

Species	Total in Three Counts	Males	Females	Ratio Males to Females
Mallard	137	86	51	1.7—1
Gadwall	5	3	2	1.5—1
Widgeon	36	21	15	1.4—1
Green-winged Teal	29	16	13	1.2—1
Blue-winged Teal*	64	38	26	1.5—1
Shoveller*	10	5	5	1.0—1
Pintail	35	26	9	2.9—1
Redhead	20	11	9	1.2—1
Canvasback	91	55	36	1.5—1
Lesser Scaup	424	259	165	1.6—1
Ring-necked Duck	24	12	12	1.0—1
American Golden-eye	21	11	10	1.1—1
Bufflehead	15	10	5	2.0—1
Ruddy Duck*	31	24	7	3.4—1
Totals	952	577	365	
Average totals	317.33	192.33	121.66	1.6—1

The ratios were derived from lesser numbers of birds than those used by other observers but they were taken from the actual breeding birds in their breeding territories.

PRINCE ALBERT, SASKATCHEWAN.

A STUDY OF THE WINTER BIRD LIFE IN BEAR LAKE AND UTAH LAKE VALLEYS†

BY C. LYNN HAYWARD

INTRODUCTION

During a number of years past I have had the privilege of making collections and observations of the bird life in certain parts of Utah and Idaho. These studies have been carried on in Bear Lake Valley which lies partly in the extreme southeastern corner of Idaho and partly in Utah, and in Utah Valley in central Utah. It is a striking coincident that these two valleys lying some 200 miles apart contain within their borders two of the largest and most interesting fresh water lakes in the Intermountain West, and possess many general topographical features in common; yet a difference in elevation of about 1,500 feet with its accompanying climatic variations has a significant effect upon the winter bird population in the two areas.

While no attempt is to be made in this paper to present a complete list of the winter birds of these two valleys, an effort will be

*Blue-winged Teals, Shovellers, and Ruddy Ducks increased towards the end of the survey so that there were actually more present in the district than the above table shows. However, in the case of the Shovellers by far the larger numbers were always in pairs so that the one-one relation is fairly close.

†Contribution No. 53 from the Department of Zoology and Entomology, Brigham Young University, Provo, Utah, June, 1933.

made to point out the predominating bird life as well as to indicate the contrasting climatic and environmental conditions which seem to govern the bird populations.

The collections and observations on which this study is based were made chiefly during the months of November, December, January, February, and the early part of March. It includes, roughly, the period between the end of the autumn and the beginning of the spring migrations. The Bear Lake Valley observations were made from 1928 to 1930 and the Utah Valley observations from 1931 to 1933.

I wish to acknowledge with thanks the assistance of Dr. H. C. Oberholser and Mr. Clarence Cottam of the U. S. Biological Survey in the identification of a number of doubtful specimens. I also appreciate the many helpful suggestions of Dr. Vasco M. Tanner, Brigham Young University, in the preparation of the manuscript. Numerous students and friends have supplied me with helpful information, but I wish especially to mention the assistance of Mr. D. Elmer Johnson who accompanied me on many field trips and aided in the preparation of skins and data.

TOPOGRAPHIC AND CLIMATIC FEATURES

Bear Lake Valley is located chiefly in Bear Lake County in the extreme southeastern corner of the state of Idaho. About fifteen miles of its southernmost end extends into Rich County, Utah. It is long and narrow in outline, having a maximum width of about eight miles and a total length of approximately fifty miles. In the extreme southern end of the valley, Bear Lake, a beautiful, deep, freshwater body is located; and northward there extend many acres of swamps and plains traversed by numerous wandering streams. Along the western border of the valley, low, sage covered foothills rise rather gently toward the crest of the Bear River Range of mountains which presents a somewhat even skyline and has an elevation of 8,000 to 9,000 feet. The eastern border of the valley is formed by the steep scarp of the Bear Lake Fault, and the elevated Bear Lake Plateau extends eastward for many miles into Wyoming. The valley floor is occupied largely by farming land where it is not covered by lake or swamp. It has an elevation of about 6,000 feet.

Due to the high elevation, the winters of Bear Lake Valley are rather long and severe. A summary of the climatic conditions as to mean temperature, snowfall, and periods of freezing temperatures, as shown by the records of the United States Weather Bureau are given below in Table I. As a result of these conditions, snow often lies in the valley for four or five months often to a depth of two or

three feet, covering almost every vestige of ground food, and long periods of severe sub-zero temperatures make living conditions most difficult.

On account of its great depth, Bear Lake does not usually completely freeze over until February, but it remains frozen often until the middle of April. During at least three or four of the winter months practically all of the ponds, swamps, and streams are completely frozen over or break up only for very short periods.

