ORYX VOL 27 NO 3 JULY 1993

Threatened primates in southern Vietnam

Jonathan C. Eames and Craig R. Robson

Vietnam's exceptionally rich fauna is threatened by habitat loss and hunting. Although a system of protected areas has recently been developed, many of the sites selected are subject to human encroachment, hunting pressure and other forms of exploitation. Other protected areas may be too small to hold viable populations of primates. Following faunal surveys of existing and proposed protected areas in Vietnam between 1988 and 1991, this paper documents the status of and identifies threats to three species of threatened primate: white-cheeked gibbon Hylobates leucogenys gabriellae, *red-shanked douc langur* Pygathrix nemaeus *and black-shanked douc langur* P. nigripes.

Primate diversity in Vietnam

The forests of Vietnam contain the highest primate diversity in Indochina (Burma, Thailand, Laos, Cambodia, and Vietnam) in terms of both levels of endemism and taxonomic uniqueness (Eudey, 1987). At least 16 species of primate occur in Vietnam and of these the lesser slow loris *Nycticebus pygmaeus*, tonkin snub-nosed monkey *Rhinopithecus avunculus* and three subspecies of Francois's leaf-monkey *Trachypithecus francoisi* are endemic (*T. f. poliocephalus*, *T. f. delacouri* and *T. f. hatinhensis*). Two other species, the red-shanked douc langur *Pygathrix nemaeus* and black-shanked douc langur *P. nigripes*, are endemic to Indochina (Eudey, 1987).

Until recently the crested gibbon *Hylobates concolor* was treated as a single species and divided into eight subspecies, of which four, *H. c. concolor*, *H. c. leucogenys*, *H. c. siki* and *H. c. gabriellae*, are found in Vietnam (Eudey, 1987). However, based on evidence of sympatry, morphology and behaviour this species is now generally treated as two full species: the black-crested gibbon *H. concolor* and the white-cheeked gibbon *H. leucogenys*, incorporating the subspecies *H. l. siki* and *H. l. gabriellae* (Bleisch and Chen Nan, 1990).

Contemporary information on the status, distribution and threats to Vietnam's primates is scant. Following a recent review of the conservation status of primates in the Indochinese subregion (MacKinnon and MacKinnon, 1987), information on the status of Francois's leaf-monkey, Phayre's leaf-monkey *Trachypithecus phayrei*, black-crested gibbon and white-cheeked gibbons, *H. l. leucogenys and H. l. siki*, in northern Vietnam have recently been collected (Ratajszczak *et al.*, 1990). The purpose of this short paper is to present the latest information on the status of white-cheeked gibbon *H. l. gabriellae* (and possibly *H. l. siki*), red-shanked douc langur and black-shanked douc langur in central and southern Vietnam and place this information within the context of prevailing environmental conditions.

Deforestation – the major threat

Although historically Vietnam was almost completely forested, the country has now lost over 80 per cent of its original cover. Today just 10–12 per cent of closed tropical forest remains of which less than 1 per cent is in a pristine state (FAO, 1987 and FAO/UNEP, 1981 in Collins *et al.*, 1991). The current rate of forest loss is estimated at 3110 sq km per year (Collins *et al.*, 1991).

During the Vietnam War (1963–1975) an estimated 22,000 sq km of agricultural land and forests were destroyed, largely in the south of the country (Collins *et al.*, 1991). Over 13 million tonnes of bombs and 72 million litres of herbicides were sprayed on the forests of

