shafted Flicker	Accidental
<i>Colaptes cafer collaris</i> Vigors	Red-shafted Flicker	Permanent Resident
<i>Asyndesmus lewis</i> Gray	Lewis Woodpecker	Transient
<i>Sphyrapicus varius nuchalis</i> Baird	Red-naped Sapsucker	Summer Resident
<i>Dryobates villosus leuco- thorectis</i> Oberholser	White-breasted Woodpecker	Permanent Resident
<i>Dryobates pubescens leucurus</i> (Hartlaub)	Batchelder Woodpecker	Permanent Resident
<i>Dryobates scalaris yumanensis</i> van Rossem	Yuma Ladder-backed Woodpecker	Permanent Resident
<i>Picoides tridactylus dorsalis</i> Baird	Alpine Three-toed Woodpecker	Permanent Resident
<i>Tyrannus tyrannus</i> (Linnaeus)	Eastern Kingbird	Summer Resident
<i>Tyrannus verticalis</i> Say	Arkansas Kingbird	Summer Resident
<i>Tyrannus vociferans</i> Swainson	Cassin Kingbird	Summer Resident
<i>Myiarchus cinerascens</i> <i>cinerascens</i> (Lawrence)	Ash-throated Flycatcher	Summer Resident
<i>Sayornis nigricans semiatra</i> (Vigors)	Northern Black Phoebe	Permanent Resident
<i>Sayornis saya saya</i> (Bonaparte)	Say Phoebe	Summer Resident
<i>Empidonax traillii brewsteri</i> Oberholser	Little Flycatcher	Summer Resident
<i>Empidonax hammondi</i> (Xantus)	Hammond Flycatcher	Summer Resident
<i>Empidonax wrightii</i> Baird	Wright Flycatcher	Summer Resident
<i>Empidonax griseus</i> Brewster	Gray Flycatcher	Summer Resident
<i>Myiochanes richardsonii</i> <i>richardsonii</i> (Swainson)	Western Wood Pewee	Summer Resident
<i>Nuttallornis borealis</i> <i>borealis</i> (Swainson)	Olive-sided Flycatcher	Summer Resident
<i>Pyrocephalus rubinus</i> <i>mexicanus</i> Sclater	Vermilion Flycatcher	Permanent Resident
<i>Otocoris alpestris utahensis</i> Behle	Great Salt Lake Horned Lark	Permanent Resident
<i>Otocoris alpestris merrilli</i> Dwight	Dusky Horned Lark	Winter Visitant
<i>Tachycineta thalassina lepidus</i> Mearns	Violet-green Swallow	Summer Resident
<i>Iridoprocne bicolor</i> (Vieillot)	Tree Swallow	Summer Resident
<i>Riparia riparia riparia</i> (Linnaeus)	Bank Swallow	Summer Resident
<i>Stelgidopteryx ruficollis</i> <i>serripennis</i> (Audubon)	Rough-winged Swallow	Summer Resident

<i>Scientific Name</i>	<i>Common Name</i>	<i>Status</i>
<i>Hirundo erythrogaster</i> Boddaert	Barn Swallow	Summer Resident
<i>Petrochelidon albifrons</i> <i>hypopolia</i> Oberholser	Northern Cliff Swallow	Summer Resident
<i>Cyanocitta stelleri percontatrix</i> van Rossem	Pallid Steller Jay	Permanent Resident
<i>Aphelocoma californica woodhousei</i> (Baird)	Woodhouse Jay	Permanent Resident
<i>Pica pica hudsonia</i> (Sabine)	American Magpie	Permanent Resident
<i>Corvus corax sinuatus</i> Wagler	American Raven	Permanent Resident
<i>Corvus brachyrhynchos hesperis</i> Ridgway	Western Crow	Permanent Resident
<i>Gymnorhinus cyanocephalus</i> (Wied)	Pinon Jay	Summer Resident
<i>Nucifraga columbiana</i> (Wilson)	Clark Nutcracker	Permanent Resident
<i>Parus atricapillus nevadensis</i> Linsdale	Nevada Long-tailed Chickadee	Permanent Resident
<i>Parus gambeli inyoensis</i> Grinnell	Inyo Chickadee	Permanent Resident
<i>Parus inornatus ridgwayi</i> Richmond	Gray Titmouse	Permanent Resident
<i>Auriparus flaviceps</i> <i>acaciarum</i> Grinnell	Arizona Verdin	Permanent Resident
<i>Psaltriparus minimus</i> <i>plumbeus</i> (Baird)	Lead-colored Bush-tit	Permanent Resident
<i>Sitta carolinensis nelsoni</i> Mearns	Rocky Mountain Nuthatch	Summer Resident
<i>Sitta canadensis canadensis</i> Linnaeus	Red-breasted Nuthatch	Summer Resident
<i>Sitta pygmaea melanotis</i> van Rossem	Black-eared Nuthatch	Summer Resident
<i>Certhia familiaris montana</i> Ridgway	Rocky Mountain Creeper	Summer Resident
<i>Cinclus mexicanus unicolor</i> Bonaparte	Dipper	Permanent Resident
<i>Troglodytes aedon parkmanii</i> Audubon	Western House Wren	Permanent Resident
<i>Nannus hiemalis pacificus</i> (Baird)	Western Winter Wren	Winter Resident
<i>Thryomanes bewickii eremophilus</i> Oberholser	Desert Wren	Permanent Resident
<i>Heleodytes brunneicapillus</i> <i>couesi</i> (Sharpe)	Northern Cactus Wren	Permanent Resident
<i>Telmatodytes palustris</i> <i>plesius</i> (Oberholser)	Western Marsh Wren	Permanent Resident
<i>Catherpes mexicanus conspersus</i> Ridgway	Canyon Wren	Permanent Resident
<i>Salpinctes obsoletus</i> <i>obsoletus</i> (Say)	Common Rock Wren	Permanent Resident

<i>Scientific Name</i>	<i>Common Name</i>	<i>Status</i>
<i>Mimus polyglottos leucopterus</i> (Vigors)	Western Mockingbird	Permanent Resident
<i>Toxostoma rufum</i> (Linnaeus)	Brown Thrasher	Accidental
<i>Toxostoma lecontei lecontei</i> Lawrence	Leconte Thrasher	Permanent Resident
<i>Toxostoma dorsale dorsale</i> Henry	Crissal Thrasher	Permanent Resident
<i>Oreoscoptes montanus</i> (Townsend)	Sage Thrasher	Summer Resident
<i>Turdus migratorius propinquus</i> Ridgway	Western Robin	Permanent Resident
<i>Hylocichla guttata guttata</i> (Pallas)	Alaska Hermit Thrush	Transient
<i>Hylocichla guttata nanus</i> (Audubon)	Dwarf Hermit Thrush	Transient
<i>Hylocichla guttata auduboni</i> (Baird)	Audubon Hermit Thrush	Summer Resident
<i>Sialia mexicana bairdi</i> Ridgway	Chestnut-backed Bluebird	Summer Resident
<i>Sialia mexicana occidentalis</i> Townsend	Western Bluebird	Transient
<i>Sialia currucoides</i> (Bechstein)	Mountain Bluebird	Summer Resident
<i>Myadestes townsendi</i> (Audubon)	Townsend Solitaire	Summer Resident
<i>Poliophtila caerulea</i> <i>amoenissima</i> Grinnell	Western Gnatcatcher	Summer Resident
<i>Regulus satrapa olivaceus</i> Baird	Western Golden- crowned Kinglet	Summer Resident
<i>Corthylio calendula cineraceus</i> (Grinnell)	Western Ruby-crowned Kinglet	Permanent Resident
<i>Anthus rubescens rubescens</i> (Tunstall)	Eastern Pipit	Winter Visitant
<i>Bombycilla garrula pallid-</i> <i>iceps</i> Reichenow	Bohemian Waxwing	Winter Visitant
<i>Bombycilla cedrorum</i> Vieillot	Cedar Waxwing	Permanent Resident
<i>Phainopepla nitens lepida</i> Van Tyne	Phainopepla	Summer Resident
<i>Lanius excubitor invictus</i> Grinnell	Northwestern Shrike	Winter Visitant
<i>Lanius ludovicianus gambeli</i> Ridgway	California Shrike	Winter Visitant
<i>Lanius ludovicianus</i> <i>nevadensis</i> Miller	Nevada Shrike	Summer Resident
<i>Vireo belli arizonae</i> Ridgway	Arizona Vireo	Summer Resident
<i>Vireo vicinior</i> Coues	Gray Vireo	Summer Resident
<i>Vireo solitarius plumbeus</i> Coues	Plumbeus Vireo	Summer Resident

<i>Scientific Name</i>	<i>Common Name</i>	<i>Status</i>
<i>Vireo solitarius cassinii</i> Xantus	Cassin Vireo	Transient
<i>Vireo gilvus leucopolius</i> Oberholser	Oregon Warbling Vireo	Summer Resident
<i>Vermivora celata orestera</i> Oberholser	Rocky Mountain Orange-crowned Warbler	Summer Resident
<i>Vermivora ruficapilla ridgwayi</i> van Rossem	Calaveras Warbler	Transient
<i>Vermivora virginiae</i> (Baird)	Virginia Warbler	Summer Resident
<i>Vermivora luciae</i> (Cooper)	Lucy Warbler	Summer Resident
<i>Dendroica aestiva morcomi</i> Coale	Rocky Mountain Yellow Warbler	Summer Resident
<i>Dendroica auduboni auduboni</i> (Townsend)	Audubon Warbler	Transient
<i>Dendroica auduboni memorabilis</i> Oberholser	Rocky Mountain Audubon Warbler	Summer Resident
<i>Dendroica nigrescens</i> (Townsend)	Black-throated Gray Warbler	Summer Resident
<i>Dendroica graciae graciae</i> Baird	Grace Warbler	Summer Resident
<i>Seiurus noveboracensis</i> subsp.	Water Thrush	Transient
<i>Oporornis tolmiei</i> (Townsend)	Macgillivray Warbler	Summer Resident
<i>Geothlypis trichas occidentalis</i> Brewster	Western Yellow-throat	Transient
<i>Geothlypis trichas scirpicola</i> Grinnell	Tule Yellow-throat	Summer Resident
<i>Icteria virens auricollis</i> Bonaparte	Long-tailed Chat	Summer Resident
<i>Wilsonia pusila pileolata</i> (Pallas)	Northern Pileolated Warbler	Transient
<i>Setophaga picta picta</i> Swainson	Painted Redstart	Accidental
<i>Passer domesticus domesticus</i> (Linnaeus)	English Sparrow	Introduced (Permanent Resident)
<i>Sturnella neglecta</i> Audubon	Western Meadowlark	Permanent Resident
<i>Xanthocephalus xanthocephalus</i> (Bonaparte)	Yellow-headed Blackbird	Summer Resident
<i>Agelaius phoeniceus utahensis</i> Bishop	Utah Redwing	Permanent Resident
<i>Icterus cucullatus nelsoni</i> Ridgway	Arizona Hooded Warbler	Summer Resident
<i>Icterus parisorum</i> Bonaparte	Scott Oriole	Summer Resident
<i>Icterus bullockii</i> (Swainson)	Bullock Oriole	Summer Resident
<i>Euphagus cyanocephalus</i> (Wagler)	Brewer Blackbird	Permanent Resident
<i>Molothrus ater artemisiae</i> Grinnell	Nevada Cowbird	Summer Resident

<i>Scientific Name</i>	<i>Common Name</i>	<i>Status</i>
<i>Molothrus ater obscurus</i> (Gmelin)	Dwarf Cowbird	Summer Resident
<i>Piranga ludoviciana</i> (Wilson)	Western Tanager	Summer Resident
<i>Hedymeles melanocephalus melanocephalus</i> (Swainson)	Rocky Mountain Black-headed Grosbeak	Summer Resident
<i>Guiraca caerulea interfusa</i> Dwight and Griscom	Western Blue Grosbeak	Summer Resident
<i>Passerina cyanea</i> (Linnaeus)	Indigo Bunting	Casual
<i>Passerina amoena</i> (Say)	Lazuli Bunting	Summer Resident
<i>Hesperiphona vespertina brooksi</i> Grinnell	Western Evening Grosbeak	Winter Visitant
<i>Carpodacus cassinii</i> Baird	Cassin Purple Finch	Summer Resident
<i>Carpodacus mexicanus solitudinus</i> Moore	Desert House Finch	Permanent Resident
<i>Leucosticte tephrocotis littoralis</i> Baird	Hepburn Rosy Finch	Winter Visitant
<i>Leucosticte tephrocotis tephrocotis</i> (Swainson)	Gray-crowned Rosy Finch	Winter Visitant
<i>Leucosticte atrata</i> Ridgway	Black Rosy Finch	Winter Visitant
<i>Spinus pinus pinus</i> (Wilson)	Northern Pine Siskin	Permanent Resident
<i>Spinus tristis pallidus</i> Mearns	Pale Goldfinch	Winter Visitant
<i>Spinus psaltria hesperophilus</i> (Oberholser)	Green-backed Goldfinch	Permanent Resident
<i>Loxia curvirostra bendirei</i> Ridgway	Bendire Crossbill	Summer Resident
<i>Oberholseria chlorura</i> (Audubon)	Green-tailed Towhee	Summer Resident
<i>Pipilo maculatus arcticus</i> (Swainson)	Arctic Towhee	Winter Visitant
<i>Pipilo maculatus montanus</i> Swarth	Spurred Towhee	Permanent Resident
<i>Pipilo aberti</i> Baird	Abert Towhee	Permanent Resident
<i>Calamospiza melanocorys</i> Stejneger	Lark Bunting	Transient
<i>Passerculus sandwichensis alaudinus</i> Bonaparte	Western Savannah Sparrow	Winter Visitant
<i>Passerculus sandwichensis nevadensis</i> Grinnell	Nevada Savannah Sparrow	Summer Resident
<i>Poocetes gramineus confinis</i> Baird	Western Vesper Sparrow	Summer Resident
<i>Chondestes grammacus strigatus</i> Swainson	Western Lark Sparrow	Summer Resident
<i>Amphispiza bilineata deserticola</i> Ridgway	Black-throated Sparrow	Summer Resident
<i>Amphispiza nevadensis nevadensis</i> (Ridgway)	Northern Sage Sparrow	Permanent Resident
<i>Junco hyemalis hyemalis</i> (Linnaeus)	Slate-colored Junco	Winter Visitant
<i>Junco oreganus shufeldti</i> Coale	Shufeldt Junco	Winter Visitant

<i>Scientific Name</i>	<i>Common Name</i>	<i>Status</i>
<i>Junco oreganus montanus</i> Ridgway	Montana Junco	Winter Visitant
<i>Junco oreganus mearnsi</i> (Ridgway)	Pink-sided Junco	Winter Visitant
<i>Junco caniceps caniceps</i> (Woodhouse)	Gray-headed Junco	Summer Resident
<i>Spizella arborea ochracea</i> Brewster	Western Tree Sparrow	Winter Visitant
<i>Spizella passerina arizonae</i> Coues	Western Chipping Sparrow	Summer Resident
<i>Spizella breweri breweri</i> Cassin	Brewer Sparrow	Summer Resident
<i>Spizella atrogularis evura</i> Coues	Desert Black-chinned Sparrow	Summer Resident
<i>Zonotrichia querula</i> (Nuttall)	Harris Sparrow	Winter Visitant
<i>Zonotrichia leucophrys leucophrys</i> (Forster)	White-crowned Sparrow	Winter Visitant
<i>Zonotrichia leucophrys gambelii</i> (Nuttall)	Gambel Sparrow	Winter Visitant
<i>Zonotrichia coronata</i> (Pallas)	Golden-crowned Sparrow	Accidental
<i>Passerella iliaca schistacea</i> Baird	Slate-colored Fox Sparrow	Winter Visitant
<i>Melospiza lincolni lincolni</i> (Audubon)	Eastern Lincoln Sparrow	Transient
<i>Melospiza lincolnii alticola</i> Miller and McCabe	Southern Montane Lincoln Sparrow	Transient
<i>Melospiza georgiana</i> (Latham)	Swamp Sparrow	Accidental
<i>Melospiza melodia merrilli</i> Brewster	Merrill Song Sparrow	Winter Visitant
<i>Melospiza melodia montana</i> Henshaw	Mountain Song Sparrow	Summer Resident in mountains, Winter Visitant in lowlands
<i>Melospiza melodia fallax</i> (Baird)	Virgin River Song Sparrow	Summer Resident

SUPPLEMENT TO CHECK-LIST OF THE BIRDS OF WASHINGTON COUNTY, UTAH

A great number of birds likely occurring in the southwestern corner of Utah seem thus far to have escaped the attention of bird observers and collectors. In order to round out the ornithological picture for the area as well as to stimulate further field work, the following hypothetical list is included in this report. Most of the kinds listed below have been seen or collected nearby in Utah, some indeed just outside the boundaries of the county. Most are transient water birds or shore birds which would be likely to escape detection unless intensive and continuous field work were carried on during migration. The remainder are mostly land birds that migrate through

the region or forms dwelling high in the mountains where the least field work has been done. The size of this list indicates that even though the southwestern part of the state is one of the best known areas ornithologically in the state, much work remains to be done. Simply as an aid the probable status of each of the forms is indicated.

<i>Scientific Name</i>	<i>Common Name</i>	<i>Status</i>
<i>Aechmophorus occidentalis</i> (Lawrence)	Western Grebe	Transient
<i>Nyroca marila</i> (Linnaeus)	Greater Scaup Duck	Transient
<i>Buteo lagopus s. johannis</i> (Gmelin)	American Rough-legged Hawk	Winter Visitant
<i>Charadrius nivosus nivosus</i> (Cassin)	Western Snowy Plover	Transient
<i>Charadrius semipalmatus</i> Bonaparte	Semipalmated Plover	Transient
<i>Pluvialis dominica dominica</i> (Müller)	American Golden Plover	Transient
<i>Squatarola squatarola</i> (Linnaeus)	Black-bellied Plover	Transient
<i>Tringa solitaria cinnamomea</i> (Brewster)	Western Solitary Sandpiper	Transient
<i>Pisobia bairdi</i> (Coues)	Baird Sandpiper	Transient
<i>Pelidna alpina sakhalina</i> (Vieillot)	Red-backed Sandpiper	Transient
<i>Limnodromus griseus scolopaceus</i> (Say)	Long-billed Dowitcher	Transient
<i>Ereunetes pusillus</i> (Linnaeus)	Semipalmated Sandpiper	Transient
<i>Limosa fedoa</i> (Linnaeus)	Marble Godwit	Transient
<i>Crocethia alba</i> (Pallas)	Sanderling	Transient
<i>Steganopus tricolor</i> Vieillot	Wilson Phalarope	Transient
<i>Larus philadelphia</i> (Ord)	Bonaparte Gull	Transient
<i>Sterna forsteri</i> Nuttall	Forster Tern	Transient
<i>Hydroprogne caspia imperator</i> (Coues)	Caspian Tern	Transient
<i>Chlidonias nigra surinamensis</i> (Gmelin)	Black Tern	Transient
<i>Strix occidentalis lucida</i> (Nelson)	Mexican Spotted Owl	Casual
<i>Selasphorus rufus</i> (Gmelin)	Rufous Hummingbird	Transient
<i>Sphyrapicus thyroideus nataliae</i> (Malherbe)	Natalie Sapsucker	Summer Resident
<i>Empidonax difficilis difficilis</i> Baird	Western Flycatcher	Summer Resident
<i>Perisoreus canadensis capitalis</i> Ridgway	Rocky Mountain Jay	Summer Resident
<i>Hylocichla ustulata almae</i> Oberholser	Alma Thrush	Summer Resident

<i>Scientific Name</i>	<i>Common Name</i>	<i>Status</i>
<i>Sturnus vulgaris vulgaris</i> Linnaeus	Starling	Transient
<i>Vireo olivaceus</i> Linnaeus	Red-eyed Vireo	Transient
<i>Vermivora celata celata</i> (Say)	Orange-crowned Warbler	Transient
<i>Dendroica aestiva aestiva</i> (Gmelin)	Eastern Yellow Warbler	Transient
<i>Dendroica aestiva rubiginosa</i> (Pallas)	Alaska Yellow Warbler	Transient
<i>Dendroica townsendi</i> (Townsend)	Townsend Warbler	Transient
<i>Dendroica occidentalis</i> (Townsend)	Hermit Warbler	Transient
<i>Pinicola enucleator montana</i> Ridgway	Rocky Mountain Pine Grosbeak	Summer Resident
<i>Ammodramus savannarum</i> <i>bimaculatus</i> Swainson	Western Grasshopper Sparrow	Summer Resident
<i>Poocetes gramineus affinis</i> (Miller)	Oregon Vesper Sparrow	Transient
<i>Spizella pallida</i> (Swainson)	Clay-colored Sparrow	Transient

SPECIES ACCOUNTS

***Butorides virescens anthonyi* (Mearns)**

ANTHONY GREEN HERON

Two specimens: male, Santa Clara Creek, 2800 feet, 3 miles southwest St. George, May 15, 1940; female, same locality, May 16, 1940.

