THE PEREGRINE FALCON *(Falco peregrinus)* IN SOUTHERN BRAZIL: ASPECTS OF WINTER ECOLOGY IN AN URBAN ENVIRONMENT

The study was undertaken in an urban environment of Porto Alegre, Brazil (30 02″ S and 51 13″ W), during 2 austral summers (December 1978 to March 1979 - January to March 1980). Seven falcons (4♂♂; 3♀♀) were observed between December 1978 and March 1979. Five of the falcons were adults, 1 a juvenile and 1 of unknown age. The resident pair and 1 transient adult were phenotypically similar to the Artic Peregrine Falcon (*Falco peregrinus tundrius*) in North America. An adult pair of peregrines were monitored for 540 hours. Sequences of mating behavior, such as aerial displays and courtship flights, were recorded during the study. The resident female showed strong territoriality towards other females. The pair was most active during early morning and evening, and rested in mid-day on shady ledges. Feeding activities increased from February to March, suggesting premigatory fattening. Foods of the resident female consisted mainly of pigeons (91% of the prey remains), showing preference for fledglings taken from nests on skyscraper ledges. The resident male fed mostly on bats and passerines. Predation on bats was recorded mainly in November and December. The resident female apparently took heavy prey (above 300 g) near her plucking ledge and light prey (below 100 g) when far away, implying an energy cost minimization in transportation during the flight. The male was more opportunistic in feeding behavior than the female. — **Albuquerque, Jorge, L.B. 1984. M.S. Thesis, Brigham Young University, Provo, Utah.**

DISSERTATION ABSTRACTS

ELECTRORETINOGRAPHIC RESPONSES AND RETINAL ULTRASTRUCTURE OF THE GREAT HORNED OWL, *Bubo virginianus*

This study was an investigation of the function and ultrastructure of the retina of the Great Horned Owl (*Bubo virginianus*). Gross physiological function of the retina was determined by electroretinography. Two procedures, dark-adaptation and flicker stimuli, were used to determine the relative contributions of the rod (scotopic) and cone (photopic) systems in these retinae. A total of 8 retinae from 4 Great Horned Owls provided data for this study. Owls were anesthetized and placed in a hand-built optical apparatus in which light of various wavelengths and intensities could be delivered to the subject's eye. The dark-adaptation procedure revealed that the retina of this species was dominated by scotopic (rod-generated) components, as indicated by a slow, steady rise in β-waves were also broad and rounded and had a fairly long time course. This suggested that recovery of the retina following exposure to light was primarily due to an abundance of rods in the retina. Additionally, some cone activity was observed when high intensity single-flash stimuli were used. This was indicated by prominent α-waves and β-waves with steeper peaks and short time courses. Flicker ERGs revealed a scotopic fusion frequency of approximately 16 Hz. Photopic fusion frequencies were in the range of 35-45 Hz which was quite lower than human and other diurnal primate retina. These data indicated that while cones were present in the Great Horned Owl retina and contributed to photopic responses, the number of cones was low.

This study was the first description of retinal ultrastructure in the Great Horned Owl. A total of 10 retinae from 5 Great Horned Owls provided material for electron microscopy. Subjects were euthanized and retinae were prepared according to standard procedures. Ultrastructural observations of the retina confirmed previous observations by myself (Ault, S.J., *Raptor Research*, 18(2):62-66, 1984) and others (Oehme, H., *Der Zool. Jahrb. Abt.* 2, 79:439-478, 1961; Fite, K., *Vision Research*, 13:219-230, 1973) that the retina of the Great Horned Owl possesses a high number of rods, but also contains some cones. Analysis of the ultrastructure of the retina revealed typical neuro-anatomical arrangements for a rod-dominated vertebrate retina. However, several structures not previously reported for this species were also identified. These included: 1) the presence of double cones in the receptor layer, 2) the apparent lack of electrical contacts between adjacent photoreceptors despite the presence of lateral fins on the inner segments, 3) the myelination of ganglion cell axons within the nerve fiber layer.

This study concluded that the retina of the Great Horned Owl is adapted to function optimally during the low illuminance levels at night. However, the presence of a functional photopic system and the ultrastructural arrangements of the retina may allow this owl to function in the brighter illuminances of the day. This owl is occasionally active during the day and its retina is apparently adapted for this possibility and is not relegated to a strict nocturnal category. Such adaptation allows the Great Horned Owl to be an effective nocturnal predator while at the same time allowing it to expand its activity into the diurnal realm if needed.

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