Utah valley is situated slightly north of the central part of Utah state in Utah County. In general topographic features it is very similar to Bear Lake Valley just described except that it is somewhat larger. Utah Lake has a greater area than Bear Lake but is a much more shallow body and is, therefore, frozen over during the greater part of the winter. The valley is bounded on the east by the high Wasatch Mountains and on the west by lower hills and mountains. The valley floor has an elevation of about 4,500 feet. Due chiefly to the lower elevation this valley has somewhat milder winters as will be seen in the accompanying charts. Snow is ordinarily not more than a foot deep at any time, and then usually for a month or two only.

While temperature often drops below the zero mark, these cold periods are ordinarily broken regularly by warmer days which melt the snow from sunny exposures and make considerable quantities of ground food available to birds. A considerable number of streams remain open throughout the winter affording feeding grounds for several varieties of ducks.

TABLE I. Summary of Some General Climatic Conditions in Bear Lake and Utah Valleys.

Record of Annual Snowfall from U. S. Weather Reports.

Place	No. Yrs.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Provo, Utah Valley	18	14.7	10.2	10.9	2.7	0.1	0	0	0	0	0.4	3.6	11.4
Paris, Bear L. Val.	15	16.3	12.6	11.7	2.9	1.6	0	0	0	1.1	4.5	7.3	9.4

Record of Mean Temperature, Degrees Fahrenheit.

Place	No. Yrs.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Provo, Utah Valley	20	27.0	31.4	40.6	49.3	56.5	64.5	72	70	60.5	49	39.3	28.5
Paris, Bear L. Val.	15	19	19	27.4	39.6	49.2	55.8	63.5	63	55	44	33	21

Record of Early and Late Frosts.

Place	No. Yrs.	Av. Date Last Killing Frost	Av. Date First Killing Frost
Provo, Utah Valley	20	May 24	September 24
Paris, Bear Lake Valley	15	June 14	September 3

The above charts demonstrate a number of interesting things as to the climatic conditions of the two valleys, some of which have al-

ready been pointed out. It will be noted in addition that the period in which frosts are expected in Bear Lake Valley is approximately forty-two days longer than in Utah Valley and that the snowfall is correspondingly greater and the temperature lower.

CONTRASTING BIRD POPULATIONS

The greatest contrast in bird populations in the two areas is shown, as would be expected, in the ground or near-ground feeding forms, particularly the Fringillidae and Icteridae. The contrast, however, is in number of individuals rather than in number of species since the same species in most cases may be found in Bear Lake Valley that inhabit Utah Valley but in far less numbers. The heavy snowfall of Bear Lake Valley is undoubtedly the indirect cause of this situation since a large part of the available ground food is covered for a considerable length of time.

In Utah the more common ground or near-ground feeding birds include as perhaps the most abundant the various varieties of Juncos. Shufeldt's Junco (*Junco oreganus shufeldti*) is by far the most common form. The Gray-headed Junco (*Junco caniceps*), the common breeding species of the Wasatch Mountains, is probably next in abundance; while the Pink-sided Junco (*Junco mearnsi*), which nests in the Bear River Mountains to the north, is fairly common. The Slate-colored Junco (*Junco hyemalis hyemalis*) was taken in Bear Lake Valley in March, and I have a specimen taken in Provo on November 12, 1932. Although not common, the Montana Junco (*Junco oreganus montanus*) is to be found consistently in winter in both Bear Lake and Utah Valleys.

These various species of juncos occur on the foothills and lower in Utah Valley throughout the entire winter. In Bear Lake Valley, however, I have never seen them in December or January although all of them occur in late fall and early spring.

Undoubtedly the most common finch in Utah Valley in winter is the Northern Pine Siskin (*Spinus pinus pinus*). These birds are to be found in flocks of many hundreds on the foothills where they feed upon sunflower seeds that may project above the snow. In company with them are smaller numbers of the Pale Goldfinch (*Spinus tristis pallidus*). Both of these species are rarely seen in Bear Lake Valley in mid-winter but they are replaced in numbers in that region by great flocks of Western Tree Sparrows (*Spizella arborea ochracea*). This latter species, however, seems to wander considerably and is not likely to be found in the same locality for very many days in succession.

Other common ground feeders that are found abundantly in Utah Valley but rarely in Bear Lake Valley in mid-winter are the White-crowned Sparrow (*Zonotrichia leucophrys leucophrys*), Gambel's Sparrow (*Zonotrichia leucophrys gambeli*), the Mountain Song Sparrow (*Melospiza melodia fallax*), the Spurred Towhee (*Pipilo maculatus montanus*), the Common House Finch (*Carpodacus mexicanus frontalis*), the American Pipit (*Anthus spinoletta rubescens*), the Long-crested Jay (*Cyanocitta stelleri diademata*), Woodhouse's Jay (*Aphelocoma californicus woodhousei*), and the Thick-billed Redwing (*Agelaius phoeniceus fortis*). Most of these species while occurring in Bear Lake Valley in November and again in February are not likely to be found there in large numbers during January and December.

