

THE FIELD IDENTIFICATION OF BALD AND GOLDEN EAGLES

by Paul M. Roberts, Medford

Illustrated by Julie S. Roberts, Medford

Massachusetts' birders have enjoyed a particularly pleasant development in recent years. The number of eagles wintering in the Commonwealth has been increasing! The counts have been larger not only at Quabbin Reservoir and in the Connecticut Valley, but also, for the past three years, wintering Bald Eagles have been observed regularly on the Merrimack River.

The "return" of the eagles has caused some confusion. Although most birders can easily identify an adult Bald Eagle when seen well, identifying immature and sub-adult Bald Eagles and differentiating them from Golden Eagles is another matter entirely. During the past two years, I've seen very competent birders unable to correctly identify sub-adult Bald Eagles even when seen well at close range. I've also seen sub-adult Bald Eagles identified as Rough-legged Hawks, Ospreys, Red-tailed Hawks, and a "possible Swainson's Hawk," and at least twice, I've seen "dark phase" Rough-legged Hawks identified as Golden Eagles.

There are good grounds for such confusion. The major birding field guides (Peterson, Robbins, Pough, and Bull) depict only two plumages, immature and adult, for the Bald and Golden eagles. This is adequate for the latter, in which the many sub-adult plumages vary only slightly from the immature plumage depicted. However, no standard field guide portrays the great variety, and disparity, of sub-adult Bald Eagle plumages. Well over half the Bald Eagles I've seen in Massachusetts during the past two years were not in either plumage represented in the field guides. These were the birds, perched, that were often seen well by other observers but misidentified because they were in sub-adult plumage.

This article attempts to supplement the information conveyed in the major guides regarding the field identification of eagles. It concludes with a special two-page "coloring book" and a request for your help in identifying and tracking the movement of individual eagles, especially in the Merrimack Valley, along the Essex County coast, and in southern New Hampshire.

BALD EAGLE

The Bald Eagle (*Haliaeetus leucocephalus*) is by far the most commonly seen eagle in Massachusetts. A fish eater and scavenger, it is frequently found near dumps, roadkills and other carrion, especially along lakes, rivers, and ocean shores. The dimensions (wingspan c. 72 to 98 inches, weight 7 to 12 pounds) are quite similar to those of the Golden Eagle. The



Immature Bald Eagle at Quabbin Reservoir

Photo by Peter A. Southwick, A.P.

sexes look alike, except that the female is larger.

In Flight. Three characteristics help identify the Bald Eagle in flight.

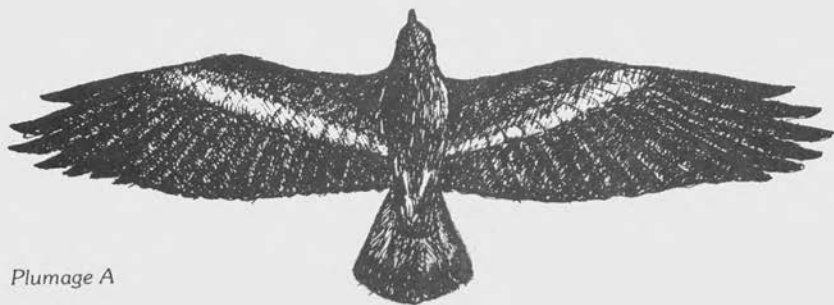
- ▶When the bird's head and tail are well seen, the large head and beak appear to stick out as far in front of the leading edge of the wing as the long tail sticks out behind the trailing edge.
- ▶The wings appear very long and consistently thick from the base of the wing to the tip. The leading and trailing edges of the wing seem parallel.
- ▶When soaring or gliding, the wings are held flat. This flatness, combined with the straightness of the wings, prompts some observers to call the bird a flying plank.

In powered flight, the wingstrokes are deep, imposingly long, and somewhat disjointed. The differences between the Bald and Golden eagle wingstrokes are subtle and subject to much qualification.

