

Northern Red-tailed Hawk (*Buteo jamaicensis abieticola*) revisited

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During migration and winter across the central and eastern United States and southern Canada, Red-tailed Hawks (*Buteo jamaicensis*) with heavily marked underparts have been a source of confusion in recent decades. In many cases, such individuals have been identified as Western Red-tailed Hawks (*B. j. calurus*). Few observers have considered another, almost forgotten alternative: Northern Red-tailed Hawk (*B. j. abieticola*).

W. E. Clyde Todd was the first to describe this subspecies in “A Northern Race of Red-tailed Hawk” (1950). Among the differences from typical Eastern Red-tailed Hawk (*B. j. borealis*) that Todd noted were a dark throat, more richly colored underparts, and a heavier bellyband. Todd named the subspecies *abieticola* (“dweller of the firs,” *Abies* being the genus of true firs) because he believed its breeding range overlapped extensively with that of Balsam Fir (*A. balsamea*).

Despite its recognition by at least some subsequent authors, *abieticola* has remained obscure to most ornithologists and birders. Dickerman and Parkes (1987) offered evidence in support of Todd’s work, identifying *abieticola* as “the breeding race of the spruce-fir belt of Canada west to Alberta” and providing a more comprehensive comparison of *abieticola* with both *borealis* and *calurus*. Importantly, Dickerman and Parkes (1987) reviewed claims of light-morph *calurus* from the Northeast and found that all referred to well-marked examples of *abieticola*. Red-tailed Hawks fitting the description of *abieticola* are sometimes treated as intergrades between *borealis* and *calurus* (see Clark and Wheeler 1997, Wheeler



2004); other authors have treated *abieticola* as a more heavily marked type of *borealis* (Liguori 2001, 2005, 2011; Sullivan 2011; Crossley et al. 2013). Most texts that treat the species omit mention of *abieticola*, with a few notable exceptions (e.g., Pittaway 1993).

This paper seeks to highlight what we know about the distribution and identification of *abieticola* and to inspire the birding community to look more closely at plumages of Red-tailed Hawks. Photographs included here (Figures 1-19) feature mostly typical *abieticola*, with the intent of defining the distinguishing features of this taxon for a new generation of naturalists and birders.

Distribution

Red-tailed Hawk breeds from tree line in the North through the Caribbean and southern Central America and shows extensive variation across its range, even within the numerous generally accepted subspecies. In North America, most birders are familiar with the widespread Eastern and Western subspecies. The lesser-known subspecies in North America (e.g., *harlani*, *alascensis*, *abieticola*) are distributed across vast, often inaccessible breeding areas, and studying them during the breeding season is challenging; presumably frequent (but rarely documented) interbreeding of subspecies complicates study still more. In the West, the breeding range of *abieticola* overlaps with the ranges of *calurus* and *harlani*, and recent genetic studies suggest that some gene flow between these latter two taxa may occur (Hull et al. 2010), and it seems likely *abieticola* fits this model. However, few mixed pairs have been documented so that phenotype could be examined (see e.g., Sullivan 2011, in which an *abieticola*-like bird is paired with a *harlani*). *Abieticola* breeds with *borealis* where their ranges blend at the southern periphery of the boreal forest; the authors have reviewed documentation of mixed pairs from Alberta (Kara Donahue) and from northern New England (Maine, New Hampshire). More work on nesting Red-tailed Hawks in southern Canada and the U.S. border states would likely reveal more such pairs, as has been the case,

Figure 1. This striking after-second-year Red-tailed Hawk (left) is a beautiful example of the little-known subspecies *abieticola*, Northern Red-tailed Hawk. It was identified by its fully banded tail, dark throat, heavy bellyband, and strong patagial bar. *Abieticola* is sometimes considered a heavily marked version of Eastern Red-tailed Hawk (subspecies *borealis*) but is usually distinguishable from other subspecies and appears to be a widespread breeder in the boreal forest from central Alaska to Labrador. This bird was photographed near Tunica, Mississippi, 21 December 2009. Age terminology in this article is based on calendar year, the system used in bird banding. Photograph by Brian L. Sullivan.



