

Conservation, Status and Ecological Importance of the Galapagos Hawk *Buteo galapagoensis*

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INTRODUCTION

The Galapagos Hawk (*Buteo galapagoensis*) is widespread in the Galapagos Archipelago, breeding to-day on ten islands: Santa Cruz, Isabela, Santiago, Fernandina, Marchena, Pinta, Pinzón, Rábida, Santa Fe and Española. Breeding previously occurred on Seymour and Daphne Mayor, two small uninhabited islands; it has also disappeared from the islands colonized by man - Baltra, San Cristobal and Floreana - whereas numbers on Santa Cruz have dwindled from several hundreds at the beginning of the century down to 2-3 pairs. The total population nowadays is about 150 pairs.

Ecological studies have thrown light upon some specific problems such as the sociobiology of polyandric breeding units, sexual size dimorphism, island biogeography and Lack's premise on ecological poverty on islands and species diversity and high numbers.

ECOLOGICAL IMPORTANCE

The Galapagos Hawk is the only diurnal raptor in the islands (cats and dogs have been introduced and become feral; two species of owl are native) and, being a versatile hunter, the hawk has been an important element in evolutionary processes on the island fauna (de Vries 1973, 1975, 1976; Voous & de Vries 1978). Its behaviour has attracted special interest, as polyandry is a common feature (de Vries 1977; Faaborg *et al.* 1980).

The evolved social behavioural pattern seems to be a consequence of the presence of restricted dry habitat in a tropical environment, forming polyandric breeding and feeding units. Two to four males shared by one female are common, all defending a territory year-round against all intruders, i.e. other territorial and non-breeding adults as well as juveniles. This is a clear difference as compared with *Buteo polyosoma* and *B. poecilochrous*, where juveniles are tolerated within the territory, even in the breeding period.

This special behaviour is currently being further analysed and compared with two continental species in which pair bonds of 2-3 males to one female have also been observed, e.g. *Buteo poecilochrous* and *Parabuteo unicinctus*.

So far little emphasis has been placed on the role the Galapagos Hawk has played in problems of island biogeography (de Vries 1983b), where it was concluded that isolation, ecological poverty and high numbers of broad-ranged species are the main factors limiting the numbers of species on islands.

Sexual size dimorphism is most pronounced in the genus *Buteo* in the species *galapagoensis*, using Walter's ratio (Walter 1979) it is 9.0 (in *Falco* it varies between 0.6 and 14.4).

The problem of diverse sexual size dimorphism has occupied the literature for several decades. In the Galapagos Hawk it was demonstrated (de Vries 1980) that it is caused by ecological differentiation and adaptation to different prey species and a consequently submissive behaviour by the female in critical encounters with the male (copulation, prey brought to the nest).

It is noticeable that in the evolution and speciation of the Galapagos Hawk it was the female sex which became larger (and not the male sex becoming smaller) which has made the size dimorphism so conspicuous in this species (see Figure 1). Some morphological differences in wing formula demonstrate similarities between *B. galapagoensis* and *B. polyosoma* (see Figure 2). It also sets *B. ventralis* apart from the white-tailed hawk group (*B. albicaudatus*, *B. polyosoma*, *B. poecilochrous*) and *B. jamaicensis*, defining *Buteo ventralis* as a valid species (de Vries 1973; see also Clark 1986).