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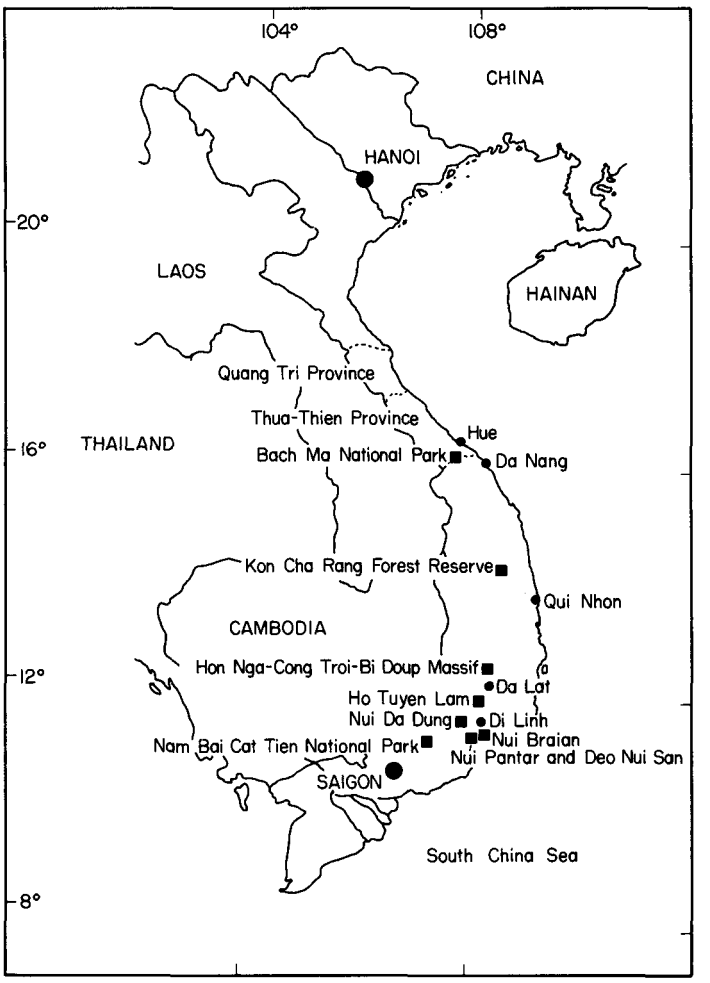

Figure 1. Map of Vietnam showing localities mentioned in the text.

Vietnam (CVRER, 1985), with 12 per cent of the forests in the south of the country being sprayed at least once (Collins *et al.*, 1991).

During and since the Vietnam War the human population has grown rapidly; its current 66.8 million people make Vietnam the most densely populated country in Indochina. With a growth rate of 2.4 per cent the country has one of the world's most rapidly growing populations, which is expected to peak at 168 million in 2125 (Collins *et al.*, 1991).

Approximately 80 per cent of the population are engaged in subsistence agriculture and are totally dependent on forest lands and their products to meet basic needs, such as fuelwood, timber for construction and palm fronds for making the conical hats worn by most rural Vietnamese. The remaining forests are subject to commercial logging, hunting, and clearance for agriculture and settlement.

The economy of Vietnam was devastated by the war and has been slow to recover for several reasons. As a result Vietnam may have been forced to exploit its forests for timber and rattan at a greater rate than would otherwise have been the case.

The protected areas system

The Vietnam Government inaugurated the first national park at Cuc Phuong in 1962 (Hoang Hoe and Vo Quy, 1991). Six national parks, 28 nature reserves, five historical and

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cultural reserves and two unclassified areas have been designated to date, with an area totaling 10,945 sq km (Collins *et al.*, 1991). Responsibility for developing and managing this programme lies with the Ministry of Forests.

Many of the areas selected have been degraded by war and commercial logging and are threatened by agricultural encroachment, wood-cutting and hunting. Furthermore, little attention has been paid to identifying these areas on the basis of their biodiversity or levels of endemism. For example, recent research has identified three 'biodiversity hotspots' in Vietnam of which only 0-5 per cent are in protected areas (ICBP, 1992).

To assist in obtaining baseline data the International Council for Bird Preservation (ICBP), in collaboration with the Forest Birds Working Group of the Centre for Natural Resources Management and Environmental Studies (CRES), carried out faunal surveys in existing and proposed protected areas in Vietnam. Surveys were undertaken in Cuc Phuong, Bach Ma and Nam Bai Cat Tien National Parks, Kon Cha Rang Nature Reserve and Nui Tam Dao Historic/Cultural Reserve (Figure 1). This work focused mainly on threatened bird species but also attempted to collect data on primates, the results of which are presented in this paper.

Survey techniques

The presence of primates in an area was usually first determined by conducting interviews with local people. These were undertaken on an *ad hoc* basis and invariably took the form of group discussions with older men and hunters. Informants were asked if they knew of any primates in the area and to describe pelage or to imitate the call. Informants were further encouraged to produce material evidence such as skin or skulls. Informants' reports were augmented with direct observation and records of calling individuals.

In Bach Ma and Nam Bai Cat Tien National Parks the time and position of calling white-cheeked gibbons were plotted on 1:25,000 maps and the extent and suitability of available habitat were noted. Surveys were undertaken during the early morning to coincide with the peak period of calling activity.