Figure 2. Three *abieticola* near Watson Lake, Yukon. Note bobby bellyband, dark throat, and faintly banded tail (left bird; after-second-year bird; June); heavy bellyband, pale throat with dark border, and boldy banded tail (middle; third-year bird; June); and extensive bobby bellyband, pale throat with dark border, faintly banded tail, and retained juvenile band-tipped outer primaries, shown by many *borealis* and *abieticola* but very rarely by *calurus* (right; third-year bird; May). Compare these birds, and those in Figures 1, 3-19, with “classic” *borealis* and *calurus*, depicted in Figure 20, on the final page. Photographs by Jukka Jantunen.



Figure 3. Breeding after-third-year *abieticola* at Yellowknife, Northwest Territories, 2 August 2013. Note the *borealis*-like appearance of this bird but the fully banded tail. Photograph by Reid Hildebrandt.

Figure 4. Breeding after-third-year male *abieticola* at Gunsight Mountain, Alaska, 9 May 2011 (below). Bellyband, tail pattern, and dark-bordered pale throat are *abieticola*-like, while the degree of rufous in the underwing coverts approaches that of *calurus*. This bird's mate was a light-morph female *harlani*. Photograph by Brian L. Sullivan.





Figure 5. After-third-year *abieticola* migrants at Gunsight Mountain, Alaska, 10 April 2009. These were potentially the first *abieticola* reported in Alaska, but the subspecies has been noted in small numbers there since 2009. Note prominent bellybands, streaked chest sides, dark throats, and rufous wash to chest (right). Photographs by Jerry Liguori.

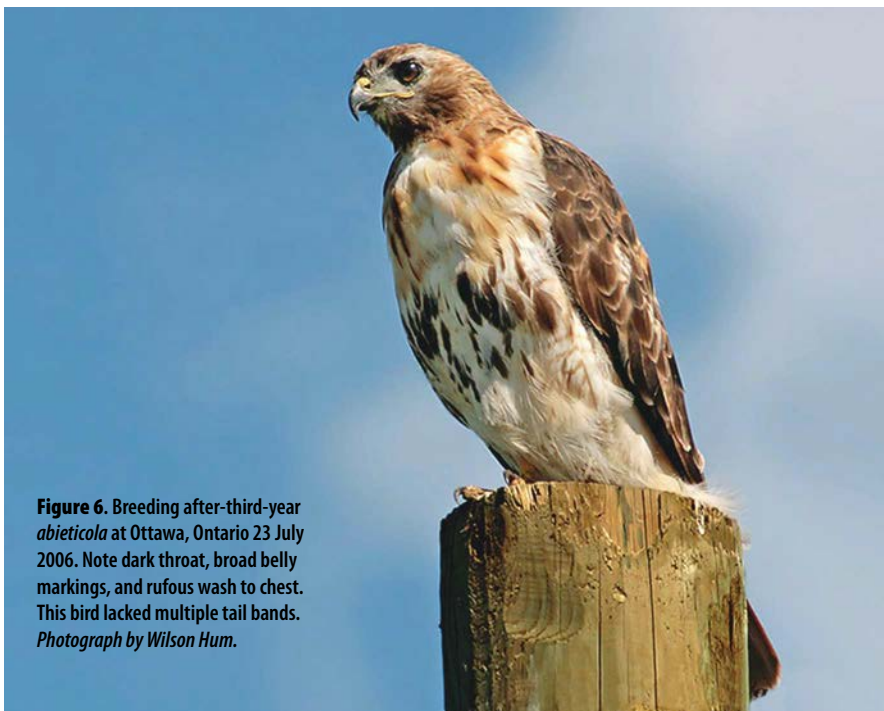


Figure 6. Breeding after-third-year *abieticola* at Ottawa, Ontario 23 July 2006. Note dark throat, broad belly markings, and rufous wash to chest. This bird lacked multiple tail bands. Photograph by Wilson Hum.