This bird is apparently an uncommon summer resident of the wooded river bottoms along the Santa Clara and Virgin rivers. Our first experience with it was at noon on May 12, 1940, when one was seen flying upstream along Santa Clara Creek and was noticed to enter a clump of cottonwoods near our camp bordering on the creek. On May 15, at dusk, a green heron was again seen entering this grove. The bird was this time obtained and proved to be a male with testes measuring 6 mm. in length and 3 mm. in width. The following morning at sunrise the raucous call of another heron was heard coming from the same clump of cottonwoods. This bird, too, was obtained and proved to be a female with several eggs in the oviduct, the largest measuring 18 mm. in diameter. Thus, it would seem that we secured a pair of birds that was probably nesting in that particular grove of trees.

The only other recorded data for the Anthony green heron in Utah are the records of Hardy and Higgins (1940:96) who saw one on April 9, 1940, near the junction of the Virgin and Santa Clara rivers, and who mention a specimen in the Dixie College collection taken in the same area September 17, 1936. Hardy (1940a:125) later referred to the same specimen.

***Nycticorax nycticorax hoactli* (Gmelin)**

BLACK-CROWNED NIGHT HERON

One specimen: male, Hurricane, April 23, 1932.

A heron of this species was observed for several minutes on May 17, 1940, as it stood on a post at the edge of a marsh near the junction of the Virgin and Santa Clara rivers. The bird is probably an uncommon summer resident in the river bottoms. Records extend from March through the breeding season to September (Tanner, 1927:197 and Hardy and Higgins, 1940:96).

***Mycteria americana* Linnaeus**

WOOD IBIS

One specimen: male, Virgin City, August 28, 1939.

Long (1940:122) in originally reporting this record states that the bird was a single individual walking about on a sand-bar in the Virgin River.

***Plegadis guarauna* (Linnaeus)**

WHITE-FACED GLOSSY IBIS

On May 10, 1941, at the Eardley Ranch, Beaver Dam Wash, a white-faced glossy ibis was seen in rapid flight northward along the stream course closely pursued by a pair of prairie falcons. It turned abruptly back on its course, again passing our camp while traveling southward. Just below our camp it diverged into some cultivated fields where it presumably lost its pursuers, for the two falcons were seen within a minute or two in flight going up the wash. While the chase went on the falcons did not appear to gain appreciably on the ibis.

***Cathartes aura teter* Friedmann**

WESTERN TURKEY VULTURE

One specimen: female, Tonaquint Fields, St. George, April 20, 1932.

A grove of large cottonwoods surrounding the spring near our camp at the Danish Ranch, 4200 feet, served nightly as a roosting place for a small flock of vultures. Eight were counted on several occasions. They were seen regularly (April 30 to May 7, 1939) each evening and in the early morning but were seldom seen during the daytime, presumably because of their wide-ranging foraging habits. The species was frequently seen soaring in the lower areas around Santa Clara, St. George and Beaver Dam Wash. On September 12, 1941, near Irontown ruins one was associated with a raven at the carcass of a coyote. Both were feeding on the carrion.

***Accipiter striatus velox* (Wilson)**

SHARP-SHINNED HAWK

One specimen: male, Tonaquint Fields, St. George, November 26, 1937.

Sight records include one seen December 18, 1939, at Harrisburg, one two miles south of St. George, December 15, 1939, and another at Santa Clara, December 21, 1939, thus indicating their common occurrence in winter. A notable feature of the southern Utah avifauna is the winter influx of great numbers of passerine birds. The numbers of these bird-eating hawks are, perhaps, likewise augmented in winter in accord with their food supply. Undoubtedly this hawk breeds in the region, but at higher elevations, probably in the yellow pine belt.

***Buteo jamaicensis calurus* Cassin**

WESTERN RED-TAILED HAWK

Two specimens: male, Kanarraville, Iron County, April 14, 1932; unsexed specimen, Virgin, Washington County, April 22, 1932.

This hawk is evidently a permanent resident in the region, for we saw it commonly during our spring and summer field work, and it was also observed at Harrisburg, December 15, 1939 and at Santa Clara, December 16, 1939. During the summer it was encountered from the lowlands as at St. George up to 9000 feet in the Pine Valley Mountains.

Buteo regalis (Gray)

FERRUGINOUS ROUGH-LEGGED HAWK

One specimen: male, Santa Clara, 2800 feet, December 15, 1939.

Rough-legged hawks seemed especially numerous around St. George during our winter trip of mid-December, 1939. The only specimen, though, that we collected was the one noted above. Portions of a gopher (*Thomomys*) were found in its crop. This species is probably a permanent resident. The American rough-leg is known to occur elsewhere in the state as a winter resident and thus probably occurs in the St. George area as well in winter, but there are no certain records as yet.

Aquila chrysaetos canadensis (Linnaeus)

GOLDEN EAGLE

A golden eagle was seen on several occasions soaring over our Pine Valley camp in mid-June, 1938. On December 15, 1939, one was seen perched on top of a telephone pole about one-half mile north of Kanarraville, Iron County, Utah. Crushed remnants of rabbits were to be found nearby along the highway, and it may be that the eagle was attracted to that potential food supply.

Circus hudsonius (Linnaeus)

MARSH HAWK

This hawk was seen daily from December 15 to 18, 1939, in low flight over fields and marshes along the Virgin River south of St. George and south of Washington. Frequent sight records were likewise obtained from May 11 to 18, 1940, and from September 8 to 11, 1941, near the confluence of the Virgin and Santa Clara rivers.

Falco mexicanus Schlegel

PRAIRIE FALCON

Prairie falcons were commonly seen along the Beaver Dam Wash from May 6 to 10, 1941. Cliffs there furnished the proper nesting habitat. On May 10, 1941, a pair was observed in pursuit of a white-faced glossy ibis.

Falco sparverius sparverius Linnaeus

EASTERN SPARROW HAWK

Three skins: female, Virgin, April 22, 1932; male, St. George, November 26, 1937; male, 5 miles south Washington, 2800 feet, December 17, 1939.

On June 14, 1938, while driving along the roadway at Page's Ranch north of Pinto, a male sparrow hawk was seen flying low along the ground with a chipmunk dangling from its talons. Seeing us, the hawk dropped its burden, and it was noticed that the chip-

munk's skull had been crushed as if it had been struck there by the hawk. Many sight records acquired during spring and summer field work indicate that this hawk is common throughout the region everywhere except in the mountains proper.

***Dendragopus obscurus obscurus* (Say)**

DUSKY GROUSE

Six specimens: adult female and five young, Hop Canyon, 7300 feet, 4 miles east of Pine Valley, June 16, 1938.

The female was flushed about noon and shot at close range. The presence of a brood patch was noticed, so search was made for the young. It resulted that five chicks were found within fifteen feet of where the adult was shot. They were all motionless and well concealed. The adult and her brood were at the time in a mixed grove of aspen and Gambel oak. This same day, returning to camp, another adult was flushed from a dense grove of oaks about 500 feet lower and near the mouth of the canyon. On June 17, 1938, one was flushed from a stand of spruce at 9000 feet. Droppings were common in the vicinity.

***Centrocercus urophasianus* (Bonaparte)**

SAGE GROUSE

While no specimens were collected, the bird was occasionally flushed from the sage brush country near Pine Valley. Residents there regarded it as quite common.

***Lophortyx gambelii gambelii* Gambel**

GAMBEL QUAIL

Twelve skins: male, Santa Clara, April 22, 1930; male, St. George, April 22, 1930; male and female, Beaver Dam Wash, April 22, 1930; male and female, Terry Ranch, 6 miles north Utah-Arizona line, Beaver Dam Wash, April 19, 1932; male, Santa Clara Creek, 2800 feet, 3 miles southwest St. George, May 15, 1940; female, 3 miles west Santa Clara, 2800 feet, May 18, 1940; three males and one female, west slope Beaver Dam Mountains, 3300 feet, 4 to 5 miles north Utah-Arizona border, May 4, 1941.

At the Danish Ranch, Gambel quails frequented thickets of Fremont barberry in the piñon-juniper belt. Near St. George and Santa Clara they were encountered on drier slopes among the mesquite brushland as well as down in the river bottoms. West of Santa Clara a pair was flushed from a stand of screwbean in a dry wash. On the west slope of the Beaver Dam Mountains the quail were found in patches of creosote along dry washes. In the Beaver Dam Wash they occur in stands of acacia. Thus it would seem that the nature of the cover is not so important as long as there is adequate cover. During our four day stay in the Joshua tree belt on the west slope of the Beaver Dam Mountains, individuals were heard throughout each day from one particular wash that had more than the usual

amount of vegative growth. Males were occasionally seen perched on the tops of Joshua trees uttering their distinctive call. The flocks encountered appeared to be sedentary. One small flock was flushed daily from the same river-bottom thicket December 16 through December 19, 1939. The Danish Ranch records indicate that they are not confined to the lowlands but range up in places at least to the juniper-piñon pine forest.

A female taken May 18, 1940, 3 miles west of Santa Clara contained an egg with calcified shell, which was about to have been laid and another of smaller size but without a shell.

Charadrius vociferus vociferus Linnaeus

KILLDEER

One specimen: 3 miles south St. George, 2800 feet, December 18, 1939.

Two killdeers were seen throughout the week of April 29 to May 6, 1939, at the Danish Ranch and were undoubtedly established there for nesting. The species was abundant along the lower stretches of Santa Clara Creek and along the Virgin River near St. George throughout our stay there in early May, 1940. The birds' behavior indicated nesting, although no effort was made to locate their nest or eggs. The species was abundant in the same area in winter too; small flocks of 30 or more individuals were seen frequenting the rivers and bars. On December 18, 1939, a large flock was found in a field associated with a flock of pipits. In shooting the latter, the specimen listed above was incidentally killed. Killdeers were seen once again in the Beaver Dam Wash where a pair was carrying on nesting activities at a seepage area near our camp at the Eardley Ranch.

Columba fasciata fasciata Say

BAND-TAILED PIGEON

On June 24, 1938, several adults were seen in the vicinity of the Forest Service Camp at Oak Grove on the east side of the Pine Valley Mountains. We were told by the fire guard that they were nesting in a large western yellow pine near the entrance to the camp. Two days later, while at Whipple Meadow, 9000 feet, in these same mountains a flock of ten passed overhead. Cottam (1941:122) has presented data that indicate the bird to be a regular summer resident of fairly common occurrence in the region.

Zenaidura macroura marginella (Woodhouse)

WESTERN MOURNING DOVE

Three specimens: male, Beaver Dam Wash, April 22, 1930; male, Shem, April 16, 1932; male, Danish Ranch, 3800 feet, 5 miles northwest Leeds, May 5, 1939. One male weighed 122.1 grams.

Mourning doves were among the commonest summer residents of the region, being seen at all of our base camps as well as along most of the country roads. On June 18, 1939, near Pinto, one was flushed from a nest which was merely a crude platform of small twigs.

It was laid on the stump of an old cottonwood tree, some six feet above ground and contained two eggs. Large flocks were seen elsewhere on the same day. On May 3, 1940, in the Santa Clara river bottoms, three miles southwest of St. George, another nest was found when the adult flushed from the nest platform located in a precarious position where two willow saplings crossed. The adult performed pronounced "crippled-bird" antics. Two nestlings with very little feathering occupied the nest.

A winter record involves seeing a lone individual at Santa Clara on December 15, 1939.

***Coccyzus americanus occidentalis* Ridgway**

CALIFORNIA CUCKOO

One specimen: Juvenile female, Berry Springs, 2800 feet, along Virgin River, 5 miles west of Hurricane, August 20, 1932.

Woodbury (1939:157) has previously given the details of the securing of this specimen. Hardy and Higgins (1940:99) report specimens taken near St. George, July 11, 1937 and a nest with eggs taken July 26 of the same year.

***Geococcyx californianus* (Lesson)**

ROAD-RUNNER

One specimen: male, Duncan, near Virgin, August 17, 1932.

This species was encountered frequently in the lowland areas in the spring and was seen once during the winter. One was seen on December 15, 1939, near St. George. Sight records were acquired daily from May 11-16, 1940, in the Santa Clara region. The introduced tamarix which has formed a dense thicket in the bottom land was used extensively as a haven of refuge.

***Tyto alba pratincola* (Bonaparte)**

BARN OWL

One specimen: male, Junction Virgin and Santa Clara rivers, 2700 feet, 2 miles south St. George, September 11, 1941.

This owl undoubtedly nests in the St. George area, but the only contact we had with it was the daily observation from September 8 to 11, 1941, of four individuals, possibly a family group, roosting in a dense willow thicket in a swampy area at the above-noted location. The owls remained close to one especially tall clump of willows where the trunks were several inches in diameter at their bases. The owls perched about twenty feet off the ground, and the numerous blotches of excreta around the site indicated usage of the site for several days at least. The nightly foraging activities of the birds commenced about one hour after sundown each evening.

Bubo virginianus occidentalis Stone

MONTANA HORNED OWL

One specimen: female, Pine Valley Mountains, 7100 feet, 4 miles east Pine Valley, September 13, 1941.

As indicated by many specimens in the University of Utah collection, the race *occidentalis* is distributed over the greater part of the state, both in the mountainous central and eastern sections and the western Great Basin portion. If the specimen listed above represents the breeding population of the mountainous areas, there is a rather abrupt transition in ranges of the two subspecies in southwestern Utah.

Bubo virginianus pallescens Stone

WESTERN HORNED OWL

One specimen: female, Zion Canyon, August 31, 1932.

This probably represents the breeding population of the lowland "Lower Sonoran" region. This race seems restricted in its distribution in Utah to the extreme southern portion of the state.

Asio wilsonianus (Lesson)

LONG-EARED OWL

Two specimens: adult female, Santa Clara Creek, 2800 feet, 3 miles southwest St. George, May 11, 1940; juvenile female, same locality, May 12, 1940.

The above specimens were evidently part of a family group frequenting a dense cottonwood grove. One other juvenile was seen with the two birds collected. The immature specimens establish the breeding status of the species in the area.

Hardy and Higgins (1940:100) refer to a specimen being collected by Henshaw in Grass Valley, Washington County. The Grass Valley mentioned by Henshaw was, however, not in Washington County, but rather farther to the north in central Utah, in Piute and Sevier counties, not far from Koosharem.

Phalaenoptilus nuttallii nuttallii (Audubon)

NUTTALL POOR-WILL

One specimen: male, Beaver Dam Wash, 2800 feet, April 20, 1930.

Chordeiles minor howelli Oberholser

HOWELL NIGHTHAWK

One specimen: female, Junction Virgin and Santa Clara rivers, 2700 feet, 2 miles south St. George, September 9, 1941; weight 57.9 grams.

This specimen, a late transient, was the only one seen when shot and, although atypical, seems closest to the race *howelli*.

Chordeiles acutipennis texensis Lawrence

TEXAS NIGHT HAWK

Four specimens: male, Beaver Dam Wash, near Utah-Arizona border, 2800 feet, May 15, 1940; female and sex ?, Santa Clara Creek, 2800 feet, 3 miles southwest St. George, May 15, 1940; female, same locality, May 17, 1940.

The specimens taken along Santa Clara Creek were foraging at dusk along the river bottom, following up and down the stream course. They were common at the time.

The Texas Nighthawk appears to be restricted in its distribution in Utah to the extreme southwestern portion of the state.

Aeronautes saxatalis saxatalis (Woodhouse)

WHITE-THROATED SWIFT

One specimen: female, Danish Ranch, 3800 feet, 5 miles northwest Leeds, May 1, 1939; weight, 31.5 grams.

This bird was common at all of our base camps. Along Santa Clara Creek, pairs were observed copulating in mid-air on May 12, 1940. They would fall together nearly to the ground at such times before separating. Along certain stretches of Santa Clara Creek where rocky cliffs were present, the birds were carrying on nesting activities.

With reference to the description of a new swift from Colorado by Rogers (1939:465), this specimen has a wing measurement of 134.2 mm.; the tail measures 56.0 mm. These are close to the average given for *A. s. saxatalis*.

Archilochus alexandri (Bourcier and Mulsant)

BLACK-CHINNED HUMMINGBIRD

Seven specimens: 2 males and 2 females, Terry Ranch, 6 miles north Utah-Arizona border, April 18, 1932; male, Danish Ranch, 4200 feet, 5 miles northwest Leeds, May 1, 1939; male, 3 miles west of Santa Clara, May 18, 1940; female, Santa Clara Creek, 2800 feet, 3 miles southwest St. George, May 12, 1940. One male had a body weight of 3.0 grams.

This is the common hummingbird of the region in the lowlands and foothills ranging from Lower Sonoran to Upper Sonoran conditions. It was not found above 6000 feet, but it did occur in the pygmy forest. It has been found ranging up as high as 9000 feet in the Wasatch Mountains east of Salt Lake City.

Calypte costae (Bourcier)

COSTA HUMMINGBIRD

Two specimens: male, Shem, April 15, 1932; male, Eardley Ranch, 2800 feet, Beaver Dam Wash, 8 miles north Utah-Arizona border, May 8, 1941. One male weighed 2.7 grams.

The above specimens apparently constitute the only specimens taken in Utah to my knowledge, although several sight records have been recorded. The species is found only where Lower Sonoran conditions prevail, and the species is uncommon in contrast to the abundant black-chinned hummingbird.