It was not possible to employ a quantitative method for surveying red-shanked and black-shanked douc langurs for a number of reasons. Unlike white-cheeked gibbons, douc langurs do not have loud territorial calls. They appear to occur at low density (either naturally or as a result of hunting pressure) and are generally quiet when foraging. In addition, the topography of survey sites was often steep and because of time constraints it was not considered feasible to undertake transects or point counts.

Results

During three periods of fieldwork undertaken during 1988, 1989/90 and 1991, white-cheeked gibbons, and red-shanked and black-shanked douc langurs were recorded in several forest areas in southern Vietnam, including Bach Ma and Nam Bai Cat Tien National Parks.

Bach Ma National Park

Bach Ma National Park covers approximately 190 sq km. The topography is steep and precipitous, with elevations ranging from sea-level to *c.* 1450 m. Forest types in the park have been classified as closed broadleaved tropical evergreen seasonal lowland, dominated by Dipterocarpaceae, Fabaceae, Meliaceae and Sapindaceae (CVRER, 1985) and tropical montane evergreen forest (MacKinnon and MacKinnon, 1986).

Much of the park was subject to chemical defoliant spraying during the Vietnam War. Subsequently it was logged until 1989 and is currently threatened by logging, rattan extraction, hunting and gold mining (Robson *et al.*, 1991; Eames and Robson, 1992).

Nam Bai Cat Tien National Park

Nam Bai Cat Tien National Park covers 350–365 sq km. The west of the park is occupied by

https://doi.org/10.1017/S0030605300027940 Published online by Cambridge University Press

Deforestation by hill-tribes on the Di Linh Plateau – habitat of black-shanked douc langur (*Jonathan Eames*).

a range of forested hills between *c.* 150 and 300 m in elevation, while the centre and east are level lowland. The vegetation comprises a mosaic of primary evergreen forest and secondary forest formations, including bamboo, resulting from logging and agricultural clearance. Riparian habitats, including swamp forest, are found in the centre of the park. The forests have been classified as lowland semi-evergreen (MacKinnon and MacKinnon, 1986) and closed broadleaved tropical evergreen seasonal lowland (mostly dominated by Dipterocarpaceae, Fabaceae, Meliaceae and Sapindaceae) with closed bamboo tropical lowland and sub-montane forest (CVRER, 1985).

Some of the forest was sprayed with chemical defoliants during the Vietnam War and the area was logged until its declaration as a national park in 1978. There are several villages within the park and rice and sugar cane are cultivated. The wetlands are subject to fishing and disturbance and there is widespread poaching (Eames and Robson, 1992).

Da Lat and Di Linh Plateaux

Da Lat and Di Linh Plateaux form a contiguous highland massif covering 2400 sq km, rising to 2289 m at the summit of Mount Bi Doup. At higher elevations the natural climax vegetation consists of tropical montane evergreen forest (MacKinnon and MacKinnon, 1986). Much of the landscape has been subject to modification, historically by hill tribes and latterly by Vietnamese settlers. As a result most land under 1500 m has been deforested and cultivated. Extensive forests of *Pinus insularis* are found in the region and evergreen forests are increasingly confined to the more inaccessible and less agriculturally viable areas such as ridges and hill tops (Eames and Robson, 1992).

Thua-Thien and Quang Tri provinces

Level lowland forest in Thua-Thien and Quang Tri provinces has been completely destroyed by chemical defoliation and clearance for agriculture. The remaining forest is con-

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fined to small patches, some as small as 50 ha, on ridges that form the eastern slope of the Annamite chain. During the 1988 and 1991 surveys reports were received from hill-tribe villages of the continued presence of white-cheeked gibbons and red-shanked douc langurs in these isolated forest patches (Eames *et al.*, 1989; Eames and Robson, 1992).

Kon Cha Rang Nature Reserve

Kon Cha Rang Nature Reserve is a proposed protected area of 160–200 sq km in Gia Lai and Kon Tum provinces. A short faunal survey was conducted here during 1988 (Eames *et al.*, 1989). White-cheeked gibbons were not recorded during the survey but were said to occur in the area (Cao Van Sung and various Bohnar tribal hunters, pers. comm.).

White-cheeked gibbon

During January and February 1990 dueting pairs of white-cheeked gibbons were recorded from eight areas in the centre and east of Bach Ma National Park (Robson *et al.*, 1991), in primary and secondary forest at elevations between 200 and 500 m above sea-level. During April 1991 three male white-cheeked gibbons were heard calling alone along the Song Ta Trach and Khe Thoung valleys in the south-west of the park. No pairs were recorded and no females were heard calling in this area during the survey period.