Figure 7. Migrant after-second-year *abieticola* at Vaughn, Montana 13 October 2011. Note extensive bellyband, dark streaks on sides of whitish chest, pale uppertail coverts, and multiple tail bands. Photographs by Brian L. Sullivan.

for instance, with Krider's Red-tailed Hawk (*B. j. kriderii*) (see Figure 9d in Liguori and Sullivan 2010b and Figure 6 in Sullivan and Liguori 2010; in both cases, female *abieticola* are identified as heavily marked *borealis*).

An extensive review by the authors of photographs and of specimens indicates that breeding records for typical *abieticola* span the boreal forest from central Alaska to Labrador. The boreal forest shows remarkably little change in species composition from western Alaska to Atlantic Canada, and several widespread bird species that otherwise show pronounced geographic variation are represented by a single subspecies in this habitat, e.g., Slate-colored Junco (*Junco hyemalis hyemalis*), Yellow-shafted Flicker (*Colaptes auratus luteus*), and Myrtle Warbler (*Setophaga coronata coronata*). In this context, a far larger breeding range for *abieticola* than described by Todd (1950) or Dickerman and Parkes (1987) would not be surprising.

The extent of the wintering range of *abieticola* is not known. A collaborative effort over the past decade to study thousands of photographs of Red-tailed Hawks across North America (Liguori, Sullivan, Lish, and many others) suggests that *abieticola* winters largely from the Great Plains (see Dickerman 1989) eastward through the Northeast and sparingly into the northern mid-Atlantic states; thus its winter range overlaps extensively with that of *borealis*. The authors are aware of no records of *abieticola* from the Carolinas through Florida, and only a few records are known from Gulf coastal states. The collaborative study of photographs, and the authors' extensive observations of Red-tailed Hawks in the western United States (1997-2014), suggest that *abieticola* is very uncommon or rare from the Rocky Mountains westward in winter, with few birds documented from the region.

Migration routes in *abieticola* are also little known. The authors' 1993-2013 seasonal studies of raptor migration at sites on the Great Lakes (Derby Hill, NY; Braddock Bay, NY; Whitefish Point, MI; Hawk Ridge, MN) and on the Atlantic coast (Cape May Point, NJ; Kiptopeke, VA), together with the recent collaborative photographic study, suggest a mostly central and easterly migration route for *abieticola*; this route fits well with a wintering range that lies mostly east of the Rockies. Among the up to 8000 Red-tailed Hawks that pass through the Pembina Valley of Manitoba in spring, for in-



Figure 8. Two heavily marked adult *abieticola* on wintering grounds from Stillwater, Oklahoma 27 October 2009. In this after-second-year bird (left), note the extensive blackish, bobby bellyband, rufous chest, dark throat, barred leg feathers, and faintly banded tail. This bird is similar to rufous-morph *calurus* but lacks a solid bellyband, has a paler lower belly, and has less extensively marked underwing coverts. In this second-year bird (right), note extremely heavy bellyband, marked underwing coverts, spotted leg feathers, dark-bordered pale throat with dark streaks, and faintly banded tail. Photographs by Jim Lish.

stance, *abieticola* has been verified by photographs (K. Bardon, Liguori), though the percentage of *abieticola* there is not known. Farther east, along shorelines of the southern Great Lakes, the peak of spring migration of *abieticola* occurs on average about two weeks after that of *borealis* (Liguori 2001). The authors' review of photographs also suggests that heavily marked migrant Red-tailed Hawks from the eastern Great Lakes through the Northeast reported as light-morph *calurus* are instead *abieticola*, as Dickerman and Parkes (1987) also found to be the case in the Northeast.

Identification

Few nonspecialists are familiar with plumage variation exhibited by *calurus* and *borealis* or with the degree of overlap in their plumages. Distinguishing *abieticola* from the similar *calurus* is also an underappreciated challenge.