***Selasphorus platycercus platycercus* (Swainson)**

BROAD-TAILED HUMMINGBIRD

One specimen: male, Hop canyon, 7400 feet, 5 miles east Pine Valley, June 11, 1938.

In contrast to the limitation to the lowlands of the preceding hummingbird, this form is wide ranging like the black-chinned species, being commonly encountered from the lowlands up to the high mountain meadows around 9000 feet.

***Megaceryle alcyon caurina* (Grinnell)**

WESTERN BELTED KINGFISHER

One was seen on September 13, 1941, foraging at the reservoir of the Forest Service Camp, about three miles east of Pine Valley.

***Colaptes cafer collaris* Vigors**

RED-SHAFTED FLICKER

Seven specimens: male, Motoqua, April 17, 1932; male, Tonaquint Fields, St. George, November 26, 1937; adult female, juvenile female and juvenile male, one mile southeast Pinto, 6500 feet, June 18, 1938; female, Santa Clara, 2800 feet, December 21, 1939; male, 3 miles south Washington, December 17, 1939.

Flickers showed a wide range of tolerance for environmental conditions, being found from the cottonwood-studded river bottoms to the coniferous forests as high as 10,000 feet. Near Pinto a nest was found on June 14, 1938, in a large hollow cottonwood. The nest faced east and was located about five feet above the ground level. Young were in the nest when first discovered. In fact, their hisses attracted us to the nest. The site was not disturbed until June 18, when we chopped into the hole finding seven young nearly completely feathered out. The nesting hole extended down two and one-half feet below the entry hole, and while the tree was naturally partly hollow, some excavation had been performed.

Flickers were seen daily from December 16 to 21, 1939, along the Santa Clara river bottoms. Their abundance suggested an altitudinal migration to lowland wintering grounds.

***Asyndesmus lewis* Gray**

LEWIS WOODPECKER

Three specimens: 2 males, Danish Ranch, 4200 feet, 5 miles northwest Leeds, May 2, 1939; male, Santa Clara Creek, 2800 feet, 3 miles southwest St. George, May 11, 1940. The two males from Danish Ranch weighed 135.5 and 115.0 grams.

These birds were taken in the vicinity of Gambel oaks but had been feeding extensively on tent caterpillars which were devouring the leaves of the ash trees. The woodpeckers were undoubtedly migrants. They were excessively fat.

Sphyrapicus varius nuchalis* Baird*RED-NAPED SAPSUCKER**

Two specimens: male and female, 4 miles east of Pine Valley, 8700 feet, June 26, 1938.

These two represented a pair collected near their nest which was located in an aspen grove in a small ravine. The nest site was twelve feet above ground facing southwest and proved to be a newly excavated nest. The circular entrance measured one and a half inches in diameter. The nest cavity occupied much of the center of the tree which had a diameter at that point of eight inches. Young were in the nest being fed by the adults. In the same grove of aspens, hardly twenty feet away from a nest of the white-breasted woodpecker was found.

Dryobates villosus leucothorectis* Oberholser*WHITE-BREADED WOODPECKER**

Five specimens: male and female, 4 miles east Pine Valley, 8700 feet, June 26, 1938; female, same locality, 9000 feet, June 17, 1938; female, Danish Ranch, 4200 feet, 5 miles northwest Leeds, April 29, 1939; female, Pine Valley Mountains, near Whipple Valley, 9000 feet, 5 miles east Pine Valley, September 14, 1941. Two females weighed 57.5 and 58.0 grams.

A nest with young was found on June 26, 1938, in the aspen grove at 8700 feet. The entrance was located twelve feet above ground. It faced south and was wedge-shaped in outline, the narrow part being on top. The aspen had a diameter of eight inches at the nest site, and in constructing the nest, the birds had cut through about two inches of solid sapwood into softer heart wood where the main excavation had been made. Red-naped sapsuckers, as noted above, nested in the same aspen grove.

Hardy and Higgins (1940:101) erroneously reported the race *monticola* from Washington County on the basis of a skin taken by Henshaw in Grass Valley. As was pointed out in the account of the long-eared owl, the Grass Valley of Henshaw's collecting was not that near Pine Valley.

Dryobates scalaris yumanensis* van Rossem*YUMA LADDER-BACKED WOODPECKER**

Twelve specimens: female, Motoqua, April 17, 1932; 2 males and 2 females, Terry Ranch, 2800 feet, Beaver Dam Wash, 6 miles north Utah-Arizona border, April 19, 1932; female, Castle Cliffs, U. S. Highway 91, 2500 feet, November 27, 1936; male, west slope Beaver Dam Mountains, 3300 feet, 5 miles north Utah-Arizona border, May 4, 1941; female, same locality, May 6, 1941; male and female, Eardley Ranch, 2800 feet, Beaver Dam Wash, 8 miles north Utah-Arizona border, May 8, 1941; male and female, same locality, May 9, 1941. Body weights of three males were 38.9, 36.7 and 37.5 grams; of three females, 39.5, 33.5 and 34.2 grams.

The cactus woodpecker was found to occur primarily in the Joshua tree forest on the west slope of the Beaver Dam Mountains. Not only were these birds numerous there, but many old nest sites were noticed in the Joshua trees. However, the species was frequently encountered also down in the wash, especially in cottonwood trees. It has been reported by several observers as far east as St. George which is out of the Joshua belt.

Van Rossem (1942:24) has recently described the race *yumanensis* ascribing to it a range extending from extreme southwestern Nevada, south in Arizona and California to the Delta region in Lower California and Sonora; east in the valley of the Gila River to about Gila Bend and west in the Imperial Valley of California to the Salton Sea. In his discussion under the race he states: "This species has been personally observed as not uncommon at St. George in the Virgin River Valley of southern Utah, but what race is present there I cannot say, since no specimens were collected." The birds in the University of Utah collection appear to be closest to the population designated as *yumanensis* and thus represent its northeastern-most outpost. As such, they might be expected to be a bit atypical. They show measurements slightly larger than the figures given by van Rossem for either *cactophilus* or *yumanensis*. Five males measure as follows: wing, 103.2-105.0 (103.9); tail, 58.7-63.3 (61.5); exposed culmen, 22.1-26.0 (24.0) mm. Seven females measure: wing 98.4-107.6 (101.8); tail, 56.4-66.4 (62.3); exposed culmen, 20.7-23.0 (21.6) mm. In color characteristics they show the general paler coloration and wider barring on the back of *yumanensis*.

Picoides tridactylus dorsalis Baird

ALPINE THREE-TOED WOODPECKER

One specimen: female, 5 miles east Pine Valley, 9000 feet, June 17, 1938.

The presence of a brood patch on this specimen together with enlarged ova signifies breeding status.

Tyrannus verticalis Say

ARKANSAS KINGBIRD

Ten specimens: male, Pintura, April 14, 1932; female, Motoqua, April 17, 1932; male, Terry Ranch, 2800 feet, Beaver Dam Wash, 6 miles north Utah-Arizona border, April 19, 1932; male, Hamblin, 6500 feet, 8 miles southwest Pinto, June 14, 1938; male, 1 mile east Pine Valley, 8600 feet, June 18, 1938; male, Danish Ranch, 4200 feet, 5 miles northwest Leeds, April 29, 1939; male and female, 3 miles south St. George, 2800 feet, May 16, 1940; male, west slope Beaver Dam Mountains, 3300 feet, 4 miles north Utah-Arizona border, May 4, 1941; male, Beaver Dam Wash, 2600 feet, 5 miles north Utah-Arizona border, May 4, 1941. Three males had weights of 43.5, 37.5 and 38.9 grams.

On May 4 and 5, 1939, a pair was noted constructing a nest in a large cottonwood tree near the ranch-house at the Danish Ranch. The site selected was a crotch about thirty feet above ground.

Myiarchus cinerascens cinerascens (Lawrence)

ASH-THROATED FLYCATCHER

Seventeen specimens: male, 5 females and 1 sex ?, Terry Ranch, 2800 feet, 6 miles north Utah-Arizona border, Beaver Dam Wash, April 17-22, 1932; male, 2 miles north Pinto, 6600 feet, June 23, 1938; 5 males and a female, Danish Ranch, 4200 feet, 5 miles northwest Leeds, April 29-May 4, 1939; male and female, Santa Clara Creek, 2800 feet, 3 miles southwest St. George, May 12, 1940; female, 3 miles south St. George, 2800 feet, May 14, 1940. Three females weighed 27.8, 35.1, 26.2 grams; 6 males averaged 28.5 grams with extremes of 25.4 and 31.9.

A variety of habitats were occupied by this flycatcher. It was found in the juniper-piñon association near our Pine Valley camp. In the open sparsely vegetated lowland around St. George it was frequently encountered. It was perhaps most abundant in the Joshua tree belt of the west slope of the Beaver Dam Mountains. A family group of two adults and two juveniles was seen on May 13, 1940, near Santa Clara at which time the adults were copulating in flight. Presumably this meant a second nesting.

Sayornis nigricans semiatra (Vigors)

NORTHERN BLACK PHOEBE

Three specimens: male, Beaver Dam Wash, April 20, 1930; male and female, Terry Ranch, 2800 feet, 6 miles north Utah-Arizona line, April 19-20, 1932.

Presnall (1935:203) has recorded the species as occurring in Zion, while Hardy and Higgins give several sight records for St. George. Lack of records from northern Utah indicate that the species is restricted to the southern part of the state.

Sayornis saya saya (Bonaparte)

SAY PHOEBE

Ten specimens: male, Beaver Dam Wash, April 22, 1930; male, Buckhorn Springs, Iron County, April 14, 1932; male, Jackson Spring, 6 miles west Gunlock, April 17, 1932; male, Terry Ranch, 2800 feet, 6 miles north Utah-Arizona border, April 17, 1932; male, 2 miles southwest Santa Clara, February 21, 1936; male, St. George, February 20, 1936; 2 males, St. George, November 26, 1937; adult female, and juvenile female, 2 miles north Pinto, 6600 feet, June 23, 1938.

A family group of two adults and two juveniles was found in the piñon-juniper forest near Pinto on June 23, 1938, thus indicating the progress of the nesting season.

This small collection of Say phoebes presents a number of problems. The adult female and juvenile from near Pinto, the only certain resident birds of the lot, are a little paler than the others, thus suggesting an approach to the race *quiescens*. It may be that this latter race extends considerably farther northward along the Colorado River than supposed. Linsdale (1936:76) reports a specimen of this southern race taken in winter in extreme southern Nevada.

The three winter-taken birds from St. George are a trifle grayer than the others and may represent the northern population called *yukonensis* by Bishop (1900:115). One of the three has a noticeably shorter bill. There seems to be some doubt, however, as to the validity of the northern race.

Empidonax traillii brewsteri Oberholser

LITTLE FLYCATCHER

Thirteen specimens: male, Springdale, June 26, 1932; female, Rockville, July 24, 1932; male, St. George, 2800 feet, May 3, 1939; 3 males and female, 3 miles south St. George, 2800 feet, May 12-16, 1940; 6 males, Santa Clara Creek, 2800 feet, 3 miles southwest St. George, May 12-13, 1940. Eight males had average and extreme weights of 12.9 grams (12.2-14.0 grams). A female weighed 12.0 grams.

This flycatcher was restricted to a riverbottom habitat of dense willow groves with much shade as a consequence of thick top-foliage. Males were easily located through their calls as they were presumably proclaiming their territories. Swollen testes of the males indicated the breeding condition. Whether the females were secretive because of egg laying and incubation or whether they had not arrived yet was not ascertained.

The dorsal color of this series of breeding males all taken about the same time is exceedingly variable. Some are brown, others gray and yet others more of a greenish coloration. This extreme individual variation conforms with Miller's findings (1941:259) and thus casts doubt upon the validity of Oberholser's race *E. t. adastus* (1932:3).

***Empidonax hammondii* (Xantus)**

HAMMOND FLYCATCHER

One specimen: male, Pine Valley Mountains near Whipple Valley, 9000 feet, 5 miles east Pine Valley, September 14, 1941; weight 9.8 grams.

This bird, an immature, was taken in a dense, dark, coniferous forest of spruce and fir.

***Empidonax wrightii* Baird**

WRIGHT FLYCATCHER

Six specimens: male, Middle Fork Canyon, 7500 feet, 5 miles southeast Pine Valley, June 12, 1938; female, Hop Canyon, 7400 feet, 5 miles east Pine Valley, June 11, 1938; 4 males, west slope Beaver Dam Mountains, 3300 feet, 5 miles north Utah-Arizona border, May 4-6, 1941. Body weights of three males were 12.4, 11.5 and 12.2 grams.

As a breeding bird, this species was found at intermediate elevations, about 7000 feet, near the mouths of canyons and fringing on clumps of scrub thickets of roses, Gambel oak, alder and birch or in aspen groves. The specimens from the west slope of the Beaver Dam Mountains were not breeding birds; their gonads were scarcely swollen.

***Empidonax griseus* Brewster**

GRAY FLYCATCHER

Five specimens: male, East Rim Zion National Park along Mt. Carmel Road, July 8, 1932; female ?, 1 mile north Pinto, 6700 feet, June 14, 1938; male and female, west slope Beaver Dam Mountains, 3300 feet, 5 miles north Utah-Arizona border, May 6, 1941; male, Eardley Ranch, 2800 feet, Beaver Dam Wash, 8 miles north Utah-Arizona border, May 9, 1941. Two males weighed 14.2 and 14.5 grams; one female, 12.5 grams.

The only breeding bird of the lot was from near Pinto, taken in the piñon-juniper forest. Experience with the species elsewhere indicates that this piñon-juniper association is its characteristic habitat. Thus, although the gray, Wright and Hammond flycatchers all nest in the same general region, their habitats are decidedly different.

Myiochanes richardsonii richardsonii (Swainson)

WESTERN WOOD PEWEE

Five specimens: male, Zion National Park, August 12, 1931; 3 females, 1 mile south-east Pinto, 6500 feet, June 14-18, 1938; male, 3½ miles east Pine Valley, 7100 feet, June 15, 1938.

This species nested in cottonwoods at 7000 feet and among aspens at higher elevations but often occurred in the coniferous forest as well.

Pyrocephalus rubinus mexicanus Sclater

VERMILION FLYCATCHER

Two specimens: male, Beaver Dam Wash, April 22, 1930; male, Hurricane, April 23, 1932.

Woodbury (1939:159) has summarized the Utah records of the species including those listed above.

Otocoris alpestris merrilli Dwight

DUSKY HORNED LARK

One specimen: male, St. George, February 15, 1933.

This specimen seems best referable to this race, although it represents the brownish extreme of the race so common in breeding birds of the Columbia river region of eastern Oregon and Washington. Four specimens previously secured by the writer from three miles south of Harrisburg and now in the Museum of Vertebrate Zoology, represent the subspecies *utahensis*, thus indicating that at least two subspecies winter in the region. What the breeding bird of the area is, is unknown, as none seem to have been collected.

Tachycineta thalassina lepida Mearns

VIOLET-GREEN SWALLOW

Two specimens: sex ?, St. George, April 20, 1932; female, Danish Ranch, 3800 feet, 5 miles northwest Leeds, May 1, 1939. One female weighed 15.7 grams.

This swallow was common along the Virgin and Santa Clara rivers in spring and summer. It also was seen in aspen groves higher in the mountains where it probably nested.

Iridoprocne bicolor (Vieillot)

TREE SWALLOW

One specimen: sex ?, St. George, April 20, 1932.

The species was common on May 16, 1940, along Santa Clara Creek. The birds were probably transients on their way north or to higher elevations, for this swallow was seen in aspen groves in the Pine Valley Mountains during late June and probably nests there.

Stelgidopteryx ruficollis serripennis (Audubon)

ROUGH-WINGED SWALLOW

Eleven specimens: male and female, Shem, April 16, 1932; male, St. George, April 26, 1932; male, Hurricane, April 23, 1932; male, 2 miles southeast Pinto, 6500 feet, June 18, 1938; 3 males and female, 3 miles south St. George, 2800 feet, May 14, 1940; male and female, Santa Clara Creek, 2800 feet, 3 miles southwest St. George, May 18, 1940. Two females weighed 13.6 and 14.8 grams. Four males averaged 15.1 grams with extremes of 17.7 and 13.6 grams.

This swallow was common throughout the region wherever there was water. South of St. George near the junction of the Virgin and Santa Clara rivers they commonly perched on wires over a swampy area. In the vicinity of Pinto where stream erosion had cut deep banks, they were very abundant and, judging by the gonad condition, were breeding in the vicinity.

Wetmore (1939:202), Miller (1941:259) and Brodkorb (1942:214) are of the opinion that the race *aphractus* described by Oberholser (1932:5) does not present any differences from *serripennis*. My birds then must be referred to the latter race. Indeed, they do not appear different from examples of *serripennis* from the eastern part of the country.

Cyanocitta stelleri percontatrix van Rossem

PALLID STELLER JAY

Ten specimens: female, Hop Canyon, 7400 feet, 5 miles east Pine Valley, June 11, 1938; female, 3 miles east Pine Valley, 7200 feet, June 10, 1938; 4 males and 4 females, Pine Valley Mountains, 7000-7100 feet, 4 miles east Pine Valley, September 13-16, 1941.

The two breeding birds are badly faded and worn, and the plumage is of little diagnostic value. The series of jays taken in early September, however, is comprised of individuals nearly completely molted, thus displaying their fresh fall plumage. Some are immatures in first winter plumage; others are adults in adult winter plumage. The series is fairly uniform in appearance, though, no differences between the age groups being apparent. The most notable feature about the group is their pale, blue-gray coloration. They are paler above and below than specimens of the races *annectens* and *diademata*, although they are closest to the latter. They have a lighter iridescent blue to the upper surface of the tail feathers and the secondaries of the wing in contrast to a darker appearance in these areas in the other two races mentioned. In their general pallor and blue-gray tone, together with their conspicuous white frontal stripes and white eye lids, they seem closest to the race recently described by van Rossem (1931:328) from the Sheep and Charleston mountains of southern Nevada.

The identification of these specimens has necessitated a comparative study involving the races *annectens*, *diademata* and the lately proposed race *cottami* (Oberholser, 1937b:117). In characterizing *cottami* the describer stated that the representatives of this supposed new race differed from *diademata* in being larger, darker, and with the frontal streaks darker, less whitish, smaller and less

numerous. From *annectens* they were said to differ in being smaller, lighter in coloration and with the blue more greenish and the blue frontal streaks paler. Furthermore, the Utah birds were said to have a conspicuous short, broad, streak above the eye which character was said to be absent in *annectens*. Practically all of Utah was designated as the range of the proposed race, including the Pine Valley Mountains.

Through the courtesy of Dr. John M. Aldrich and Dr. Clarence Cottam of the United States Fish and Wildlife Service, Dr. C. Lynn Hayward of Brigham Young University, and Dr. J. S. Stanford of the Utah State Agricultural College, much comparative material has been assembled. These specimens, together with the skins in the collection at the University of Utah, made a total of nearly a hundred specimens. Study of this material indicates a most interesting intermediate situation in the geographic area ascribed to the range of *cottami*.