During 1990 and 1991 approximately 83 sq km were surveyed in the park. To obtain crude density estimates, the number of calling white-cheeked gibbons was divided by the survey area. This produced density estimates for the five survey areas of 0, 0.12, 0.12, 0.16 and 0.16 calling males/groups per sq km. Assuming that all gibbons present were recorded during the survey periods, that there was no duplication of records and that gibbons occur at equal density throughout the park, this would give a population of 23-30 males/groups in the park.

Although the subspecies concerned was not determined, gibbons collected in Bach Ma between July to November 1989 by the Forest Inventory and Planning Institute, were reported to be *H. l. gabriellae* (Vu Van Dung, pers. comm.).

During December 1989 and January 1990, five pairs of white-cheeked gibbons were recorded from three areas in the north and east of Nam Bai Cat Tien National Park in primary and logged forest at elevations ranging between *c.* 100 and 200 m above sea-level. During June 1991 calling was recorded from nine areas in the park, including two of those identified in 1989/90 (Eames and Robson, 1992). The data obtained is insufficient to attempt to determine the density of white-cheeked gibbons in Nam Bai Cat Tien. Most of the park remains unsurveyed and there is probably extensive habitat for gibbons in the hilly west of the park. The subspecies involved was determined as *H. l. gabriellae* on the basis of an animal caught in the park and held by a villager and our own observations of a pair.

During the May and June 1991 surveys white-cheeked gibbons were reported by hill tribes on the Da Lat Plateau, from the Hong Nga-Cong Troi-Bi Doup Massif and Ho Tuyen Lam, and on the Di Linh Plateau, from Nui Ta Dung and Nui Braian. White-cheeked gibbons were heard calling from four areas on Mount Bi Doup at *c.* 1700-2000 m. Dueting pairs were heard in two of the four areas. During 72 man-days in the field during January 1990 and May and June 1991, white-cheeked gibbons were recorded only on 2 days. Subsequently, on 3 January 1992, a dueting pair was heard calling at 1500 m at Ho Tuyen Lam. Most of the surveys were conducted at elevations ranging from 1500 to 2000 m and it is clear that the species is scarce or absent from most of the forest in this altitudinal range. Although the ecological requirements of this species are virtually unknown, it is probable that forest in this altitudinal range is sub-optimal. However, other factors affect the status of white-cheeked gibbon in the area. The remaining tracts of evergreen forest are subject to increasing fragmentation by clearance for agriculture, notably by slash-and-burn agriculture practised by the hill tribes, and commercial logging. Both these activities cause not only

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deforestation but also, because of regular burning, promote the development of *Pinus insularis* fire-climax habitats, thereby reducing the extent of the evergreen forest on which the white-cheeked gibbon depends.

Red-shanked douc langur

During the 1990 survey in Bach Ma National Park red-shanked douc langurs were recorded twice (Robson, 1990, unpubl. data). A group of three or four animals, including one juvenile, was observed on 27 January. The forest at this site had been sprayed with chemical defoliant but showed good signs of regeneration. The canopy was 6–10 m high and closed canopy cover exceeded 50 per cent. The second record was of a solitary male in primary forest at 700 m on 9 February. Canopy cover was again estimated at more than 50 per cent.

Black-shanked douc langur

Although none was seen, black-shanked douc langurs were reported from the centre and west of Nam Bai Cat Tien National Park during the 1990 and 1991 survey periods. More recently a group of four black-shanked douc langurs was observed in the east of the park in primary forest at *c.* 150 m on 30 January 1991.

On the Di Linh Plateau the black-shanked douc langur was recorded at two sites: on 6 June 1991, 10–15 animals were observed on Nui Pantar at 1350 m. The following day two troops of *c.* 20 and *c.* 10 animals were located on Deo Nui San at *c.* 1200 m. Additionally during May and June 1991, we received reports of this species from the Hon Nga-Cong Troi-Bi Doup Massif on the Da Lat Plateau at *c.* 1500 m and from Nui Ta Tung and Nui Braian on the Di Linh Plateau. The paucity of records from the Hon Nga–Cong Troi-Bi Doup Massif suggests that the species occurs primarily below 1500 m.

Hunting and trade

Both white-cheeked gibbons and black-shanked douc langurs are subject to hunting on the Da Lat and Di Linh Plateaux. On 18

Captive white-cheeked gibbon captured in Nam Bai Cat Tien National Park (*Jonathan Eames*).

