

# COLLISIONS AND OTHER CALAMITIES: A WINDOW ON AUTUMN MIGRATION OF THE VIRGINIA RAIL

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Albeit of considerable and ongoing conservation concern, avian mortality from collisions with tall structures such as television (TV) and radio towers (and their guy wires), power lines, and buildings that dot the landscape, has yielded information on patterns of migration in a wide range of species.<sup>1-5</sup> For the secretive and seldom-observed Virginia Rail (*Rallus limicola*), collisions provide the few migration dates available for this

nocturnal migrant. An observation of a Virginia Rail on a window ledge in the heart of Winnipeg provided a rare autumn migration date for this species in Manitoba. It augments the few additional dates of migration recorded in the other Canadian Prairie Provinces and, together with dates deduced from collisions in autumn at points along this species' migratory pathway, compiled below, a picture of the timing of fall migration emerges.

On the morning of 13 September 1983, SGS received a phone call from a worker in an office building on the south side of Portage Avenue in Winnipeg, Manitoba. The caller stated that there was a bird on a second-story window ledge that overlooked the busy street below. Upon visiting the office that morning, an adult Virginia Rail was found huddled against the window, not moving despite being

viewed through the glass by several people. No attempt was made to capture the bird for release at a safer place because it would have flushed and likely been killed by traffic. The rail remained on the sill for the rest of that day but was reported to have been gone the following morning. This unusual record stimulated a search for other evidence of active migration dates for Virginia Rails, primarily from tower kills.

September 12 was cool and cloudy all day, with a high temperature of 16°C, before dropping to a low of 3°C through the night and morning of September 13. No precipitation was recorded and wind speed was 9 km/h, with a maximum of 17 km/h; visibility was 24.1 km.<sup>6</sup> Conditions suggest the rail became disoriented by city lights while migrating during the night of 12/13 September 1983.



**FIGURE 1.** Ventral view of specimens of Virginia Rail found injured following storms at Regina, Saskatchewan, in 1959. Top: 11 October (juvenile male, RSKM\_BIRD\_A-483923); bottom: 23 September (adult male, RSKM\_BIRD\_A-4838). Photo credit: Danae Frier.

## Methods

Records were uncovered of tower-killed Virginia Rails documented in the literature and the age of specimens preserved in museums were determined from photographs (Table 1). In cases where there was no indication that specimens were preserved, curators were contacted at the institutions with which authors were associated. Birds in the year of hatching (HY, i.e., juveniles) or after the year of hatching (AHY, i.e., adults) were distinguished on the basis of plumage characteristics.<sup>7,8</sup> In two cases (Table 1), authors identified the birds as juveniles, but this could not be confirmed. Adults are characterized by “upperparts sooty with dull-rufous fringing; wing cov[er] chestnut to rufous ...; auriculars gray.” Juveniles have heavy blackish mottling on the breast and flanks.<sup>7</sup> Plumages of adults and a juvenile Virginia Rail in autumn are shown in Figures 1 and 2.

## The Casualties

### Canadian Prairie Provinces

Virginia Rails were not recorded among individuals salvaged at eight TV-tower kills in Manitoba in autumns between 1962 and 1979.<sup>9-11</sup> Also, no Virginia Rails, or other species of rail, were detected during surveys of bat casualties at wind turbines near St. Leon, in southern Manitoba, that were inspected during Septembers in 2007 through 2009 (Craig Willis and Joel W. Jamieson, *email*, 8 May 2018). Two fall migration dates, however, can be deduced from tower kills reported in Saskatchewan at Regina (4 September 1964)<sup>12</sup> and Biggar (5 September 1981)<sup>13</sup>. In addition, two Virginia Rails were brought to the Saskatchewan Natural History Museum (now Royal Saskatchewan Museum [RSKM]), following storms in the Regina area in 1959 — an adult male on 23 September and a juvenile male on 11 October (Figure 1). Both birds apparently were injured while migrating.<sup>14</sup> The first was “found

injured on lawn”, away from its normal habitat, possibly having struck an overhead structure or wire during the night. The second was “found injured, Oct storm victim”, but it was not stated where it was discovered.

Two records from Alberta provide putative fall migration dates. A “slightly” injured juvenile Virginia Rail that was discovered in Calgary on 28 September 1972 recovered and was released.<sup>15</sup> The other was found dead on 8 September 1980, although the circumstances were unrecorded.<sup>16</sup> That several of these birds were injured suggests collisions during nighttime migration, as does the Virginia Rail that struck a window near Birch Hills, Saskatchewan, on 11 November 2006.<sup>17</sup> This individual was a juvenile (Jared B. Clarke, *email*, 24 April 2018). These records are summarized in Table 1.

