

SHORT COMMUNICATIONS

RECENT BIRD RECORDS FROM THE VIRGIN RIVER VALLEY OF UTAH, ARIZONA, AND NEVADA

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More than 2700 hours of field time were spent in the study and analysis of the avifauna of the Virgin River Valley of Utah, Arizona, and Nevada from November 1962 through July 1966 while I resided at Zion National Park, Utah. Several notes were published as a result of data obtained (Carter and Wauer 1965; Wauer 1965a, b, 1966a, b, c, 1967, 1968; Wauer and Russell 1967). Habitats along the Virgin River drainage were discussed in the last reference.

The information in this paper concludes the reporting of distributional data obtained during the research. All specimens reported are in the museum collection of Zion National Park, except for those from Dixie College, St. George, Utah.

Eared Grebe. *Colymbus nigricollis*. Wintering in large numbers on Lake Mead, it migrates through the valley from 20 April to 14 May and from 30 September through 27 October. A female (ovary 13×9 mm) was taken at St. George, Washington County, Utah, on 21 April 1966.

Green Heron. *Butorides virescens*. A nest of this species found on 18 May 1966, 55 ft high in a cottonwood tree along Santa Clara Creek, Washington County, Utah, confirms the continued breeding of this species in Utah; young were seen at the edge of the nest on 24 May. Behle (1943) found it breeding three miles southwest of St. George on 15 May 1940. One taken at St. George on 26 October 1965 represents the race *anthonyi*. Stomach contents included 47 minnows, three small grasshoppers, one large dragonfly, one small damselfly, and a small worm.

Wood Duck. *Aix sponsa*. Apparently this species is a rare winter visitor to the St. George Basin. Two individuals were seen at a stock pond along Santa Clara Creek on 29 December 1964, and a specimen in the Dixie College collection was taken at St. George in December 1964. These are the first records for the Virgin River Valley although it is considered to be a "casual transient" in Utah (Woodbury et al. 1949:8) and "very rare" in Arizona (Phillips et al. 1964:14).

Black Hawk. *Buteogallus anthracinus*. Although earlier sightings in the Virgin River Valley have been reported for this species (Carter and Wauer 1965; Wauer and Carter 1965:47; Wauer and Rus-

sell 1967:420), a male taken at Washington, Washington County, Utah, on 21 April 1966 is the first specimen for Utah and the Virgin River Valley. Found perched on a low limb of a cottonwood tree along the Virgin River, the bird seemed stupified, could not fly, and was hopping from the tree to the ground trying to escape. It weighed 572 g; stomach contents included a partly digested meadowlark (*Sturnella*).

Virginia Rail. *Rallus limicola*. Hardy and Higgins (1940:97) reported this species for the St. George Basin. Recent records include a downy black juvenile male (testes 4×1.5 mm; weight 42.6 g), a male (testes 4×2 mm) taken at Washington on 19 October 1965 identified as the race *limicola* by L. L. Short (pers. comm.), and one in the Dixie College collection taken at St. George on 21 December 1947 by Jerome Gifford. The species has been found every month in the St. George Basin.

Common Gallinule. *Gallinula chloropus*. Wauer and Russell (1967:420) first reported it in the St. George Basin as a northward extension of its winter and summer range. The first specimen, however, is a male (testes 17×10 mm) taken at Washington on 5 May 1966.

American Golden Plover. *Pluvialis dominica*. One of four birds was taken at Bowman Reservoir, Logandale, Clark County, Nevada, on 20 October 1965. The specimen was a very fat (145.1 g) female (ovary 5×1 mm) of the race *dominica*. One earlier Nevada record is that of Hayward et al. (1963), who collected two specimens at the Nevada Test Site, Nye County, 14 September 1961. Phillips et al. (1964:33) reported only one Arizona record, "near Peoria, Maricopa County, 15 May 1963." Woodbury et al. (1949:12) regard it as a casual migrant farther north in Utah, but there are no records from south of the central part of the state.

Solitary Sandpiper. *Tringa solitaria*. Although Woodbury et al. (1949:13) regard this species as a "sparse migrant" in Utah, I recorded it regularly in the St. George Basin from 8 April to 4 May and 4 August to 12 September. A male (testes 5×5 mm) taken at Washington on 22 April 1966 represents the race *cinnamomea*.

