> “I welcome any article on molt, aging, and sexing in *Birding*.”
>
> —Peter Pyle

Discuss the letter writers’ opinions online: **aba.org/birding**

Harrier Molts and Plumages

I welcome any article on molt, aging, and sexing in *Birding*, I second the caution advised by Jerry Liguori and Brian Sullivan in aging male Northern Harriers (May/June *Birding*, pp. 30–35), and I appreciate the emphasis in this article on more study based on banded, known-age birds. I’d like to remind birders that there is a technical literature describing molts and plumages that usually extends well beyond that illustrated in field guides.

For example, I showed in a pair of 2005 papers that male Northern Harriers can replace up to 50% of the body feathers of the upper parts with grayish feathers during the preformative (i.e., postjuvenile) molt (*Journal of Raptor Research* 39:378–385) and that 15% of Northern Harriers can retain 1–6 secondaries during their second and later prebasic molts, but that few if any birds retain primaries (*Condor* 107:823–834). Moreover, in a 2006 paper, I showed how the replacement sequence of the secondaries in most large birds proceeds distally from s1 and s5 and proximally from the tertials, such that a species like the Northern Harrier, with 14–15 secondaries, retains feathers among s3–s4 and s7–s10 in its second, and often later, prebasic molts (*Western Birds* 37:179–185).

Further research, based on known second-cycle and older birds with retained feathers representing more than 100 specimens of Northern Harriers

Instructions for Contributors

We want to hear from you! *Birding* is the members’ magazine of the American Birding Association, and **you** are the heart and soul of the ABA. *Birding* welcomes articles, essays, and commentaries on anything having to do with birders and birding in the Americas.

If you are interested in contributing to *Birding*, a great first step is to familiarize yourself with recent content in the magazine. Browse back issues, available online. Then contact Editor Ted Floyd, and tell him about your proposed article or other contribution.

Articles with supplemental online content are especially appropriate. We are keenly interested in articles that promote discussion in online social media forums such as The ABA Blog. Most of all, we value contributions that are broadly reflective of the varied interests, outlooks, and objectives of the growing community of birders in North America and beyond. ❑ Browse back issues of *Birding*: **aba.org/birding/archives.html** ❑ Check out current content: **aba.org/birding** ❑ Contact Editor Ted Floyd: **tfloyd@aba.org**

Quick Links to Online Content for the July/August 2013 *Birding*

If you’re reading just the print version of the July/August Birding, you’re missing out! Online content for the July/August issue includes discussion of photo quizzes, sound recordings of birdsong, ABA members’ tributes to Betty Petersen, and **your** feedback on letters to the editor, feature articles, and more.

❑ Online content exclusively for members is indicated by this symbol:

❑ Online content for everybody is indicated by this symbol:

❑ Access all online content by visiting ***Birding* Online: aba.org/birding**

***Birding* Online** is a “dashboard”—an electronic Table of Contents—for all online content for the magazine. Just click on the links, and off you go!

(summarized in my *Identification Guide to North American Birds*—Part II, pp. 411–414), has led me to conclude that second-cycle ("second-year" in the *Birding* article) males have a distinct plumage that is reliably distinguished from older ("after second-year" in the *Birding* article) males in most cases, that older males with brown in the plumage might be third-cycle individuals, and that paler gray males might be older than third or fourth cycle. I also pointed out (*Identification Guide*, p. 29) that older adult females of most if not all sexually dichromatic bird taxa can show male-like plumage characters, as related to hormonal senescence; see also Ian Owen and Roger Short's 1995 paper (*Trends in Ecology and Evolution*, 10:44–47) and references therein.

I see little in Liguori and Sullivan's article to challenge the technical literature on plumages in male Northern Harriers, and a misinterpretation of molts and plumages in several of the illustrated birds weakens my confidence in the article's primary new suggestion, namely, that a substantial proportion of three-year-old and older males may show significant brown in the plumage.

The "classic adult" opposite the title page has retained s7 on the right wing. It's hard to say for certain, but this could be a juvenal feather, which would indicate a second-cycle bird showing more definitive-like characters.