### Along the southward migration route

The most extensive of the numerous reports of bird mortality incurred at towers and similar structures published in the past 50 years that reported Virginia Rail casualties are summarized in Table 1. Where available, age and sex of specimens are included, or, if specimens were not examined, extreme dates of the casualties are given.

**North Dakota:** Omega Navigation Station, near LaMoure. Eleven Virginia Rails were recorded from fall 1971 through fall 1973 (7 and 1 in spring 1972 and 1973, respectively; 2 and 1 in fall 1972 and 1973) from among 937 birds of 102 species found dead or injured at the site.<sup>2</sup>

**Wisconsin, Eau Claire Co.:** WEAU - TV tower; Minnesota, **Westport, Stearns Co.:** KCMT - TV tower. Twenty-two Virginia Rails were salvaged during autumn migration over a period of 38 years (1957 to 1994), with casualties spanning 1 September to 12 October.<sup>3</sup> Despite “... thousands of specimens [donated]

to various museums throughout the country”<sup>3</sup>, SGS located only two Virginia Rails apparently linked to this program (Table 1).

**Kansas, Shawnee Co.:** Three of four Virginia Rails picked up under the 290-m high WIBW - TV tower near Topeka, in fall 1954, were preserved in the Museum of Natural History at the University of Kansas (KU).<sup>1</sup> All were adults: two killed on 1 October (as was a third), the other on 6 October (Table 1, Figure 2). Searches were conducted on 11 days between 25 September and 23 October 1954, and 1,090 casualties of 61 species were recorded. These were among the first TV-tower casualties studied that provided information on sex, age, weight, and molt condition of nocturnal migrants.

Ball *et al.* described four major overnight mortality events between 1985 and 1994 at the taller (439 m) KTKA tower, also near Topeka.<sup>18</sup> The total of 2,808 birds found represented 91 species including 35 Virginia Rails, with a peak of 21 on the night of 25-26 September 1985 (Table 1). No information is given on the age or disposition of Virginia Rail specimens, but it appears that only some state rarities were preserved.<sup>18</sup>

**Tennessee, Davidson Co.:** airport ceilometer, WSIX-TV tower, and other towers near Nashville. Casualties were recorded from 1948<sup>19</sup> through 1968.<sup>20</sup> At least 7 Virginia Rails were killed; extreme dates were 10 September [1960] and 20 October [1963] (Table 1).

**Florida, Leon Co.:** WCTV-TV tower, near Tallahassee. Three specimens were examined (Table 1) from among 53 casualties reported over 25 years (October 1955 to September 1980) by personnel of Tall Timbers Research Station. Virginia Raul casualties spanned 2 September [1975] to 22 December [1967].<sup>21</sup>

**Florida, Brevard Co.:** Migrant bird kills similar to those at TV towers have occurred at the Vehicle Assembly Building of the John F. Kennedy Space Center on Merritt Island.<sup>22</sup> Altogether

**Table 1. Autumn migration dates of the Virginia Rail deduced from casualties incurred during nocturnal migration. Records are derived from TV and other communication tower kills, unless otherwise noted, and are listed in chronological order for each site. Sex and age of specimens are included.**

