

IDENTIFICATION OF BALD AND GOLDEN EAGLE FEATHERS

Identification Guides for Wildlife Law Enforcement No. 15

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Wildlife law enforcement officers often encounter suspected eagle feathers, either loose or in crafted items such as headdresses and dance fans. Identification of these feathers can be challenging. Bald and Golden Eagle feathers are similar in size and their appearance changes dramatically with age in both species, with the feathers of subadult eagles particularly variable. In addition, feathers of other large birds, including turkeys, geese, and vultures, may be used in place of eagle feathers and must be ruled out during the identification process.

This Identification Guide uses wing and tail feather scans from the Feather Atlas of North American Birds (<http://www.fws.gov/lab/featheratlas>) to illustrate distinctive characters of adult and subadult Bald and Golden Eagle flight feathers. The features distinguishing eagle feathers from those of waterfowl, large gamebirds, vultures, and other raptors are also illustrated and discussed. Major points are summarized in Table 1 (p. 26).

Terminology. Flight feathers are the large wing and tail feathers that provide lift and maneuverability in flight. They are the feathers most commonly used in crafted items, and are thus the subject of this Identification Guide. On the wing, the outer ten flight feathers are the primaries; the inner flight feathers are the secondaries (Fig. 1).

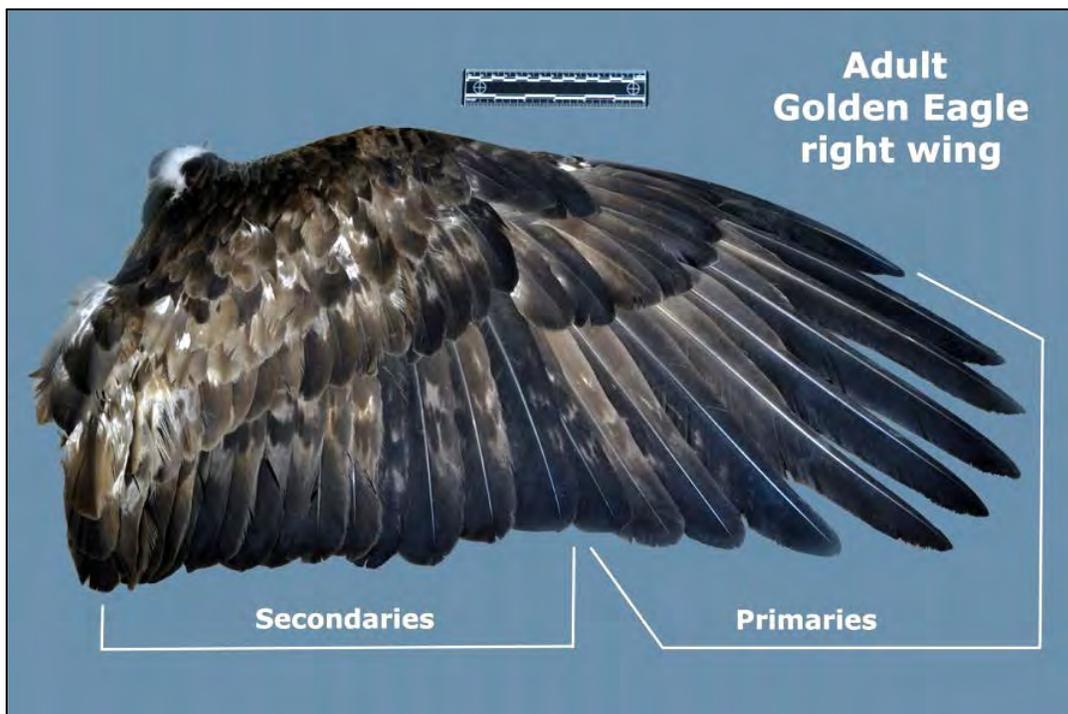


Figure 1. Right wing of adult Golden Eagle, showing the positions of the primaries and secondaries.

Figure 2 shows one of the outer primaries of a Bald Eagle, to illustrate the basic parts of a feather. The primaries of eagles are pointed, and the outer ones have narrow tips created by emargination of the outer vane and a notch in the inner vane. Eagle primaries are asymmetrical, with the inner vanes much wider than the outer. The inner wing feathers (secondaries) are rounded and the vanes are more symmetrical. The tail feathers are also rounded. The vanes on the outer tail feathers are very unequal, but they become progressively more symmetrical toward the center of the tail. It is often difficult to distinguish inner tail feathers from secondaries.

