



Have you ever noticed how tattered adult Ruby-throated Hummingbirds look in mid-summer? During fall migration, why don't adult females retain the "nest mark" so conspicuous during the breeding season? And why do body feathers of adults look so fresh during fall migration, considering that, by this time of the year, those feathers should be approximately seven to eight months old?

The Alternate Plumage of the Ruby-throated Hummingbird



We have designed our yard to be attractive to birds and wildlife, with particular emphasis on hummingbirds. It took a few years to build up our "clientele," but our feeders and flowers now attract large numbers of Ruby-throated Hummingbirds. During spring migration, the first northbound adult males usually appear in early March, and the first females show up by mid-March. Numbers peak in pulses during the second and third weeks of April, when "in-view-at-once" counts at our front porch feeder array can exceed 60 individuals.

Ruby-throated Hummingbirds nest in older second-growth deciduous hardwood forests—in our yard and vicinity, for example. Breeding activity is underway here by mid-March, and by early May we regard counts of 20–40 as representing local breeders, not migrants. Following a modest dip in late May, average counts level off to 20–30 through late June. Sometimes seen as early as mid-May, youngsters tend to be inconspicuous because initially they prefer to visit flowers; they don't become common at our feeders until late June.

We suspect that our breeding females produce two broods per season, as reported by Robinson et al. (1996). We base this assumption on both appearance and behavior: We have observed females suspected of being "ready to lay" (Fig. 1) or collecting nest material as late as mid-August. By early fall, it becomes impossible to distinguish local breeders and their offspring from southbound migrants. Feeder counts increase during August, and the largest numbers pass through in waves during September, when counts of 70–80+ are not uncommon; numbers fluctuate greatly during September (and between years), with accumulation of individuals between cold fronts and an exodus during favorable migration conditions following a front.

Fall counts drop off quickly during October, by which time adults are uncommon; this trend is summarized in Fig. 2. Occasional stragglers linger into early November. Ruby-throats also appear during the winter, and in recent years, we have usually had one or more known wintering individuals from December to April or even into early May. Adults and immatures that have spent the winter can usually be differentiated until early spring by diagnostic plumage and molt features.

Studying Summer Molt: Methods

Published accounts indicate that hummingbirds undergo a single complete molt per year, which for Ruby-throats occurs on the wintering grounds, after fall migration (Baltosser 1995, Robinson et al. 1996, Pyle 1997). Baltosser (1995) stated that Ruby-throated Hum-

Donna L. Dittmann¹
Steven W. Cardiff²

435 Pecan Drive
St. Gabriel, Louisiana 70776
¹ddittma@gmail.com
²scardif@gmail.com

All photos are from the authors' home in St. Gabriel, Iberville Parish, Louisiana.
All photos are by © Donna L. Dittmann.

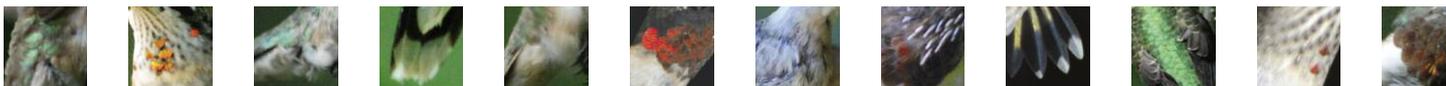
Full content for this article is available online <aba.org/birding/v41n5p35w1.pdf>.

Online content includes an additional 13 pages of text, 12 large-format photographs, 4 graphs, 2 sidebars, glossary of terms, and literature cited.



Fig. 1. This **adult female**, photographed 15 July 2007, is likely nearly ready to lay an egg. Although we can't be 100% certain without in-hand examination, this bird clearly has a fat, distended belly (**A**), suggesting the presence of a shelled egg in the oviduct, which causes the abdomen and vent to be thrust outward. Note that this individual looks particularly thin-necked; missing feathers contribute to this appearance.

This "skinny" appearance is in contrast to a bird with pre-migratory fat; on such birds, subcutaneous body fat is deposited around the entire body but most heavily in the furcular region (neck and upper breast), resulting in a conspicuous bulge or roll. Because it is mid-July, the bird in this image has probably already raised one brood. Note that this bird is molting; with close inspection, at least seven sheathed feathers are visible (**B**, **C**, **D**). Numerous other feathers are missing, and, although the camera did not freeze motion, the rough, brownish appearance of the lower back (**E**) suggests that molt may also be in progress in this region.



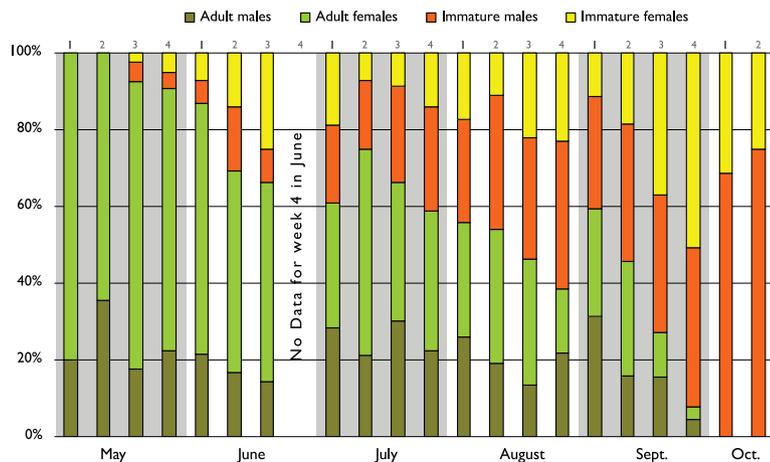


Fig. 2. Shown here is the relative percentage by age and sex of Ruby-throated Hummingbirds present at feeders between the first week of May and second week of October. Data are derived from the photographic study described in the main text of the article; no photographs were obtained during the fourth week of June. Graph © by Kei Sochi.