Birds that obtain their food from the fruits, seeds, buds, or blossoms of trees are about equally abundant in both valleys throughout all of the winter months. Very large flocks of Western Evening Grosbeaks (*Hesperiphona vespertina brooksi*) are found in both valleys throughout the entire winter period. They seem to be particularly fond of the fruit of the boxelder and the white ash. These birds often remain until the latter part of May, feeding upon the buds and blossoms of elms and other trees during the spring months.

An interesting winter bird of Bear Lake Valley is the Common Redpoll (*Acanthis linaria linaria*), but I have never as yet seen this bird in Utah Valley. I have often noted these birds in large flocks in February and early March feeding on the blossoms of the Fountain Birch which grows so profusely along the streams in Bear Lake Valley. Under similar circumstances considerable numbers of Rocky Mountain Pine Grosbeaks (*Pinicola enucleator montana*) are often encountered feeding upon the blossoms of the alder. This latter species seldom visits Utah Valley in winter but prefers to remain much higher in the mountains.

Both the Eastern Ruby-crowned Kinglet (*Corthylio calendula calendula*) and the Western Golden-crowned Kinglet (*Regulus satrapa olivaceous*) are fairly common in Utah Valley in winter, but I have never seen either of them in Bear Lake Valley during the winter months. The Golden-crown may scarcely be called a valley bird since it confines itself largely to the mountains and higher portions of the canyons even in winter. On March 11, 1933, a party of students and

I encountered a large flock of these in the Canadian zone in Rock Canyon near Provo. On the eighteenth of the same month we saw a similar flock on the mountain east of Provo. Specimens were obtained on both days. On April 22, 1933, I was surprised to collect another specimen of this kinglet in the Juniper Belt on some low hills west of Utah Lake.

Considerable numbers of Western Robins are to be found in both valleys throughout the winter months. These birds more frequently occur in the mouths of canyons where dried berries of various kinds are available. A few Townsend's Solitaires (*Myadestes townsendi*) are to be found consistently on the outskirts of towns every year. During the winter of 1933 we were surprised to see a number of Mountain Bluebirds (*Sialia currocoides*) about the campus of the Brigham Young University at Provo in the early part of January. They remained in the vicinity until spring in spite of the fact that it was one of the coldest and longest winters of a number of years.

Other smaller winter birds of both Utah and Bear Lake Valleys are the Rocky Mountain Hairy Woodpecker (*Dryobates villosus monticola*), Batchelder's Woodpecker (*Dryobates pubescens leucurus*), the Rocky Mountain Creeper (*Certhia familiaris montana*), and many others less common which space will not permit me to mention at this time.

In suitable localities where the water is open throughout the winter, considerable numbers of ducks remain. The most common of these are the Common Mallard (*Anas platyrhynchos platyrhynchos*), Baldpate (*Mareca americana*), American Pintail (*Dafila acuta tzitzihoa*), Green-winged Teal (*Nettion carolinense*), Cinnamon Teal (*Querquedula cyanoptera*), American Golden-eye (*Glaucionetta clangula americana*), and Buffle-head (*Charitonetta albeola*). In Utah Valley most of these ducks concentrate on two or three warm streams that remain open throughout the winter. In Bear Lake Valley only one small stream known as Spring Creek remains unfrozen, and consequently very few ducks are to be found in that region in mid-winter.

Of the shore birds only Wilson's Snipe (*Capella delicata*) and the Killdeer (*Oxyechus vociferus vociferus*) remain with us during the entire winter. These birds are to be found frequently along small, open streams in both Bear Lake and Utah Lake Valleys.

Members of the hawk family are fairly common in both areas in winter, although in recent years shooting campaigns against them

have greatly reduced their numbers. With the exception of the migratory forms, the winter species are about the same as those of summer except that the Eastern Goshawk (*Astur atricapillus atricapillus*) often wanders into this territory. The Western Goshawk (*Astur atricapillus striatulus*) is fairly common in winter, and Mr. R. G. Bee informs me that this species remains here during the summer, nesting in the vicinity of Provo.

The more interesting winter representatives of the family Strigidae include the Montana Horned Owl (*Bubo virginianus occidentalis*), the Snowy Owl (*Nyctea nyctea*) and the Saw-whet Owl (*Cryptoglaux acadica acadica*). A specimen of the Montana Horned Owl was taken by Mr. Clarence Cottam at Aspen Grove near Provo, April 4, 1928, and I obtained two specimens at Paris, Idaho, in February, 1930, which I believe to be this species. A single specimen of the Snowy Owl was taken on Provo Bench in December, 1908, and is now in the collection of the Brigham Young University. On February 20, 1929, one of my students brought me a Saw-whet Owl that was taken at Paris, Idaho, and a few days later I saw another bird near my home at that place. A number of other more common species of owls are to be found in this area in winter as well as in the summer.

CONCLUSIONS

Many problems of an ecological nature present themselves in connection with the winter bird life of these inter-mountain valleys of the West. More details as to the exact food of our winter birds would be of interest and value. While much data of interest and value has been accumulated during the past number of years, much is yet to be done before we can have a really accurate knowledge of the winter bird inhabitants of these interesting areas.

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