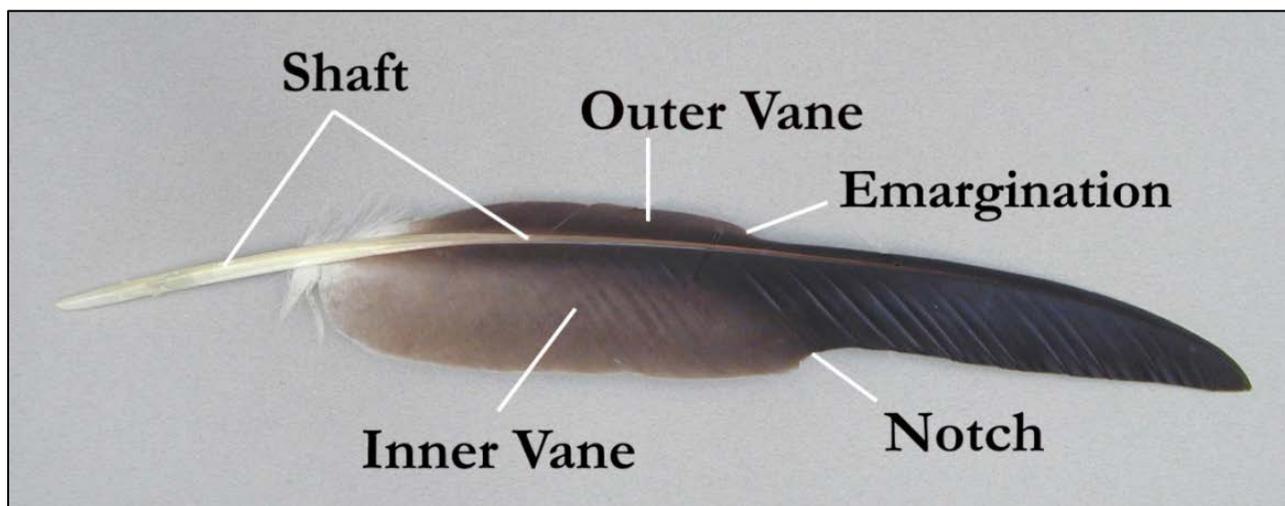


Figure 2. Parts of an eagle feather (a Bald Eagle right outer primary). For additional definitions and illustrations, see the **Glossary of the Feather Atlas of North American Birds** (<http://www.fws.gov/lab/featheratlas/glossary.php>)

The goal of this guide is eagle species identification, not age determination, and feathers from eagles of different ages are illustrated simply to show the range of variability for each species. In the following scans, adult refers to feathers exhibiting the final, fully mature pattern; subadult refers to feathers exhibiting any characteristics of birds that are not fully mature, including one-year-olds (“juveniles”). Both eagle species typically attain full adult plumage by their fifth year.

Note on Scans: In this Identification Guide, as on the Feather Atlas, all wing feathers are from right wings, and unless otherwise noted, the upper surfaces of the feathers are shown. The outermost wing feather is always positioned on the left side of the scan, with increasingly inner feathers arranged to the right. Eagle wing feather scans illustrate either all 10 primaries or a representative selection of eight secondaries (eagles possess approximately 14 secondaries). Some other species’ wing feather scans include both primaries and secondaries.

Tail feathers are also arranged with the outermost feather on the left, and the central tail feather on the right side of the scan. Eagles have twelve tail feathers; only the right half of each set of tail feathers is shown.

In all scans, the scale is in centimeters (2.54 cm = 1 inch; thus, 25 cm ≈ 10 inches).

DISTINGUISHING BALD AND GOLDEN EAGLE FLIGHT FEATHERS

Bald Eagle Adult

Adult Bald Eagles are easily recognizable, with their pure white heads and tails and dark brown bodies. The detached white tail feathers (Fig. 7) cannot be confused with Golden Eagle feathers (which are never all white), but may be confused with the white flight feathers of swans and domestic white forms of turkey (see section on distinguishing eagle feathers from other species, pp. 12-25). Adult Bald Eagle wing feathers are plain dark gray or gray-brown, sometimes with a very small whitish patch at the base (Fig. 3 and 4). They never exhibit marbling or other patterning within the vanes.

