COLOR PHASES OF THE EASTERN SCREECH-OWL IN TENNESSEE

Linda J. Fowler

In the eastern part of its range, the Eastern Screech-Owl (Otus asio) occurs in two distinct color phases (red and gray) which are independent of sex, age, or season. The relative frequency of red phase birds generally follows a cline from north to south with about a quarter of the northern population composed of red phase birds and up to three quarters of the southern population (Gulf Coast and Florida excluded) in red phase birds (Owen 1963). Birds intermediate in coloration occur in low frequency in most of the bird’s range. Only two Tennessee researchers have investigated color phase in the screech-owl. Stupka (1963) collected dead on road (DOR) screech-owls in the Great Smoky Mountains National Park (GSMNP) from 1936-1954 and reported a ratio of greater than 4:1 red to gray phase for 104 DOR screech-owls. In a Nashville study, Laskey (1963) noted a 1:1 red to gray phase ratio for 97 owls brought to her attention over a 32-year period (banded birds, DOR birds, miscellaneous observations, etc.). To date, there have been no studies that focus on color phase of the screech-owl in the Ridge and Valley Physiographic Region of Tennessee. The purpose of this paper is to report on color phases of Eastern Screech-Owls that were collected dead on Tennessee roads from 1976-1982 and banded in Tennessee from 1977-1982, primarily in the Ridge and Valley Physiographic Region.

METHODS

Between November 1976 and February 1982, DOR screech-owls were collected by me or others knowledgeable of my study. Birds were brought back to the laboratory where they were sexed by internal examination and the color phase was recorded. In addition, stomach contents were analyzed; these results have been reported elsewhere (Turner and Dimmick 1981). From May 1977 to May 1982 screech-owls were captured in wooden owl boxes located in Knox and Anderson Counties, Tennessee, and in Wood Duck (Aix sponsa) boxes located along the Holston River in Hawkins County. Both adult and nestling birds were banded using U.S. Fish and Wildlife Service No. 5 lock-on bands, and the color phase was recorded.
RESULTS AND DISCUSSION

A total of 191 DOR screech-owls was collected from 34 of the 95 counties in Tennessee, predominantly (87%) in the Eastern Ridge and Valley Region from 1976-1982. Four of these birds (all red phase) were collected from counties in the Western Coastal Plain and 12 birds (7 red, 4 gray, 1 intermediate) from the Central Plateau and Basin. Of the total birds, 74% were red, 22% were gray, and 4% intermediate in coloration, which basically agrees with Owen (1963). He examined museum specimens throughout the United States and reported 79% red phase birds from Tennessee. The ratio of 3.4:1 red to gray phase birds in my study was only slightly lower than the 4:1 ratio reported previously by Stupka (1963) for the GSMNP. However, my ratio differs significantly from the 1:1 ratio of Nashville birds reported by Laskey (1963).

Sex was determined for 127 of the 191 DOR birds (Table 1). Ratio of male to female birds was approximately 1:1, which agrees with the sex ratio of screech-owls from an Ohio study (VanCamp and Henny 1975). Ratio of red to gray birds for the sexed birds was nearly identical to the total DOR sample. No significant relationship was detected between sex and color phase of DOR birds (chi-square test). Although it was first concluded in 1874 (Baird et al. 1874) that color phase was independent of sex in screech-owls, VanCamp and Henny (1975) doubted that this theory had been tested using a large sample of birds from a given area. Subsequently, VanCamp and Henny (1975) examined 760 nesting screech-owls from northern Ohio and reported no relationship between sex and color phase, which agrees with my findings.

Table 1. Sex and color phase of 127 Eastern Screech-Owls found dead on Tennessee roads 1976-1982.

<table>
<thead>
<tr>
<th>Sex</th>
<th>Red</th>
<th>Gray</th>
<th>Intermediate</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Females</td>
<td>46 (36%)</td>
<td>13 (10%)</td>
<td>6 (5%)</td>
<td>65 (51%)</td>
</tr>
<tr>
<td>Males</td>
<td>48 (38%)</td>
<td>12 (9%)</td>
<td>2 (2%)</td>
<td>62 (49%)</td>
</tr>
<tr>
<td>Total</td>
<td>94 (74%)</td>
<td>25 (20%)</td>
<td>8 (6%)</td>
<td>127 (100%)</td>
</tr>
</tbody>
</table>

Of 225 screech-owls banded between 1977-1982 (105 adults, 120 juveniles), 62% were red, 36% were gray, and 2% were intermediate in coloration (Table 2). The ratio of red to gray owls (1.7:1) was nearly identical for adult and juvenile birds. Intermediates were not detected in juvenile birds and if present were probably misclassified as to color phase. Ratios of red to gray Table 2. Color phase of 225 nestling and adult owls banded between 1977-1982.

<table>
<thead>
<tr>
<th>Age</th>
<th>Red</th>
<th>Gray</th>
<th>Intermediate</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adult</td>
<td>64 (61%)</td>
<td>37 (35%)</td>
<td>4 (4%)</td>
<td>105 (47%)</td>
</tr>
<tr>
<td>Nestling</td>
<td>76 (63%)</td>
<td>44 (37%)</td>
<td>0</td>
<td>120 (53%)</td>
</tr>
<tr>
<td>Total</td>
<td>140 (62%)</td>
<td>81 (36%)</td>
<td>4 (2%)</td>
<td>225 (100%)</td>
</tr>
</tbody>
</table>

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phase birds differed significantly among banded and DOR birds. A good explanation to account for these differences is not available. Gray phase owls may be less noticeable on gray and black road surfaces resulting in possible underestimation of gray phase owls in the DOR sample.

However, if it is assumed that the banded sample more accurately reflects the true color phase ratio in the population, then some type of differential mortality between red and gray phase owls must be present. Mosher and Henny (1976) reported that metabolic rates of gray phase screech-owls enabled them to withstand cold temperatures better than red phase owls. Thus, differential survival rates (along with other environmental factors) among red and gray phase owls accounts for higher number of gray phase birds in the north. Higher survival for gray phase birds during extremely cold weather has also been reported in Ruffed Grouse (Bonasa umbellus) by Gullion and Marshall (1968). Although not tested, Mosher and Henny (1976) speculated that hot, humid weather may reduce survival of gray birds in the more southern parts of its range. Future long-term field and laboratory studies should provide more insight into color phase differences in the screech-owl.

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LITERATURE CITED