Examples of *annectens* as they occur in Idaho, Washington and Oregon show narrow frontal stripes which are of a decided blue color. Examples of *diademata* from Arizona, New Mexico and northern Mexico show broader frontal stripes of a prevailing white color, although occasionally blue crops up, especially high on the forehead. In general, though, the two races are distinctive as to this character. Specimens from the general range ascribed to *cottami* are highly variable in this character. Some are close to *annectens*, others to *diademata*, yet others are intermediate in various degrees.

In dorsal color tone, *annectens* is dark, uniformly so in all individuals examined. There is an underlying suffusion of dark blue color in contrast to *diademata* which has a browner back, essentially lacking the dark bluish cast. Specimens from the range of *cottami* are variable in this character, too, overlapping both *annectens* and *diademata*. It seems as though there is a long southward gradient from a dark dorsal color to a lighter color. Birds of the alleged race *cottami* are intermediate along this cline, but there are no breaks separating the population from the races to the north and south.

As to coloration of underparts, *annectens* is very dark with a sooty or smoky cast as compared with birds of the race *diademata* which are of a lighter blue. However, *diademata* is more variable as to color of the underparts than is *annectens*. Specimens from the range of *cottami* are extremely variable in this character too.

From all this it appears that birds from central and northern Utah are highly variable individually. Yet there are indications of a different combination of characters. This might be evidence of a different race if the character combination were constant and delimited to a definite area. Materials now at hand do not show this to be the case. Instead, it appears that in Utah there is an area of complicated intergradation extending over a vast area.

One further point to mention is the circumstance that a short supraorbital stripe appears in specimens from British Columbia to Mexico. There is, then, no substance to the claim that *cottami* alone possesses this character.

TABLE 1. Summary of the Characters of Several Populations of Steller Jays in Utah

<i>C. s. annectens</i>	<i>C. s. "cottami"</i>	<i>C. s. diademata</i>	<i>C. s. percontatrix</i>
1. Frontal stripes: narrow and blue	highly variable but as whole closest to <i>diademata</i>	heavy and whitish, less bluish	as in <i>diademata</i>
2. Dorsal color tone: dark with bluish-black cast	highly variable but as whole closest to <i>diademata</i>	lighter brown, lacking any bluish cast for most part	paler, more ashy blue
3. Coloration of underparts: uniformly dark blue with sooty or smoky cast	highly variable and intermediate but as whole closest to <i>annectens</i>	lighter blue but quite variable — fades to various brown tones	conspicuously lighter blue; iridescence of upper tail feathers, and secondaries lighter and corresponding with color of underparts and back
4. Superciliary stripe: present from British Columbia southward	present	present south into Mexico	present

Specimens fairly typical of *annectens* are of common occurrence in winter in northern Utah, and there are a few examples of breeding birds at hand from near the Utah-Idaho line which are "good *annectens*." Starting in extreme northern Utah the gradual southward approach to *diademata* commences. The Pine Valley Mountains population is something different, seemingly constituting a north-eastern outpost of the race of southern Nevada.

Presentation of quantitative data, to be significant, must await the acquisition of more and larger series of breeding birds. Such data now at hand show no appreciable differences in size between the races concerned.

Aphelocoma californica woodhousei (Baird)

WOODHOUSE JAY

Ten specimens: male, Jackson Spring, 6 miles west Gunlock, April 17, 1932; adult female and two juvenile males, 2 miles southeast Pinto, 6500 feet, June 18, 1938; juvenile male and adult female, 2 miles north Pinto, June 23, 1938; male and 2 females, Danish Ranch, 4200 feet, 5 miles northwest Leeds, April 30-May 4, 1939; male, Pine Valley Mountains, 7000 feet, 4 miles east Pine Valley, September 16, 1941. One male weighed 69.7 grams; two females, 81.0 and 86.9 grams.

This jay typically occurred in the juniper-piñon forest. Family groups of adults and three or four juveniles were commonly seen about mid-June.

Corvus corax sinuatus Wagler

AMERICAN RAVEN

This species was common in the Great Basin portion of the section, as around Pinto, very often being associated with the pygmy forest. A family group was found at the Irontown ruins, June 14, 1938. Their nest had been built in the chimney of the old smelter, but the young, four in number, were lined up on the top of an adjacent wall. They showed great reluctance to leave their perch, but when pushed off flew away with labored flight characterized by rapid wing beats and awkwardly outstretched necks. In flight they constantly peered around and soon circled back to their original resting place.

On May 18, 1930, a raven was seen beside a rabbit carcass on the highway three miles west of Santa Clara but was driven away by a shrike which then perched on a nearby fence post. On September 12, 1941, a raven was seen associated with a turkey vulture at the carcass of a coyote. These last observations suggest that the bird is possessed of carrion-eating habits.

Corvus brachyrhynchos hesperis Ridgway

WESTERN CROW

A flock of eighteen crows was seen in a field south of Washington on December 17, 1939, and lone birds were seen subsequently at Santa Clara on December 18, 1939. Apparently crows are common in the region in the winter and probably in the summer too.

Gymnorhinus cyanocephalus (Wied)

PINON JAY

One specimen: female, Washington Flats near St. George, April 20, 1932.

Piñon jays were closely associated with the pygmy forest throughout the nesting season. By mid-September flocks of fifty or more were conspicuous.

Nucifraga columbiana (Wilson)

CLARK NUTCRACKER

Two specimens: adult and juvenile males, 5 miles east of Pine Valley, 9000 feet, June 17, 1938.

These birds were found to occur commonly in the spruce-fir belt. The juvenile establishes the bird as a summer resident of the Pine Valley Mountains. On September 14, 1941, a small flock of six individuals, possibly a family group, was seen in the coniferous timber at 9000 feet, five miles east of Pine Valley.

Parus gambeli inyoensis Grinnell

INYO CHICKADEE

Fifteen specimens: male, west rim Zion National Park, July 5, 1931; 7 males, 4 females, Pine Valley Mountains, 3-5 miles east Pine Valley, 7200-8700 feet, June 10-26, 1938; 3 males, Pine Valley Mountains, 7100-9500 feet, 4-5 miles east Pine Valley, September 13-14, 1941. One male weighed 12.4 grams; two females, 11.4 and 11.7 grams.

This species ranged commonly from the Gambel oaks up through the coniferous forest. In early September they occurred in flocks down in the cottonwoods around 7000 feet, as well as higher in the mountains.

These chickadees proved to be of the race *inyoensis*, being rather typical of the pale Great Basin race.

Parus inornatus ridgwayi Richmond

GRAY TITMOUSE

Fifteen specimens: male, Jackson Spring, 6 miles west Gunlock, April 17, 1932; male, Pintura, November 26, 1936; adult male and female, 2 miles southeast Pinto, 6700 feet, June 18, 1938; 2 adult males, adult female and juvenile female, 2 miles north Pinto, 6600 feet, June 23, 1938; 2 juvenile males and sex ? juvenile, 2 miles southeast Irontown Ruins, 6500 feet, Iron County, September 16, 1941; 3 males and female, Danish Ranch, 4200 feet, 5 miles northwest Leeds, April 30-May 2, 1939.

In the Great Basin, titmouses are as closely associated with the juniper-piñon pygmy forest as those of coastal California are tied up with the live oaks. They were not found to occur outside of this habitat.

On June 14, 1938, a family group of adults and juveniles was encountered one mile south of Page's Ranch, just a short distance from the type locality which is Irontown or Iron City. This site, long deserted, is located in Iron County, Utah, some five miles airline northeast of Pinto or about eight miles airline southeast of Newcastle. The site is in the juniper-piñon forest.

***Auriparus flaviceps acaciarum* Grinnell**

ARIZONA VERDIN

Two specimens: male, Beaver Dam Wash, 2100 feet, 2 miles south Utah-Arizona line, Mohave County, Arizona, October 28, 1938; male, Eardley Ranch, 2800 feet, Beaver Dam Wash, 8 miles north Utah-Arizona border, Washington County, Utah, May 9, 1941. The male from Utah weighed 6.4 grams.

The Eardley Ranch skin seems to be the first specimen taken in Utah to be recorded, although Merriam (Fisher, 1893:142) discovered a nest May 14, 1891, near the junction of the Virgin and Santa Clara rivers.

***Psaltriparus minimus plumbeus* (Baird)**

LEAD-COLORED BUSH-TIT

Fourteen specimens: female, nest and 6 eggs, Pine Valley, June 20, 1936; 2 males and female, Danish Ranch, 4200 feet, 5 miles northwest Leeds, November 27, 1936; male, same locality, May 2, 1939; 3 females, 2 males, 1 sex ?, 1 mile east Pinto, 6500 feet, June 14, 1938; male and female, Irontown Ruins, 6000 feet, Iron County, September 12, 1941; male, Pine Valley Mountains, 7100 feet, 4 miles east Pine Valley, September 13, 1941. One male weighed 6.2 grams.

The bush-tits, like the titmouses, were closely confined to the juniper-piñon pygmy forest during the breeding season but unlike the latter tended to wander widely out of that habitat in the fall, as indicated by one being seen at 9000 feet in the mountain mahogany belt of the Pine Valley Mountains on September 14, 1941. It was in a flock of ruby-crowned kinglets. In the pygmy forest a flock of twenty-five or more bush-tits was seen September 12, 1941.

This series of bush-tits presents a combination of characters suggestive of intergradation. As to dorsal coloration, they are like *P. m. plumbeus* with the back olivaceous in contrast to the more grayish pileum. The color of the auriculars is as in *plumbeus*. The underparts in general show the characters of *providentialis*. The pinkish wash so characteristic of *plumbeus* is lacking for the most part, and the throat color, instead of being lighter as in *plumbeus* conforms to the color of the belly.

Arvey (1941:75) states that bush-tits from Inyo and Mono counties, California, are intergrades between *plumbeus* and *providentialis*. Seemingly, though, the characters behave in an entirely different manner than in the Pine Valley birds, for the upper parts and flanks are as as in *providentialis*, while the under part show the characters of *plumbeus*.

I notice a discrepancy in the statements of van Rossem (1936:85) and Arvey (*op. cit.*) with respect to the dorsal coloration of the bush-tits of the southern Great Basin. Both agree that the back and pileum are concolor, but van Rossem states that his Charleston Mountain birds have a clear, ashy-gray color, while Arvey states that the dorsum is olivaceous.

***Sitta carolinensis nelsoni* Mearns**

ROCKY MOUNTAIN NUTHATCH

Three specimens: male and female, Pine Valley Mountains near Whipple Valley, 9500 feet, 5 miles east Pine Valley, September 14, 1941; male, Pine Valley Mountains, 7100 feet, 4 miles east Pine Valley, September 15, 1941. An immature female weighed 18.4 grams, an immature male 16.2 grams, and an adult male 17.9 grams.

The species ranged from the yellow pine belt into the spruce-fir belt during the breeding season.

Of the three specimens, two are typical of *nelsoni*. The third is characterized by a longer and more tapering bill which resembles that of the race *tenuissima*. However, the depth of bill is not as in that race. Perhaps the longer bill is an indication of an approach of the Pine Valley population to the race *tenuissima*.

***Sitta canadensis canadensis* Linnaeus**

RED-BREASTED NUTHATCH

Three specimens: male, Whipple Meadow, 8700 feet, 5 miles east Pine Valley, June 26, 1938; 2 males same locality, September 14, 1941. Two males weighed 10.9 and 11.3 grams.

This species was seemingly confined to the spruce-fir forest during the nesting season.

***Sitta pygmaea melanotis* van Rossem**

BLACK-EARED PYGMY NUTHATCH

Two specimens: adult male and immature female, Pine Valley Mountains, 7100 feet, 4 miles east Pine Valley, September 15, 1941. The male weighed 10.8 grams; the immature female 11.2 grams.

This form of nuthatch occurred in areas where yellow pines, aspens and the spruce-fir forest blended together but was more commonly found in the yellow pines than elsewhere.

These two specimens are typical of *melanotis*. While not breeding birds, nevertheless, doubt is cast upon Hardy's (1941b) statement that the pygmy nuthatches of the area are *canescens* described by van Rossem (1931:328) from the Charleston Mountains of Nevada.

***Certhia familiaris montana* Ridgway**

ROCKY MOUNTAIN CREEPER

One specimen: female, Pine Valley Mountains near Whipple Valley, 9500 feet, 5 miles east Pine Valley, September 14, 1941; weight 8.2 grams.

The single specimen of creeper obtained appears to be lighter than the average run of specimens of the race *montana*. This might be an indication of an affinity with the race *leucosticta* described by van Rossem (1931:329) from the Charleston Mountains of southern Nevada. However, the specimen can be matched by birds in fresh plumage from Wyoming, Arizona, and east-central Nevada. Some of the latter are even more extremely white than this Pine Valley specimen.

***Cinclus mexicanus unicolor* Bonaparte**

DIPPER

Dippers were common along all the mountain-streams of the Pine Valley Mountains. They were seen during our field work both in June and early September.

***Troglodytes aedon parkmanii* Audubon**

WESTERN HOUSE WREN

Five specimens: male, Pine Creek Canyon, Zion National Park, June 18, 1931; male, Motoqua, April 17, 1932; male, 4 miles east Pine Valley, 8000 feet, June 26, 1938; female, 3 miles south St. George, 2800 feet, December 18, 1939; female, Santa Clara, 2800 feet, December 16, 1939. Two winter-taken females weighed 9.2 and 10.2 grams.

This wren was commonly encountered in the mountains during the breeding season and in the lowlands in winter. Thus, it appears that there may be an altitudinal migration in this form with its having a status of summer resident in the mountains but a winter visitant to the lowlands.

***Thryomanes bewickii eremophilus* Oberholser**

DESERT WREN

Twelve specimens: male, Jackson Spring, 6 miles west Gunlock, April 17, 1932; male, west slope Beaver Dam Mountains, U. S. Highway 91, 3 miles southeast Yucca Service Station, Nov. 25, 1937; male, Danish Ranch, 4200 feet, 5 miles northwest Leeds, May 2, 1939; female, 3 miles south St. George, 2800 feet, December 18, 1939; female and 2 males, Santa Clara, 2800 feet, December 16-21, 1939; juvenile male, juvenile female and adult male, Santa Clara Creek, 2800 feet, 3 miles southwest St. George, May 11-13, 1940; female, west slope Beaver Dam Mountains, 3300 feet, 5 miles north Utah-Arizona border, May 4, 1941; male, junction Virgin and Santa Clara rivers, 2700 feet, 2 miles south St. George, September 11, 1941. One male weighed 10.0 grams.

This wren is an inhabitant of the lowlands and apparently a permanent resident. A preference seemed to be shown by these wrens for side gulches with much vegetation or cover.

***Heleodytes brunneicapillus couesi* (Sharpe)**

NORTHERN CACTUS WREN

Thirteen specimens: female and 4 nestlings, west slope Beaver Dam Mountains, 4 miles north Utah-Arizona border and 1½ miles east U. S. Highway 91, April 12, 1941; 5 juveniles (3 females, 2 males) and 3 adults (1 female, 2 males), west slope Beaver Dam Mountains, 3300 feet, 5 miles north Utah-Arizona border, May 4-6, 1941. Three male juveniles weighed 33.7, 35.0 and 41.5 grams. Two male juveniles weighed 37.0 and 37.5 grams. An adult male weighed 40.0 grams; an adult female 42.9 grams.

Cactus wrens occurred commonly on the west side of the Beaver Dam Mountains in the Joshua tree belt. While they often perched and sang from the Joshua trees, all of the nests found were located in cholla cactus. Description of one nest containing the nestlings has been given by Higgins (1941:117).

Telmatodytes palustris plesius (Oberholser)

WESTERN MARSH WREN

Four specimens: male, St. George, February 15, 1933; male, 3 miles south Washington, 2800 feet, December 17, 1939; male, 3 miles south St. George, 2800 feet, December 18, 1939; male, junction Virgin and Santa Clara rivers, 2700 feet, 2 miles south St. George, September 11, 1941. Three males weighed 10.7, 11.0 and 11.7 grams.

Although closely confined to its marshy habitat, this wren was common in both summer and winter.

Catherpes mexicanus conspersus Ridgway

CANYON WREN

Three specimens: male, Toquerville, April 23, 1930; male, Danish Ranch, 4200 feet, 5 miles northwest Leeds, November 27, 1936; male, same locality, May 2, 1939. One male weighed 11.2 grams.

Study of this small group of canyon wrens and others collected in recent years in Utah has led to a further consideration of the problem of whether those canyon wrens of California described as *Catherpes mexicanus punctulatus* are separable from those of the Great Basin representing the race *C. m. conspersus*. In a previous publication (Grinnell and Behle, 1935:247-251) the view was expressed that only two races of canyon wrens occur in the United States, namely, *albifrons* and *conspersus*. It was argued that *punctulatus* should not be recognized as distinct from *conspersus* but should be synonymized under the latter name. In this earlier study differences were noted between selected individuals from various parts of the western United States, but the differences were attributed to great individual variation. While this type of variation is extreme in canyon wrens, enough new material has accumulated to demonstrate that there is a center of differentiation in Nevada and Utah to which the name *conspersus* applies and that this population is different from that in California west of the crest of the Sierra Nevada which has been designated as *punctulatus*. Intergradation occurs over vast areas, however, between the two centers, and it is this feature that has, no doubt, led to much of the confusion relative to the two races.

As systematic data concerning our geographically variable birds accumulate, it becomes more and more evident that there are many "centers" where characters appear extreme and from which "typical" specimens come. If these centers are of large enough extent to constitute a geographic range, and if the characters are constant over this range, a race or subspecies is recognized. Connecting these centers are usually long gradients or clines over which a blending of characters occurs. This is commonly expressed as intergradation. In the case of the canyon wrens, it appears that these gradients or intergradational areas may be of greater geographical extent than the differentiation centers themselves, a rather unusual condition.

With such a situation existing in nature, lack of material may obscure the main differentiation centers, yet there may be and often is an abundance of material from the intermediate areas. Con-

fusion is then bound to result. When an abundance of material accumulates, the ambiguities usually straighten themselves out. However, before that time systematists working with the small bits of material at their immediate disposal are apt to acquire widely divergent views. Or acquisition of new material may necessitate a reversal of opinion. So it is with the problem of the distribution and variation of canyon wrens. Material representing this species is not overly abundant in collections, and much of that which is seems to have come from intergradational areas.

To elaborate on the two differentiation areas in question, birds most typical of *punctulatus* seem to come from the west slope of the Sierra Nevada as around the Yosemite region; those most representative of *conspersus* from eastern Nevada and Utah in general. Although the type of *conspersus* was collected in western Nevada at old Fort Churchill in the Washoe Range, Lyon County, Nevada, and thus on the periphery of the range, it is indistinguishable from birds from southern and central eastern Utah. Along the eastern escarpment of the Sierra Nevada the separation of the two races is rather abrupt, then, at least when compared with the situation prevailing throughout the southern deserts and to the north across Oregon. In these last two areas intergradation seems to occur. Material in the collection of Stanley Jewett, largely from the western desert region of Oregon seems to consist of a variable lot of intergrades linking *punctulatus* with *conspersus*. The specimens seem closest to the former, as has been indicated by Gabrielson and Jewett (1940:459). Much material in the various California collections is indicative of the southern trend.