Golden Eagle Adult

Adult Golden Eagles are brown overall, with no large areas of white. Most flight feathers of both wing and tail exhibit a diagnostic pattern called “marbling,” characterized by curved or irregular pale patches, spots, and bars (Fig. 3, 4, 7, and 8). These marbling markings contrast with the predominant chocolate-brown color of adult Golden Eagle feathers, and vary from light brown to tan to (rarely) almost white. Marbling is never seen on Bald Eagle feathers.

It is important to note that the outer three to five primaries of Golden Eagles lack marbling, and are plain grayish-brown, with almost black tips (Fig. 3). These are the feathers with a prominent “notch” in the vane and elongated finger-like tips. Such feathers are not common in crafted items, but when they are encountered, they usually can’t be distinguished from the corresponding feathers of Bald Eagle without reference specimens.

Bald Eagle Subadult

Bald Eagles undergo a more complex and variable series of immature plumages than do Golden Eagles. Juveniles (one-year-olds) are usually dark overall, while two- and three-year-olds may be very light, with large pale areas on the lower breast and belly.

This variability is seen in individual flight feathers, making subadult Bald Eagle feathers probably the most challenging to identify. In comparison with subadult Golden Eagle feathers, subadult Bald feathers look mottled or “mud-spattered” (Fig. 5, 6, 9, and 10). White areas are marked with blotches and speckles, and are often toward the middle or even tip of the feather, in isolated patches within the dark vane. If a pure white patch is present at the base of the feather, it is much smaller than the comparable area on a subadult Golden Eagle feather. Subadult Bald flight feathers occasionally show irregular pale markings toward the tip, but never the well-developed marbling patterns typical of Golden Eagle. If in doubt about a possible marbling pattern, look for white areas with speckling or blotching in other parts of the feather, which would rule out Golden Eagle.

Golden Eagle Subadult

Subadult Golden Eagles are distinguished from adults by the large amounts of white at the bases of their feathers (Fig. 5, 6, 9 and 10). In the flying bird, this is visible as white patches in the wing and at the base of the tail. The tail feathers of yearling (juvenile) Golden Eagles, with their striking white bases and dark tips, are the most prized eagle feathers for headdresses and other items.

The amount of white at the base of subadult Golden Eagle flight feathers varies with age (most in one-year-old birds), the location of the feather (most on inner secondaries and tail feathers, least in outer primaries), and also shows individual variation. Nevertheless, there are several consistent differences from subadult Bald Eagle feathers. The white area is almost always a solid patch extending up from the base of the vane, not a white patch surrounded by a darker area as in subadult Bald Eagles. A large part of the white area is typically pure white (Fig. 9), even if there are brown speckles at the edges (Fig. 6). Finally, subadult Golden Eagles often show the beginnings of the distinctive “marbling” pattern of adults, either at the edge of the white patch or within the brown outer portion of the feather (Fig. 10).

