Identification and Status of Bald Eagles, Golden Eagles, Turkey Vultures, and Black Vultures in Ontario

by

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Introduction

In flight, Bald Eagles (*Haliaeetus leucocephalus*), Golden Eagles (*Aquila chrysaetos*), Turkey Vultures (*Cathartes aura*), and Black Vultures (*Coragyps atratus*) all appear large and black with varying amounts of paler or white markings here and there in the plumage. Superficially, they are similar, but closer examination reveals differences in shape, size, flight style, and markings that usually identify each.

Two recent books, *A Field Guide to the Hawks of North America* by Clark and Wheeler (1987) and *Hawks in Flight* by Dunne *et al.* (1988) cover the identification of these species very well. This paper adds or emphasizes certain distinctions and provides information on the status of each species in Ontario; it is not intended to be a complete discussion of identification features.

Some helpful terms

All birds are not created equal. In spite of appearing similar in the sky, the four species considered here have structural differences that influence flight and can assist with identification. The important differences for large, soaring species include wing loading, aspect ratio, and the number of emarginated or slotted primaries. The definitions of these terms are:

Wing Loading: Weight divided by wing area;

Aspect Ratio: Ratio of wing span to wing width;

Emarginated Primaries: Primary feathers having one or both vanes reduced in width from the tip inwards.

For a much fuller discussion, see Kerlinger (1989), chapter 5.

How do they affect flight?

(1) Wing loading:

A soaring bird with a low wing loading (i.e., less weight per unit of wing area) is able to fly more slowly and still remain airborne (i.e., not stall). It also has a smaller turning circle, and can soar on weaker thermals, an ability that is especially

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helpful early and late in the day. One with a high wing loading (i.e., more weight per unit of wing area) is able to make high speed dives and has a lower rate of sink when gliding at high speed.

The Bald Eagle has a wing loading of 80.94 N/m^2 (Kerlinger 1989) while the others have wing loadings that are either unknown or unpublished. However, weights and wingspans are given in Brown and Amadon (1968), and show Golden and Bald eagles having double to triple the weights of Black and Turkey vultures, while wingspans of eagles and Turkey Vultures are similar, and Black Vultures smaller (see Table 1).

This means that Turkey and Black vultures have low wing loadings and the eagles, higher.

(2) Aspect ratio:
The higher the aspect ratio, the longer and narrower the wing and the more efficient it is for continuous gliding. Albatrosses have aspect ratios of about 20, while the Sharp-shinned Hawk's (*Accipiter striatus*) is 4.57 (Kerlinger 1989). Aspect ratios of the four species are indicated as similar by Kerlinger and are considered low, although no figures are given. Bald Eagles have a slightly higher aspect ratio (somewhat narrower wings compared to the other species).

Immature birds (i.e., those in their first year of life) have longer wing and tail feathers than adults and therefore have slightly lower aspect ratios (Gerrard and Bortolotti 1988; Brown and Amadon 1968). This means that immatures may be slightly less efficient gliders. However, it also provides a technique for aging these birds. Older birds will have moulted some or all of the wing feathers and replaced them with shorter ones. Eagles typically do not have a complete annual flight feather moult so that the trailing edge of the wing has some long and some short feathers; it appears ragged compared to the even-edged immature's wing. This is often the case with the tail as well.

The ragged edges are generally an indication that an eagle is older than immature. On occasion an immature will lose a wing or tail feather by accident and replace it before the annual moult. The replacement feather will be shorter. Immatures like this are few and far between.

(3) Emarginated primaries:
All four species have six emarginated outer wing feathers, providing six slots at the tip of the wings. These slots do two related things: (a) lower the stalling speed (i.e., the speed at which a soaring or gliding bird can stay airborne); and (b) add more lift to the wings without lengthening them.

Since the feathers are "cut" on both vanes, the slots formed have squared ends when the wings are fully spread; this is apparently more efficient than one-sided slots for providing lift to the wing (Brown 1976).