Pectoral Sandpiper. *Erolia melanotos*. Two males (testes 4×1 mm, weight 47.6 g; testes 3×1 mm, weight 74.3 g) taken on 10 September 1965 at Washington were the first for the Virgin River Valley, although the species was recorded from 7 to 17 September in the St. George Basin and at Bowman Reservoir on 20 October 1965. Woodbury et al. (1949:14) consider it to be a regular migrant in Utah, while in Arizona it is an "uncommon fall migrant, recorded chiefly in the lower Colorado Valley" (Phillips et al. 1964:35).

Dunlin. *Erolia alpina*. One of two individuals was taken in a muddy pasture at the confluence of Santa Clara Creek and the Virgin River, St. George, 28 December 1965. The specimen is a

male and represents the race *pacifica*. The second bird was observed in the area through 9 February 1966. These winter records are the first for Utah although Woodbury et al. (1949:14) consider the species to be a migrant only from 1 to 26 May and 11 August to 18 November. In Arizona, Phillips et al. (1964:35) call it a "rare winter visitant in western Arizona, scarcer to east and unrecorded in the north."

Franklin's Gull. *Larus pipixan*. One of three individuals was collected at Washington on 15 April 1966. The specimen is a female (ovary 18×9 mm) whose stomach contained approximately 35 earthworms. This is the second record for the Virgin River Valley. Earlier Hardy and Higgins (1940:99) obtained a specimen from a flock of 20 at St. George on 23 April 1940. The species is a "Rather rare migrant" in Arizona (Phillips et al. 1964:38), and a "Common summer resident" in the northern part of Utah (Woodbury et al. 1949:15).

White-winged Dove. *Zenaida asiatica*. I found this species regularly as far north as the Terry and Lytle Ranches in Beaver Dam Wash, Washington County, Utah; Beaver Dam and Littlefield, Mohave County, Arizona; and Overton, Clark County, Nevada, from 5 April to 4 August. A male in breeding condition (testes 14×6 mm) was taken at Beaver Dam on 26 April 1966.

Ground Dove. *Columbigallina passerina*. An immature male with an unossified skull, taken at Overton on 20 July 1966, represents the race *palescens*. This is the first specimen taken in the Virgin River Valley although the species previously has been reported for extreme southern Nevada and north in Arizona "to Flagstaff" (Phillips et al. 1964:43). I also observed it at Overton on 19 October 1965.

Yellow-billed Cuckoo. *Coccyzus americanus*. A female (ovary with an ovum 10×10 mm) of the race *occidentalis* was taken at Beaver Dam on 21 July 1966.

Pygmy Owl. *Glaucidium gnoma*. Wauer and Carter (1965:55) reported this species to be an "Uncommon winter visitor" in the lowlands of Zion National Park, but no specimens were available. However, on 5 July 1964 a specimen of an immature bird of the race *pinicola* was found dead near Zion Lodge.

Saw-whet Owl. *Aegolius acadicus*. Presnall (1935a:202) reported a specimen taken at Springdale, Washington County, Utah, 15 September 1933; the skin was later destroyed. An additional specimen was taken from a mist net in Oak Creek Canyon, Zion National Park, on 24 October 1964. Also, one was seen at Springdale by Jerome Gifford on 29 December 1964.

Lesser Nighthawk. *Chordeiles acutipennis*. Woodbury et al. (1949:17) considered this species a "Sparse summer resident in the low Virgin River Valley of southwestern Utah." Apparently this species has increased in recent years as I found it to be a common summer resident throughout the Virgin River drainage below 2500 ft elevation from 24 April to 25 August. Two specimens of the race *texensis* were secured: a male (testes 5×5.5 mm) at Washington on 7 May 1965 and a male (testes 5×3 mm) at Berry Spring near Hurricane, Washington County, Utah, on 2 June 1966.

Costa's Hummingbird. *Calypte costae*. Published records of this species in the Virgin River Valley

area are sparse (Hardy and Higgins 1940:202; Woodbury et al. 1949:18). A specimen taken at Washington on 27 April 1966 (testes 3×2 mm) was one of two males found feeding among arrowweed (*Pluchea*).

