Recognizable Forms

Morphs of the Eastern Screech-Owl

by
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Introduction

The Eastern Screech-Owl (*Otus asio*) is a widespread resident in southern Ontario south of the Canadian Shield (James 1991). It prefers small deciduous or mixed woodlots with mature trees and snags for roosting and nesting. The Eastern Screech-Owl is strictly nocturnal. During the day it usually perches close to the trunk of a thick evergreen or roosts in a natural cavity or old flicker hole, rarely more than 10 metres up. On winter days it often sits in the entrance of a south-facing hole, absorbing the warm sunlight. If disturbed, it retreats down the hole. Many birders are familiar with its two common calls: a short horse-like whinny in the fall and winter, and a toad-like trilling in the spring and nesting season.

Field guides illustrate and describe two colour morphs (phases), gray and red, of the Eastern Screech-Owl. Both the gray and red morphs are illustrated in the Peterson's Guide (1980), the Golden Guide (Robbins et al. 1983) and the National Geographic Guide (Scott 1987). In addition, there is a little-known brown or intermediate morph. In this account I discuss the identification, frequency, genetics, and some ecological differences of the three morphs of the Eastern Screech-Owl in Ontario. The three morphs are illustrated in Voous (1988) and by Peter Burke in Figure 1.

Taxonomy

Godfrey (1986) and James (1991) list *O.a. naevius* as the only subspecies (race) of the Eastern Screech-Owl in Ontario. A much paler subspecies *swenki* breeds in western Manitoba, intergrading with eastern *naevius* at Winnipeg and Whitemouth. These locations are shown on the map on the inside cover of *The Birds of Canada* (Godfrey 1986). Other subspecies in North America are listed in the American Ornithologists' Union Check-list (1957). This treatment of subspecies is in need of revision. I agree with DeBenedictis (1977) that the most sensible treatment of subspecies is by Marshall (1967) who lists five subspecies: nominate *O.a. asio* (includes *naevius* of the AOU 1957 and Godfrey 1986) of the East, *O.a. maxwelliae* (includes *swenki* of the AOU 1957 and Godfrey 1986) of the Great Plains, *O.a. floridanus* of Florida west to Mississippi, *O.a. hasbrouchi* of Texas, and *O.a. mccallii* of the Rio Grande Valley.

Morphs vary in hue depending on whether the subspecies is dark or pale. For example, compare the eastern gray morph with the paler western gray morph *maxwelliae* (includes *swenki*) on page 243 of the National Geographic Guide (Scott 1987). Similarly, the red morph of the western *maxwelliae* is paler than the eastern red morph.

Figure 1: Gray Morph (top), Brown Morph (middle), and Red Morph (bottom). Note differences in feather markings. Drawing by *Peter Burke*.

Why are the three morphs of the Eastern Screech-Owl not considered subspecies? Subspecies are forms having separate breeding ranges, interbreeding where their ranges meet. Morphs are forms occurring in the same breeding range, with different morphs even occurring in the same brood. The third part of the scientific name is the name of the subspecies, for example, *Otus asio naevius* is the subspecies in Ontario (A.O.U. 1957). It has three morphs. Morphs do not have scientific names. In screech-owls, the morphs are more recognizable than the subspecies!

Plumages, Molts, Aging and Sexing

The sexes are similar in all ages and plumages. Juveniles (juvenals) in summer are narrowly barred all over, except on the wings and tail which are much like the adult. Gray and red morph juveniles usually are distinguishable in the field. See the illustration of the gray morph juvenile on page 243 in the National Geographic Guide (Scott 1987). In late summer and early fall, juveniles undergo a partial molt to first year (first basic) plumage, retaining the juvenile wings, scapulars and tail. First year birds and adults (definitive basic) are similar in appearance. First year birds (when they are one year old) and adults undergo a complete molt from late July to mid-November to fresh adult plumage. Colours become faded and dull on worn birds by the next spring and summer. See Bent (1938) for excellent descriptions of plumages and molts in juveniles, first year birds and adults. Partial and total albinos are known in this species (Holt et al. 1995).

Morph Genetics

The three morphs vary in colour and in the extent and pattern of the dark markings on their feathers. See Figure 1. Out of a total of 1320 specimens examined by Owen (1963) from throughout the range, 54 percent were gray, 38 percent red and 8 percent intermediate (brown). In his study, Owen divided 833 screech-owls from selected areas into six colour types, grading from gray to red: two gray, two intermediate (brown), and two red. Figure 2 shows the strong bimodal (gray and red) distribution of the morphs and the continuous variation between the morphs.

The gray, brown and red morphs are not linked to age, sex or subspecies. A bird is born a certain morph and remains that colour all its life. All three morphs have been observed in the same brood (Hrubant 1955, Smith 1993). There are two main theories for the three morphs: (1) the gray and red morphs are due to one gene having two alleles (forms) with red dominant over gray, with the brown morph due to other modifying genes; (2) the morphs are due to one gene having three alleles with a graded order of dominance, red over brown over gray (Hrubant 1955, Owen 1967, VanCamp and Henny 1975, DeBenedictis 1977). There is no clear resolution of which hypothesis is correct. Perhaps the variation observed in the morphs is under the control of more than one gene.