LOCATION	DATE	COMMENTS <sup>a,b</sup>
Alberta : Calgary	28 Sep 1972	Juvenile: "slightly" injured, released <sup>15</sup>
: Calgary	8 Sep 1980	"found dead" <sup>16</sup>
Saskatchewan: Regina	23 Sep 1959	RSKM_BIRD_A-4838: adult ♂; discovered after storm <sup>14</sup> (Figure 1)
: Regina	11 Oct 1959	"RSKM_BIRD_A-4839: juvenile ♂; downed on lawn following storm, "very thin" <sup>14</sup> (Figure 1)"
: Regina	4 Sep 1964	Not preserved <sup>12, 14</sup>
: Biggar	5 Sep 1981	Struck "power wires" <sup>13</sup>
Manitoba : Winnipeg	13 Sep 1983	Adult: alive on windowsill
: Winnipeg	1 Dec 2015	Adult: killed by falconer's Red-tailed Hawk
Wisconsin : Eau Claire	1 Oct 1959	"BMNH 17769: unsexed <sup>3,23</sup> "
: Eau Claire	12 Sep 1961	"BMNH 22410: unsexed <sup>3,23</sup> "
Indiana : Floyd Co.	23 Oct 1965	Not preserved <sup>24</sup>
Kansas : Shawnee Co.	1 Oct 1954	KU 31725: adult ♂; "moderately fat" <sup>1</sup> (Figure 2)
: Shawnee Co.	1 Oct 1954	KU 31726: adult ♀ <sup>1</sup> (Figure 2)
: Shawnee Co.	1 Oct 1954	Not preserved <sup>1</sup>
: Shawnee Co.	6 Oct 1954	KU 31727: adult ♂ <sup>1</sup> (Figure 2)
: Shawnee Co.	26 Sep 1985	21 Virginia Rails found <sup>18</sup>
: Shawnee Co.	1 Oct 1986	4 Virginia Rails found <sup>18</sup>
: Shawnee Co.	12 Oct 1986	7 Virginia Rails found <sup>18</sup>
: Shawnee Co.	9 Oct 1994	3 Virginia Rails found <sup>18</sup>
Kentucky : Louisville	7 Oct 1951	Salvaged from roof of airport building under control tower <sup>25</sup>
Tennessee : Nashville	24 Sep 1955	Not preserved <sup>26</sup>
: Nashville	11 Sep 1958	"... [among the] uncommon birds collected" <sup>27</sup>
: Nashville	10 Sep 1960	"early arrival date" <sup>27</sup>
: Nashville	20 Oct 1963	"late date" <sup>28</sup>
: Nashville	23 Sep 1965	"The heaviest casualties were 23/24 through 25/26 Sep 1965, but date this bird was killed was not specified" <sup>29</sup>
: Nashville	26 Oct 1966	"late date" <sup>30</sup>
: Nashville	25 Sep 1966	Among "heavy kill" <sup>20</sup>
North Carolina : Bladen Co.	24 Sep 1971	"Records for this species inland in North Carolina are scarce" <sup>31</sup>
: Bladen Co.	30 Sep 1973	"... was only the second kill record [for Virginia Rail] ... for these towers" <sup>32</sup>
: Bladen Co.	4 Sep 1974	... third record for this tower <sup>32</sup>
: New Hanover Co.	Nov 1971	"UNC-W B265: adult ♀; data for this and the following 5 specimens were provided by S.D. Emslie (emails, 9 May, 15 June and 3 July 2018)"
: New Hanover Co.	22 Oct 1981	"UNC-W B533: adult, unsexed; struck window"
: New Hanover Co.	9 Oct 1985	"UNC-W B808: juvenile, unsexed"
: New Hanover Co.	2 Sep 1987	"UNC-W B786: adult, unsexed "
: New Hanover Co.	12 Oct 1993	"UNC-W B 925: adult, unsexed"
: New Hanover Co.	26 Oct 2009	"UNC-W B1172: adult, unsexed"
Georgia : Savannah, Travis Field	6-8 Oct 1954	Single birds collected at this site and the one below were from 2 of 7 sites inspected for casualties following cold fronts. "Many of the birds were saved as study skins..." <sup>33</sup>
: Grady Co.	2 Oct 1962	"Not often detected away from coastal areas ... probably more common both in migration and winter than published reports indicate. Also this date is fairly early" <sup>34</sup>
Florida : Leon Co.	14 Sep 1959	TTRS 200: adult ♂ <sup>4</sup>
: Leon Co.	9 Sep 1962	"TTRS 199: juvenile ♀; "feathers missing on right breast, not very fat" <sup>4</sup> "
: Leon Co.	9 Sep 1966	TTRS 2313: adult ♀ <sup>4</sup>

<sup>a</sup> Specimens were aged based on examination of photographs provided by curators of the collections in which they were deposited: Bell Museum of Natural History, University of Minnesota (BMNH), Kansas University Museum of Natural History (KU), Royal Saskatchewan Museum (RSKM), Tall Timbers Research Station (TTRS), and University of North Carolina at Wilmington (UNC-W).

<sup>b</sup> Included in this column are additional notes written on specimen labels or in accession catalogues, and also references to the literature in which records and specimens were reported.



**FIGURE 2.** Side view of adult Virginia Rails killed at a TV tower near Topeka, Kansas, in 1954. Top: 1 October (male, KU 31725); middle: 1 October (female, KU 31726); bottom: 6 October (male, KU 31727). Photo credit: Mark. B. Robbins.

5,046 birds of 62 species were retrieved between 1970 and 1981, a large majority (4,336, 86%) of them in spring. These included four Virginia Rails: one in early May, two in late September, and one in early October. Since exact dates were not given, these are not included in Table 1. All bird carcasses were frozen for later processing at the University of Central Florida, but the final disposition of Virginia Rail specimens is unknown to us.<sup>22</sup>

## Discussion

The migration date documented here for Manitoba (13 September 1983) fell within the span of dates deduced from casualties in Alberta: 8 September [1980] to 28 September [1972]); and Saskatchewan (4 September [1964] to 11 October [1959], or to early November [2006] if that bird was a migrant, rather than a straggler. The span of fall migration in Manitoba is incompletely known, although observations of individuals in their natural habitat suggest, "... few birds remain after September, the tardiest straggler being reported in

Winnipeg on 9 November 1967".<sup>35</sup> An even later Virginia Rail was an adult (Figure 3) killed by a Red-tailed Hawk (*Buteo jamaicensis*) flown by a falconer on the outskirts of Winnipeg on 1 December 2015.<sup>36</sup>