All specimens from Utah are noticeably paler than California examples of *punctulatus*, and their most outstanding feature is the great amount of tawny color on the lower back, rump, and upper tail coverts.

Thus, despite all remarks made at the previous time, I believe these two races to be distinct in typical form. Their distribution is probably essentially as Oberholser (1930:96) has indicated in his revision of the group. The characters separating these races seem to be on the basis of color, not average measurements.

The Great Basin birds, although not the palest of the species, are the tawniest. Yet this population is essentially surrounded by darker forms. *Punctulatus* to the west is darker, and its intergradational trend across Oregon makes a darker though variable population there as compared with the Great Basin population proper. Specimens that I have examined from Colorado on the east side of the Rocky Mountains are dark too. In southern Arizona a dark population again exists. The dark Colorado and Arizona populations suggest the influence of *polioptilus* as Oberholser (*op. cit.* p. 95) has worked it out, or possibly *mexicanus* extends north into those states.

I am indebted to several people for the loan of comparative material for this particular study: Dr. John M. Aldrich for sending me the type of *conspersus* as well as for the loan of several specimens of that race from Utah and Colorado; Mr. Stanley Jewett for the loan of his large series from Oregon; Dr. J. S. Stanford for the loan of a few specimens from Utah; and Dr. Alden H. Miller for comparative material from California.

Salpinctes obsoletus obsoletus (Say)

COMMON ROCK WREN

Eight specimens: male, Harrisburg, April 15, 1932; 2 males, Shem, April 16, 1932; male, Terry Ranch, Beaver Dam Wash, 2600 feet, 6 miles north Utah-Arizona border, April 18, 1932; male, Castle Cliffs, U. S. Highway 91, west slope Beaver Dam Mountains, November 28, 1936; male, one mile north Veyo, 5000 feet, June 24, 1938; Danish Ranch, 4200 feet, 5 miles northwest Leeds, May 2, 1939; female, 3 miles south Harrisburg, 3200 feet, December 20, 1939. A male weighed 15.0 grams; a female 16.2 grams.

Mimus polyglottos leucopterus (Vigors)

WESTERN MOCKINGBIRD

Three specimens: female, St. George, 2800 feet, May 3, 1939; male, Santa Clara Creek, 2800 feet, 3 miles southwest St. George, May 12, 1940; male, 3 miles south St. George, 2800 feet, May 14, 1940. Two males weighed 46.0 and 47.2 grams.

The mockingbird was also heard in the Beaver Dam Wash. It is statewide in its distribution in Utah, although in my field work throughout the state I have found it to be most abundant in southwestern Utah.

Oreoscoptes montanus (Townsend)

SAGE THRASHER

Four specimens: male, Beaver Dam Mountains, April 20, 1930; male, Santa Clara, April 15, 1932; male, 15 miles southwest St. George, February 21, 1936; male, Grass Valley, 6500 feet, 3 miles north Pine Valley, June 14, 1938.

The habitat of this bird seemed to be sagebrush flats or farms near sagebrush.

Turdus migratorius propinquus Ridgway

WESTERN ROBIN

Four skins: male, Zion National Park, April 24, 1930; male, Pine Valley, 6800 feet, June 14, 1938; male, 1 mile southeast of Pinto, 6500 feet, June 14, 1938; female, 4 miles east Pine Valley, 7500 feet, June 12, 1938.

On December 17, 1939, two robins were seen perched in an orchard on the outskirts of St. George and one was also seen in a field south of Washington. At Pine Valley, on September 12, 1941, they occurred in large flocks of 50 or more individuals. They were most abundant during summer around 7000 feet in the upper stretches of the cottonwoods and in the yellow pine belt.

Hylocichla guttata auduboni (Baird)

AUDUBON HERMIT THRUSH

Thirteen skins: 5 males and 3 females, 4-5 miles east Pine Valley, 7100-7500 feet, June 12-20, 1938; 2 males and 3 females, Pine Valley Mountains, 7100-7500 feet, 4 miles east Pine Valley, September 13-14, 1941. Three females weighed 27.5, 29.5 and 25.0 grams; two males 28.9 and 35.2 grams.

Hermit thrushes were most often seen in dark spruce-fir forests. They were still common in mid-September in the canyons east of Pine Valley.

The McCabes (1932:32) have suggested that the race *polionota* may extend into Utah. The birds listed above, however, seem clearly of the race *auduboni* both on the basis of coloration and measurements. The series averages definitely larger than *polionota*. Five breeding males measure as follows: wing, 100.2 (104.7-98.4) mm.; tail, 76.1 (80.8-72.4) mm. Three breeding females had wing measurements of 99.4, 97.3 and 92.8 mm.; tail, 72.4, 72.1 and 71.8.

It may be pertinent here to clear up the McCabe's (*op. cit.*) uncertainty as to the location of Parley's Park, Utah, from which locality they had specimens collected by Robert Ridgway in 1869. This was not the present day "Parley" in Juab County (Tintic Hills) as was supposed. The location was one of Ridgway's principal collecting stations while serving as naturalist for the King survey. Parley's Park was located near the head of Parley's Canyon in the Wasatch Mountains a few miles east of Salt Lake City.

***Sialia mexicana bairdi* Ridgway**

CHESTNUT-BACKED BLUEBIRD

One specimen: male, Springdale, November 26, 1937.

This bird probably represents the breeding race of the region, although it was taken in the lowlands during migration.

***Sialia mexicana occidentalis* Townsend**

WESTERN BLUEBIRD

Five specimens: female, Springdale, April 22, 1932; male, same locality, November 26, 1937; male and 2 females, Danish Ranch, 4200 feet, 5 miles northwest Leeds, April 30 to May 2, 1939.

These specimens were evidently migrants passing through the region.

***Sialia curruoides* (Bechstein)**

MOUNTAIN BLUEBIRD

Two specimens: female, Jackson Spring, 6 miles west Gunlock, April 17, 1932; male, 3½ miles east Pine Valley, 7100 feet, June 16, 1938.

This was one of the commonest birds of the region, being found most frequently along roadsides and open benchlands at higher elevations, such as near Pinto and Pine Valley.

***Myadestes townsendi* (Audubon)**

TOWNSEND SOLITAIRE

Three specimens: male, Springdale, April 22, 1932; male and sex ?, Danish Ranch, 4200 feet, 5 miles northwest Leeds, April 29 and May 5, 1939. Two males weighed 32.5 and 40.0 grams.

This solitaire is a migrant to the lowlands, for it nests in the mountains in the spruce-fir-aspen areas.

***Poliptila caerulea amoenissima* Grinnell**

WESTERN GNATCATCHER

Twenty-four specimens: male, Beaver Dam Wash, April 21, 1930; male, 3 miles south Pinto, 6500 feet, June 14, 1938; male, $\frac{1}{2}$ mile east Pine Valley, 6700 feet, June 22, 1938; 12 males and 6 females, Danish Ranch, 4200 feet, 5 miles northwest Leeds, April 29-May 5, 1939; male and female, 3 miles west Santa Clara, 2800 feet, May 18, 1940; male, west slope Beaver Dam Mountains, 3300 feet, 5 miles north Utah-Arizona border, May 5, 1941. Fourteen males have extreme and average weights of 4.9-5.9 (5.5) grams; seven females, 4.7-6.3 (5.7) grams.

At most places where gnatcatchers were encountered they were in the juniper-piñon forest, but on the west slope of the Beaver Dam Mountains, they occurred in the Joshua belt. Near St. George they were widely distributed, often being associated with either the desert willow or screwbean.

***Corthylio calendula cineraceus* (Grinnell)**

WESTERN RUBY-CROWNED KINGLET

Twenty-three specimens: 3 males, Tonaquint Fields, St. George, November 26, 1937; 2 males, Pine Valley Mountains near Whipple Meadow, 9000 feet, 5 miles east Pine Valley, June 26, 1938; 2 males and female, same locality, September 14, 1941; female, St. George, 2800 feet, May 3, 1939; male and 3 females, Danish Ranch, 4200 feet, 5 miles northwest Leeds, April 29-30, 1939; male, 3 miles south St. George, 2800 feet, December 18, 1939; 4 males, Santa Clara, 2800 feet, December 16-19, 1939; 5 males, 3 miles south Washington, 2800 feet, December 17, 1939. Thirteen males had extreme and average weights of 5.7-7.7 (6.2) grams; five females, 5.7-6.5 (6.0) grams.

Kinglets were common in the spruce-fir forest in the mountains during the breeding season and abundant in the lowlands in winter. This probably represents a case of altitudinal migration. Of ten winter-taken, lowland birds, all were males, and they were most abundant in patches of creosote bush bordering on small streams. On the west slope of the Beaver Dam Mountains they were found in creosote stands on May 7, 1941. At the Danish Ranch from May 1 to 3 they were exceedingly abundant but later seemed to be scarce. It would appear that they were moving up to their breeding habitat early in May.

***Anthus rubescens rubescens* (Tunstall)**

EASTERN PIPIT

Four specimens: male, St. George, November 26, 1937; 2 males and a female, 3 miles south St. George, 2800 feet, December 18, 1939. Two males weighed 21.2 and 21.5 grams, a female 17.7 grams.

The three birds taken in mid-winter were shot from a flock of three hundred or more pipits in a close-cropped alfalfa field. Apparently they commonly winter in the region.

The four specimens are somewhat variable as to dorsal coloration but agree in having heavily streaked breasts and light underparts. Thus they do not represent the race *alticola* (Todd, 1935:64) which breeds in the high meadows of the Uintah Mountains of Utah and in the Rocky Mountains of Colorado.

***Bombycilla cedrorum* Vieillot**

CEDAR WAXWING

One specimen: male, Pine Valley Mountains, 7100 feet, 4 miles east Pine Valley, September 13, 1941.

This specimen is a bird of the year which suggests that the species may breed in the Pine Valley Mountains.

***Phainopepla nitens lepida* Van Tyne**

NORTHERN PHAINOPEPLA

Three specimens: male and female, Anderson's Ranch, U. S. Highway 91, 4 miles northeast Leeds, July 5, 1932; male, same locality, June 28, 1932.

***Lanius ludovicianus gambeli* Ridgway**

CALIFORNIA SHRIKE

Ten specimens: male, St. George, February 15, 1933; male, St. George, October 21, 1933; female, Castle Cliffs, U. S. Highway 91, 2500 feet, November 28, 1936; male, St. George, November 26, 1937; female, 3 miles south St. George, 2800 feet, December 18, 1939; 2 males and a female, Santa Clara, 2800 feet, December 16-21, 1939; male and female, 3 miles south Harrisburg, 3200 feet, December 20, 1939. Available weights for males are 41.1, 45.0 and 45.5 grams; for females, 42.0, 45.7 and 45.7 grams.

All the representatives of this subspecies are fall or winter birds. The race, therefore, is a winter resident in the region. One specimen is paler than the rest, thus showing an approach to *nevadensis*.

***Lanius ludovicianus nevadensis* Miller**

NEVADA SHRIKE

Twelve specimens: male, Beaver Dam Wash, April 22, 1930; male, Central, June 24, 1938; male, Danish Ranch, 4200 feet, 5 miles northwest Leeds, April 29, 1939; male, 3 miles southeast St. George, 2800 feet, December 16, 1939; adult female and 2 juvenile males, 3 miles south St. George, 2800 feet, May 15, 1940; 3 males and 1 female, west slope Beaver Dam Mountains, 3300 feet, 5 miles north Utah-Arizona border, May 3-6, 1941; male, junction Virgin and Santa Clara rivers, 2700 feet, 2 miles south St. George, September 10, 1941. Seven males had an average weight of 45.2 (43.3-48.2) grams. Two females weighed 46.3 and 52.4 grams.

Early nesting is indicated by the fact that a family group of two adults and three fully grown juveniles was seen south of St. George on May 15, 1940.

Six breeding males showed measurements as follows: wing, 96.1-100.7 (98.1); tail, 95.0-105.8 (99.3); exposed culmen, 13.1-15.1 (14.4) mm. The lot seems representative of the Great Basin population, although a large series especially from the Beaver Dam Wash may show an approach to *sonoriensis*.

Vireo vicinior Coues

GRAY VIREO

Nine specimens: male, Beaver Dam Mountains, April 22, 1930; 5 males and female, Danish Ranch, 3800-4200 feet, 5 miles northwest Leeds, April 30-May 4, 1939; 2 males, west slope Beaver Dam Mountains, 3300 feet, 5 miles north Utah-Arizona border, May 4-6, 1941. Six males had an average weight of 12.1 (11.1-12.9) grams. One female weighed 11.7 grams.

At the Danish Ranch this vireo occurred commonly in the juniper-piñon forest. On the west side of the Beaver Dam Mountains they frequented the Joshua tree belt. The testes were only slightly swollen in males taken at both localities. It appeared to me that the juniper-piñon forest was the normal habitat of the species. Those of the Beaver Dam Mountain area may have been just moving into the area, where they are summer residents.

Vireo solitarius plumbeus Coues

PLUMBEUS VIREO

Four specimens: all males, Danish Ranch, 4200 feet, 5 miles northwest Leeds, May 2-4, 1939. Three males weighed 15.3, 15.9 and 16.0 grams.

The birds occurred in a general forested area of juniper-piñon bordering a meadow where scrub-oak, occasional cottonwoods and ash trees also occurred. Thus, their habitat was not clearly defined. They were probably on their breeding grounds at the time, as the testes were swollen, and the males were actively singing.

Vireo solitarius cassinii Xantus

CASSIN VIREO

Two specimens: female, Terry Ranch, 2600 feet, Beaver Dam Wash, 6 miles north Utah-Arizona border, April 18, 1932; female, near junction of Virgin and Santa Clara rivers, 2700 feet, 2 miles south St. George, September 8, 1941. One female weighed 15.2 grams.

In both instances the birds were taken in river bottom land from willow-cottonwood vegetative areas. The race is transient through the region.

Vireo gilvus leucopolius Oberholser

OREGON WARBLING VIREO

Thirteen specimens: male juvenile, Zion Canyon, July 17, 1933; 7 males and 1 female, 3-5 miles east of Pine Valley, 7000-8000 feet, June 11-16, 1938; female, 2 miles southeast Pinto, 6500 feet, June 18, 1938; 2 males, Danish Ranch, 4200 feet, 5 miles northwest Leeds, May 5, 1939; female, junction Virgin and Santa Clara rivers, 2700 feet, 2 miles south St. George, September 9, 1941. Two males weighed 11.7 and 12.1 grams; a female 12.4 grams.

This species of vireo seemed to be associated with broad-leaved vegetative forms from aspen groves of the mountainous areas down to the cottonwoods of the river bottoms. They were more abundant than any of the other kinds of vireos collected. They nested primarily in the mountains between 7000 and 9000 feet.

In 1932, Oberholser described a race *V. g. leucopolius*, ascribing to it a range that included the Warner Valley and a narrow area north and south of this region. Sibley (1940:256) and Miller (1941:262) have recognized this race and extended its range greatly to include the whole of the Great Basin. As they point out, there is considerable over-lap in the color of back with *swainsonii* and this feature shows up in the Pine Valley series. Nevertheless, the lot as a whole has a more grayish tone to the back, and there is less yellow on the flanks than in *swainsonii*.

Vermivora celata orestera Oberholser

ROCKY MOUNTAIN ORANGE-CROWNED WARBLER

One specimen: male, Danish Ranch, 4200 feet, 5 miles northwest Leeds, May 1, 1939.

This specimen probably represents the breeding population and is of maximum size, even for the race *orestera* as indicated by the measurements of Oberholser (1905:246) and Twomey (1942:438). The specimen has measurements in millimeters as follows: wing, 66.6, tail, 52.6, exposed culmen, 9.4. In coloration it conforms with the Rocky Mountain race, being more yellowish than in *celata* and without the gray, especially in the head of the eastern form. The specimen likewise has a yellow eyelid. As compared with *lutescens* the specimen is darker without the bright yellow of the latter form.

Vermivora virginiae (Baird)

VIRGINIA WARBLER

Three specimens: male, Mt. Carmel Road, Zion National Park, July 8, 1932; male, Danish Ranch, 5 miles northwest Leeds, April 29, 1939; male, west slope Beaver Dam Mountains, 3300 feet, 5 miles north Utah-Arizona border, May 4, 1941.

The Danish Ranch specimen was probably on its breeding grounds, while that from the Beaver Dam area was a migrant. Elsewhere in Utah I have found this warbler nesting in Gambel oaks and aspen groves.

Vermivora luciae (Cooper)

LUCY WARBLER

Eleven specimens: 2 females and 1 sex ?, Beaver Dam Mountains, April 22, 1930; male, Terry Ranch, Beaver Dam Wash, 6 miles north Utah-Arizona border, April 18, 1932; male, Virgin, April 22, 1932; female, Shem, April 17, 1932; 2 males, Santa Clara Creek, 2800 feet, 3 miles southwest St. George, May 11-12, 1940; male, 3 miles south St. George, 2800 feet, May 14, 1940; male, 3 miles west Santa Clara, 2800 feet, May 18, 1940; male, Eardley Ranch, 2600 feet, Beaver Dam Wash, 8 miles north Utah-Arizona border, May 7, 1941. Four males weighed 6.5, 6.6, 7.0 and 7.2 grams.

The Lucy warbler is an abundant summer resident in the river bottoms frequenting essentially the willows and cottonwoods.

***Dendroica aestiva morcomi* Coale**

ROCKY MOUNTAIN YELLOW WARBLER

Twenty-seven specimens: 4 males and 2 females, $\frac{1}{2}$ mile east Pine Valley, 6700 feet, June 21-22, 1938; male, St. George, 2800 feet, May 3, 1939; 3 males and 2 females, 3 miles south St. George, 2800 feet, May 15-17, 1940; 3 males and 2 females, Santa Clara Creek, 2800 feet, 3 miles southwest St. George, May 11-14, 1940; 4 males, Beaver Dam Wash, 2600 feet, 5 miles north Utah-Arizona border, May 3-4, 1941; 2 males, west slope Beaver Dam Mountains, 3300 feet, 5 miles north Utah-Arizona border, May 4-6, 1941; 3 males and female, Eardley Ranch, 2800-3300 feet, Beaver Dam Wash, 8 miles north Utah-Arizona border, May 7-9, 1941. Fourteen males had average and extreme weights of 9.8 (9.0-10.8) grams; five females, 9.3 (8.8-10.0) grams.

Yellow warblers were found near Pine Valley in willow and hawthorne thickets along the stream as it meandered through a meadow. They were not found in cottonwoods a few miles upstream at not more than a few hundred feet higher elevation. At the Danish Ranch yellow warblers were seen for the first time on May 5, 1940. They had not been seen for several days prior to this date. Along the Santa Clara River near its junction with the Virgin River they frequented the willow-cottonwood river bottom vegetation being especially numerous where these vegetative types bordered on a marsh. They were abundant and breeding there during mid-May, 1940. Field work in the same vicinity in the second week of September, 1941, failed to reveal any present at that time. On the west slope of the Beaver Dam Mountains, we found them common during the first week in May of 1941. Here they occurred in the Joshua-creosote belt, frequenting especially the latter low shrub. They were common, too, down in the wash in the cottonwoods. These birds were not breeding, although their testes were several millimeters in length. Since they appear identical with breeding birds collected elsewhere in the general region, the assumption is that they had lately arrived in the area and were not yet established.