The four-year-old or older individual in Fig. 4 with a brown wash to the plumage could be an anomalous male or perhaps an older female (see above), as also suggested by its broader wings and bulky appearance; females are larger than males in most hawks.

The bird in Fig. 5 may well be a second-cycle individual, but I see no retained feathers as reported. Rather, differences in wear among primaries and secondaries appear to have resulted from protracted and/or suspended molts; see Joseph Schmutz and Sheila Schmutz's 1975 *Auk* paper (92:105–110) and my 2005 *Condor* paper (107:823–834). Furthermore, the very pale inner primaries and contemporaneously molted secondaries (s1–s2 and s5–s7) make me wonder if this is an older individual.

The three September birds shown in Figs. 6 and 7 are either still molting or may have suspended molt for migration, rather than showing retained feathers from an arrested molt. As I noted above, few if any Northern Harriers retain primaries during incomplete molts.

I accept that it is possible that adult males show some sort of polymorphism as older birds. However, I can't think of another example among species with delayed plumage maturation (gulls, albatrosses, boobies, etc.) in which plumage does not progress through early cycles toward a universally definitive plumage state, let alone showing sexual dimorphism as well.

I do applaud the authors for focusing on the possibility of retained underwing coverts and how these might assist with reliable age determinations. Because these coverts cannot be viewed on most (round-skin) specimens, we know very little about variation in their molt and coloration. Most blackbirds of several species, despite undergoing otherwise complete preformative molts, retain a few under-wing coverts—a pattern serendipitously discovered by Brooks Meanley in 1966 while examining recently killed blackbirds during control efforts. This discovery has proven very reliable in aging these species in the hand. Flamingos can also retain under-wing coverts but no other feathers during the second and later prebasic molts, a pattern discovered only because color patterns in juvenile

under-wing coverts are burnt orange with black tips, very different from the pink coverts of adults. I have been encouraging bird banders to examine and photograph the under-wing coverts in other birds reported to have complete preformative molts, among them Bushtits, Northern Cardinals, certain sparrows, and meadowlarks, thus far without further discovery.

As highlighted by Liguori and Sullivan, crisp digital imagery may prove a very useful tool for better understanding molt and color of under-wing coverts, not just in Northern Harriers and other raptors, but potentially in passerines and other birds as well.

—Peter Pyle
BOLINAS, CALIFORNIA

RESPONSE:

We appreciate that Peter Pyle took the time to read our article, and we're happy to respond to his concerns. Unfortunately, Pyle's comments are speculative, circular, contradictory, or demonstrably incorrect. Pyle starts out by noting that several of his papers were not cited in our *Birding* article. While we value his research, the papers cited by Pyle explore general molt sequences of raptors, the findings of which are not disputed in our *Birding* article. Our main point was to show the plumage overlap between second-year male vs. older male Northern Harriers.

Pyle summarizes his research suggesting that second-year males are brownish above and washed rufous below, and that progressively older birds become grayer above and whiter below. We provide examples of gray second-year birds aged definitively by their retained juvenile feathers. We know of no reliable way to age third-year or fourth-year male harriers. Male harriers with two generations of adult feathers (frontispiece and Fig. 7) can only be aged as "after-second-year."

Pyle indicates that we misinterpreted molts and plumages in several birds, but we show below that his interpretations are incorrect. We also demonstrate the validity of the analysis laid out in our article.

Pyle wonders if the bird in the frontispiece could be a second-year individual, but s7 (the 7th secondary) is a retained, faded, adult feather showing the same pattern and the same gray on the inner web as shown by the secondaries adjacent to it, making this bird an after-second-year male. We wish this were a second-year, as it would provide excellent documentation of a grayer variant.

Pyle suggests the bird in Fig. 3 could be an older female showing male characters, yet, as stated in the caption, this is a breeding adult male observed during the course of several years. There is no evidence that female Northern Harriers can show male traits. Adult female harriers can show a grayish-brown cast to the upper side of the remiges (i.e., the primaries and secondaries); see p. 35 in Liguori's *Hawks From Every Angle* (Princeton University Press). However, they are not known to resemble males in other ways. If the bird in Fig. 3 were a female, there would be no way to distinguish males and females by plumage. Identifying this bird as a female based on its "broad wings" or "size" is faulty. Shape and size characters are notoriously difficult to assess with accuracy from a single photo. For example, the male on p. 31 of our *Birding* article also appears stocky.