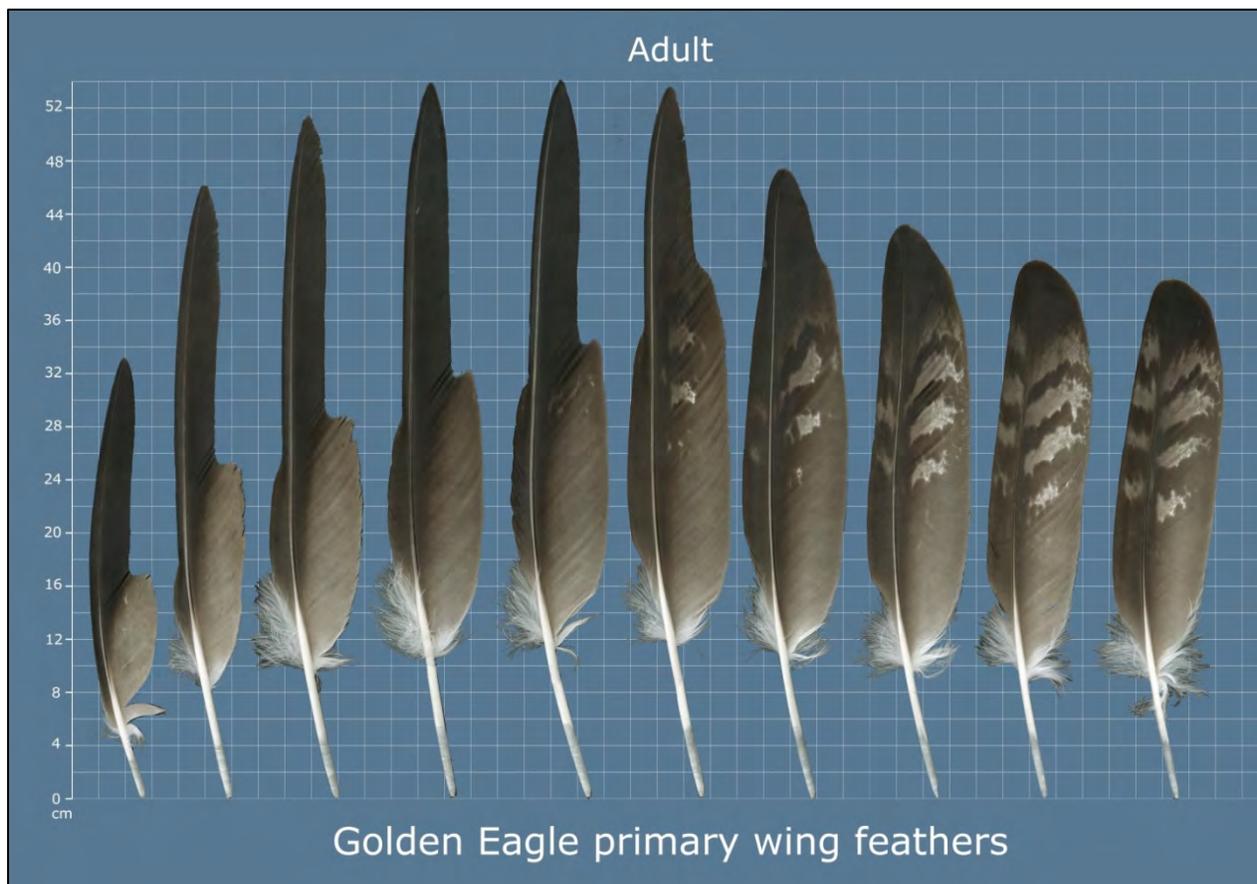
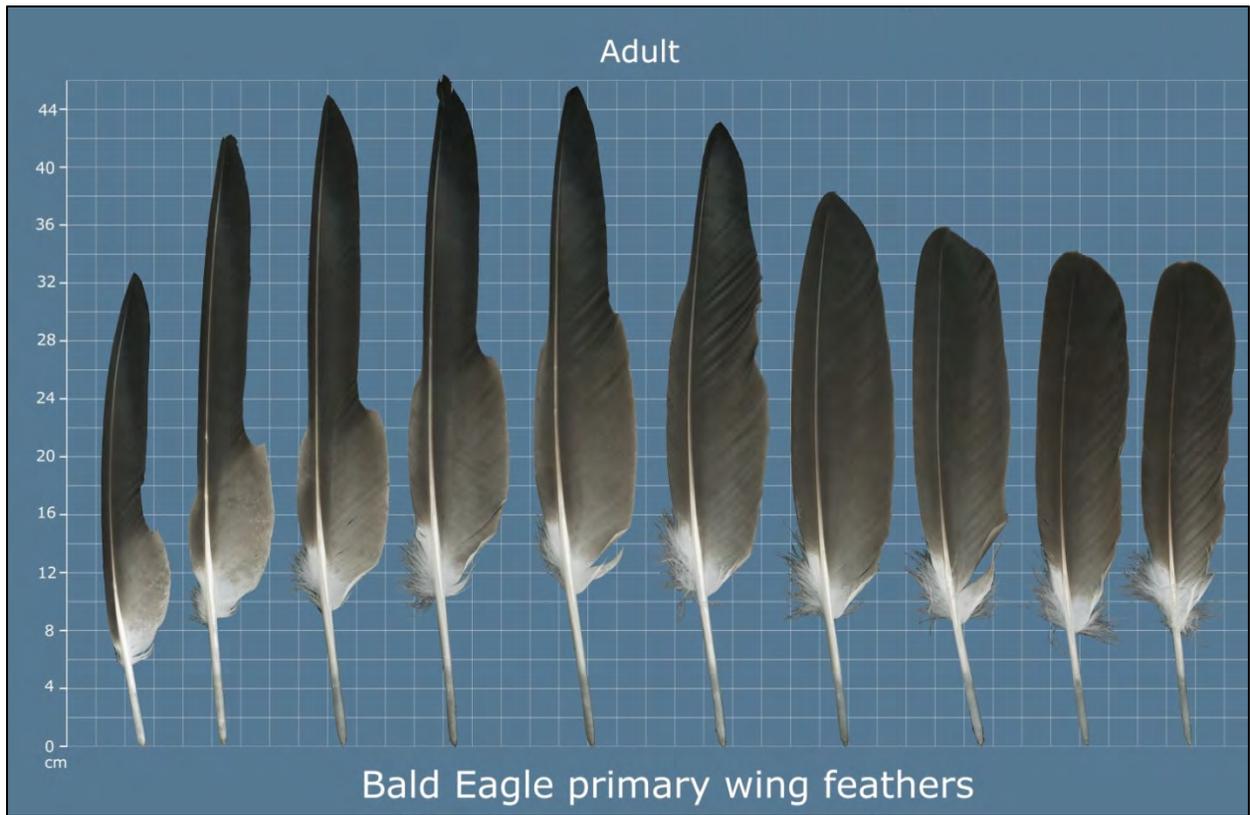