Perched. This is an extremely large bird that tends to sit very erect in trees, like a Red-tailed Hawk only much bigger. Unless the bird is quite distant, the massive head and long beak clearly differentiate it from any other perched raptor, including the Golden Eagle, seen in the Commonwealth. If you are standing under the bird, you'll note that the feathering on the tarsi stops an inch or more above the toes. The tail is impressively long, broad, and slightly rounded. (The large head can minimize the perception of a long tail.) In immature plumages, the tail often appears wedge shaped. The long beak, cere, feet, and iris are bright yellow in the adult-plumaged bird. Immatures and sub-adults have dull yellow feet, a greyish cere, a horn-brown to black beak, and a brown iris. Sub-adults can often show some yellow at the base of the mandible.

Plumage. The Bald Eagle is our national symbol, one of the most famous birds in the world, and one of the best known eagles (in scientific terms). Thus, it is surprising how little is known about Bald Eagle plumages, molt, and aging. The best discussion of Bald Eagle plumages was written by Southern (1967), who identified seven distinct plumages, at least two "transition" plumages, and attempted to correlate plumage with age. However, recent evidence has raised serious questions with regard to aging eagles by plumage. That subject will be addressed in a forthcoming article.

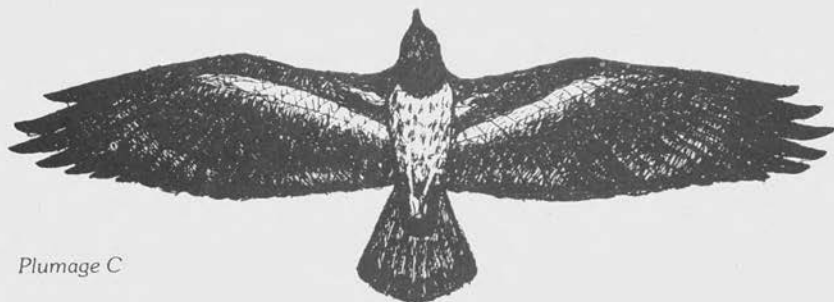
Four fairly distinctive plumages are shown here to indicate the great variability in Bald Eagle plumages. There are many gradations between these plumages that are not depicted here, and no attempt is made to correlate specific chronolog-