This series is in every respect typical of *morcomi*, not showing any approach to *sonorana*. The twenty males measured as follows: wing, 60.9 (63.7-57.9) mm.; tail, 46.3 (50.4-44.4) mm. The seven females measured: wing, 58.2 (59.4-55.4) mm., tail; 43.6 (45.4-42.1) mm.

***Dendroica auduboni memorabilis* Oberholser**

ROCKY MOUNTAIN AUDUBON WARBLER

Nineteen specimens: 2 males, Terry Ranch, 2800 feet, Beaver Dam Wash, 6 miles north Utah-Arizona border, April 18, 1932; 3 males and 2 females, 3 to 5 miles east Pine Valley, 7100-8500 feet, June 12-26, 1938; 11 males and one female, Danish Ranch, 4200 feet, 5 miles northwest Leeds, April 29-May 4, 1939. Eight males had an average weight of 13.6 grams with extremes of 16.2 and 11.5 grams. One female weighed 11.0 grams.

During the first few days of May, 1939, a great wave of warblers passed through the Danish Ranch area and Audubon warblers were very abundant at the time. Some may have been on their way to higher elevations in the Pine Valley Mountains where they breed throughout June in the aspen-yellow pine-spruce forest. Many of the summer residents had a sticky substance on the feathers at the base of their bills like pitch from pine trees.

Apparently all the Audubon Warblers we collected were of the resident race, even though some were in non-breeding locations. The race *D. a. auduboni* passes through the area as a transient. This is indicated by Hardy (1941:125) who reports examples of both races having been taken from the same flock in the lowlands at St. George.

All the specimens listed above are uniform in the great amount of black appearing in their plumage. The centers of the feathers of the back are black. The lores are black with the dark extending over to the auriculars. The black on the breast and sides is also very extensive.

Sixteen miles had an average wing measurement of 78.2 mm. with extremes of 80.3 and 75.2 mm.; the tails averaged 59.4 mm. with extremes of 61.8 and 56.5 mm. The wing measurements of three females averaged 72.4 with extremes of 73.4 and 71.8 mm; tail, 55.3 (57.2-53.4) mm.

***Dendroica nigrescens* (Townsend)**

BLACK-THROATED GRAY WARBLER

Eight specimens: male, 2 miles north Pinto, 6600 feet, June 23, 1938; male and female, 2 miles southeast Pinto, 6700 feet, June 18, 1938; 3 males, female and sex ?, Danish Ranch, 4200 feet, 5 miles northwest Leeds, May 1-4, 1939. Three males weighed 7.4, 8.0 and 9.2 grams. One female weighed 7.4 grams.

During the breeding season this warbler was found exclusively in the pygmy forest of piñon pines and junipers. In early May they were found as transients at lower elevations in the cottonwoods.

Oberholser (1930:101) has stated that there are two races of black-throated gray warblers. The population in the southwest and the Great Basin area supposedly is different from that of British Columbia and the Pacific Coast region of the northwestern United States. Twomey (1942:444) follows Oberholser in the usage of the name *D. n. halsei* for the southern race and places his examples from the Uinta Basin with the more southern race. The average wing measurement for my birds is more like that of *halsei* in comparison with the figure given by Oberholser for the population of Washington and Oregon. The tail measurements of the Utah birds, however, stand closest to that of the northwest population. The seven males from southwestern Utah have measurements as follows: wing, 64.1 (67.2-60.6) mm.; tail, 50.9 (53.2-47.4) mm. The female had a wing measurement of 59.6 mm.; a tail of 47.9 mm.

The characters for *halsei* involving the extent of white and dusky areas on certain rectrices seem to be of little if any diagnostic value. I prefer not to use the trinomial until further study of the species confirms the existence of two races.

***Oporornis tolmiei* (Townsend)**

MACGILLIVRAY WARBLER

Six specimens: female, Pine Valley Forest Service Camp, 3 miles east Pine Valley, June 20, 1936; male, Danish Ranch, 4200 feet, 5 miles northwest Leeds, May 4, 1939; male, 3 miles south St. George, 2800 feet, May 16, 1940; 3 males,

west slope Beaver Dam Mountains, 3300 feet, 5 miles north Utah-Arizona border, May 4-6, 1941. Five males had an average weight of 12.7 grams with extremes of 13.5 and 11.7 grams.

This form of warbler seemed to first arrive at the Danish Ranch on May 4, 1939. They had not been seen or heard for several days prior to this date. As a breeding bird they commonly occurred throughout the region around 7000 feet frequenting dense thickets and chaparral of oak, mountain mahogany and service berry.

***Geothlypis trichas occidentalis* Brewster**

WESTERN YELLOW-THROAT

One specimen: male, 3 miles south St. George, 2800 feet, May 14, 1940; weight, 9.2 grams.

This was evidently a transient taken when the resident race was breeding. It is grayer on the back than the other yellow-throats, has a narrower post-frontal white stripe and has less yellow below. It appears that the bird was undergoing a prenuptial molt, for the throat feathers seem new and consequently brighter than those of the rest of the underparts. Van Rossem (1930:297) has stated that many migratory specimens of *occidentalis* are passing through the southern deserts at a time when the resident race has commenced to breed. This appears to be true for southwestern Utah likewise.

***Geothlypis trichas scirpicola* Grinnell**

TULE YELLOW-THROAT

Twenty specimens: 2 males and female, St. George, 2800 feet, May 3, 1939; 5 males and 2 females, 3 miles south St. George, 2800 feet, May 14-17, 1940; 8 males and 2 females, near junction Virgin and Santa Clara rivers, 2700 feet, 2 miles south St. George, September 9-11, 1941. Weights of the 15 males averaged 10.5 grams with extremes of 9.2 and 13.0 grams. The five females averaged 10.6 (9.8-11.6) grams.

Yellow-throats were found inhabiting areas of cattail and tule swamps in the river bottoms and, although of local occurrence, were numerous where they were found. They were breeding in mid-May and were still fairly common in early September, although they were more wary than earlier, probably because of the molting activity.

That the breeding yellow-throats of the Virgin River Valley are not *occidentalis* was first shown by van Rossem (1930:297) when, on the basis of two specimens from Washington, Washington County, Utah, he extended the range of *scirpicola* to include extreme southwestern Utah. The larger amount of material now at hand from the region substantiates the view that they do not represent *occidentalis*, although certain characters show an approach to that race. The southern Utah birds have backs greener than in *occidentalis*, but perhaps not so green as in *scirpicola*. The yellow of the underparts is intense, as in *scirpicola*, but it does not extend as far down on the belly as in the southern race. As such, the situation is more as in *occidentalis*. The white, post-frontal band is rather wide, thus indicating closest affinities in this character to *scirpicola*.

Measurements are as follows for seven breeding males: wing, 55.7-57.4 (56.7) mm.; tail, 50.0-55.4 (53.5) mm.; exposed culmen, 11.3-12.4 (11.6) mm. Three breeding females measured as follows: wing, 51.8, 53.0, 53.3 mm.; tail, 50.4, 51.3, 52.6 mm.; exposed culmen, 10.7, 11.0, 11.3 mm.

Icteria virens auricollis Bonaparte

LONG-TAILED CHAT

Five specimens: male, Springdale, June 26, 1932; male and 2 females, Santa Clara Creek, 2800 feet, 3 miles southwest St. George, May 11-12, 1940; female, Beaver Dam Wash, 2600 feet, 5 miles north Utah-Arizona border, May 4, 1941. Two males weighed 24.0 and 22.4 grams; a female 27.4 grams.

At all locations noted above this species was found in a dense streamside thicket. The birds were actively singing at the time. The gonads were slightly enlarged.

Wilsonia pusilla pileolata (Pallas)

NORTHERN PILEOLATED WARBLER

Eight specimens: male, Santa Clara Creek, 2800 feet, 3 miles southwest St. George, May 13, 1940; 3 males and female, 3 miles south St. George, 2800 feet, May 16-17, 1940; 2 males, Eardley Ranch, Beaver Dam Wash, 2800 feet, 8 miles north Utah-Arizona border, May 7-9, 1941; female, junction Virgin and Santa Clara rivers, 2700 feet, 2 miles south St. George, September 10, 1941. Six males had an average weight of 7.8 grams with extremes of 7.4 and 8.7 grams.

This warbler nests elsewhere in the mountains of Utah around 9000 feet and may do so in the Pine Valley Mountains. However, we did not encounter them except in the river bottoms where they were transients. On two successive years we collected them in mid-May on their northward migration. One was also taken in the lowlands in early September at which time they were common there.

Sturnella neglecta Audubon

WESTERN MEADOWLARK

Four specimens: male, St. George, November 26, 1937; male, Hurricane, November 27, 1937; male, 3 miles south St. George, 2800 feet, December 18, 1939; male, St. George, 2800 feet, May 3, 1939.

Evidently the species is permanently resident, for meadowlarks were abundant in spring and summer and were commonly seen in small flocks in the fields south of St. George and Washington from December 16-21, 1939.

Agelaius phoeniceus utahensis Bishop

UTAH RED-WING

Forty-seven specimens: male and female, Zion National Park, June 27, 1931; 2 males and 4 females, Hurricane, April 21, 1932; male, St. George, February 15, 1933; 2 males, St. George, October 21, 1933; male, 2 miles south St. George, March 21, 1934; 2 females, St. George, November 26, 1937; 2 males and female, Springdale, November 26, 1937; 3 males, Hurricane, October 30, 1938; 5 males and 3 females, ½ mile east Pine Valley, 6700 feet, June 13-22, 1938; male, Pinto, 6500 feet, June 24, 1938; male, 1 mile east Pinto, 6500 feet, June 14, 1938; 6 males and 3 females, St. George, 2800 feet, May 3, 1939;

female, Santa Clara, 2800 feet, December 16, 1939; 5 males and 2 females, 3 miles south St. George, 2800 feet, May 14-17, 1940. Eleven males had an average weight of 65.7 grams. Extremes were 62.1 and 70.0 grams. Six females averaged 43.0 (34.5-47.0) grams.

Redwings were abundant as breeding birds wherever marshes or wet meadows occurred. During the winter there were great concentrations in the Virgin River Valley. Flocks numbering more than a thousand individuals were sometimes seen.

The redwings from all locations are to be placed with *utahensis*, although a few individuals show an approach to *nevadensis*, suggesting the beginnings of an area of intergradation to the southward (Behle, 1940b).

***Icterus cucullatus nelsoni* Ridgway**

ARIZONA HOODED ORIOLE

One specimen: female, Terry Ranch, 2800 feet, Beaver Dam Wash, 6 miles north Utah-Arizona border, April 22, 1930.

***Icterus parisorum* Bonaparte**

SCOTT ORIOLE

Two specimens: male and female, west slope Beaver Dam Mountains, 3300 feet, 5 miles north Utah-Arizona border, May 3, 1941. The male weighed 35.6 grams; the female 32.3 grams.

The Scott oriole was found in Utah by Merriam (Fisher, 1893:76) who noted it in the juniper belt of the Beaver Dam Mountains, May 10-11, 1891. Hardy and Higgins (1940:107) saw the species in the Joshua trees on the west slope of the Beaver Dam Mountains on May 6, 1939 and May 26, 1940. The two listed above were breeding birds taken in the Joshua tree belt. A second male was seen on May 3, 1941 and another pair two days later on May 5.

This species is normally an inhabitant of the southern deserts, yet it was found by Twomey (1942:453) nesting in the Uinta Basin in the northeastern portion of the state. There they occurred along the lower fringe of the juniper-piñon pygmy forest. It would appear that there has been an extension of range northward in Utah along the Colorado River-Green River drainage.

***Icterus bullocki* (Swainson)**

BULLOCK ORIOLE

Thirteen specimens: male, Motoqua, April 17, 1932; male and 2 females, Terry Ranch, 2800 feet, Beaver Dam Wash, 6 miles north Utah-Arizona border, April 17-19, 1932; male, 1 mile southeast Pinto, 6500 feet, June 18, 1938; 2 males and female, Danish Ranch, 4200 feet, 5 miles northwest Leeds, April 29-30, 1939; male, St. George, 2800 feet, May 3, 1939; male, 3 miles south St. George, 2800 feet, May 16, 1940; male, Beaver Dam Wash 2600 feet, 5 miles north Utah-Arizona border, May 4, 1941; 2 males, Eardley Ranch, 2800 feet, Beaver Dam Wash, 8 miles north Utah-Arizona border, May 7-8, 1941. Six males weighed 35.6 (32.2-40.0) grams; one female, 32.0 grams.

This oriole showed a decided preference for cottonwoods where they nested high in the upper branches. On May 4, 1939, at the Danish Ranch pairs were copulating and selecting nest sites.

Euphagus cyanocephalus (Wagler)

BREWER BLACKBIRD

Nine specimens: female, Terry Ranch, 2600 feet, Beaver Dam Wash, 6 miles north Utah-Arizona border, April 19, 1932; male, St. George, October 19, 1933; 2 adult females, 1 juvenile female, 2 adult males, 1 juvenile male, ½ mile east Pine Valley, 6700 feet, June 13-21, 1938; female, Eardley Ranch, 2800 feet, Beaver Dam Wash, 8 miles north Utah-Arizona border, May 8, 1941.

This species of blackbird is a permanent resident gathering in large flocks in winter in the lowlands. They nest around ranches, especially where there are adjacent wet meadows. They occur as high as 7000 feet. Use of this habitat often brings it in close contact with the redwing blackbird. The Brewer blackbird is the most abundant blackbird of the region.

Molothrus ater obscurus (Gmelin)

DWARF COWBIRD

Twenty specimens: 3 males and female, Danish Ranch, 4200 feet, 5 miles northwest Leeds, April 29-May 1, 1939; male, St. George, 2800 feet, May 3, 1939; male and female, 3 miles south St. George, 2800 feet, May 17, 1940; 3 males and 2 females, Santa Clara Creek, 2800 feet, 3 miles southwest St. George, May 11-13, 1940; 5 males, 3 females, Eardley Ranch, 2800 feet, Beaver Dam Wash, 8 miles north Utah-Arizona border, May 8-9, 1941. The average weight of 11 males was 40.9 grams, with extremes of 35.4 and 46.5 grams. Five females averaged 35.6 grams; extremes were 30.4 and 42.0 grams.

At the Danish Ranch cowbirds were found in pastures associated with cows, sometimes perching on their backs as the livestock quietly fed. At the Eardley Ranch in the Beaver Dam Wash they were abundant around the barnyard. Along the lower stretches of the Santa Clara Creek they were common in the willows and cottonwoods.

The series from the Beaver Dam Wash are of the race *obscurus*. The five males are of small size as indicated by the following measurements: wing, 97.0-104.0 (99.8); tail, 65.0-69.2 (68.0); exposed culmen, 14.5-15.8 (15.3) mm. Three females from the Beaver Dam Wash measured as follows: wing, 91.7-99.5; tail, 62.8-68.0; exposed culmen, 13.5 mm. The cowbirds from the vicinity of St. George and from the Danish Ranch are larger which suggests an approach to the Great Basin race *artemisae*. Unfortunately, no specimens were obtained from Pine Valley. However, I would expect this population to be *artemisae*, since specimens from the Great Basin to the north are *artemisae*. Five males from St. George average: wing, 107.5-104.8 (105.5); tail, 74-76 (75); exposed culmen, 15.0-17.8 (16.8) mm. Three females measured: wing, 95.7-97.4; tail, 66-68; exposed culmen, 14.5-15.6. Those from the Danish Ranch are intermediate in size. Three males measured: wing, 101.9-103.7; tail, 70.3-72.0; exposed culmen, 15.6-16.0. One female had a wing measurement of 91.8, tail, 63.6, exposed culmen, 13.3.

Piranga ludoviciana (Wilson)

WESTERN Tanager

Two specimens: male, Hop Canyon, 7400 feet, 5 miles east Pine Valley, June 11, 1938; male, Eardley Ranch, 2800 feet, Beaver Dam Wash, 8 miles north Utah-Arizona line, May 7, 1941. One male weighed 29.2 grams.

Western tanagers were abundant as transients in the lowlands in early May. Later, they were found nesting in the yellow pines in the mountains.

Hedymeles melanocephalus melanocephalus (Swainson)

ROCKY MOUNTAIN BLACK-HEADED GROSBEAK

Twenty-two specimens: male, Springdale, June 25, 1932; juvenile male and juvenile female, Pine Valley, 6700 feet, August 8, 1935; 4 males and 2 females, 3.5 miles east Pine Valley, 7100-8600 feet, June 10-26, 1938; 6 males, Danish Ranch, 4200 feet, 5 miles northwest Leeds, April 29-May 5, 1939; male, 3 miles south St. George, 2800 feet, May 16, 1940; 2 males and 2 females, Santa Clara Creek, 2800 feet, 3 miles southwest St. George, May 11-12, 1940; 2 males, Eardley Ranch, 2800 feet, Beaver Dam Wash, 8 miles north Utah-Arizona border, May 9, 1941. Eight males had an average weight of 45.6 grams, extremes being 39.6 and 48.0 grams. One female weighed 44.5 grams.

This species showed a wide-ranging tolerance to environmental conditions. It was abundant as a breeding bird in the willows and cottonwoods of the lowlands both along Santa Clara Creek and the Beaver Dam Wash. It was again common in the stands of mountain mahogany around 7000 feet where it was associated with spurred towhees which occurred in the same habitat. One was seen in late June at 8500 feet in an aspen grove in the Pine Valley Mountains. Surrounding the aspens were yellow pines and some spruces.

These birds apparently are of the large Rocky Mountain race named by Oberholser (1919:412) *Hedymeles melanocephalus papago*. According to the findings of van Rossem (1932:489) the race should be designated as *H. m. melanocephalus* (Swainson).

Thirteen breeding males have measurements as follows: wing, 96.2-105.4 (101.4); tail, 70.7-83.2 (78.8); exposed culmen, 16.0-19.1 (17.7); depth of bill at base, 12.7-14.0 (13.3) mm. There is a tendency, though, for the birds of the valleys and river bottoms to average smaller. Eight males from the mountain areas have an average wing length of 102.9 mm., as compared with that of 99.1 mm. for five males taken in the river bottom land. While suggestive of geographic variation, a much larger series will be necessary to verify this.

Guiraca caerulea interfusa Dwight and Griscom

WESTERN BLUE GROSBEAK

Three specimens: male, Rockville, July 18, 1932; male, Springdale, July 31, 1932; female, Santa Clara Creek, 2800 feet, 3 miles southwest St. George, May 11, 1940. The female weighed 36.6 grams.

The blue grosbeak was encountered only in the river bottoms where it frequented the dense willow-cottonwood cover.

Passerina cyanea (Linnaeus)

INDIGO BUNTING

A male was seen May 14, 1940, in a field about a mile south of St. George and constitutes the third record of the species for the area. The species was first recorded from Utah and the St. George region by Hardy (1939:86) who reported a male in the collection at the Dixie Junior College, taken June 11, 1937, at St. George. Cottam (1941:122) recorded seeing a male at the mouth of Zion Canyon near the entrance to Zion National Park, July 21, 1940.