May 1991 a group of three hunters armed with an M16 semi-automatic rifle was encountered near Klong, 17 km south of Da Lat. They were hunting white-cheeked gibbons, which they sold for traditional medicinal purposes. According to these hunters the species is used as a tonic for pregnant women.

The skins of black-shanked douc langurs were examined at a village near Nui Ta Dung and in Di Linh (collected from Nui Braian). In both cases the animals had been hunted for food. This casts doubt on the claim that local people seldom hunt red-shanked douc langurs because they find the meat unpalatable or even inedible due to the high concentrations of toxic substances absorbed with its leafy diet (Ratajszczak, 1989).

Taxidermy is popular in Vietnam and mounted white-cheeked gibbons and black-shanked douc langurs were located regularly in taxidermists shops and in hotel lobbies in Da Lat and along the road between Da Lat and Bao Loc. As a former hill station, Da Lat is a popular tourist destination and stuffed animals are popular souvenirs.

In addition to hunting for meat and medicinal purposes, primates are further threatened by the wildlife trade. Primates are available regularly in Cau Mong Market in Saigon. During three visits made to the market in 1991, three black-shanked douc langurs and up to 13 white-cheeked gibbons were

https://doi.org/10.1017/S0030605300027940 Published online by Cambridge University Press

A male black-shanked douc langur photographed on Deo Nui San, Di Linh Plateau. This is almost certainly the first photograph taken in the wild of this species *(C. R. Robson).*

recorded. Both species were being offered for $US 200 each (Eames and Robson, 1992). It has been claimed that the red-shanked douc langur is unknown in the pet trade and seldom appears in the Saigon market (Ratajszczak, 1989). Because its sibling species clearly is traded this claim should be treated with caution. It is interesting to note that a pileated gibbon *Hylobates pileatus* was being offered for sale $US600. This species does not occur in Vietnam and, according to the owner, this individual was obtained in Cambodia (Eames and Robson, 1992). However, it has been suggested that a small part of its range lies within Vietnam (Ratajszczak, 1989).

Although Vietnam may soon become a signatory to the Convention on Trade in Endangered Species of Wild Fauna and Flora (CITES), there is currently no legislation to control the domestic trade in primates. However, the Government is preparing a new list of protected species, which will include three species of primates in Appendix I and eight species in Appendix II (Ratajszczak, 1989).

Discussion

The density estimates for the white-cheeked gibbon population in Bach Ma National Park are much lower than have been obtained in other studies. In a recent study of the moloch *H. moloch* in Gunung Halimun reserve on Java, using a similar acoustic method to that used in our study, density was estimated at 2.53 groups per sq km (Kool, 1992). In a study of the more closely related black-crested gibbon in Wuliang Mountain Reserve in China density was estimated at 0.64–1.2 groups per sq km (Bleisch and Chen Nan, 1990).

The density estimate obtained at Bach Ma National Park is lower than would be expected under natural conditions and reflects a combination of factors prevalent at this site, which include logging, a history of defoliation and hunting pressure.

By simple extrapolation we can use these figures to obtain a crude estimate of the number of white-cheeked gibbons in protected areas in Vietnam. If it is assumed that white-cheeked gibbons are found at densities of 0.12–0.16 per sq km in all the protected areas, covering a total of 3762 sq km, within the species's range in Vietnam, this would give an estimate of 450–600 white-cheeked gibbons. Using the 'working density' estimate of three gibbons per sq km, given in MacKinnon and MacKinnon (1987), would produce a population estimate of almost 11,300 white-cheeked gibbons in protected areas in Vietnam. Bearing in mind that gibbons will be absent from many protected areas because the habitat will be unsuitable, this latter figure would appear to be much too high. The actual number of white-cheeked gibbons in Vietnam may therefore be nearer or even below the initial estimate of 450–600.

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MacKinnon and MacKinnon (1987) estimated a total world population of 131,000 concolor gibbons (including *H. leucogenys*) with 16,300 of these in protected areas. Assuming that forest cover has remained constant at 87,532 sq km (which it is unlikely to have done), at densities of 0.12 and 0.16 gibbons per sq km the world population of concolor gibbon could be in the range 10,500–14,000 animals. This is significantly less than the 131,000 of MacKinnon and MacKinnon (1987) and the estimate of 228,000 for Laos and Vietnam by Chivers (1977). If these estimates tell us anything at all, it is just how little we know about the true situation and how dangerous it can be to try and estimate population sizes based on guestimates and inadequate data. However, we can assume that the white-cheeked gibbon in Vietnam is perhaps more threatened than was previously believed.