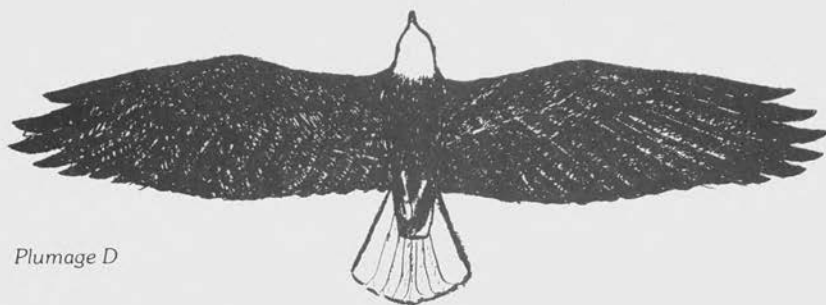
Plumage A



Plumage B



Plumage C



Plumage D

Four Bald Eagle Plumages

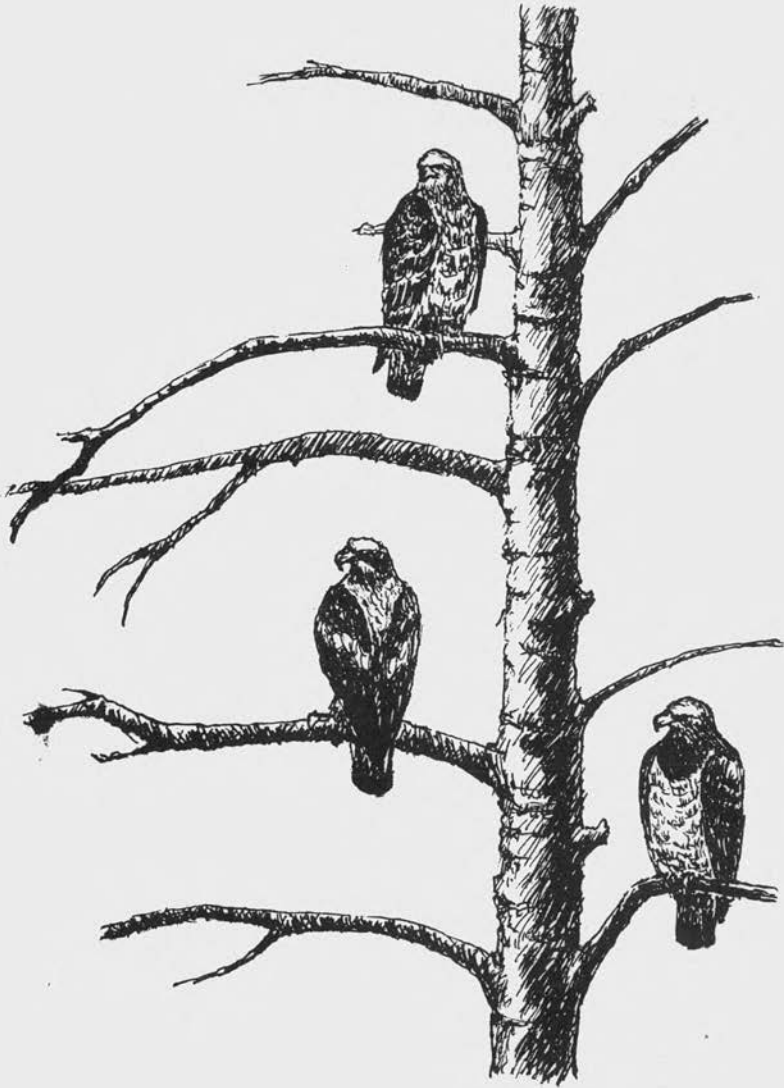
ical age with a certain plumage. However, it is generally assumed that birds progress from Plumage A, commonly considered to be the immature, first-year plumage, to Plumage D, or full adult plumage.

Plumage A. The head is dark brown to black. The body is similarly colored, with occasional white feathers (bases) evident. The wings are also dark brown, but diffuse grey mottling is evident at the base of the flight feathers, the primaries and secondaries. Greyish-white is often found on the dark brown tail, especially on the central rectrices. What white there might be on the tail is most apparent ventrally.

Plumage B. The head and body are dark brown. The neck, however, may be lighter brown or tan, contrasting with the dark brown crown and nape, perhaps creating the impression of golden hackles. Occasionally, there are white feathers on the lower back; sometimes this white is quite extensive. The upper breast is dark brown, creating a "bib" effect as it contrasts with a lighter brown lower breast and belly. This lighter brown area is often streaked with white, giving the lower breast and abdomen a light, speckled "salt and pepper" appearance. The primaries are dark brown to black, but there can be diffuse white mottling on the secondaries and wing linings. The tail usually has dirty-white patches, often flecked with brown, and the dark tips to the rectrices create the effect of an ill-defined terminal tail band.

Plumage C. This is the most enigmatic plumage. The head is generally dark brown, but the crown and nape can be tawny. There may be a tan eye stripe contrasting with a dark brown face patch. The throat can be tan or streaked white. The back is dark brown, but often there is a large white patch on the back. When the bird is perched with wings folded, the patch looks V-shaped. When the wings are spread, however, the full extent of the patch is visible and it is usually rectangular. The upper breast has a distinctive, but not sharply delineated, dark brown bib (or breast shield) contrasting with a lighter brown lower breast and belly that are heavily streaked with white. Often, the lower breast and belly appear white streaked with brown, variable from individual to individual. The contrast between the bib and the belly is much more pronounced in this plumage than in Plumage B. Diffuse dirty-white mottling is found in the wing linings and in the tail.