Violet-green Swallow. *Tachycineta thalassina*. Although this species is a common summer resident in the upper drainages and is known to breed "from 3,000 to 10,000 ft" in Utah (Woodbury et al. 1949:21), the following record represents the first nesting record for the extreme lowland section of southwest Utah. On 18 May 1966 a pair was nesting in a cottonwood tree at the Lytle Ranch (elev. 1950 ft) in Beaver Dam Wash. A female (ovary 6×3.5 mm) was secured. Phillips et al. (1964:95) reported lowland nesting colonies in Arizona in "Havasupai Canyon, near Camp Verde, and along the Colorado River at Parker Dam."

Bank Swallow. *Riparia riparia*. Woodbury et al. (1949:22) considered this species to be a common migrant, "sometimes in huge flocks," in Utah. In the Virgin River Valley it was an occasional visitant from 25 March to 19 May, and 7 to 17 September. A male with inactive testes was taken at St. George on 15 September 1965.

Rough-winged Swallow. *Stelgidopteryx ruficollis*. A male (testes 3×2 mm) from Springdale, 11 May 1965, and a male (testes 2×2 mm) from Washington, 25 April 1966, represent the race *serripennis*, the breeding race of the St. George Basin (Behle 1943:48). However, a female (ovary 11×3.5 mm) of the race *psammochroa*, taken at Beaver Dam on 14 April 1966 was one of four individuals seen flying about a dirt bank with holes which were their assumed nesting sites. Since the race *psammochroa* breeds throughout "southern Arizona north to Prescott and tip of Nevada" (Phillips et al. 1964:97), the systematic status of the Rough-winged Swallow in the Virgin River Valley needs further study.

Cliff Swallow. *Petrochelidon pyrrhonota*. Behle (1960) reported the breeding race for the St. George Basin as *hypopolia*. Yet a female (ovary 5×3 mm) taken from a nesting colony of approximately 45 birds at Littlefield on 26 April 1966 was identified as the race *tachina* by R. C. Banks (pers. comm.). Phillips et al. (1964:99) refer to the latter race as the most "widespread nesting race in Arizona."

Black-billed Magpie. *Pica pica*. This species was recorded by Merriam (Fisher 1893) at Touquerville, Washington County, Utah, 31 September 1888; Presnall (1935a:203) found "several" at Zion Lodge in May 1935; and Tanner (1927) reported it as "occasionally seen about St. George in winter." I observed one at Beaver Dam on 26 October 1965.

Black-capped Chickadee. *Parus atricapillus*. A common resident in the upper drainages of the Virgin River Valley, a female (ovary 4×4 mm) taken at Springdale on 20 March 1965, representing the race *nevadensis*, is the first for the Virgin River Valley.

Winter Wren. *Troglodytes troglodytes*. Woodbury et al. (1949:103) considered this species as a "rare winter resident in southern Utah," based upon a specimen taken at St. George by Hardy and Higgins (1940:103) on 16 March 1940. I found it regularly in the St. George Basin from 10 October to 24 March. A female (ovary 3×1 mm) taken at Washington on 24 March 1966 was identified as the race *pacificus*.

Long-billed Marsh Wren. *Telmatorhynchus palustris*. I found this species to be fairly common at scattered localities throughout the Virgin River Valley from 7 September to 5 May only; I did not record it in summer. Behle (1943:56) reported the species "common in both summer and winter" in the St. George Basin, and identified four specimens as the race *plesius*. Later, however, Behle (1948:75) referred to these specimens as the race *aestuarinus*. Two males taken at St. George on 9 and 18 February 1966 were identified by L. L. Short (pers. comm.) as the race *plesius*. This species needs further clarification in the Virgin River Valley.

Sage Thrasher. *Oreoscoptes montanus*. Woodbury et al. (1949:25) regarded this species as a "common or abundant summer resident" in Utah. One seen at St. George on 29 December 1965 represents the first winter record. In Nevada Linsdale (1951:240) reported it present in winter in the southern end of the state. An additional record is an immature male (testes 4×2 mm) taken at St. George on 19 October 1965.