Figure 3. Adult Bald vs. Golden primaries. Note the obvious marbling on Golden inner primaries.

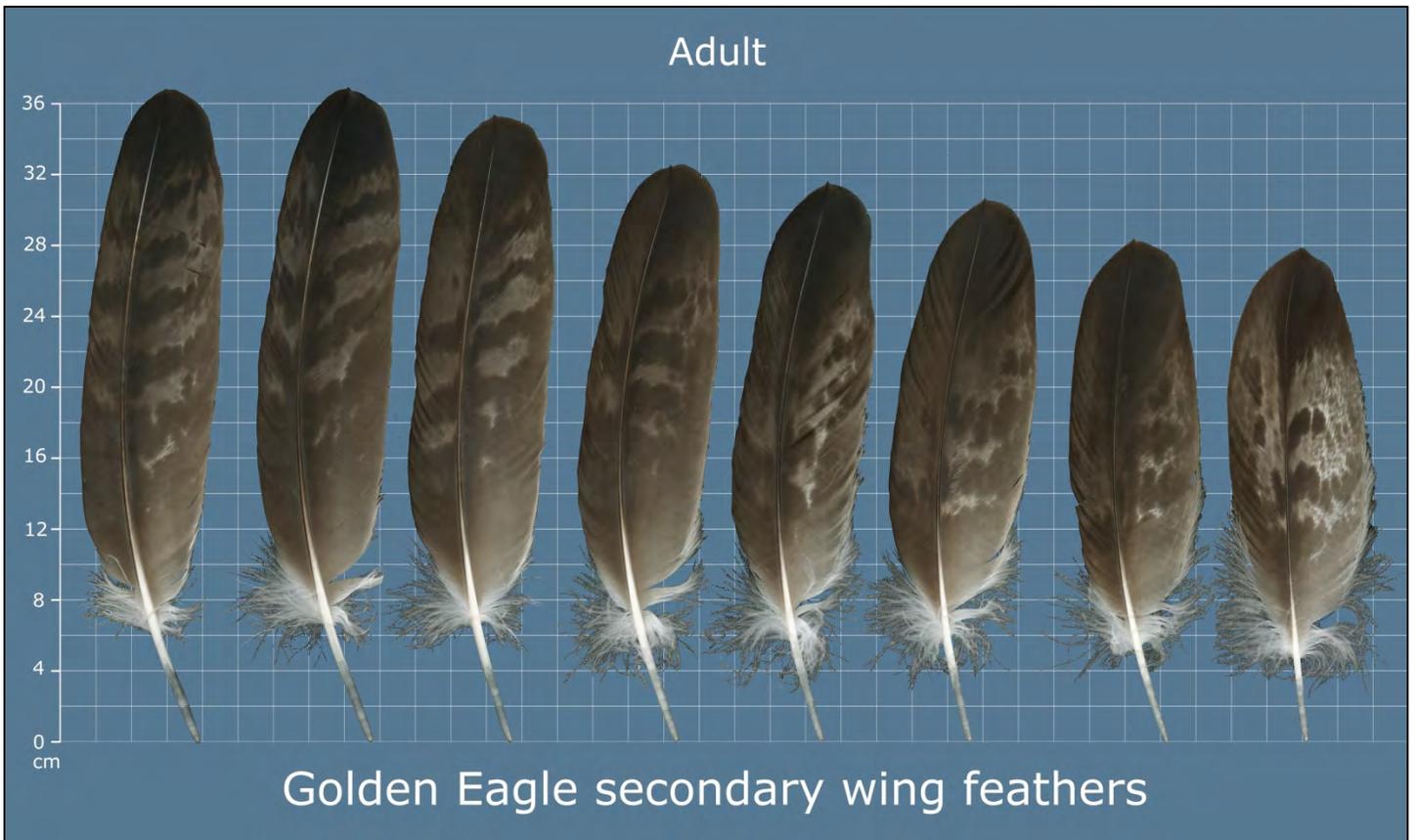


Figure 4. Adult Bald vs. Golden secondaries. Note the obvious marbling on the Golden Eagle feathers.