Plumage D. In the familiar adult plumage, the bird has acquired a bright white head and tail and a lighter brown cast to the body. Some brown mottling will occasionally be found on the head and tail. The flight feathers and wing linings are dark brown. Occasionally, pale-edged, or faded, worn feathers are seen, especially on the wings.



Some Sub-adult Bald Eagle Plumages

There are probably more variations between plumages C and D than any others, but birds in such plumages are progressively less difficult to identify because they increasingly resemble adult eagles. One "transition" plumage deserves special mention, however. Before advancing to full adult plumage, many birds develop a dusky white head and neck mottled with brown streaks. The remnants of the brown face patch can extend around the eye to the back of the head, giving the bird a distinct Osprey-like head pattern that can easily confuse the observer unfamiliar with sub-adult eagle plumages. (See "Other Likely Sources of Confusion" in this article.)



Bald Eagle in "Osprey-like" Transition Plumage

GOLDEN EAGLE

The Golden Eagle (Aquila chrysaetos) is seen much less frequently in Massachusetts than is the Bald Eagle. The Golden Eagle is usually found in mountainous terrain or over fields, hunting for larger mammals such as rabbits and woodchucks. The Golden Eagle is every bit as large as the Bald, with a wingspan ranging between 75 to 94 inches and weight between 7 to 14 pounds. Again, the sexes look alike, with the exception of the larger female size.

In Flight. Three characteristics help identify the Golden Eagle in flight.

- ▶When the bird's head and tail are well seen, the head and beak appear significantly shorter than the long tail. That is, the head and beak do not stick out in front of the leading edge of the wing nearly as much as the tail protrudes from the trailing edge of the wing.
- ▶The long wings noticeably vary in thickness. The wing appears pinched at the base, especially on the trailing edge. The wing gradually broadens to the "wrist" and narrows on the "hand." This gives the trailing edge of the wing a modest but distinctive "S" curve.

▶When soaring or gliding, the bird has a slight dihedral, most obvious on the hand. When soaring, the wings often seem to be swept forward, as though the primaries were attempting to encircle something in front of the bird.

Perched. This is an extremely large bird that dwarfs other hawks or crows perched nearby. The head and beak are much smaller than those of a Bald Eagle, yet noticeably larger than those of a "dark-phase" Rough-legged Hawk. The smaller head dramatizes the effect of the long tail, which can be straight, slightly rounded, or deeply rounded. If your vision is acute, you might note the tarsi are fully feathered to the toes, a characteristic shared with the Rough-legged Hawk. Many birds will have greyish-white, not brown feathers on the tarsi. At close range the Golden Eagle's talons are impressively large; the Roughleg's are not.

Immature, sub-adult, and adult birds have a bluish-black beak, significantly smaller than that of the Bald Eagle. In all age groups, the cere and toes are bright yellow and the iris dark brown.

Plumage. There are two conspicuously distinctive plumages in the Golden Eagle: immature and adult, with all sub-adult plumages only minor variations on a theme.

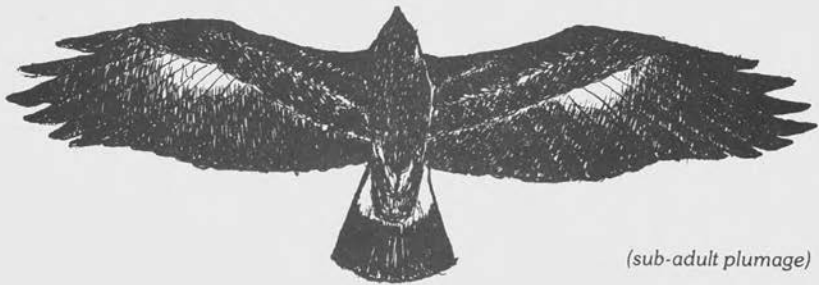
Plumage A is that of an immature (first year) bird. All feathers are white with blackish-brown tips, so the bird appears dark brown. The young bird looks much darker than the adult, except for where the white bases of the primaries and rectrices, and to a much lesser extent the secondaries, are exposed. This gives the young bird crisp, sharply defined, white wing patches, which are virtually diagnostic when seen well from below. Smaller "wrist" patches are visible on the upper wing. The white bases of the rectrices give the tail a distinct ringed effect. The basal half to two thirds of the tail appears strikingly white with a very dark, sharply defined terminal tail band. (New rectrices will have a narrow white terminal tail band, which wears away quickly.) The famous golden hackles are usually evident at this stage, although they are occasionally a whitish buff rather than golden.