Hermit Thrush. *Hylocichla guttata*. Presnall (1935b) reported a migrant of the race *nanus* in Zion Canyon, although the breeding form of the Utah highlands is *auduboni* (Behle 1943:58). A male (testes 2×2 mm) taken at Zion's Oak Creek Canyon on 14 April 1966, represents the race *guttata*, the first for southwestern Utah.

Swainson's Thrush. *Hylocichla ustulata*. A female (ovary 6.5×4 mm) taken in Oak Creek Canyon on 27 May 1966 is the first of this species reported for the Virgin River Valley. It was racially identified by L. L. Short (pers. comm.) as *swainsonii*.

Black-tailed Gnatcatcher. *Poliophtila melanura*. First taken at Bunkerville, Clark County, Nevada, on 9 May 1891 (Fisher 1893:110), a second record for the Virgin River Valley is a male (testes 4×3 mm) taken at Overton, Clark County, Nevada, on 12 May 1966.

Water Pipit. *Anthus spinoletta*. Hardy and Higgins (1940:105) reported the races *rubescens* in winter and *alticola* in October for the St. George Basin, and Woodbury et al. (1949:26) reported the race *pacificus* from 15 miles southeast of St. George in winter. In addition, I found a male (testes 3×1 mm) of the race *geophilus*, taken from a flock of over 200 birds at St. George on 6 January 1966. A male taken at Beaver Dam on 19 October 1965 represents the race *pacificus*.

Phainopepla. *Phainopepla nitens*. This species was recorded throughout the year below Beaver Dam but has been recorded in Utah only from 1 April to 15 November. It apparently nests early at Littlefield, where a male (testes 7×4 mm), already defending a territory, was taken on 22 February 1966. Then on 22 April 1965, 14 individuals, including many young of the year, were seen at Beaver Dam. On 19 May 1966 a nest containing three eggs was found on a mesquite at Littlefield. These observations indicate that the species is either double-brooded or that Phainopeplas in the Virgin River Valley exist in different roles, as Phillips et al. (1964:139) suggests for the species in Arizona. Apparently, wintering birds nest early and move north, being replaced by summer visitants from the south. Hardy and Higgins (1940:105) reported nesting in May and June in the St. George Basin.

Gray Vireo. *Vireo vicinior*. This vireo is a summer resident in the Beaver Dam Mountains and Zion Park from 2 April to 30 June; five singing birds and a nest were found within a square mile on the east slope of Beaver Dam Mountains on 25 May 1966. A male (testes 3×2 mm), taken at Littlefield on 26 April 1966 is the first for the Virgin River Valley lowlands.

Orange-crowned Warbler. *Vermivora celata*. Although this species is a common spring and fall migrant through the Virgin River Valley, until now there have been no records in winter. It is, however, a regular winter resident at riparian habitats at Beaver Dam and Washington. A female (ovary 3×1 mm) taken at Washington on 6 January 1966 was identified by L. L. Short (pers. comm.) as representing the race *lutescens*. Two other specimens represent the race *orestera*: a female (ovary 10×3.5 mm) from Springdale on 13 May 1965, and a female (ovary 1×1 mm) from Beaver Dam on 20 October 1965.

Yellow Warbler. *Dendroica aestiva*. A female (ovary 1×1 mm) of the race *amnicola* was taken at Springdale on 6 May 1965 and is the first of that race reported from the Virgin River Valley. The breeding race is *morcomi*, and two specimens of this form were taken: a female (ovary 5×2 mm) from Beaver Dam on 12 May 1966, and a female (ovary 4×5 mm) from Beaver Dam on 27 May 1965. A nest was discovered 7 ft from the ground on a tamarisk tree at Washington on 15 June 1966.

Yellowthroat. *Geothlypis trichas*. Two specimens taken in the St. George Basin were identified by L. L. Short (pers. comm.) as the race *occidentalis*: a male from Washington on 5 May 1966, and one male (testes 9×6 mm) of several dozen singing males defending territories at a tule swamp at St. George on 24 May 1966. Van Rossem (1930:299) and Behle (1950:210) indicate *scirpicola* as the breeding form there, although Phillips et al. (1964:158) consider *occidentalis* as the breeding race "from southern California and the Colorado River up through Nevada, Utah, Colorado and northeastern Arizona."