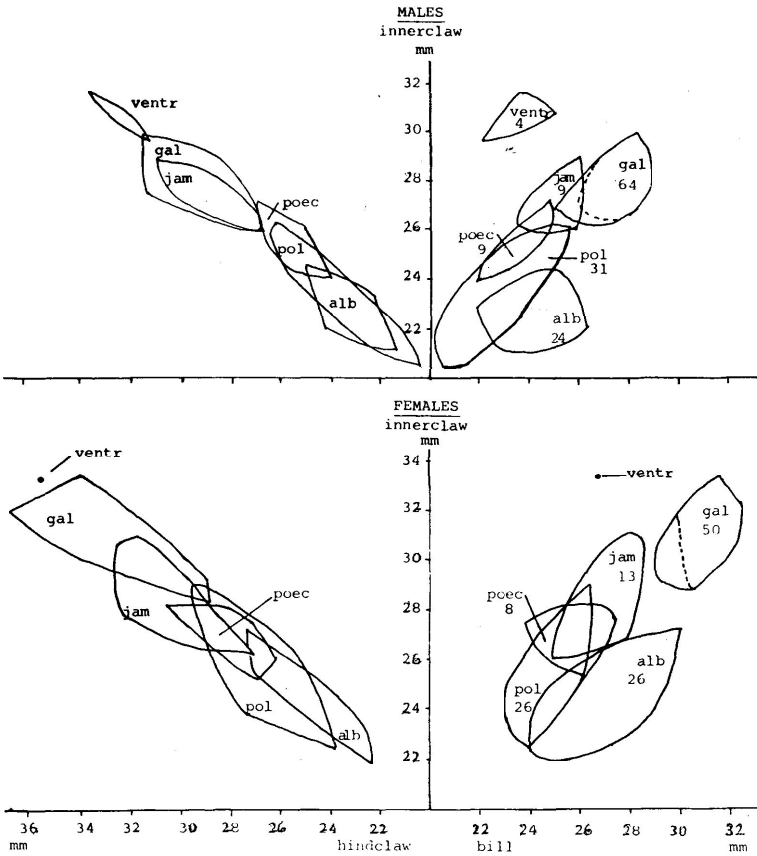


Figure 1. Relation between bill and claws of the Galapagos Hawk (gal) and 5 continental Buteos. ventr = *B. ventralis*; jam = *B. jamaicensis*; poec = *B. poecilochrous*; pol = *B. polyosoma*; alb = *B. albicaudatus*. Figures under abbreviated species names indicate number of records of which the outline of clustered points has been composed. For *galapagoensis* adults and juveniles have been separated (left of dotted line juveniles only); modified from de Vries 1973.

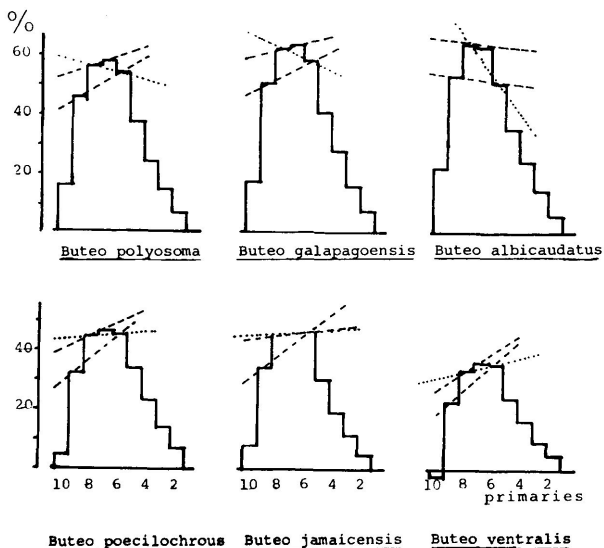


Figure 2. Types of wing-tip (p1-p10).

Note similarity of *B. polyosoma* and *B. galapagoensis* and disparity of *B. jamaicensis* and *B. ventralis*, the latter type being closer (but still more rounded) to *B. poecilochrous*; modified from de Vries 1973.

THREATS TO THE POPULATION

Conservation problems in the Galapagos are various, the most serious being related to introduced animals (goats, pigs, cattle, donkeys, dogs, cats, rats, ants and anis), introduced plants and, more recently, tourist activities (Perry 1984; de Vries 1983a, 1984).

The hawk has mostly suffered from man, simply through direct killing and depletion of its main prey, doves and rice-rats, through introduced animals (cats and black rats). With the present conservation policy and protection by the Galapagos National Park Service, the Galapagos Hawk is safe from extinction and has stable populations on the uninhabited islands, eight in all.

This is in marked contrast to continental Ecuador with its 75 species of birds of prey, of which 4 species are considered rare, 3 are insufficiently known, 4 are vulnerable and 2 are subjects of special concern, most of these being from vanishing dry and humid tropical forests and in urgent need of protection and studies to establish priorities and measures for their conservation (Ortiz 1986; Meyburg 1986).

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