mingbirds “migrate to winter quarters in worn plumage and then undergo a complete annual molt.” A number of years ago, however, we began to pay closer attention to our summering population and noticed that a high percentage of individuals were obviously in *active body molt*. Summer molt has not gone totally unnoticed; for example, Robinson et al. (1996) state, “Prebasic body molt may begin on breeding grounds late June (RRS), late August (hatch year female, C.W. Thompson, pers. comm.), Sep or Oct.” Also, the phenomenon has been discussed <museum.lsu.edu/~remsen/HUMNETf/molt.html> and illustrated <hiltonpond.org/ThisWeek060822.html> at least anecdotally on the internet. However, body molt observed during the late summer has

generally been interpreted as the unusually early onset of a single prolonged prebasic molt that is completed on the wintering grounds.

Our extensive observations of Ruby-throats suggest otherwise. We have discovered that molt during summer and early fall is much more extensive than has been previously reported, both in terms of the number of molting individuals and (at least in adults) the replacement of a *large percentage* (perhaps all) of the body plumage, excluding the flight feathers of the wings and tail. Interestingly, the extensive bird collection at the Louisiana State University Museum of Natural Science has only one (!) Louisiana breeding-season specimen, and it is an adult male with

heavy body molt. Thus, in the absence of representative series of specimens, we attempted to document and roughly quantify this summer molt phenomenon in 2006 (summer–fall) and 2007 (spring–fall) with photographs of birds at feeders.

One or two feeders were chosen from an array of 12 (or more) hanging on our front porch (Fig. 3), and hummingbirds were digiscoped (in 2006 with a Nikon Coolpix 5700) or photographed (in 2007 with a Nikon D80 with a Nikkor 70–300 mm lens) as they fed. Ventral and side views (see Fig. 4) were selected for objective comparison of individuals, because sheathed feathers are more conspicuous on the underparts and it is easier to capture such angles at a feeder. One



Fig. 3. The study site is a feeder array on the authors’ front porch in St. Gabriel, Iberville Parish, Louisiana. Their house is located on three acres of second-growth deciduous forest, approximately 60–80 years old, dominated by water oak, pecan, and hackberry. The garden around the house and the understory vegetation are managed for hummingbirds. The typical “summer” (mid-March–mid-October) feeder array consists of 10–25 feeders, depending on use.

to six photographs were taken per individual, depending on how long a bird used the feeder. Photo sessions ranged from as little as 13 minutes to two hours, with most in the 30–45-minute range, depending on feeding activity, weather, lighting, the photographer's schedule, and her ability to tolerate humidity and mosquitoes.

Due to such variation, there was no attempt at daily standardization (numbers per time of day, etc.). Besides, the primary goal was simply to obtain decent sample sizes of photographed individuals over the course of late spring and summer in order to assess the extent and timing of molt in the local breeding population. Assuming random feeder use by age and sex classes, our photographs documented a sample of birds using particular feeders on a given day. Arrangement of the feeder array, removal of feeder perches, large numbers of competing birds, and proximity of the photographer generally discouraged territorial individuals and reduced skewing of photo sampling.

Some recognizably well-marked individuals (for example, a female with several white remiges and rectrices) would tend to visit the same one or two feeders on any particular day, but such birds did not guard particular feeders or consistently use the same feeders on different days. During review of photographs, some uniquely patterned individuals were detected more than once during a single photo shoot; these individuals were counted only once per day. Because of these known examples, we assumed some duplication of some other individuals, but we believe this duplication too low to influence the overall patterns (see sidebar, p. 35-w13). Usable photographs (adequately portraying age, sex, and plumage) were obtained of 2,543 Ruby-throated Hummingbirds. In 2006, photos of approximately 574 individuals were taken on 18 days during the period 8 July–1 October, plus 21 October. In 2007, photos were taken of approximately 1,969 birds on 49 days during the period 4 May–12 October, plus 6 April. Data were consolidated into four-week intervals. No photos were obtained during the fourth week of June (Fig. 2).



Fig. 4. This ensemble shows the **same adult female** on four dates. Although this bird is not banded, she can be identified with rea-

sonable certainty by her unique plumage: Two dark throat spots identify this particular individual. On 26 May 2007 (A), she shows slight wear on the underparts, likely caused by feather abrasion during nest building and incubation of her first brood; the dark blotch is created by exposed dark feather bases, the result of missing or damaged feathers.

On 17 June 2007 (B), she shows greater wear and more missing or damaged feathers. By 28 July 2007 (C), her underparts are worn and tattered, most likely from abrasion during incubation of a second brood; her "nest mark" is conspicuous. Also note at least three sheathed feathers on the crown, indicating that body molt is now underway. By 1 September 2007 (D), the bird lacks a nest mark (no more holes or missing feathers). Her plumage is fresh; the feathers have buffy edges, and the femoral tufts are fluffy. Her worn and tattered feathers on the underparts have clearly been replaced prior to departure for the wintering grounds.



This article continues online
aba.org/birding/v41n5p35w1.pdf.