The Condor 89:433–434

FIRST NORTH AMERICAN NESTING AND OCCURRENCE OF *HALIAEETUS ALBICILLA* ON ATTU ISLAND, ALASKA[1]

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Key words: White-tailed Eagle; first nest; Attu Island; Aleutian Islands; adults; immatures.

The nearctic range of White-tailed Eagles (*Haliaeetus albicilla*) is listed as casual in the Aleutian Islands, Alaska (Attu, where probably breeds, Unalaska), in eastern Greenland and off Massachusetts, near Nantucket Lightship (AOU 1983). The species breeds only in western Greenland in the nearctic; a breeding report from Baffin Island has not been confirmed (AOU 1983). Reference in the AOU Check-list to *H. albicilla* breeding at Attu is based on data presented herein. We discovered an active aerie of this species on Attu Island (52°49′N, 173°10′E) in 1982. We have numerous observations of four individual *H. albicilla* there in May to September, 1977 to 1986 (summary follows). These observations and the nest site are all from the river valleys and coastline at the east end of Attu Island.

We located the active nest in Temnac Valley on 25 May 1982 after watching both adult eagles take turns sitting in a rocky depression on a cliff ledge. On subsequent trips to this site in 1982 (31 May, 4 June) both adults were seen attending to a single downy chick. Photographs of the nest site are on file at the University of Alaska Museum (UAM). The same nest was active in 1983 with a single chick present. This chick was fledged and feeding on pink salmon (*Oncorhynchus gorbuscha*) with the adults along the Temnac River in September 1983. This nest has not been active since 1983; only one adult eagle has been recorded at Attu since 1983.

The nest site was located on the north side of Temnac Valley, 2.7 km from the Temnac River mouth (and salt water) at approximately 80 m above sea level. The nest cup sat on a fractured rock ledge 20 m up the southeast face of a rock pinnacle. This pinnacle stood immediately in front of a south-facing 40-m high cliff face. A heavily vegetated 35° talus slope stretched from the pinnacle base to a point close to the river, roughly 30 m away.

With a rim about 10 to 15 cm high on the outside, the nest was approximately 1 m in diameter. The well-packed cup consisted of kelp (probably *Laminaria*), fronds and rachis of *Athyrium filix-femina*, and *Elymus arenarius*. Stalks and a few umbel heads of *Heracleum lanatum* were included in the rim. This is a similar to contents from Aleutian nests of Bald Eagle *H. leucocephalus* (Murie 1959).

SUMMARY OF OBSERVATIONS

Our first observation of these eagles was 27 May 1977 when we watched two adults perform aerial displays over Massacre Valley. Annually since 1977 while conducting early-May to mid-June bird tours to Attu, we recorded at least one adult *H. albicilla*; most observations were in Temnac, Massacre, or Peaceful Valleys. Two adults with the juvenile were still in Temnac Valley on our departure in 1983 (27 September), the only year we conducted fall field work.

Additionally, we recorded a one-year-old individual twice in May 1979, a two-year-old bird (presumably the immature from 1979) on 29 May 1980, a second year bird in May 1985, and a three-year-old bird in May and early-June 1986 (all over the east end of Attu). It is likely the young bird from the 1983 nest that was observed in the springs of 1985 to 1986 in progressive plumages. Detailed field descriptions of the immatures and photographs of the adults are on file at UAM.

Johansen (1961) listed *H. albicilla* as a former breeder and occasional winter visitor to the Commander Islands. Dement'ev and Gladkov (1951) reported it as a common, but decreasing breeder on the Kamchatka Peninsula, and "scant" in northeast Siberia east of the Kolyma River. They also report a clear relationship between the species' range and the availability of salmon and other fish. The Temnac is the largest of several rivers on eastern Attu, and has a large run of pink salmon. These birds may be resident on Attu. We have two winter reports (December 1979, March 1980) of single "eagles" by local Coast Guardsmen and Sutton and Wilson (1946) reported two *H. albicilla* on 15 March 1945 at Murder Pt. on Attu Island.

