tractive for tourism because the rocky seashore is often inaccessible and the sea is always rough owing to dominant easterly winds. Nevertheless, there was two potential threats to the area's future suitability for raptors. The southern part of the island was increasingly being settled by people and there were projects designed to build new residences and several villages. Perhaps the greatest threat was a project to build a second electric power station on the island. The project would involve the destruction of 8 ha of native habitat along the coast where the majority of raptor sightings were made.

Because we observed so many migratory raptors during our surveys, Rhodes seems to play an important role in the migration of several raptor species. Rhodes is probably important because it offers undisturbed resting areas, water, and food resources. Due to this, future developments on the island should take into consideration the importance of native habitats on the island to migratory species of raptors.

RESUMEN.—En agosto desde 1997–99, censamos las aves rapaces en la Isla de Rodas para determinar los impactos de carreteras y construcciones asociadas al aumento de turismo en su abundancia. Hubo dos zonas diferentes de impacto, la zona norte con altos niveles de turismo y la zona sur con impacto relativamente poco de la gente. Diez rutas de investigación, cinco en cada zona de impacto fueron utilizadas. Un total de ocho especies de aves rapaces fueron observadas: Cuatro especies residentes *Falco tinnunculus, Buteo rufinus, Buteo buteo, Accipiter nisus,* un residente de verano *Falco eleonorae* y tres migratorios *Falco subbuteo, Falco columbarius* y *Hieraaetus pennatus.* Las especies ocurrieron en forma desigual con especies asociadas a la gente (*Falco tinnunculus* y *Buteo buteo*) mas frecuentemente observadas en la parte norte mas altamente impactada de la isla.

[Traducción de César Márquez]

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THE INCIDENCE OF INTESTINAL PARASITES IN BRITISH BIRDS OF PREY

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During studies on the comparative morphology of the digestive tract of British birds of prey, we examined the gut contents of 379 individuals of six raptor species. Methods of *postmortem* examination and the sources of these birds are given in Barton and Houston (1991, 1992, 1993a, 1993b, 1994, 1996). To obtain weights and measurements of empty digestive tracts, we removed the digesta from the whole gut by cutting the gut open along its entire length and carefully scraping out the gut contents, followed by washing. We took this opportunity to examine carefully the gut wall and gut contents for parasitic worms. We only recorded those clearly visible to the naked eye, and some species or microscopic individuals too small to be seen may have been missed. We counted the total number of worms removed from each individual. All those recovered were nematodes. This group of

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worms are extremely difficult to identify. Because their taxonomy is still very poorly known (D.W.T. Crompton and J.D. Ewald pers. comm.), we were not able to identify them further. Most of the carcasses examined had been found dead and submitted for pesticide analysis. The cause of death was assessed during the dissection and based on criteria routinely used by the Institute of Terrestrial Ecology (Newton et al. 1982). Many birds had died from starvation or collisions. The body condition of all birds was estimated from pectoral muscle weight by dissecting the muscles, drying them to constant weight at 60°C, and extracting the fat by chloroform Soxhlet extraction to determine the fat-free dry muscle weight and fat content. A condition index, which accounted for the body size differences, was calculated from the residuals of the regression of dry muscle weight against a body size factor developed from factor loadings derived from Principal Components Analysis of five body measurements (Barton and Houston 1994). In this note, we report on the incidence of intestinal parasites and consider whether there was any correlation between the number of parasitic worms and the body condition of the birds.

We examined 135 Sparrowhawks (*Accipiter nisus*), 23 Peregrine Falcons (*Falco peregrinus*), 76 Eurasian Kestrels (*Falco tinnunculus*), 77 Common Buzzards (*Buteo buteo*), 9 Red Kites (*Milvus milvus*), and 59 Goshawks (*Accipiter gentilis*). The incidence of intestinal parasites was low, with only 20% of individuals having one or more parasites. There was no significant difference between species in the incidence of parasitic infection. The number of worms per individual was very variable, with up to 70 recorded from some individuals. It might be expected that birds in poor condition would have the greatest number of parasites and there was some slight evidence for this. Goshawks showed a significant negative correlation between the amount of pectoral fat and parasite numbers ($r_{13} = -50$, $P < 0.05$), so birds with the least fat reserves had the greatest parasite load. There were no significant relationships between pectoral fat and parasites for the other species. Our small sample sizes might have accounted for this, so we also examined whether those individuals with no parasites were in better condition than those individuals with parasites. In buzzards, those individuals with little fat were also likely to be individuals with parasites ($U = 76.0$, $N = 39$, $P < 0.005$, Mann-Whitney *U*-test) as were those with the smallest lean dry muscle weights ($U = 71.0$, $N = 39$, $P < 0.003$), but there was no significant relationship for the other species.

We were surprised that the incidence of parasite infection was so low. Our sample may have been biased because we discarded all birds that had not been freshly killed but, even with this precaution, most birds would have been dead for a day or so before collection, and frozen and thawed before examination. Few tapeworms were found. This may have been due to the fact that they disintegrated before the digesta was examined. Nevertheless, the cuticle of nematodes is remarkably resilient (Bird 1971, Lee 1972) and all of the nematodes removed from the gut were in good condition. Therefore, we think it likely that most nematodes were recovered.

There was some weak evidence of a correlation between body condition and parasite load, although it is impossible to establish cause and effect. Birds in poor condition might have been more susceptible to parasitism. Alternatively, parasites could have been the cause of the poor condition. There is very little literature on the incidence of intestinal parasites in birds of prey. They appear uncommon in captive birds (Greenwood et al. 1984) but, apart from some references to unusual individual case histories (Simpson and Harris 1992), there have been few surveys of wild birds. McInnes et al. (1994) surveyed 109 Tawny Owls (*Strix aluco*) and found nematodes were present in the small intestine of only 18% of individuals, although 68% were infected with an Acanthocepahalan worm, and Houston and Cooper (1975) examined the intestines of 18 Rueppell's Griffon Vultures (*Gyps rueppellii*) and found nematode infections in 16 individuals. Parasites often use predators at the top of food chains as definitive hosts (Crompton and Nickol 1985). There is a considerable lack of information about the role of birds of prey in parasite transmission and this is an area of study which might repay further examination for those with the opportunity to carry out *postmortem* examinations.

RESUMEN.—Examinamos 379 individuos de seis especies de aves rapaces británicas de las cuales sólo el 20% tenían nematodos intestinales. Hubo una pequeña evidencia que los individuos de *Accipiter gentilis* y *Buteo buteo* en condiciones físicas pobres tuvieron una carga mayor de parásitos.

[Traducción de César Márquez]

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