Table 1: Weights and wingspans of selected species

Species	Wingspan (cm)	Weight (g)
Bald Eagle	168–244	3000–6300
Golden Eagle	152–204	2900–5800
Turkey Vulture	180 (average)	1400–1800
Black Vulture	137–150	1181–1940[1]

[1] *Brasiliensis* race, which is about 7% smaller. Information for the *atratus* race of our region is not available.

The flight styles of the birds under consideration are affected by all three of these factors together. The two vultures search for carrion over large areas and so need to be efficient soarers and gliders, and may need to fly very slowly over an area in order to detect food. Low wing loadings and six emarginated primaries allow the vultures to do this over land, including fairly early and late in the day when thermals are too weak for eagles. The vultures, Turkey Vultures in particular, seldom flap, an activity that requires more energy than soaring.

The two eagles, having higher wing loadings, are able to make high speed dives, essential when chasing prey, but with six slotted primaries can also soar more efficiently, important when searching for food and migrating. The higher aspect ratio of the Bald Eagle also makes it a more efficient glider, helpful when migrating. Because of their weight (and higher wing loading), the two eagles can glide or dive at much higher speed than either vulture. A Golden Eagle was once timed flying at 195 km/h in a generally uphill direction (Brown 1976).

Identification

The following brief notes may add to or emphasize some aspects of identification. For a complete treatment, see the two books mentioned at the beginning of this article.

(1) Flight

Turkey Vultures fly with wings uptilted in a pronouced dihedral, moving slowly, and rocking as they go. They frequently give a half-flap with the outer half of the wings, then straighten them out again quickly. Golden Eagles have slightly uptilted wings, but not nearly so pronounced a "V" as the Turkey Vulture. Bald Eagles and Black Vultures soar on flat wings. In fact, Bald Eagles look like flying planks because of their long, narrow wings.

When flapping, Black Vultures give half a dozen stiff, jerky flaps at a time; Turkey Vultures and eagles have much slower, more deliberate wingbeats.

When gliding, all species tuck

their wings back more or less depending on wind and strength of rising air. The eagles are able to glide more rapidly than the vultures but this may not be apparent. Watch carefully any single, fast-gliding, big black bird — Turkey Vultures are most often seen in flocks. It may be a Golden Eagle migrating at the same time as vultures and looking very similar when in a half-tucked gliding position; so similar, in fact, as to be dismissed as a Turkey Vulture without close scrutiny. The Black Vulture as the rarest of these species in Ontario will be seen alone or with a group of Turkey Vultures.

(2) Plumage:

BLACK VULTURE

This species is only two-thirds the size of a Turkey Vulture and half the size of eagles. At a distance, it may be confused — not with the distinctive dihedral of the other vulture species — but with an eagle's fairly flat profile. However, its distinctive white primary patches will give it away.

TURKEY VULTURE

There is nothing new to add to the plumage descriptions already in the guides.

BALD EAGLE

In immature and some subadult plumages, the Bald Eagle has extensive white tipped with black-brown in the tail. This pattern is the same for immature and subadult Golden Eagles. However, in Golden Eagles, the white is a clear band with no dark sides on the outer tail feathers. In Bald Eagles, the white is ordered all around (tips and outer tail feathers) with dark. Usually the white is marbled with dark like a Harlan's Hawk (*Buteo jamaicensis harlani*) tail; in Golden Eagles the white appears immaculate.

GOLDEN EAGLE

The tawny and golden neck and head feathers of the Golden Eagle can appear white (like the head of an adult Bald Eagle) when in full sun. The extensive white in an immature Golden Eagle's tail coupled with sun-lightened gold on the head can bear a superficial resemblance to an adult Bald Eagle. At distances, the bird may easily be passed off as the wrong species.

Nicoletti (1989) also pointed out something interesting about immature Golden Eagles: some may show little or no white at the bases of the flight feathers. One of this plumage was caught and banded at Hawk Cliff, Ontario, on 12 November 1990; there was no white at all on the underwing flight or covert feathers. These two white patches, in conjunction with the white patch in the tail, are considered standard field marks. Obviously, one must use great care and more than one or two field marks when identifying or attempting to age this species.