As the bird matures, passing through several sub-adult plumages, the amount of white in the wing patches and tail decreases. At times wear or molt will expose small, isolated white patches on the throat or breast, or elsewhere, but the mottling is never as extensive as in the Bald Eagle.

In Plumage B, or adult plumage, the bird will be mottled various shades of brown, a lighter brown than in the immature. The wrist and tail patches are brown, but slightly paler than the tips of the remiges and rectrices, giving the



Plumage A (immature)



(sub-adult plumage)



Plumage B (adult)

Three Golden Eagle Plumages

bird a slightly two-toned effect in good light. Often some white remains at the base of the tail, and some birds have white, scapular "epaulettes."

OTHER LIKELY SOURCES OF CONFUSION

In retrospect, the most difficult "call" might be to separate an adult Golden Eagle from the Bald Eagle depicted in plumage A, especially if the bird is not seen in good light. The head/tail proportions and the shape and angle of the wing would be the critical criteria for identification. Otherwise, knowing the variability of sub-adult Bald Eagle plumages, there should be little difficulty in differentiating the species if the birds are seen well.

However, as noted earlier, other raptors are often confused with eagles.

The Turkey Vulture has the wingspan (68 to 72 inches) of a small eagle and a long, squared tail, but it has an extremely small head, which is often hard to discern at a distance. The bird is much lighter (30 to 51 ounces) than either eagle, so its flight is much more buoyant. The Turkey Vulture glides and soars with a fairly deep dihedral: the "arm" of the wing is held well above the horizontal in a shallow "V." Neither eagle has such a distinctive dihedral. The Turkey Vulture also spends most of its time soaring and gliding, often rocking to and fro in the glide. However, when the large-winged vulture does flap, its deep strokes can easily mislead someone accustomed to seeing the bird only gliding or soaring.

The long, thick wings differ from those of the eagles, and when seen well, the underwings are clearly two-toned. The wing linings are quite dark, contrasting with the silvery-grey flight feathers.

The first Golden Eagle I saw in Massachusetts was initially identified as a Turkey Vulture by the spotter. When my attention was called to the bird, I saw a very dark, uniformly dark, thick-winged bird hanging motionless above the summit of Mt. Wachusett facing into a stiff 35 mph wind. Turkey Vultures would not, could not, do that. The white wing patches and the white base to the tail confirmed young Golden Eagle; a sighting I shall never forget.

The Rough-legged Hawk has a significantly shorter wingspan (c. 48 to 56 inches) than either eagle, but in its "dark phase" plumage, it can cause consternation, especially if the bird is perched. Dark-phase Roughlegs can be totally dark chocolate brown, looking much like the Golden Eagle, especially if the tarsi are seen clearly. Both species have tarsi feathered to the toes and can also have a white base to the tail with a thick, dark terminal tail band. At close

range the Roughleg, however, can easily be differentiated from the Golden Eagle by its smaller head, noticeably smaller beak, shorter tail, and much smaller talons. Although adult Golden Eagles and some dark-phase Roughlegs can have totally dark brown tails, in all dark Roughlegs I've seen, the tail is dark dorsally only. The tail appears greyish from below, often marked with a diffuse dark terminal band. The underside of the tail can also show a series of paler, narrower bands, some of which may be incomplete.