American Redstart. *Setophaga ruticilla*. Although there are a few sightings, a male (testes 4×3 mm) taken at the Lytle Ranch in Beaver Dam Wash on 18 May 1963 represents the first specimen for the Virgin River Valley area.

Painted Redstart. *Setophaga picta*. The northerly record of this species in the United States was a 1930 sighting from Zion National Park. It is considered "casual north in summer to southwestern Utah (Zion National Park) and northwestern New Mexico (Zuni Mountains)" (A. O. U. 1957:520). The following series of observations help to substantiate the Painted Redstart as a spring visitor to Utah and offer further evidence of its northerly movements in spring.

At least three individuals were recorded in Emerald Pools Canyon, Zion National Park, 22 to 30 April 1966. Robert Hudson, U. S. Forest Service, reported it to me first on 22 April. Sharon Stephenson and I visited the site 24 April and found two individuals and heard a third near the spot where Hudson had seen it two days earlier. Further verification was obtained on 30 April when Russell found one at the same location.

These 1966 sightings represent only the second record of the species in Utah. The first was that of Vasco M. Tanner (Presnall 1935a:207) who found

it within a quarter of a mile of the 1966 sightings on 26 April 1930 (Tanner correspondence). The Emerald Pools Canyon environment is similar to Painted Redstart nesting habitats in southern Arizona. Douglas fir (*Pseudotsuga menziesii*) and ponderosa pine (*Pinus ponderosa*) grow along the shady north slope, and willow (*Salix* sp.), boxelder (*Acer negundo*), and cottonwood (*Populus fremontii*) grow along the waterway, which drops 25 ft to a pool at the base of a sandstone ridge. Gambel's oak (*Quercus gambelii*) and scrub oak (*Quercus turbinella*) are common along the south slope.

Yellow-headed Blackbird. *Xanthocephalus xanthocephalus*. Woodbury et al. (1949:30) report the species summering in Utah only, but five individuals were seen with a huge flock of *Euphagus cyanocephalus* at Washington on 28 December 1965. A male (testes 4×2.5 mm) found dead at Overton on 25 March 1966 represents the earliest spring record in the Virgin River Valley. It nests among the tules at Washington where several fledged young were seen on 16 June 1966.

Hooded Oriole. *Icterus cucullatus*. This species was recorded from 8 April to 25 August, and two nests were found about 40 ft apart on mesquite trees at Littlefield on 14 June 1966. Both nests were attended by a pair of adults. I took two specimens of the race *nelsoni*: a male (testes 5×5 mm) from the Lytle ranch on 27 April 1966 and a male (testes 8×6 mm) from Beaver Dam on 12 May 1966.

Summer Tanager. *Piranga rubra*. This species was first reported for Utah by Easterla (1966), and additional data were given by Wauer and Russell (1967:422). A new record extends its range northward along the Virgin River to Berry Spring near Hurricane where a male (testes 11×10 mm) of the race *cooperi* was taken on 11 May 1966.

Indigo Bunting. *Passerina cyanea*. Two singing males were found in riparian habitat at Beaver Dam on 14 June and one singing male was seen at the Lytle Ranch on 23 June 1966. A male (testes 9×6 mm) was taken at Beaver Dam on 23 June 1966, presumably one of the two singing males of 14 June. This species nests in riparian habitats to about 3000 ft elevation in the Virgin River Valley, such as at Springdale in June 1964 (Wauer and Carter 1965:79), while *Passerina amoena* seems to prefer the higher side canyons with more brushy habitats.

Savannah Sparrow. *Passerculus sandwichensis*. This species is present in the St. George Basin all year. A male (testes 9×7 mm) of the breeding form *nevadensis*, taken on 24 May 1966 from several singing birds at Washington, was actively defending a territory. Three additional specimens represent the race *anthinus*: a female (ovary 4×1 mm) taken at Washington on 14 January 1966, a male (testes 3×3 mm) taken at Washington on 18 February 1966, and a male (testes 2×2 mm) taken at St. George on 4 March 1966.