It is also difficult to arrive at a population estimate for the two species of douc langur. MacKinnon and MacKinnon (1987) estimated that perhaps the population of both species in protected areas was 9000 and conceded that it may be many fewer. Our discovery of black-shanked douc langur in Nam Bai Cat Tien National Park contradicts a recent claim that the species at this site is the red-shanked douc langur, which was described as both common and easily observed there (Ratajszczak, 1989). Despite the claim that red-shanked douc langur occurs in Yok Don Nature Reserve (Ratajszczak, 1989) the species was not detected there during a recent survey (Laurie *et al.*, 1989). The red-shanked douc langur is believed to occur in Mom Ray and Kon Kha Kinh Nature Reserves (MacKinnon and MacKinnon, 1987; Ratajszczak, 1989). However, the only protected area from which the red-shanked douc langur is currently known in Vietnam is Bach Ma National Park (Robson *et al.*, 1991; Huynh Van Keo, pers. comm.). The 27 January 1990 record provides firm evidence that red-shanked douc langurs can survive in secondary forest formations following chemical defoliation. Another cause for slight optimism was the ease with which groups of black-shanked douc langurs were discovered at forest sites on the Di Linh Plateau adjacent to a road. Despite the assertion by Ratajszczak (1989) that the black-shanked douc langur has a lower population than the red-shanked douc langur, he presented no evidence in support of this claim.

Vietnam has one of the fastest growing human populations in the world. Most of the population is rural and dependent on forest resources to meet basic needs. As forests in Vietnam continue to be cleared for agriculture and for timber, primate populations will continue to decline. Outside protected areas remaining primate populations will become more fragmented and isolated. Many such populations will not be genetically viable in the long term and groups of animals in such confined areas are particularly vulnerable to hunting. This scenario is now evident in parts of Thua Thien and Quang Tri Provinces (Eames and Robson, 1992). The outlook, therefore, for conserving forest and primate populations outside protected areas appears extremely bleak.

Although a protected-areas programme is now being developed, only four of the 87 proposed areas currently receives any measure of protection. In every case the level of protection is insufficient to prevent poaching or some other form of encroachment. Although this situation will, it is hoped, improve in the future, many of the areas so far proposed may be too small to support viable populations of the primates described in this paper. To date no protected areas have been designated that are known to contain populations of the *H. c. siki* subspecies of the white-cheeked gibbon. Further survey work to identify such areas is a priority.

There is, at last, increased interest in the conservation of wildlife in Vietnam from the international conservation community. It is essential that, as the number of non-governmental organizations involved in practical conservation action in Vietnam increases, their activities are co-ordinated and prioritized to reflect the needs of biodiversity conservation. If we are to be successful in conserving primates in Vietnam, it is important that conservation resources are invested in the development of the protected areas programme and

https://doi.org/10.1017/S0030605300027940 Published online by Cambridge University Press

are not side-tracked into costly captive breeding or reintroduction programmes.

Acknowledgments

The success of our fieldwork was due to a large number of people in Vietnam and the UK. With respect to the information presented here we would particularly like to thank the following: Nguyen Cu (CRES); Truong Van La (Institute for Ecology and Biological Resources, Hanoi); Le Van Chiem and the staff of Nam Bai Cat Tien National Park; Huynh Van Keo and staff of Bach Ma National Park; Dr Nguyen Dang Khoi and staff of the Centre for Scientific Research; Da Lat and Vu Van Dung (FIPI). We would like to express our gratitude to the following organizations, companies and individuals for financial support: Geo-Initiative 'Projekt Tropischer Regenwald e.V.'; John Lewis Partnership plc; International Council for Bird Preservation; Vogelbescherming Nederland; Fauna and Flora Preservation Society; Royal Geographic Society; Rolex Watch Co. Ltd; World Pheasant Association; Zoological Society for the Conservation of Species and Populations; Conder Conservation Trust; British Ornithologists' Union; A. S. Butler Charitable Trust; Clifton Nicholson; The Bird Exploration Fund; and the Oriental Bird Club. Thanks are also due to Roger Cox, Simon Thirgood and Roland Wirth for reading earlier drafts of this paper.

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https://doi.org/10.1017/S0030605300027940 Published online by Cambridge University Press