Passerina amoena (Say)

LAZULI BUNTING

Thirteen specimens: female, Zion National Park, June 25, 1932; male, Springdale, June 25, 1932; 5 males, $\frac{1}{2}$ mile east Pine Valley, 6700 feet, June 21-22, 1938; 4 males and female, Danish Ranch, 4200 feet, April 29-May 5, 1939; male, Beaver Dam Wash, 2600 feet, 5 miles north Utah-Arizona border, May 4, 1941. Four males had an average body weight of 14.1 grams with a wide individual variation from 9.9 to 17.2 grams.

This bunting was very abundant from the river bottoms up to 7000 feet, being most frequently encountered where bushes bordered cultivated fields. They were especially common in rose thickets.

Carpodacus cassinii Baird

CASSIN PURPLE FINCH

Three specimens: 2 males, 5 miles east Pine Valley, 8600-9000 feet, June 17, 1938; male, Danish Ranch, 4200 feet, 5 miles northwest Leeds, May 4, 1939. One male weighed 26.0 grams.

Cassin purple finches bred in the mountains in the yellow pine and spruce belts. They were uncommon.

Carpodacus mexicanus solitudinus Moore

DESERT HOUSE FINCH

Twenty-five specimens: 3 females, Beaver Dam Wash, April 21-22, 1930; male, Terry Ranch, 2600 feet, Beaver Dam Wash, 6 miles north Utah-Arizona border, April 19, 1932; male, Motoqua, April 17, 1932; male, 2 miles southwest Santa Clara, February 21, 1936; male, 4 miles south Castle Cliffs, U. S. Highway 91, November 27, 1936; male, Danish Ranch, 4200 feet, 5 miles northwest Leeds, April 29, 1939; 2 males and 2 females, 3 miles south Harrisburg, 3200 feet, December 20, 1939; female, Santa Clara, 2800 feet, December 16, 1939; male, 3 miles south St. George, 2800 feet, Dec. 18, 1939; 2 males, Santa Clara Creek, 2800 feet, 3 miles southwest St. George, May 11, 1940; male, 3 miles west Santa Clara, 2800 feet, May 18, 1940; male and female, Beaver Dam Wash, 2600 feet, 5 miles north Utah-Arizona border, May 4, 1941; 6 males, Eardley Ranch, 2800 feet, Beaver Dam Wash, 8 miles north Utah-Arizona border, May 4-9, 1941. Twelve breeding males weighed 20.3 (18.3-22.7) grams. Three females weighed 18.4, 19.7, and 20.2 grams.

The house finch or "peach bird" as it is locally called, was extremely common the year around in the lowland areas. They were as abundant in the willows and cottonwoods as they were around ranches and in orchards. During the winter, flocks were observed, often numbering about one hundred individuals. Three miles south of Harrisburg such a flock was attracted to a standing pool of water and even though repeatedly frightened away, the birds kept returning to the edges of the pool. One of the two males taken in December at three miles south of Harrisburg is a yellow type, the other partly so.

Moore (1939a:107) has recently named the house finch of the western Great Basin region as *Carpodacus mexicanus solitudinis* and in a later publication (1939b:191) indicates that examples from southwestern Utah are intergrades between this race and the more eastern *frontalis* as he limits the latter. Some of the material listed above was available to him at the time of his revision.

Spinus pinus pinus (Wilson)

NORTHERN PINE SISKIN

Six specimens: 3 males, Pine Valley Mountains, 7800-9000 feet, 4-5 miles east Pine Valley, June 17-26, 1938; male and female, Danish Ranch, 3800-4200 feet, 5 miles northwest Leeds, April 30-May 1, 1939; male, Santa Clara, 2800 feet, December 21, 1939. One male weighed 12.2 grams.

During the breeding season pine siskins were common in the yellow pine-aspen-spruce forest. During the winter they were common in the lowlands in small flocks.

Spinus psaltria hesperophilus (Oberholser)

GREEN-BACKED GOLDFINCH

Twenty-three specimens: male and female, Springdale, June 26, 1932; 2 males and female, 2 miles southwest Santa Clara, 2800 feet, February 21, 1935; male, Danish Ranch, 4200 feet, 5 miles northwest Leeds, November 26, 1936; male, Pine Valley, 6700 feet, June 13, 1938; 2 males and 2 females, 1 mile southeast Pinto, 6500 feet, June 18, 1938; 2 males and female, Danish Ranch, 4200 feet, 5 miles northwest Leeds, May 1-4, 1939; 3 males, Santa Clara, 2800 feet, December 16-19, 1939; male and 2 females, Santa Clara Creek, 2800 feet, 3 miles southwest St. George, May 11, 1940; 2 males and female, Eardley Ranch, 2800 feet, Beaver Dam Wash, 8 miles north Utah-Arizona border, May 7, 1941. Three males weighed 8.8, 9.5 and 10.2 grams.

The green-backed goldfinch was the only goldfinch encountered in our field work, but the species was exceedingly abundant. It showed preference for cottonwood stands and ranged from the river bottoms up to 7000 feet. During the winter, small flocks of these finches were common in the lowlands.

Oberholseria chlorura (Audubon)

GREEN-TAILED TOWHEE

Thirteen specimens: male, Hurricane, April 21, 1932; male, Pine Valley, August 8, 1935; male, 3½ miles east Pine Valley, 7200 feet, June 20, 1938; 3 males, Hop Canyon, 7200-7400 feet, 5 miles east Pine Valley, June 11-16, 1938; male and female, Middle Fork Canyon, 7500 feet, 3 miles east Pine Valley, June 13, 1938; sex ? and male, Danish Ranch, 4200 feet, 5 miles northwest Leeds, April 30-May 3, 1939; female, 3 miles south St. George, 2800 feet, May 17, 1940; female, Castle Cliffs Service Station, 3000 feet, U. S. Highway 91, 25 miles west St. George, May 12, 1939; male, west slope Beaver Dam Mountains, 3300 feet, 4 miles north Utah-Arizona border, May 3, 1941. One male weighed 26.8 grams; a female 31.4 grams.

We found this towhee as a breeding bird around 7000 feet. It was most frequently encountered in dense growths of mountain mahogany, service berry, and Gambel oak. It had very much the same habitat as the spurred towhee. As a migrant it was common on lower slopes and in the lowlands. Here, too, it was found in thickets which afforded cover.

The series shows no significant departures in diagnostic characters from Rocky Mountain birds.

Pipilo maculatus montanus Swarth

SPURRED TOWHEE

Eight specimens: male, Pintura, April 14, 1932; male, Tonaquint Fields, St. George, 2800 feet, November 26, 1937; male, 1 mile east Pinto, 6500 feet, June 14, 1938; male and female, 2 miles southeast Pinto, 6500 feet, June 18, 1938; male, ½ mile east Pine Valley, 6700 feet, June 22, 1938; male, 4 miles east Pine Valley, 8400 feet, June 17, 1938; male, Middle Fork Canyon, 7500 feet, 5 miles east Pine Valley, June 12, 1938; male, Hop Canyon, 7400 feet, 5 miles east Pine Valley, June 11, 1938; 2 females, Santa Clara, 2800 feet, December 16-19, 1939. One male weighed 43.2 grams; a female 42.3 grams.

The habitat of the spurred towhee was a chaparral type of country at middle elevation, 5000 to 7500 feet, where the cover was made up of service berry, mountain mahogany or even Gambel oak. The pairs were rather widely spaced. In such situations they were associated with green-tailed towhees, both species having been collected as breeding birds from the same cover type. The spurred towhee did not occur in the lowlands except in winter, and then it was associated with the Abert towhee in the latter's river-bottom habitat of dense cover. Whereas the Abert towhee was silent in winter, the spurred towhees occasionally uttered their "mewing" note.

Pipilo aberti Baird

ABERT TOWHEE

Thirteen specimens: male and sex ?, Tonaquint Fields, St. George, 2800 feet, April 20, 1932; female, 5 miles south St. George, February 22, 1935; male and female, 15 miles southwest St. George, February 21, 1936; male, Tonaquint Fields, St. George, November 26, 1937; male and 3 females, Santa Clara Creek, 2800 feet, 3 miles southwest St. George, May 12-13, 1940.

This is the form of towhee occupying the lowlands where it is a permanent resident of common occurrence. It was a silent bird indicating its presence only by the rustle of leaves as it scratched when foraging. Juveniles being taken May 12 indicates early nesting. The form was found along the river-bottoms where there was dense cover, although it was occasionally seen to venture out along fields and irrigation ditches, but even so there had to be sufficient cover nearby.

Calamospiza melanocorys Stejneger

LARK BUNTING

One specimen: male, west slope Beaver Dam Mountains, 3300 feet, 5 miles north Utah-Arizona border, May 6, 1941.

Only a pair of these birds was seen. They occurred in the Joshua tree belt, but were actually perched in a cholla cactus. The male was secured. Its testes were greatly enlarged, each being about the same size and measuring 12 x 7 millimeters. The records of this form in Utah have lately been summarized by Behle (1942:230).

***Passerculus sandwichensis laudinus* Bonaparte**

WESTERN SAVANNAH SPARROW

One specimen: female, Santa Clara, 2800 feet, December 19, 1939; weight, 16.2 grams.

This was a single individual foraging among sunflower stalks in an open field. It was the only savannah sparrow seen in a week of field work in mid-December, thus suggesting the scarcity of the bird in the area in winter.

In using the above name, Grinnell (1939:119) has been followed rather than Peters and Griscom (1938).

***Passerculus sandwichensis nevadensis* Grinnell**

NEVADA SAVANNAH SPARROW

Nine specimens: female, Hurricane, 2800 feet, November 26, 1937; 1 sex ?, 6 females, 1 male, junction Virgin and Santa Clara rivers, 2700 feet, 2 miles south St. George, September 10-11, 1941. One male weighed 18.4 grams; four females, 18.4, 18.4, 17.1, 17.6 grams.

This subspecies probably represents the breeding form of the region, although no specimens were secured during the breeding season. The species is probably uncommon in the area because of the general lack of the suitable habitat consisting of damp meadows.

***Poocetes gramineus confinis* Baird**

WESTERN VESPER SPARROW

Two specimens: male, Grass Valley, 6700 feet, 3 miles north Pine Valley, June 14, 1938; female, junction Virgin and Santa Clara rivers, 2700 feet, 2 miles south St. George, September 11, 1941. One female weighed 22.6 grams.

This sparrow nested in sage brush areas primarily, but also occurred on grassy stretches of the foothill areas as at Mountain Meadows and Grass Valley. They seem to migrate through the lower valleys in large numbers in the fall and spring.

***Chondestes grammacus strigatus* Swainson**

WESTERN LARK SPARROW

Nine specimens: female, Beaver Dam Wash, 6 miles north Utah-Arizona border, April 20, 1930; male, Virgin, April 22, 1932; 3 males, La Verkin, April 22, 1932; female, Pine Valley, 6700 feet, June 13, 1938; male, ½ mile east Pine Valley, 6700 feet, June 22, 1938; female, Danish Ranch, 3800 feet, 5 miles northwest Leeds, May 1, 1939; female, Eardley Ranch, 2800 feet, Beaver Dam Wash, 8 miles north Utah-Arizona border, May 8, 1941. One female weighed 30.0 grams.

This species of sparrow appeared to be widespread during the summer, occurring along roadsides, sage brush flats, and edges of cultivated fields.

***Amphispiza bilineata deserticola* Ridgway**

BLACK-THROATED SPARROW

Thirteen specimens: male, Shem, April 16, 1932; 2 males and female, St. George, 2800 feet, May 3, 1939; male and female, same locality, May 15, 1940; male, 3 miles west Santa Clara, 2800 feet, May 18, 1940; male, Castle Cliff Service Station, 3000 feet, U. S. Highway 91, 25 miles southwest St. George, May 12, 1940; 3 males, west slope Beaver Dam Mountains, 3300 feet, 4-5 miles north Utah-Arizona border, April 12 and May 5, 1941; male, Beaver Dam Wash, 2600 feet, 5 miles north Utah-Arizona border, May 4, 1941; male, Eardley Ranch, 2800 feet, Beaver Dam Wash, 5 miles north Utah-Arizona border, May 9, 1941.

The desert black-throated sparrow was of infrequent occurrence in the St. George area on open flats dotted with an occasional mesquite. On the west slope of the Beaver Dam Mountains it was more abundant, but there occurred in the creosote bush-Joshua tree association. Merriam (Fisher, 1893:96) found the species on both slopes of the Beaver Dam Mountains, ranging up into the junipers. Also he found it abundant in the lower Santa Clara Valley.

***Amphispiza nevadensis nevadensis* (Ridgway)**

NORTHERN SAGE SPARROW

Fourteen specimens: male, Pintura, April 15, 1932; juvenile, Anderson Ranch, U. S. Highway 91, 4 miles north Leeds, June 28, 1932; 2 males, west slope Beaver Dam Mountains, 3 miles west Castle Cliffs, November 27-28, 1936; male, female and sex ?, same locality, October 28, 1938; 7 males, 3 miles south Harrisburg, 3200 feet, December 20, 1939. The seven December males had an average weight of 19.2 grams, extremes being 17.7 and 20.8 grams.

The only specimens collected during the writer's field work were the seven from south of Harrisburg. They occurred in an open flat where occasional patches of creosote grew and rarely a mesquite bush. They occurred in isolated pairs in low bushes, rather than in small flocks, as did many of the sparrows wintering in the region. None were seen in this same area during the breeding season, but they have been found farther north in sage-brush areas. Merriam (Fisher, 1893:97) similarly did not find the sage sparrow in the lower valleys but met with it in great abundance as he traveled north encountering the species at such places as the Mountain Meadows, Shoal Creek and the Escalante Desert. Twomey (1942:470) reports having seen large flocks on the shrub deserts near St. George in October.

***Junco hyemalis hyemalis* (Linnaeus)**

SLATE-COLORED JUNCO

One specimen: male, Santa Clara, 2800 feet, December 17, 1939. The specimen weighed 20.0 grams.

It was shot among a small flock of Oregon juncos. Samples of the flock proved to be *J. o. montanus*. The slate-colored junco is probably a regular winter visitor in the region in small numbers. Further collecting should result in the finding of the race *J. o. cismontanus* wintering in the region (see Behle and Higgins, 1942:54).

Junco oreganus shufeldti Coale

SHUFELDT JUNCO

One specimen: male, Santa Clara, 2800 feet, December 19, 1939; weight, 17.2 grams.

The specimen is allocated to this race on the basis of measurements. It was taken with several examples of *J. o. montanus* and is, evidently, an uncommon winter visitant in the region.

Junco oreganus montanus Ridgway

MONTANA JUNCO

Thirteen specimens: male and female, 15 miles southwest St. George, 2500 feet, February 21, 1936; 2 males, Danish Ranch, 4200 feet, 5 miles northwest Leeds, November 27, 1936; female, Anderson Ranch, 3000 feet, U. S. Highway 91, 4 miles north Leeds, November 27, 1936; male, 3 miles south Washington, 2800 feet, December 17, 1939; male, 3 miles south St. George, 2800 feet, December 18, 1939; 5 males, Santa Clara, 2800 feet, December 19, 1939. Five males weighed 18.5 (17.2-19.2) grams.

The Montana junco was one of the commonest birds in the lowlands around St. George in the winter. They occurred in small flocks of from fifteen to thirty-five birds and seemed to be most frequently encountered on exposed sunny hillsides. They were less common in the river bottom thickets.

Two males show an approach to *shufeldti* in their smaller size.

Junco caniceps caniceps (Woodhouse)

GRAY-HEADED JUNCO

Nine specimens: 2 males and female, Middle Fork Canyon, 7500 feet, 5 miles east Pine Valley, June 12, 1938; male, female and juvenile, Hop Canyon, 7200 feet, 4 miles east Pine Valley, June 17-20, 1938; 3 males, Whipple Meadow, 8500 feet, Pine Valley Mountains, 5 miles east Pine Valley, June 26, 1938.

The gray-headed junco is the summer resident of the juncos of the region. It occurs in the mountains from 7000 to 9000 feet. At lower elevations within the limits mentioned they were found most often in side draws arising from main canyons; at higher elevations they frequented the dense cover bordering meadows and occasionally ventured out along the edges of the meadows. Their diet seemed largely insectivorous while feeding young, for nearly every individual shot had the mouth and throat filled with bodies of moths, measuring worms, or larval insect forms.

Spizella passerina arizonae Coues

WESTERN CHIPPING SPARROW

Twelve specimens: male, Zion National Park, April 24, 1930; male, Pintura, April 15, 1932; male, Virgin, April 22, 1932; male, Springdale, April 22, 1932; 4 males and female, Hop Canyon, 7000-7400 feet, 4-5 miles east Pine Valley, June 11-20, 1938; male and female, Danish Ranch, 4200 feet, 5 miles northwest Leeds, April 29-May 1, 1939; male, junction Virgin and Santa Clara rivers, 2700 feet, 2 miles south St. George, September 10, 1941. Two females weighed 12.4 and 12.8 grams.

As a breeding bird, the chipping sparrow was found primarily in the Gambel oak-mountain mahogany belt, although occasionally they

were seen on the borders of mountain meadows. In the fall they tended to wander widely and were common in small flocks in mid-September in the pygmy forest of the juniper-piñon association. They were a common migrant in the lowlands in the fall.

Spizella breweri breweri Cassin

BREWER SPARROW

Five specimens: male, Jackson Spring, 6 miles west Gunlock, April 17, 1932; female, 2 miles north Pinto, 6600 feet, June 23, 1938; female, St. George, 2800 feet, May 3, 1939; male, Beaver Dam Wash, 2600 feet, 5 miles north Utah-Arizona border, May 4, 1941; female, Irontown Ruins, 6000 feet, Iron County, September 12, 1941. One male weighed 10.4 grams; a female 10.0 grams.

This was the breeding *Spizella* of the sage brush areas where it was common. Thus it did not occur in the lowland valleys.

Spizella atrogularis evura Coues

DESERT BLACK-CHINNED SPARROW

Four specimens: 4 males, Danish Ranch, 4200 feet, 5 miles northwest Leeds, April 29-30, 1939. The weights of these birds were 11.0, 11.7, 11.8 and 11.8 grams.

The males were singing birds with enlarged gonads, hence, probably breeding specimens. They were taken along a more or less rocky ridge in the juniper-piñon association (Behle, 1940a:224). Further evidence of the species breeding in the area is furnished by Hardy and Higgins (1940:110) who, in addition to two other records for the Beaver Dam area, collected an immature from a large flock of adults and young on June 16, 1939.

Zonotrichia querula (Nuttall)

HARRIS SPARROW

One specimen: male, Santa Clara, 2800 feet, December 16, 1939; weight, 34.1 grams.

The specimen was taken in the dense river-bottom vegetation and was in a small flock of Gambel sparrows. With the great concentration of the latter species, Harris sparrows could be easily overlooked. The several records that have accumulated of recent years (Behle and Higgins, 1942:54) indicate that the species may be a regular winter visitor, although in small numbers.