Nicoletti also added that on birds in later plumages than immature there is a tawny bar

Table 2: Dates and locations of Black Vulture sightings in Ontario

Date	Location
16–17 Feb 1984	Long Point
31 Mar 1984	Point Pelee
2–3 July 1986	Walsingham and Turkey Point, Haldimand-Norfolk
29 July 1982	Highway 402, east Lambton County
17 Aug 1981	Point Pelee
24 Aug 1974	Cayuga, Haldimand-Norfolk
20 Sep 1979	near Kingsville, Essex County
26 Dec–3 Jan 1987-88	Aldershot, Halton

across the upper wing coverts. This bar fades over time and is very pronounced in spring migrants. By that time, immatures may have a slightly pale area here due to fading; however, the bar is a very good mark to aid in aging Golden Eagles.

Status of the species in Ontario

Black Vulture

This is the rarest of these species reported in the province, with eight records accepted by the Ontario Bird Records Committee (James 1983; Wormington 1985, 1986, 1987; Coady and Wormington 1989). The dates are listed in Table 2.

There appears to be no pattern to the times of the sightings, although four may have been wandering non-breeders during summer. The locations were all in the southwest of the province, close to Lake Erie in most cases, Aldershot being the furthest north and west (at the western end of Lake Ontario).

In the Black Vulture's breeding range further south, it is considered a permanent resident although individuals wander or withdraw seasonally from the northern areas (Palmer 1988a). It is currently spreading northward east of the Mississippi River.

Turkey Vulture

McIlwraith (1894) reported that the Turkey Vulture "...is a rare visitor to the southwest of Ontario, and to the east I have not heard of its being observed." Today it is a common nesting species across the south and west of the province (Cadman *et al.* 1987), and the number seen in migration is steadily increasing, with 12 365 sighted at Holiday Beach in the fall of 1988 (Benoit 1989).

The Turkey Vulture enters Ontario beginning around mid March, and peaks during the spring migration in the last week of that month and the first two weeks of April (pers. obs.). These dates apply to the extreme south of the

province.

During the nesting season it can be seen almost daily in rural areas away from unbroken forest. After the breeding season, the movement out of Ontario begins in early September to the north and late September along the Lake Ontario and Lake Erie shores. These birds exit in largest numbers from about 5 to 20 October, with the last few going in mid November. However, in the past five years, there have been a number of sightings of Turkey Vultures in December, January, and February in southern Ontario, an indication, perhaps, of its expanding population. With more birds in the province, it is more likely that there will be some unable to move south because of illness or injury, along with an additional few who may inherit a defective migratory orientation that results in them migrating to southern Ontario rather than with the rest of the population.

Bald Eagle

The Bald Eagle had declined in Ontario due to habitat loss, direct persecution and DDT poisoning. In the late 1970s and throughout the 1980s, however, its numbers have slowly increased with the elimination of DDT and reintroduction programs. Ontario's western population in the Rainy River District has remained quite large even though reproductive success declined during the DDT years (Grier 1985), but the southern Ontario population reached a low of seven active nests in 1983 (McKeating 1985) from which it is slowly recovering (Cadman *et al.* 1987; Gerrard and Bortolotti 1988).

The migration of Bald Eagles is complicated by the fact that immatures and subadults from the southeastern United States also move into the province in spring and out in fall. Ontario (and probably some Quebec) breeders move into the province fairly early, in March and April (Nicoletti and Dodge 1986, 1987). Younger cohorts return north later in general (Palmer 1988a), although occasional adults are seen even in June — a few might be southern breeders. For example, at Braddock Bay on the south shore of Lake Ontario in June 1987, one adult, one four-year old, five subadult (two- and three-year olds), seven one-year olds, and two of unknown age were sighted. Although outside Ontario, many of these birds may have been on their way into the province.

Southern birds of the year (immatures) from Florida, as well as west along the Gulf Coast, and as far north as Chesapeake Bay, become independent of their parents from March to June. Palmer (1988a) stated

> "Their northern movement is rapid, and they spread out from near the Atlantic coast to inland well west of the main axis of the Appalachians ... The young, in their first calendar year, are dominated by older cohorts. By going north, presumably they

> can find room to feed where they are free of aggression from their own kind; those still surviving in fall return south and enter roosting assemblies of other pre-breeders — a better social situation that prevails until reproductive maturity, when the birds become territorial (pp. 204–205)."