Todd's (1950) description of *abieticola* reads: "Similar to *Buteo jamaicensis borealis* of the eastern United States and southern Canada, but underparts more heavily streaked; throat and upper breast darker colored (more brownish, less rufescent); upperparts (including wings externally) darker colored (more blackish); and sub-terminal black band on tail averaging wider." Dickerman and Parkes (1987) add: "differs from both *borealis* and [*calurus*] in having bold, heavy, dusky to black streaking on the feathers of the bellyband. The throat is never pure white as in many *borealis*, and may be so heavily streaked as to appear almost sol-



Figure 9. An after-second-year *abieticola* on migration at Hawk Ridge, Duluth, Minnesota, October 2013. Note teardrop shaped belly markings, rufous chest, bold patagial bars, unmarked underwing coverts, and dark throat. This bird lacked multiple tail bands. Photograph by Jerry Liguori.

id black. The ground color of the underparts of *abieticola* averages more richly colored (buffy) than in *borealis*, overlapping somewhat with the palest individuals of *calurus*; most 'normal' (i.e., not erythristic or melanic) individuals of the latter race have underparts that are distinctly orange-buff. The westernmost specimens of *abieticola*, as one might expect in an area of inter-

gradation with *calurus*, are the most deeply colored ventrally." Plumage variation in *abieticola* on the breeding grounds, however, has yet to be studied. Until more information is available, it is best to leave many individual migrants and wintering birds unidentified to subspecies. Thus far, it has not been proven that *abieticola* occurs in a dark morph; thus, dark-morph

Red-tailed Hawks should be either *calurus* or *harlani*, though further research could reveal dark-morph *abieticola*.

Morphometric data that could help distinguish *abieticola* from other taxa are few. Banding data from Braddock Bay, Monroe County, New York in three spring migration seasons, 1994-1996 (Liguori, unpubl. data), are of interest: birds recorded as *abieticola* males (sexing based on weight and tarsus width) averaged both smaller and lighter than *borealis* males, whereas *abieticola* females were closer in size and weight to *borealis* females. Larger samples are needed to determine whether these differences are consistent.

Based on the type description by Todd (1950), the work of Dickerman and Parkes (1987), and subsequent research by the authors, *abieticola* typically shows:

- Throat dark, dark-streaked, or dark-bordered, rarely purely whitish;
- Prominent, blackish bellyband, typically with teardrop-shaped streaking;
- Rufous wash or rufous streaks often in breast;
- Variable tail pattern: multiple tail bands that are sometimes incomplete and/or limited to the tail base; a single, narrow band above the subterminal band; or no tail bands; generally more banding than in *borealis*, less heavily barred or banded than most *calurus* (but much variation in *calurus* as well)
- Darker head and upperparts (fewer pale scapulars and coverts) than in typical *borealis*;
- Broader, bolder patagial bars than in typical *borealis* but less bold than in typical *calurus*;
- Less heavily marked underwing coverts than in most *calurus*;
- More retained juvenile remiges after the first molt than *calurus*; and
- Less extensive prebasic molts (adults) than Red-taileds from more southerly areas.



Figure 10. An after-third-year *abieticola* wintering near Tunica, Mississippi, 21 December 2009. Note prominent bellyband, dark throat, streaks on sides of chest, and partially banded tail. Photograph by Brian L. Sullivan.



Figure 11. Third-year *abieticola* on migration at Whitefish Point, Michigan, April 2000. Note prominent bellyband, dark throat, streaks on sides of chest, faintly banded tail, and retained juvenile outer primaries, banded at tips, very rarely shown by *calurus*. Photograph by Jerry Liguori.



Figure 12. After-second-year *abieticola* trapped on migration at Hawk Ridge, Minnesota, October 2013. Note extensive bellyband, rufous chest, pale throat, unmarked underwing coverts, pale uppertail coverts, unbanded tail, and dark upperside. This plumage in *abieticola* most closely resembles light-morph *calurus*. Photographs by Jerry Liguori.



Figure 13. After-second-year *abieticola* trapped on migration at Hawk Ridge, Minnesota, October 2006. Note extensive bellyband, streaked chest, mostly dark throat, faintly marked underwing coverts, dark patagial bars, widely spaced tail bands, and dark upperparts. Uppertail coverts are extensively pale. Photographs by Step Wilson.



Figure 14. After-third-year *abieticola* trapped on migration at Braddock Bay, New York, April 1996. Note streaked chest, dark throat, broad patagial bars, unmarked underwing coverts, partially banded tail, pale uppertail coverts, and nearly unmarked dark upperparts. Photographs by Jerry Liguori.