In flight, the dark-phase Roughleg can be distinguished from the eagles by its long, but much narrower, more tapered wings, and by the dark wing linings that contrast sharply with the silvery flight feathers. The Roughleg also has a distinctive dihedral, most obvious from the body to the wrist, with the hand held flatter. The Golden Eagle's dihedral is the reverse, most obvious on the hand. Of the two birds, only the Roughleg will hover in mid-air, actively beating its wings.

Three other species might be confused with eagles, especially sub-adult Bald Eagles.

The Osprey approaches the eagles in wingspan (c. 54 to 74 inches), but the wings are narrower than those of either eagle. The primary source of confusion might be the facial markings. The sub-adult Bald Eagle can have a cream-colored head with a brown patch through the eye and extending to the back of the head, much like the patch on an Osprey. The Osprey, however, can be identified by its bright, white crown and throat and the much smaller beak. Also, the Osprey has a white breast and belly, and white wing linings with a distinctive black carpal (wrist) patch.

In flight, the Osprey's wings are usually bowed when gliding. The arm is held slightly higher than the hand, much like a gull does, and the wrist is pressed forward, creating a "broken-wing" effect. The Osprey will also regularly hover over open water; the two eagles do not hover.

The Red-tailed Hawk, especially if perched, might be confused with the sub-adult Bald Eagle with the brown bib or breast band. And, the sub-adult Bald Eagle has specifically that, a brown bib or upper breast band. The Redtails seen in Massachusetts normally have a white throat, breast, and belly, with a highly variable reddish-brown, often indistinct belly band. The Redtail, which has a much smaller wingspan, c. 46 to 58 inches, can also have extensive white mottling on the scapulars, coverts, and back, which might prompt one to think eagle. However, the Redtail's mottling is more diffuse and less extensive than on the sub-adult Bald Eagle.

The sub-adult Bald Eagle's brown bib has caused some observers to think "Swainson's Hawk." The latter is extremely rare in Massachusetts, and there is an obvious size differ-

ence between the relatively slim Swainson's (wingspan c. 47 to 57 inches) and the Bald Eagle. The Swainson's can also be identified by its distinct white throat patch, and the cream-colored wing linings that contrast sharply with the much darker flight feathers, totally unlike the wings of either eagle. Furthermore, the Swainson's tail is greyish and crossed with twelve to fourteen narrow, dark-brown bars; the thickest of which is subterminal.

The "dark-phase" Swainson's can pose problems, however. Several characteristics are helpful here. The Swainson's has only three notched primaries; in all plumages there is a light pattern on the leading edge of the wing; and seen from above, the basal half of the tail is usually whitish. The bird also has a marked dihedral, much like that of the Northern Harrier (Marsh Hawk).

THE EAGLE PROJECT

The following two-page "spread" contains outlines of eagles: both species as seen from below in flight, and perched, and the Bald Eagle as seen from above in flight. You are encouraged to make photocopies of this spread to help you record the plumages of eagles if and when you see them. As more is learned about eagle plumages, especially those of the Bald Eagle, it will then be possible for you to return to your sketches and attempt to correlate the plumages you have observed with age or note specific variations.

Second, and of more immediate importance, you will be able to help the New Hampshire Audubon Society (ASNH) conduct an important eagle research project. Funded by federal and state grants, ASNH is seeking to identify local eagle wintering areas, including perch sites, feeding areas, and night roosts, and to record behavior patterns and food habits. This data will be used to help minimize the effects of possible winter oil spills in New Hampshire and nearby waters. The information will also be used in planning energy development projects in the Merrimack Valley and along the coast, so that such projects will have minimal effect on the eagle population of the region.

ASNH asks that you inform them of any eagle sightings, providing as much detail as possible on the bird's plumage. Also, note the date, time, and exact location of the sighting, and if any colored wing tags or leg bands were seen. (Last year, two color-marked eagles wintering in Maine were identified as residents of the Tennessee Valley.) A photocopy of your "filled-in" photocopy of the silhouette spread would be an excellent reporting form. Whatever form your eagle sighting reports take, please send them to:

Eagle Project, NHESP
ASNH
P.O. Box 528-B
Concord, NH 03301

The author and artist would appreciate photocopies of "reports" of any Bald Eagles between plumages "A" and "D," and any Golden Eagles. Please mail these copies to 254 Arlington Street, Medford, MA 02155.