Palmer also noted that banding evidence indicates that only a fraction of second-year and older Bald Eagles migrate in the manner of the immatures. These southern-hatched birds probably comprise the bulk of early spring immatures seen on migration while birds hatched the previous year in Ontario and Quebec come north later.

During the fall migration, Bald Eagles are seen from early September to late November along the Lake Erie north shore. There are two peaks, in mid September and early to mid October (Benoit 1987, 1988, 1989), perhaps indicating returning southern-hatched immatures early in the season followed by northern birds later. However, the evidence available does not include ages and is based on 122 birds over only three autumns at Holiday Beach, Ontario. It is known, according to Palmer again, that in general, young northern birds go south earlier than their elders — a pattern typical of many birds of prey.

A few Bald Eagles winter in Ontario (e.g., along the Niagara River, near Peterborough, in Hamilton Harbour, along the lower Grand River), usually below dams at rapids or falls where open water produces injured or dead fish and birds.

Golden Eagle

Cadman *et al.* (1987) showed only three breeding locations in the province and, of these, only one was a confirmed Golden Eagle nesting site. Like the Bald Eagle, it is listed under the Endangered Species Act of Ontario. To the west in mountainous country, its typical habitat, it becomes much commoner.

During spring migration, Golden Eagles, like all the other species described here, are most readily seen along the south shoreline of one of the Great Lakes. Spring passage along Lake Ontario runs from 10 March to 5 May at Derby Hill at the eastern end (Palmer 1988b); 5 March to 26 May at Braddock Bay near Rochester, New York (Nicoletti and Dodge 1986, 1987; Dodge 1989, 1990); and 24 February to 23 May at Beamer Conservation Area near Grimsby, Ontario at the western end (Dodge 1989, 1990; Grimsby Hawkwatcher 1981–88; unpublished data 1975–80). The majority pass through from 21 March to 5 May but there is no clearly-defined peak.

In the fall, based on Holiday Beach data, Golden Eagles are first seen in early October but few pass by until late in the month. From 24 October to 11 November, 102 of the three seasons' total of 129 were seen. The 15-year average and range at Holiday Beach (1974–88)

is 27 per year (0–58). Some of these could be immatures from the west that have wandered to Ontario after dispersal from the nesting area.

It is of interest to note that during both spring and fall migrations, almost all Golden Eagles are seen from 1100 to 1400h (Nicoletti and Dodge 1987; pers. obs.). This is a more restricted time than that of Bald Eagles and vultures, and probably indicates the need this species has for thermal lift during migration.

Few Golden Eagles are sighted during winter in the province, although two areas do report them with some regularity: Petroglyphs Provincial Park and Sault Ste. Marie.

Conclusion

Of these four species, three are known to have increasing populations, and will probably spread to areas of the province where they have previously been uncommon or absent. The fourth species, the Golden Eagle, has a population that in Ontario is not well known at any season.

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Nesting of White-winged Crossbills in Oxford County

by

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The White-winged Crossbill (*Loxia leucoptera*) normally breeds in the Boreal Forest zone. However, breeding has been confirmed as far south as Presqu'ile Provincial Park, Victoria County, and the Waterloo area (Smith and Lumsden 1987; Weir 1989a). This article details a breeding attempt by White-winged Crossbills in Oxford County. The nesting was at Wildwood Lake, an artificial reservoir in Oxford's northwest corner, and is among the most southerly known nest records in the province.

In the winter of 1989–90, Holdsworth and Graham repeatedly observed about 40 White-winged Crossbills feeding in spruce (*Picea* spp.) plantations located at the eastern end of Wildwood Lake. As spring arrived, breeding behaviour became apparent. On 17 March 1989, Holdsworth observed several males performing the species' characteristic flight song and displaying strong territorial behaviour. By 29 March 1989, 20 White-winged Crossbills remained, all of which appeared to be paired and very sedentary. These pairs could be found in the same small spruce plantation for several days.

On 7 April, Holdsworth and Graham observed a female White-winged Crossbill carry nesting material into a Norway Spruce

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