Figure 5. Subadult Bald vs. Golden primaries. Note pale areas mottled with brown in both basal and terminal areas of Bald inner primaries versus large pure white basal areas on Golden.

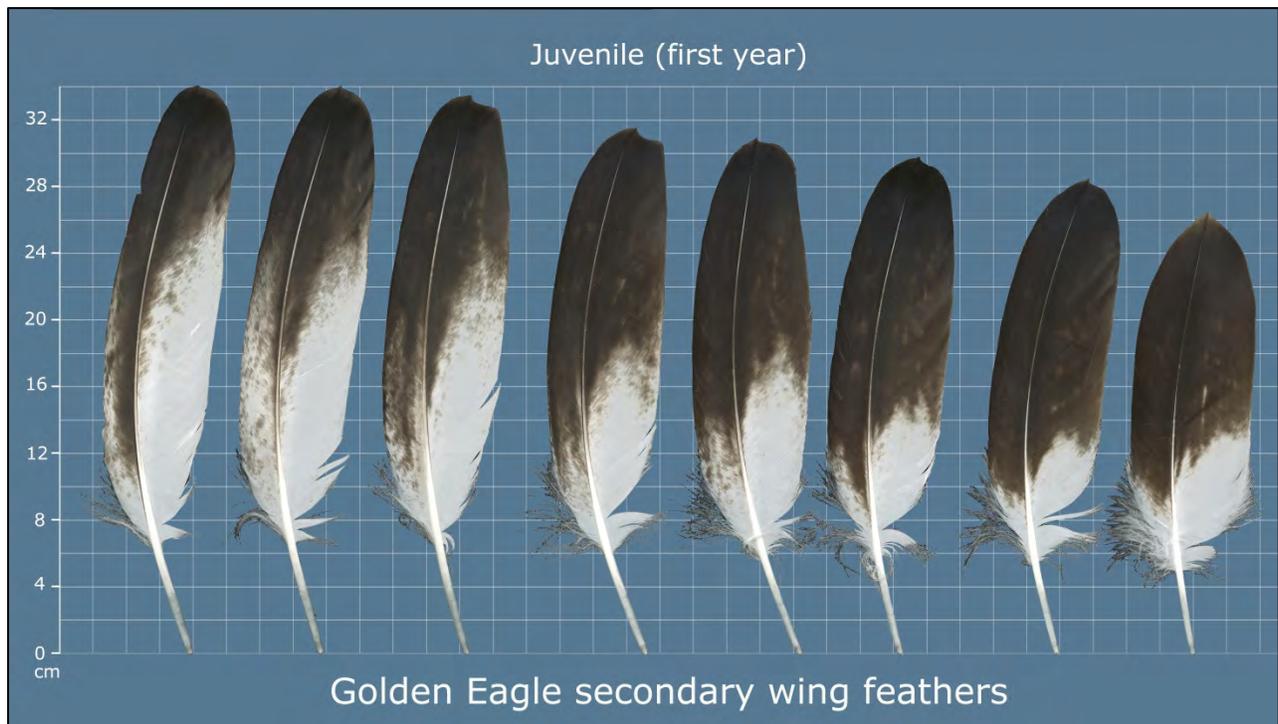
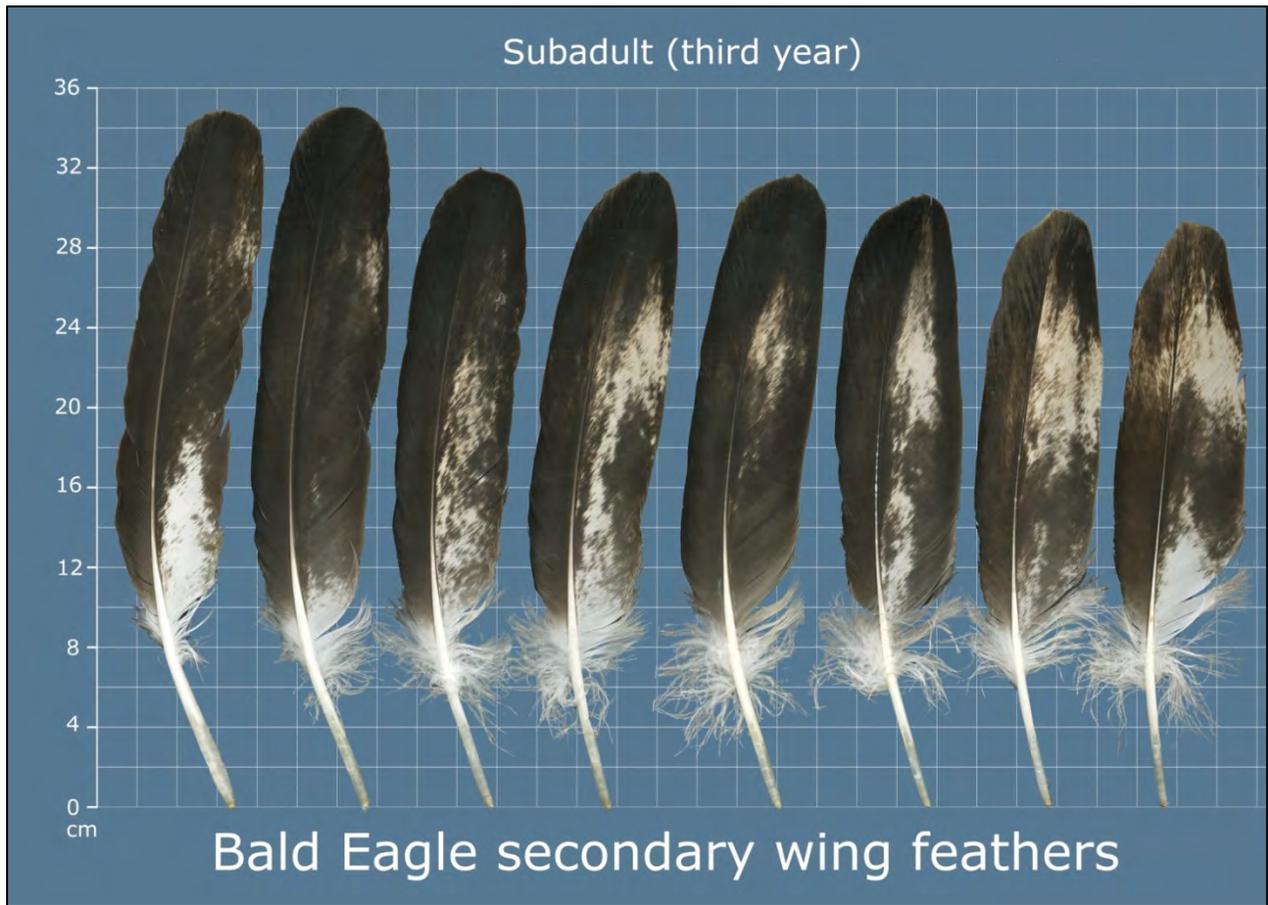


Figure 6. Subadult Bald vs. Golden secondaries. Note white mottled with brown in both basal and terminal areas of Bald inner primaries versus large areas of pure white extending from bases of Golden. Note also the faint marbling visible on the terminal portions of the Golden Eagle secondaries.



Figure 7. Adult Bald vs. Golden tail feathers. The pure white tail feathers of adult Bald can be confused only with swans or domestic turkeys. The strong marbling pattern of adult Golden tail feathers is diagnostic.



Figure 8. Adult Golden Eagle tail feathers from two individuals, illustrating the range of variation in the marbling pattern. Compare to the Golden Eagle tail feathers in Fig. 7, which are more typical.



Figure 9. Subadult Bald vs. Golden tail feathers. The mottled pattern of the Bald feathers, with pale areas in the mid-vane area, contrasts with the strong Golden Eagle pattern of white bases and dark tips.



Figure 10. Subadult Bald vs. Golden tail feathers. Bald Eagle tail feathers become whiter in older birds, with dark patches persisting longest along shafts and at tips. Golden Eagle feathers become darker in older birds, with white patches restricted to the bases and marbling evident toward the tips.