While preparing the book, *The Birds of Manitoba* (cited within ref. 35), the Manitoba Avian Research Committee of the Manitoba Naturalists Society compiled a large but not exhaustive database (housed at The Manitoba Museum) to help define migration periods for all species. Seventy-five Virginia Rail records in this database, involving 147 individuals, show a pronounced May-June peak (41 records, 84 birds), corresponding to spring migration and the early breeding season when the rails are most vocal. A second peak (22 records, 41 birds) in August and September presumably combines pre-migratory and staging activity. Extreme dates in the database are 30 April [1985] and 10 October [1938], similar to those in eBird as of 5 December 2018: 25 April [2004] and 3 October [2015]. These extreme dates help define the normal period of

occurrence and emphasize the rarity of the November and December records noted above. There is some evidence of pre-migratory concentration, or at least conspicuous behaviour, at large wetlands in southern Manitoba during August. K.A. Gardner observed no fewer than eight adult and three juvenile Virginia Rails during a short, early-morning walk at Oak Hammock Marsh on 4 August 1975.<sup>37</sup> C. Artuso detected 14 Virginia Rails during a survey along a flooded road in the Shoal Lakes Important Bird Area on 29 August 2015 (eBird list # S24811152); seven more were detected elsewhere by other surveyors.

In Minnesota, Janssen inferred a "gradual exodus from breeding areas... in August and September" but with records occasionally extending into winter in the south.<sup>38</sup> Winter records also extend northwest to Banff, Alberta, where Virginia Rails occasionally occur in the vicinity of hot springs.<sup>39</sup>

Migration dates of the Virginia Rail from the Canadian Prairie Provinces generally fall within the span of the species' migration to the wintering range in the coastal marshes of southeastern United States and inland in northern Mexico<sup>8</sup> (Table 1). Extreme dates of the migration are illustrated by the following example. An adult male Virginia Rail, taken as by-catch in a small mammal trap at Delta Marsh, Manitoba, on 28 August 1976 (University of Manitoba Zoology Museum #1378), had completed the preformative molt, but whether it was still on its summer range, or was migrating and had stopped over, is not known. On the label was the notation, "Fat - nil", which suggests the bird had not built up fat reserves necessary to initiate migration. By contrast, on the same date, in 1946, a Virginia Rail was observed in Georgia<sup>40</sup>, which is south of the species' breeding range, near or within the wintering range.

Analysis of the records compiled in Table 1 was limited by the small



**FIGURE 3.** Adult Virginia Rail captured by a Red-tailed Hawk flown by a falconer on the outskirts of Winnipeg, Manitoba, 1 December 2015.

sample size and the bias of individual, major tower-kill events. Analysis by broad geographic zones showed only small differences in the patterns of records in different regions. In the Prairie Provinces (northern portion of breeding range), seven records occurred between 4 September and 11 October (median, 13 September), with a December outlier. This is similar to the range of records for Wisconsin and Minnesota (southern portion of breeding range; 1 September to 12

October, median unknown). For mid-U.S. states where the Virginia Rail is primarily or entirely a migrant (Indiana, Kansas, Kentucky, Tennessee), records range from 10 September to 26 October; an apparent peak between 26 September and 12 October and an early-October median are weighted heavily by the Topeka-area records in Kansas. For states that include portions of the coastal winter range (North Carolina, Georgia, Florida), casualty dates extend from

2 September to 26 October (median, 1 October), with November and December outliers. Early-September records as far south as Florida are noteworthy. This suggests that, while the overall migration period spans about two months, individual transit times may be much shorter, belying the common impression of rails as “weak fliers”.

While again recognizing the small sample size, the records summarized in Table 1 suggest adult Virginia Rails leave at least the northern part of the breeding grounds ahead of juveniles. This pattern, however, is not likely to be confirmed from further analyses of tower casualties, or recoveries of banded birds<sup>41</sup>, but from known-age individuals equipped on their breeding sites with geolocators or satellite-telemetry devices that record the progress of migration of individuals, from start to finish.<sup>42</sup> Increasing use of automated bird-call recording devices, as well as nocturnal birding, may occasionally yield records of migrating Virginia Rails, at least in spring; PT heard the *kiddick* calls of a migrating Virginia Rail over Pinawa, Manitoba, at 00:30 h on 11 May 1991. Studies of migration through distance sampling, such as that conducted recently for the Sora (*Porzana carolinensis*) in Missouri<sup>43</sup>, and the citizen-based observation network eBird<sup>44</sup>, provide a general picture of timing of migration based on presence and absence of individuals at a particular site, but not dates of departure, routes followed, and dates of arrival of individuals on the wintering ground.

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