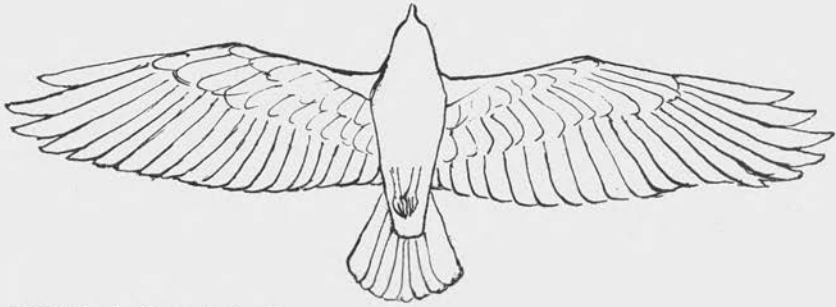
ACKNOWLEDGEMENTS

I would like to thank the Massachusetts Audubon Society and its fine staff for the use of their library resources in the preparation of this paper. I would also like to thank Lois Andelman, Richard Forster, and Leif Robinson for reading the paper at various stages. Any errors contained herein, however, are my responsibility.

REFERENCES

- Beebe, F. L. 1974. Field Studies of the Falconiformes of British Columbia. British Columbia Provincial Museum, No. 17, Occasional Papers Series.
- Bent, A. C. 1937. Life Histories of North American Birds of Prey (Part 1). Smithsonian Institution, United States National Museum Bulletin 167.
- Brown, L. and D. Amadon. 1968. Eagles, Hawks and Falcons of the World. Country Life Books.
- Brown, L. 1976. Eagles of the World. Universe Books.
- Clark, W. S., M. E. Pramstaller, and B. Pratt. 1980. Field I.D. Guide for North American Raptors. National Wildlife Federation.
- Forbush, E. H. 1927. Birds of Massachusetts and Other New England States. Massachusetts Department of Agriculture.
- Garrett, K. 1980. A Closer Look. The Western Tanager.
- Hawk Migration Association of North America. 1975. Sticky Problems of Hawk Identification: A Panel Discussion. Proceedings of the North American Hawk Migration Conference 1974, pp. 118-136.
- Jollie, M. 1947. Plumage Changes in the Golden Eagle. The Auk 64:549-575.
- Lincer, J., W. Clark, and M. LeFranc. 1979. Working Bibliography of the Bald Eagle. National Wildlife Federation Scientific and Technical Series 2.

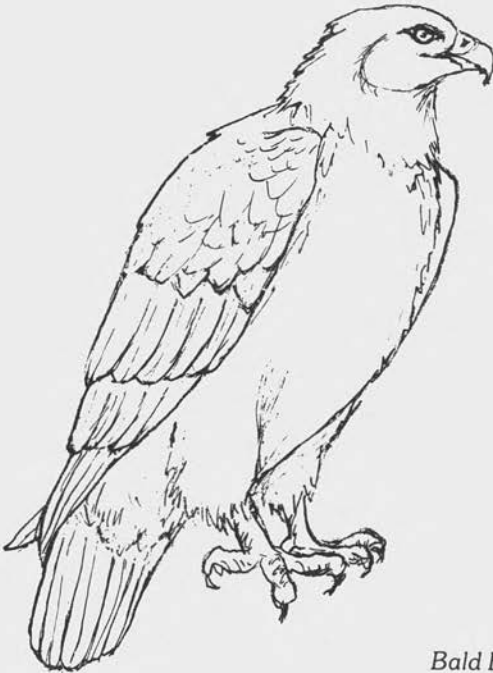
Continued on page 324.