Tree Sparrow. *Spizella arborea*. The first specimen for the Virgin River Valley is a male (testes 2×1 mm) taken from a mist net in Oak Creek Canyon on 19 November 1965. Earlier sightings include "a few individuals" seen by Cottam in December at St. George (Hardy and Higgins 1940:109) and a lone bird at Washington on 29 December 1964. In Utah, Woodbury et al. (1949:34) consider it a "Sparse winter resident" and "less numerous south." In Arizona, Phillips et al. (1964:195) re-

gard it as an "uncommon winter resident," but list no records for the northwest corner of the state.

Harris' Sparrow. *Zonotrichia querula*. Behle and Higgins (1942) first reported this species from Santa Clara on 16 December 1939. Additional records include two seen at the Terry Ranch in Beaver Dam Wash on 21 December 1964, another at the same location on 6 March 1966, and an immature male (testes 2×1 mm) taken at Santa Clara on 4 March 1966. Apparently this species winters regularly in the Virgin River Valley.

Song Sparrow. *Melospiza melodia*. Behle (1960) reported that *fallax* is the nesting race in Utah's Virgin River Valley and that *montanus* is found elsewhere in Utah. However, four specimens taken in the valley were identified as *montanus*: a female (ovary 3×3 mm) from Oak Creek Canyon from among several wintering birds on 16 March 1965; a male (testes 2×2 mm) from St. George on 9 February 1966; a female (ovary 8×5 mm) from Washington on 24 May 1966; and a female (ovary 9×5 mm) taken from a nest at St. George on 17 June 1966. Apparently this is another species whose status needs further clarification within the Virgin River Valley.

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CALCULATION AND MISCALCULATION OF THE EQUATIONS RELATING AVIAN STANDARD METABOLISM TO BODY WEIGHT

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A variety of relationships of interest to biologists can be described by the general power function equation:

$$Y = aX^b \quad (1)$$

This equation may be written in the more convenient logarithmic form:

$$\log Y = \log a + b \log X, \quad (2)$$

recognizable as a mathematical expression of a straight line. For a set of data conforming to this general relationship, the parameter estimates of a and b can be calculated by the least squares method. Although equations (1) and (2) are mathematically equivalent, their least squares solutions are not. The choice of the appropriate model for calculating estimates of a and b depends upon whether the data are homoscedastic (having constant variance) or heteroscedastic (lacking constancy of variance). Least squares regression theory assumes that the deviations between predicted and observed values of Y are normally distributed with a constant variance. If the original data exhibit heteroscedasticity, appropriate transformation of the data will stabilize the variance. Heteroscedastic data are often non-normally distributed and frequently "the transformation that gives a constant variance also simul-

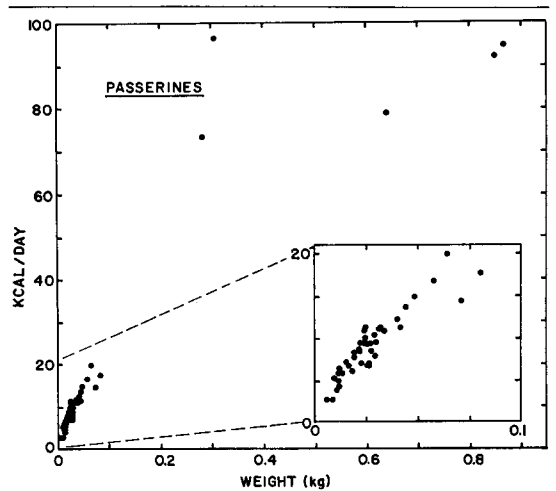


FIGURE 1. Arithmetic plot of data relating standard metabolic rate and body weight in passerine birds (from table 1 of Lasiewski and Dawson 1967).

taneously gives a distribution closer to normal" (K. A. Brownlee 1965. Statistical theory and methodology in science and engineering. Second ed. p. 146. John Wiley and Sons, New York).

The relationship between avian standard metabolism and body weight can be described by the generalized equations (1) and (2). Lasiewski and Dawson (Condor 69:13, 1967) presented data for standard metabolism and body weight of 48 passerine birds, which are plotted arithmetically in figure 1. The variance of the dependent variable (kcal/day) increases with increasing values of the independent variable (body weight), and these data are therefore heteroscedastic. Thus a least squares fit to the untransformed data is inappropriate.

Logarithmic transformation of the passerine data (fig. 2) stabilizes the variance, and more nearly approximates the normality assumptions of least