Pyle questions the age of the bird in Fig. 5 and comments that he can't see the retained juvenile feathers as reported. The retained juvenile feathers shown in Figs. 4 and 5 are elucidated in the photo captions. The bird in Fig. 4 exhibits brown retained under-wing coverts; this is easily seen in the inset figure. The bird in Fig. 5 has retained juvenile primaries, secondaries, and body feathers, with p7–p10 (the 7th–10th primaries) showing boldly banded tips instead of the solid black tips of adults.

Pyle also comments about the status of molt in the September birds (Figs. 6–7), yet we make no assumption that molt is in progress or arrested. We only point out that the retained juvenile flight feathers in Fig. 6 age these birds conclusively as second-year individuals. The bird in Fig. 7 is aged as an after-second-year individual because it has two generations of adult feathers.

Our article affirms that most harriers do not retain remiges between molts, and Pyle agrees; see his 2005 paper in the *Journal of Raptor Research*. This is why our study was arduous and has taken so long (for example, the bird in Fig. 4 was photographed in 1996).

Pyle notes that adult males might exhibit polymorphism, and we provide evidence in our *Birding* article for that phenomenon. But he questions whether species that take several years to become adults can show variation once they reach their definitive plumage state. There is variation in the definitive plumages of several raptor species, as shown previously by Liguori for Ferruginous, Swainson's, and Red-tailed hawks and Golden Eagles. Plumage variation in adult male harriers is no greater than that displayed in the upper-wing mottling and tail bands on Golden Eagles, the bibs on Ospreys, the underside barring of accipiters, the overall colors and patterns of adult male Rough-legged Hawks, and especially the colors and patterns of the tails of adult Harlan's [Red-tailed] Hawks. (For more on the tails of Harlan's Hawks, see Bill Clark's article in *Birding*, January 2009 pp. 30–36.)

Pyle closes by pointing out the difficulty of studying under-wing covert molt patterns using round-skin specimens. Based on our study of live birds over many years, we know that juvenile harrier under-wing coverts are brown and are the last feathers to be replaced, and that adult male under-wing coverts are white or rufous-spotted. Under-wing coverts are frequently retained in larger raptors, such as goshawks, eagles, and large falcons. We agree that specimens are valuable, but on specimens it is often difficult to examine such characters as eye color, the under-wing coverts, and the spread wings and tail. Our study of live birds has helped us substantiate many characters over the years.

One final note. In a 2013 article in *British Birds* (106:145–158), Jean François Blanc and coauthors showed that plumages of adult Marsh Harriers (*Circus aeruginosus*) are highly variable and do not follow the "logical" progression assumed in past literature. In this study of marked birds over many years, some males never achieved the gray plumage of "typical" males, remaining female-like throughout their lives; some progressed toward a grayer adult plumage over time; and others showed no change after the second prebasic molt. Here is their particularly telling conclusion:

> *Brown males are not just immature birds with delayed plumage maturity, which might seem logical given the similarity of their plumage to younger age classes (and females). Instead, these brown males represent a distinct morph, a permanent "female-like" plumage that is currently known in only one other bird species, the Ruff* Calidris pugnax *(Jukema and Piersma 2006). However, the situation is not quite that simple, since our study population does not consist of just brown and classic gray male morphs. In fact, these two types account for <20% of breeding males, with the remaining 80% exhibiting a wide variety of intermediate plumages.*

We maintain that more study is needed to determine if a plumage progression occurs in Northern Harrier, but we have also shown that conventional assumptions about "brown" male Northern Harriers are erroneous. Adult male Northern Harriers show plumage variation from brownish to pearl gray (and with varying amounts of rufous underneath), and aging such birds based on plumage traits alone is meretricious.

—Jerry Liguori and Brian Sullivan