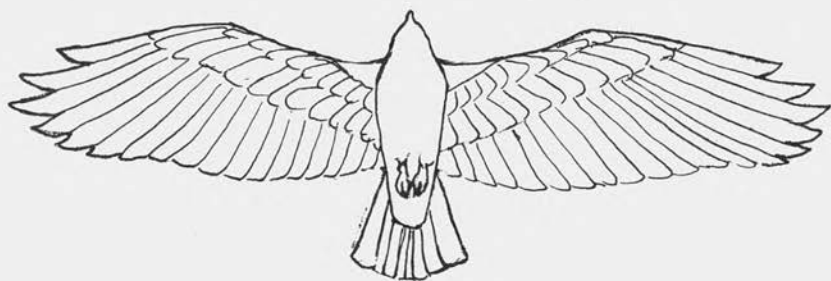
Bald Eagle (from below)



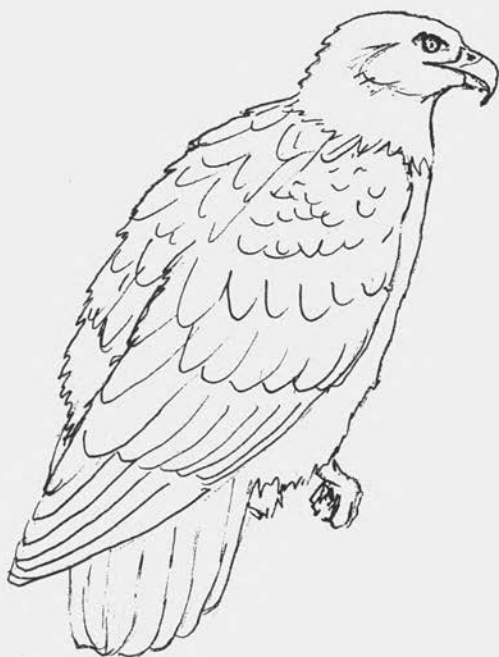
Bald Eagle (from above)



Bald Eagle (perched)



Golden Eagle (from below)



Bald Eagle (perched)



Golden Eagle (perched)

New England Hawk Watch Study. n.d. A Field Guide for Hawks Seen in the Northeast. New England Hawk Watch.

Porter, R. F., I. Willis, S. Christensen, and B. P. Nielsen. 1981. Flight Identification of European Raptors. 3rd ed. Buteo Books.

Sherrod, S., C. White, and F. Williamson. 1976. Biology of the Bald Eagle on Amchitka Island, Alaska. Living Bird 15:143-182.

Southern, W. 1967. Further Comments on Subadult Bald Eagle Plumages. The Jack-Pine Warbler 45:70-80.

Terres, J. 1980. The Audubon Society Encyclopedia of North American Birds. Alfred A. Knopf.

PAUL M. ROBERTS, a marketing communications manager for Honeywell Information Systems, has a special interest in raptors. Founder and coordinator of the Eastern Massachusetts Hawk Watch, he currently serves as chairman of the Hawk Migration Association of North America and teaches courses for Habitat and the Massachusetts Audubon Society.

JULIE ROBERTS is a freelance artist whose works include poster and program design as well as maps and bird illustrations.

King Bird Tours

P O BOX 196
PLANETARIUM STATION
NEW YORK, NY
10024 U.S.A.
(212) 866-7923


The Asia
Specialists



1983
Birding Tour
PHILIPPINES
22 April-25 May


Tour led by DR. ROBERT KENNEDY,
leading authority in Philippine birds,
and BEN KING, Asia's foremost field
birder and author of *A Field Guide to
the Birds of Southeast Asia*.

Write for itinerary.



Bird Books

Annotated catalogues are issued 3 times a year (send \$2.00 for first year subscription). Wide selection of books on birds, out-of-print, rare and new-scholarly and fine color plate, regional and foreign field guides. Also books of interest to the naturalist on the flora and fauna of this country and foreign lands, biographies and travels of naturalists. Libraries and single copies purchased.

Appraisals. 

Patricia Ledlie - bookseller

Box 46D, Buckfield, ME 04220 U.S.A.
207-336-2969