Historically (1880s to 1930s), *H. leucocephalus* was a rare breeder and winter visitor in the Near Island–Commander Island zone (Stejneger 1887, Murie 1959) but it has since retracted eastward. It now breeds in the Aleutians west to the Rat Island group and Buldir Island (52°21′N, 175°56′E) where nesting is sporadic (Byrd and Day 1986). In 10 years of field work at Attu we have never recorded *H. leucocephalus* and we know of no records there since Murie's (1959) reports of the 1930s.

We wish to thank G. F. Wagner, N. S. Proctor, and T. L. Savaloja for their field assistance and observa-

[1] Received 19 August 1986. Final acceptance 23 December 1986.

tions. The U.S. Fish and Wildlife Service provided generous support. D. D. Gibson, B. R. McClelland, and D. H. Ellis presented valuable suggestions for the manuscript.

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The Condor 89:434–436

CONE PIGMENT OF THE GREAT HORNED OWL[1]

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Key words: Cone pigment; vision; Great Horned Owl.

In most diurnal species cone photoreceptors are abundant and, typically, heterogeneously distributed across the retina. These receptors provide the signals that allow for maximum visual acuity and color vision. Cones are also present in the retinas of many nocturnal species where they are usually less prevalent and more homogeneously distributed across the retina (Walls 1942). The function of cones in nocturnal retinas, and the nature of the vision they subserve, have long been topics for debate.

Owls are among the most resolutely nocturnal of the birds, yet they too have cones. Throughout the retina of the Great Horned Owl (*Bubo virginianus*), for instance, about 7 to 8% of all photoreceptors are cones and over the expanse of this retina, thus, there are many thousands of such receptors (Fite 1973). From behavioral measurements of visual acuity in this bird Fite (1973) was led to suggest that the photopigment contained in the cones might be identical to that found in the rods. The photopigment in the latter has been extracted from the eye and measured to have an absorption peak at 503 nm (Crescitelli 1958). If owl cones do contain the same photopigment as owl rods, it would represent an arrangement that has only been infrequently claimed for other species (Jacobs 1981). That possibility prompted the measurement of cone pigment in the Great Horned Owl reported here.

Historically, it has been difficult to measure cone pigments. An in situ, noninvasive technique recently used with success on this problem involves the recording of a gross electrical potential (the electroretinogram—ERG) from a corneal electrode when the eye is stimulated with flickering lights (Neitz and Jacobs 1984, Jacobs et al. 1985). The use of rapid flicker and bright lights make it possible to obviate any contribution from rod photoreceptors and typical short wavelength cones to the recorded signal. This technique has the additional advantages of very high reliability and sensitivity, the latter allowing one to easily detect signals from cones in eyes that contain relatively small numbers of such receptors.

The ERG was recorded from a corneal contact lens electrode placed on the eye of an anesthetized Great Horned Owl. To measure the spectral sensitivity of the cones in that eye a flicker photometric procedure was used in which a 53° circular area in the center of the retina was stimulated with an alternating train of light flashes (flicker rate = 50 Hz) from an achromatic reference light and a monochromatic test light (this procedure is described in detail elsewhere: Neitz and Jacobs 1984, Jacobs et al. 1985). The experimenter then adjusted the radiance of the test light over repeated presentations until the potential produced by that light just nulled the (inverted) response produced by the reference light. Equations of this sort were made for monochromatic lights spanning the spectrum from 460 to 640 nm in steps of 20 nm.

The eye of the Great Horned Owl produced robust ERG responses under these strongly photopic test conditions. The results of the formal measurements are summarized in Figure 1. The data points there are the inverse of the radiance of the test light at the equation, each being expressed in quantal terms. The solid line drawn through each data set is a theoretical function. These functions, wavelength-dependent visual pig-

[1] Received 3 September 1986. Final acceptance 2 January 1987.