Zonotrichia leucophrys leucophrys (Forster)

WHITE-CROWNED SPARROW

Three specimens: female, Santa Clara Creek, 2800 feet, 3 miles southwest St. George, May 17, 1940; female, 3 miles west Santa Clara, 2800 feet, May 18, 1940; male, west slope Beaver Dam Mountains, 3300 feet, 5 miles north Utah-Arizona border, May 3, 1941. A male weighed 32.0 grams; a female 20.2 grams.

White-crowned sparrows were greatly in the minority while wintering in the area or as transients when compared with the abundant Gambel sparrows. The two kinds occurred in mixed flocks.

Zonotrichia leucophrys gambelii (Nuttall)

GAMBEL SPARROW

Twenty-three specimens: female, Beaver Dam Wash, 2800 feet, April 22, 1930; unsexed specimen, Hurricane, April 23, 1932; male, St. George, 2800 feet, October 21, 1933; male and 2 unsexed specimens, 15 miles southwest St. George, 2500 feet, February 21-22, 1936; male, 2 miles southwest Santa Clara, 2800 feet, February 21, 1936; male, St. George, February 25, 1936; male, St. George, November 26, 1936; male, Silver Reef, 3 miles northwest Leeds, 3250 feet, November 27, 1936; male, Danish Ranch, 5 miles northwest Leeds, November 27, 1936; 3 males, 4 miles southeast Castle Cliffs, 3500 feet, 2 miles north Utah-Arizona border, November 28, 1936; female, Beaver Dam Wash, 3 miles north Utah-Arizona border; October 29, 1938; male and 3 females, 3 miles south Harrisburg, 3200 feet, December 20, 1939; female, 3 miles south St. George, 2800 feet, December 18, 1939; male, Santa Clara, 2800 feet, December 17, 1939. Two males weighed 24.6 and 25.0 grams. Four females had average and extreme weights of 24.9 (23.6-26.5) grams.

The Gambel sparrow was the most abundant bird in the lowlands of southwestern Utah during the winter. In small flocks they occurred wherever there was brush and cover.

Melospiza lincolnii lincolnii (Audubon)

EASTERN LINCOLN SPARROW

One specimen: female, junction Virgin and Santa Clara rivers, 2700 feet, 2 miles south St. George, September 9, 1941; weight 15.2 grams.

This specimen was shot in a field near an irrigation ditch and is typical of the race indicated.

Melospiza lincolnii alticola Miller and McCabe

SOUTHERN MONTANE LINCOLN SPARROW

Two specimens: female, Hurricane, 3000 feet, October 30, 1938; female, junction Virgin and Santa Clara rivers, 2700 feet, 2 miles south St. George, September 10, 1941. One female weighed 12.4 grams.

The measurements of these two females place them with the race *alticola* (Miller and McCabe, 1935:156). The dorsal coloration of the Hurricane example is somewhat intermediate between the two races *alticola* and *lincolnii*; that of the St. George specimen is of a color type common to both races.

Melospiza melodia merrilli Brewster

MERRILL SONG SPARROW

Two specimens: female, 3 miles southwest Washington, 2800 feet, December 17, 1939; male, Santa Clara, 2800 feet, December 21, 1939. The male weighed 22.4 grams; the female 24.2 grams.

Of a series of thirty song sparrows collected in the St. George area in mid-December, 1939, all are *montana* but the two listed above which seem closer to *merrilli*. They are not typical, however. A specimen collected by Vernon Bailey at Santa Clara, January 13, 1889, has been designated as of the race *merrilli*. (See Fisher, 1893:100, and Ridgway, 1901:591).

Melospiza melodia montana Henshaw

MOUNTAIN SONG SPARROW

Forty-seven specimens: male, Danish Ranch, 4200 feet, 5 miles northwest Leeds, November 26, 1936; female, 5 miles south St. George, 2500 feet, February 22, 1936; male and female, Tonaquint Fields, St. George, 2750 feet, November 26, 1937; 3 males and 2 females, $\frac{1}{2}$ mile east Pine Valley, 6700 feet, June 21-22, 1938; male, Danish Ranch, 4200 feet, 5 miles northwest Leeds, May 5, 1939; 4 males and 4 females, 3 miles south Washington, 2800 feet, December 17, 1939; 4 males and 2 females, 3 miles south St. George, 2800 feet, December 18, 1939; 4 males and 8 females, Santa Clara, 2800 feet, December 16-21, 1939; 7 males and 4 females, junction Virgin and Santa Clara rivers, 2700 feet, 2 miles south St. George, September 8-10 1941. Eighteen males had average and extreme weights of 21.1 (17.7-22.7) grams; seventeen females, 19.7 (17.2-23.0) grams.

Song sparrows of this race, which has a breeding range throughout the Great Basin and Rocky Mountains, made up the breeding population at higher elevations in southwestern Utah. Thus, there seems to be an ecological separation between this mountain race and that of the lowlands. This has been elaborated on in a previous publication (Marshall and Behle, 1942). During the winter months song sparrows are exceedingly abundant in the lowlands and are practically all of this form. Apparently the influx into the lowlands occurs early, for by mid-September they were as abundant in the cattail swamps along the Virgin River as were song sparrows of the summer resident race. Both races were molting at the time. These early arrivals in the lowlands may have descended from the nearby higher elevations where they breed.

It was noted in our winter collecting that song sparrows were not as closely confined to streamside thickets as they are during the breeding season, but occurred most anywhere where there was brush or cover.

Melospiza melodia fallax (Baird)

VIRGIN RIVER SONG SPARROW

Twenty-seven specimens: male, Zion Canyon, Zion National Park, July 6, 1931; female, same locality, June 25, 1932; female, St. George, 2800 feet, May 3, 1939; 9 males, 6 females, 3 miles south St. George 2800 feet, May 14-17, 1940; 6 males, 3 females, near junction of Santa Clara and Virgin rivers, 2700 feet, 2 miles south St. George, September 8-10, 1941. Thirteen males had average and extreme weights of 20.4 (18.5-22.7) grams; seven females, 19.6 (16.5-25.5) grams.

The song sparrows collected from southwestern Utah were submitted to Joe T. Marshall, Jr. for study, inasmuch as he was engaged at the time in an investigation of the distribution and variation of the races of song sparrows in the Great Basin. It developed that the birds of the Virgin River Valley represented a new geographic race which was described (Marshall and Behle, 1942:123) as *Melospiza melodia virginis*. Subsequently, it came to light that the type of *M. m. fallax*, a winter-taken bird, represented the Virgin Valley race, so the name

virginis was placed in synonymy under the name of *fallax*. (See Marshall, 1942:233). It appears that Henshaw (1884) was correct in his belief that the type of *fallax* did not represent the birds of the Great Basin and Rocky Mountains which he described as *Melospiza fasciata montana*. Thus this name must be restituted to apply to the mountain song sparrow. This necessity for shifting names should not obscure the significant facts of geographic variation and distribution revealed as a result of the accumulation of this material from southwestern Utah. As a result of an independent discovery that the type of *fallax* represents the population of southern Nevada and southwestern Utah and not that of the Tucson, Arizona region as Henshaw (*op. cit.*) supposed, Phillips (1943:247) has described the Tucson song sparrow as *Melospiza melodia bendirei*.

LITERATURE CITED

Arvey, M. D.

1941. A new race of bush-tit from southeastern California. *Condor*, 43:74-75.

Behle, W. H.

1938. Highlights of ornithological work in Utah. *Condor*, 40:165-173.
1940a. Extension of range of the black-chinned sparrow into Utah. *Condor*, 42:224.
1940b. Distribution and characters of the Utah redwing. *Wilson Bull.*, 52: 234-240, 1 fig.
1941a. Barn owls nesting at Kanab, Utah. *Condor*, 43:160.
1941b. A collection of birds from the La Sal Mountain region of southeastern Utah. *Wilson Bull.*, 53:181-184.
1942a. Distribution and variation of the horned larks (*Otocoris alpestris*) of western North America. *Univ. Calif. Publ. Zool.*, 46:205-316, 13 figs. in text.
1942b. Records of the herring gull, sanderling, and lark bunting in Utah. *Condor*, 44:230-231.

Behle, W. H., and Higgins, H.

1942. Winter records of the slate-colored junco and Harris sparrow in Utah. *Wilson Bull.*, 54:54-55.

Brodkorb, P.

1942. Notes on some races of the rough-winged swallow. *Condor*, 44:214-217.

Bishop, L. B.

1900. Descriptions of three new birds from Alaska. *Auk.*, 17:113-120.
1938. An apparently unrecognized race of redwing from Utah. *Trans. San Diego Soc. Nat. Hist.*, 9:1-4.

Cottam, C.

1929. A shower of grebes. *Condor*, 31:80-81.
1941. Indigo bunting and band-tailed pigeon in Utah. *Condor*, 43:122.

Cottam, W. P.

1937. Has Utah lost claim to the Lower Sonoran zone. *Science*, 85:563-564.

Fisher, A. K.

1893. Report on the ornithology of the Death Valley expedition of 1891, comprising notes on the birds observed in southern California, southern Nevada and parts of Arizona and Utah. *North American Fauna* no. 7:7-158.

Fosberg, F. R.

1938. The Lower Sonoran in Utah. *Science*, 87:39-40.

Gabrielson, I. N., and Jewett, S. G.

1940. Birds of Oregon (O.S.C. Coop. Assoc., Oregon State College, Corvallis), xxx + 650 pp., 97 pls. (1 col.), 20 figs, 1 map.

Grantham, H.

1936. The brown thrasher in Utah. *Condor*, 38:85.

Grater, R. K.

- 1941a. Water-thrush at Zion National Park, Utah. *Condor*, 43:70.
1941b. New bird records from Zion National Park. *Great Basin Naturalist*, 2:121-122.
1943. Bird notes from southwestern Utah. *Condor*, 45:75-76.

Grinnell, J.

1914. An account of the mammals and birds of the Lower Colorado Valley, with especial reference to the distributional problems presented. Univ. Calif. Publ. Zool., 12:51-294, pls. 3-13, 9 figs. in text.
1939. Proposed shifts of names in Passerculus—a protest. Condor, 41:112-119.

Grinnell, J., and Behle, W. H.

1935. Comments upon the subspecies of *Catherpes mexicanus*. Condor, 37:247-251, 1 fig.

Griscom, L.

1937. A monographic study of the red crossbill. Proc. Boston Soc. Nat. Hist., 41:77-209.

Hardy, R.

1939. Two new bird records for Utah. Condor, 41:86.
- 1941*a*. Utah bird records. Wilson Bull., 53:124-125.
- 1941*b*. Records of the Nevada nuthatch in Utah. Wilson Bull., 53:236.

Hardy, R., and Higgins, H. G.

1940. An annotated check-list of the birds of Washington County, Utah. Proc. Utah Acad. Sci., Arts, and Letters, 17:95-111.

Hayward, C. L.

1937. Some new and unusual bird records from Utah. Wilson Bull., 49:303-305.
1940. Notes on the distribution of nighthawks in Utah. Great Basin Naturalist, 1:93-96.

Henshaw, H. W.

- 1874*a*. An annotated list of the birds of Utah. Ann. Lyceum. Nat. Hist. of New York, 11:1-14.
- 1874*b*. An annotated list of the birds of Utah. Rep't. upon ornithological specimens collected in the years 1871, 1872, and 1873. Geog. and Geol. Expl. and Surv. West 100th Mer., George M. Wheeler, Pp. 39-54.
1875. Report upon the ornithological collections made in portions of Nevada, Utah, California, Colorado, New Mexico, and Arizona during the years 1871, 1872, 1873, and 1874, by H. W. Henshaw. Rep't Geog. and Geol. Expl. and Surv. West 100th Mer. by George M. Wheeler, 5:131-507, 977-989, pls. 1-15.
1884. Description of a new song sparrow from the southern border of the United States. Auk, 1:223-224.
1919. Autobiographical notes. Condor, 21:177-181.

Higgins, H. G.

1941. Nesting notes of the cactus wren in southwestern Utah. Oologist, 58:117.

Linsdale, J. M.

1936. The birds of Nevada. Pacific Coast Avifauna no. 23, 145 pp.
1938. Environmental responses of vertebrates in the Great Basin. Am. Midland Naturalist, 19:1-206.

Long, W. S.

- 1936*a*. Golden-crowned sparrow in Zion National Park. Condor, 38:89-90.
- 1936*b*. Additions to the list of the birds of Zion National Park. Auk, 53:231-232.
1940. Lesser loon and wood ibis in Utah. Condor, 42:122.

Marshall, J. T. Jr.

1942. *Melospiza melodia virginis* a synonym of *Melospiza melodia fallax*. Condor, 44:233.

Marshall, J. T. Jr., and Behle, W. H.

1942. The song sparrows of the Virgin River Valley, Utah. Condor, 44:122-124.

McCabe, T. T., and McCabe, E. B.

1932. Preliminary studies of western hermit thrushes. Condor, 34:26-40, 4 figs.

Mearns, E. A.

1886. Some birds of Arizona. Auk, 3:289-307.

Merriam, C. H.

1895. The Leconte thrasher, *Harporhynchus lecontei*. Auk, 12:54-60.

Miller, A. H.

1931. Systematic revision and natural history of the American shrikes (*Lanius*). Univ. Calif. Publ. Zool., 38:11-242, 65 figs. in text.
1934. Field experiences with mountain-dwelling birds of southern Utah. Wilson Bull., 46:156-168.
- 1941a. Speciation in the avian genus Junco. Univ. Calif. Publ. Zool., 44:173-434, 33 figs in text.
- 1941b. A review of centers of differentiation for birds in the western Great Basin. Condor, 43:257-267.

Miller, A. H., and McCabe, T. T.

1935. Racial differentiation in *Passerella* (*Melospiza*) *Lincolnii*. Condor, 37:144-160.

Moore, R. T.

- 1939a. Two new races of *Carpodacus mexicanus*. Proc. Biol. Soc. Wash., 52:105-112.
- 1939b. A review of the house finches of the subgenus *Burricea*. Condor, 41:177-205.

Oberholser, H. C.

1905. The forms of *Vermivora celata* (Say). Auk, 22:242-247.
1919. The geographic races of *Hedymeles melanocephalus* Swainson. Auk, 36:408-416.
1930. Notes on a collection of birds from Arizona and New Mexico. Sci. Publ. Cleveland Mus. Nat. Hist., 1:83-124, 1 pl.
1932. Descriptions of new birds from Oregon, chiefly from the Warner Valley region. Sci. Publ. Cleveland Mus. Nat. Hist., 4:1-12.
- 1937a. Descriptions of three new screech owls from the United States. Journ. Wash. Acad. Sci., 27:354-357.
- 1937b. Descriptions of two new passerine birds from the western United States. Proc. Biol. Soc. Wash., 50:117-120.

Peters, J. L., and Griscom, L.

1938. Geographical variation in the savannah sparrow. Bull. Mus. Comp. Zool., 80:445-477 (+3), 1 col. pl.

Phillips, A. R.

1943. Critical notes on two southwestern sparrows. Auk, 60:242-248.

Presnall, C. C.

- 1935*a*. The birds of Zion National Park. *Proc. Utah Acad. Sci., Arts, and Letters*, 12:196-210.
- 1935*b*. Altitudinal migration in southern Utah. *Condor*, 37:37-38.
- 1935*c*. A creeper foraging head downward. *Condor*, 37:39.
- 1935*d*. Four new records from Zion National Park, Utah. *Condor*, 37:82.
- 1936*a*. Clark nutcrackers invade southwestern Utah. *Condor*, 38:36-37.
- 1936*b*. Abundance of red-breasted nuthatches in southwestern Utah. *Condor*, 38:44-45.
- 1936*c*. Two new records for Zion National Park, Utah. *Condor*, 38:217.

Ridgway, R.

1901. The birds of North and Middle America. *Bull. U. S. Nat. Mus.* no. 50, pt. 1:xxx +715, 10 pls.

Rogers, C. H.

1939. A new swift from the United States. *Auk*, 56:465-468.

Sampson, A. W.

1925. The foothill-montane-alpine flora and its environment. In *Flora of Utah and Nevada* by Ivar Tidestrom. *Contr. U. S. Nat. Herbarium*, 25:24-31.

Shantz, H. L.

1925. Plant communities in Utah and Nevada. In *Flora of Utah and Nevada* by Ivar Tidestrom. *Contr. U. S. Nat. Herbarium*, 25:15-23.

Sibley, C. G.

1940. The warbling vireo of the cape district of Lower California. *Condor*, 42:255-258.

Stanford, J. S.

1938. An annotated list of the birds in [sic] the U. S. A. C. zoological museum. *Proc. Utah Acad. Sci., Arts, and Letters*, 15:135-146.

Stephens, L. A.

1938. Calliope hummingbird at Zion National Park. *Condor*, 40:42.

Tanner, V. M.

1924. An unique blackbird. *Condor*, 26:192-193.
1926. Life zone studies of southwestern Utah. *Proc. Utah Acad. Sci.*, 3:7.
1927. Notes on birds collected in the Virgin River Valley of Utah. *Condor*, 29:196-200.
1936. The western mockingbird in Utah. *Proc. Utah. Acad. Sci., Arts, and Letters*, 13:185-187.
1940. A chapter on the natural history of the Great Basin, 1800-1855. *Great Basin Naturalist*, 1:33-61.
1941. Lesser yellow legs, new record for Washington County, Utah. *Great Basin Naturalist*, 2:86.

Twomey, A. C.

1942. Art. XVII. The birds of the Uinta Basin, Utah. *Ann. Carnegie Mus.*, 28:341-490, 11 pls., (3 of them maps).

Van Rossem, A. J.

1930. Critical notes on some yellowthroats of the Pacific southwest. *Condor*, 32:297-300.
1931. Descriptions of new birds from the mountains of southern Nevada. *Trans. San Diego Soc. Nat. Hist.*, 6:325-332.
1932. The type of the black-headed grosbeak. *Auk*, 49:489.
- 1936a. The bush-tit of the southern Great Basin. *Auk*, 53:85-86.
- 1936b. Birds of the Charleston Mountains, Nevada. *Pacific Coast Avifauna* no. 24, 65 pp.
1942. Four new woodpeckers from the western United States and Mexico. *Condor*, 44:22-26.

Wetmore, A.

1939. Notes on the birds of Tennessee. *Proc. U. S. Nat. Mus.*, 86:175-243.

Woodbury, A. M.

- 1933a. The scratching of the spurred towhee. *Condor*, 35:70.
- 1933b. Biotic relationships of Zion Canyon, Utah, with special reference to succession. *Ecological Monographs*, 3:147-246.
1938. The Lower Sonoran in southwestern Utah. *Science*, 87:484-485.
1939. Birds records from Utah and Arizona. *Condor*, 41:157-163.

Wolfe, L. R.

1928. The breeding accipitres of Utah. *Oologists' Record*, 8:90-102.

Yarrow, H. C., and Henshaw, H. W.

1874. Report upon and list of birds collected by the expedition for explorations west of the one hundredth meridian in 1872; Lieut. Geo. M. Wheeler, in charge. In *Rep't. Ornith. specimens collected in the years 1871, 1872, and 1873. Geog. and Geol. Expl. and Surv. west 100th Mer., George M. Wheeler*, pp. 5-38.