



FIGURE 1. One- to two-week-old Aplomado Falcon bearing *Philornis* larvae (arrows) embedded subcutaneously.

Cursory visual inspections of nestlings may underestimate the true extent of infestations because small larvae do not create obvious bulges on the skin of young birds. In order to count accurately larvae carried by an infested brood, nestlings and the nest floor must be checked daily until several days pass without finding additional larvae or pupae.

It is likely that small downy young (less than two weeks old) are more susceptible to infestation than older, more active, nestlings. Older nestlings bite at flies and wasps flying around the nest; also, they are well-covered by down and growing contour feathers. According to Smith (1968), *Philornis* larvae are a significant cause of nestling mortality in colonies of Chesnut-headed Oropendolas (*Psarocolius wagleri*) and Yellow-rumped Caciques (*Cacicus cela*). He indicated that young oropendolas and caciques carrying more than seven larvae usually die. The adults of these species are only slightly smaller than adult Aplomado Falcons. Perhaps heavy infestations of *Philornis* can increase

mortality rates of nestling Aplomado Falcons and similar-sized birds.

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## COLOR PHASES IN THE DOWNY AND JUVENAL PLUMAGES OF TUFTED PUFFINS

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The downy plumage of Tufted Puffins (*Lunda cirrhata*) is usually described as being either uniformly black, or brownish above and grayish on the belly (Bent 1919, Dawson 1923, Dement'ev and Gladkov 1951, Kozlova 1957); however, Dement'ev and Gladkov (1951) also stated that as the chick grows the down becomes white. Belly feathers in the juvenal plumage have been described as pure white, whitish, or various shades of gray (Stejneger 1885, Bent 1919, Dawson 1923, Kozlova 1957). The variation in color of juvenal belly feathers has caused some confusion, leading some authors (e.g., Dybowski, in Stejneger 1885:46; Bent 1919) to infer that the belly feathers in juvenal plumage are lost and replaced before the first complete prebasic

molt in spring. In a two-year study of the molts and plumages of 13 Tufted Puffins, collected as downy young and raised in captivity, Z. Eppley (unpubl. data) found no evidence of a partial molt among birds in juvenal plumage before the first prebasic molt. Eppley (unpubl. data) also noted polymorphism in the color of belly feathers among Tufted Puffins in first basic plumage. Polymorphism is not known to occur among Tufted Puffins in definitive basic or alternate plumages.

Although the existence of light (white-bellied birds) and dark (black or gray-bellied birds) color phases in the downy and juvenal plumages of Tufted Puffins has been known for some time, the frequency with which each color phase occurs in a population has not been reported. Are the frequencies of color phases in each plumage similar among populations? Is there selectivity for one color phase, or, as in the case of the Red-footed Booby (*Sula sula*; Nelson 1978), has selectively unpenalized polymorphism spread throughout the species? This paper documents the frequencies of color phases in young Tufted Puffins at two locations, thereby starting to compile the data needed before these questions can be answered.

TABLE 1. Frequency of color phases in downy and juvenal plumages of Tufted Puffins on Ugaiushak Island, 1976 and 1977, and the Barren Islands, 1977, Alaska.

Plumage	Color phase	Ugaiushak Island						Barren Islands <sup>a</sup>	
		1976		1977		Total		1977	
		No.	%	No.	%	No.	%	No.	%
Downy	Light	2	5.7	3	6.8	5	6.2	1	2.5
	Dark	35	94.3	41	93.2	76	93.8	39	97.5
Juvenal	Light			8	23.5			8	25.0
	Dark			26	76.5			24	75.0

<sup>a</sup> M. J. Amaral (pers. comm.).

While studying the feeding and breeding biology of Tufted Puffins and Horned Puffins (*Fratercula corniculata*) on Ugaiushak Island, Alaska (56°47'N, 156°41'W), during the summers of 1976–1977 (Wehle 1980), I recorded the number of Tufted Puffin chicks in light and dark color phases in both downy and juvenal plumages. Comparative data collected by M. J. Amaral (unpubl. data) on the Barren Islands, Alaska (58°55'N, 152°10'W) reveal frequencies of color phases in each plumage almost identical to those I found on Ugaiushak Island (Table 1).

In downy plumage, the amount of white on the belly varied from patches measuring about 20 mm in diameter to patches covering virtually the entire belly. Belly feathers of chicks in juvenal plumage were either pure white or ranged in color from pale to charcoal gray. Chicks that were light-phase birds in downy plumage sometimes became dark-phase as juveniles and vice versa. Among birds in general, there is no relationship between the color of the natal plumage and the later plumages (Lucas and Stettenheim 1972).

On both Ugaiushak Island and the Barren Islands, the proportion of light-phase chicks was significantly greater ( $P < 0.01$ ) in the juvenal than downy plumage. This higher incidence resulted from a number of dark-phase chicks acquiring white juvenal feathers through the down follicles. The variation in frequency of light-phase chicks between downy and juvenal plumages, therefore, appears to be the result of a genetically controlled change in morph for some birds rather than the result of differential mortality between the two color phases.

When chicks changing morph from dark-phase downies to light-phase juveniles were three to six weeks old, the black natal down feathers could be seen on the tips of the white contour feathers before they broke off. Presumably, Dement'ev and Gladkov's (1951) statement that the down becomes white refers to chicks in this transitional condition rather than to individual down feathers changing color. Although color of contour feathers may change without molting by fading, adherent substances, or wear (Lucas and Stettenheim 1972), twice-weekly checks of downy chicks on Ugaiushak Island provided no evidence of color change in individual down feathers.

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## VOCALIZATIONS OF FEMALE NORTHERN ORIOLES

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Among the oscine birds, males usually possess relatively long, patterned, melodic vocalizations termed "songs."

These songs are believed to function primarily in territorial establishment and defense and in mate attraction (Armstrong 1963). In most oscine species, females sing less than males, or not at all (Nottebohm 1975). Females sing regularly, however, in several species, including the Cardinal (*Cardinalis cardinalis*; Lemon 1968), White-throated Sparrow (*Zonotrichia albicollis*; Falls 1969), and American Robin (*Turdus migratorius*; Nice 1943). As the vocal behavior of more songbirds is investigated, more species whose females sing doubtless will be found. Relatively