Figure 15. After-second-year *abieticola* trapped on migration at Braddock Bay, New York, April 1996. Note prominent bellyband, streaked chest, streaked throat, faintly marked underwing coverts, unbanded tail, pale uppertail coverts, and dark upperparts. Photographs by Jerry Liguori.



Figure 16. Second-year *abieticola* at Cape May Point, New Jersey, November 1995. Note extensive bellyband, rufous chest, dark throat, bold patagial bars, unmarked underwing coverts, unbanded tail, and dark upperparts; birds with fully rufous uppertail coverts like this are uncommon. This plumage type most closely resembles *calurus*. Photographs by Jerry Liguori.



Figure 17. After-second-year *abieticola* trapped on migration at Cape May Point, New Jersey, November 1994. Note blobby bellyband, rufous wash to chest, streaked throat, dark head, faintly marked underwings, unbanded tail, and dark unmarked upperparts. Photographs by Jerry Liguori.

Plumage differences among Red-tailed Hawk subspecies appear to be most pronounced in adults; only adult plumages of *abieticola* have been studied thus far. Based on the few examples of known *abieticola* juveniles that we have reviewed, they appear to be more heavily marked below than typical *borealis* juveniles, often with spotted leg feathers, thus closely resembling some *calurus* juveniles.

Discussion

Past ornithologists' work on variation in Red-tailed Hawks has been exemplary. With often a paucity of material to review, especially of individuals from breeding areas, researchers such as Taverner (1927, 1936) and Todd (1950) made enormous strides in basic description of the northern and western taxa. Many of the questions they raised about the basic natural histories and appearances of the various Red-tailed Hawk taxa also continue to be relevant today. In 2014, for instance, it is unknown how far north and west typical *borealis* breeds. At Gunsight Mountain, Alaska, small numbers of migrant *borealis* and *abieticola* have been documented moving westward in April (Liguori and Sullivan 2010a); where are these birds nesting?

Although Northern Red-tailed Hawk is slowly becoming more familiar to raptor enthusiasts, much remains to be learned. With today's advanced technologies for communication, documentation, and data archiving, birders can make solid contributions toward understanding this enigmatic bird's identification, taxonomy, and natural history. Observations of *abieticola* may be reported to eBird (<www.ebird.org>), where "Red-tailed Hawk (Northern)" is available on checklists. Embedding a photograph along with any report of this subspecies will help eBird editors verify and validate the report; moreover, each photograph will provide a resource for under-

Figure 18. After-second-year *abieticola* photographed in Lehi, Utah, December 2010. *Abieticola* appears to be an uncommon wintering bird in the western United States. Note blobby bellyband, dark streaks on side of chest, pale throat with dark borders, and moderately banded tail. Photograph by Jerry Liguori.