Gray Morph

The gray morph is the most common morph in Ontario and throughout the northern part of the Eastern Screech-

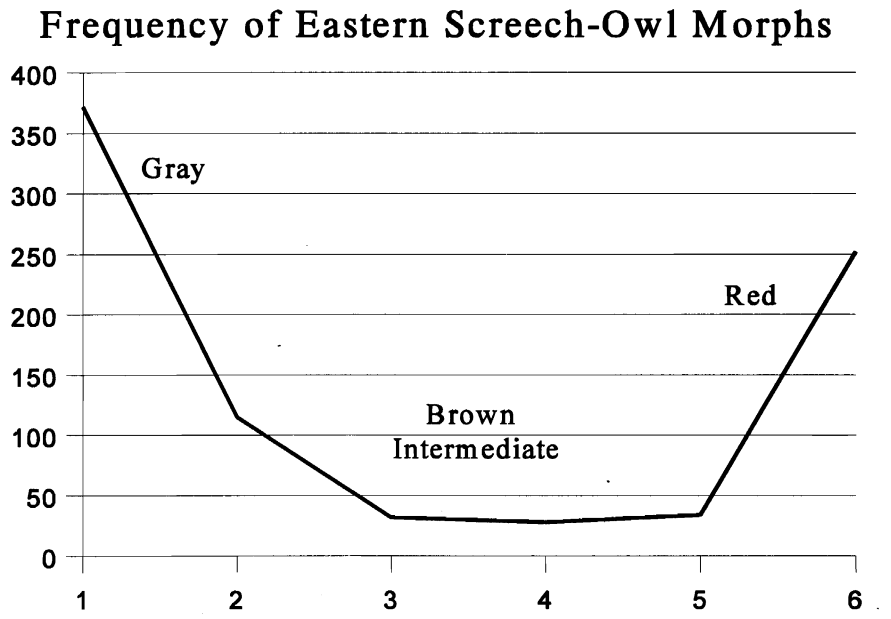

Figure 2: Data from Table 1 in Owen (1963).

Owl's range. See Figure 1. Based on specimens in the Royal Ontario Museum, Martin (1950) reported that 81 percent of the population in Ontario was of the gray morph. Martin did not recognize a brown morph, apparently lumping gray and brown birds in his study. Gray morph birds in fresh plumage in fall are a clear gray, becoming tinged with brown on worn and faded birds in spring and summer (Kaufman 1990). Typical brown morphs are a richer cinnamon-brown colour, including the facial disc.

Red Morph

Red morph screech-owls are bright, "a gorgeous rufous like a red fox" (Marshall 1967). Red morphs comprise about 19 percent of the Ontario population, based on specimens in the Royal Ontario Museum (Martin 1950).

Red birds are uncommon in the northern parts of the screech-owl's range. Why? The reason may be that red morph birds have a lower survival rate than gray birds during unusually cold and severe winters. Plumage colour is correlated with thermal adaptation. Mosher and Henny (1976) found under laboratory conditions at -5° C and -10° C that red birds had significantly higher metabolic requirements than gray birds. Differential mortality was observed in an Ohio study by VanCamp and Henny (1975). They report that 44 percent more red birds died than gray birds during the particularly severe winter of 1951-1952. Perhaps the percentage of red birds declined in southern

Ontario during the winter of 1993-1994, one of the snowiest and coldest winters on record! Similarly, Gullion and Marshall (1968) in Minnesota found a differential mortality between red and gray morph Ruffed Grouse (*Bonasa umbellus*) related to winter survival. Why red coloration is linked to winter survival in these two species is unknown.

There are two additional differences between gray and red morph birds that are noteworthy. First, Kay McKeever (pers. comm.) reports that "the feathering on the legs of red birds appears to be less dense than on grays". Second, red birds spend more time in cavities during cold winter days, 80 percent (red) versus 38 percent (gray) (Voous 1988). Bruce Di Labio (pers. comm.) reported that the red bird of a mixed pair he observed for many years in Ottawa often was more difficult to find in winter than the gray bird.

Brown Morph

The brown or intermediate morph is by far the least common form in screech-owl populations, except in Florida where intermediates make up to 40 percent of the population (Owen 1963). Based on 247 screech-owls from Ontario admitted to The Owl Foundation in Vineland, only six or 2.43 percent were classifed as brown morphs by Kay McKeever (Penak 1986). Bull (1974) examined 144 New York specimens in eight state museums; only four or 2.78 percent were brown morph birds!

Peter Burke (pers. comm) and Tim Dyson banded an intermediate morph screech-owl on 4 March 1995 near Peterborough. Peter described it as "very beautiful indeed. The overall coloration was dry gray-brown, with highlights of bright rufous-reddish areas on the scapulars and breast feathers". Kay McKeever (pers. comm.) of The Owl Foundation in Vineland describes the brown morph as a "warm brown like a saw-whet owl". Ross James (in litt.) of the Royal Ontario Museum says "there is considerable variation in the brown coloration depending on whether it tends towards reddish or grayish. In general, the brown is more of a cinnamon or tawny brown as opposed to a dark chocolate, reflecting a mix of reddish tones on one side and lighter or whiter gray on the other". In New England the brown morph is described as being chocolate brown in colour (Smith 1993), but intermediate birds from Ontario in the ROM are not chocolate brown (Ross James, pers. comm.). Similarly, Kay McKeever (pers. comm.) has never seen a chocolate brown Eastern Screech-Owl.

Be aware that brown morph screech-owls could be overlooked as gray birds given only a frontal (ventral) view. The rich brown coloration is most apparent on the upperparts (dorsum), the side least often viewed! When identifying a brown morph, keep in mind that recently molted gray morphs in fall in fresh plumage are clear gray above, but become tinged with brown on worn and faded birds by spring and summer (Kaufman 1990).

Summary

Three recognizable forms of the Eastern Screech-Owl occur in Ontario: gray, brown and red morphs. The gray morph is the most

common, comprising about 80 percent of the Ontario population; the red morph is less than 20 percent; and the brown morph is the rarest, comprising less than three percent. Typical (most) individuals of each morph are easily recognizable, but note that there is continuous variation between red and gray birds.

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