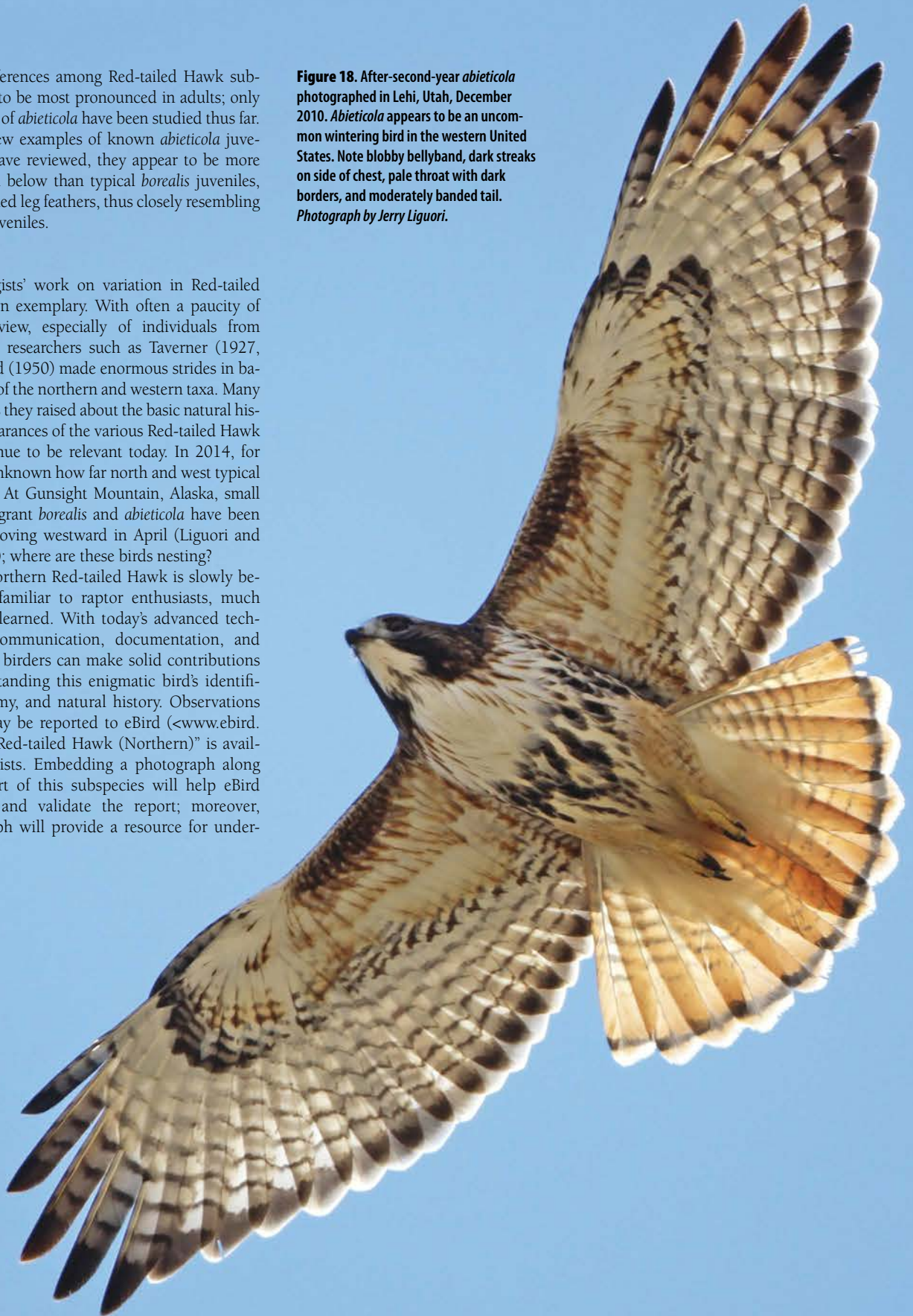




Figure 19. The left column shows mostly typical adult (after-second-year) *abieticola* tails with moderate or partial banding; the right column shows typical adult *calurus* tails, which appear on average more heavily or densely banded or barred than in *abieticola*. However, variation from no banding to heavy banding occurs in both subspecies. Note that *abieticola* usually has pale uppertail coverts, whereas *calurus* usually has solidly dark or rufous uppertail coverts. Photographs by Jerry Liguori.

standing plumage variation, with each record adding an important piece to the puzzle. Arguably, a citizen-science project on the scale of the continent, such as eBird, is required to amass enough data to shed light on the status and distribution of Northern Red-tailed Hawk. Photographic documentation of nesting Red-tailed Hawks in Canada is comparatively scarce and would be especially useful for

determining phenotypes of those that nest in the boreal forest.

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Figure 20. "Classic" *borealis* (top; probably second-year bird) with minimal bellyband, fully pale throat, golden head, and unbanded tail. Des Moines, Iowa, 13 October 2013. "Classic" *abieticola* (middle; second-year third-year bird) with heavy bellyband and dark throat. Whitefish Point, Michigan, 28 April 2006. "Classic" *calurus* (bottom; after-second-year bird) with rufous underside, bold patagial bars, dark throat, boldly banded remiges, fully banded tail, barred bellyband, and barred leg feathers. Bountiful, Utah, August 2006. Photographs by Chris Neri (middle) and Jerry Liguori.