

The status and threats to the conservation of the chestnut-headed partridge *Arborophila cambodiana* and other Galliformes in the Cardamom Mountain Range, Southwest Cambodia

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ABSTRACT

Cambodia is home to 14 species of Galliformes of which four are considered to be globally threatened. One of the most important areas for Galliformes within Cambodia is the Cardamom Mountain range, which supports nine species. Between 25th February and 25th March 2004 we undertook ornithological and questionnaire surveys to establish the status and threats to Galliformes, in particular the chestnut-headed partridge, in and around the Roleak Korng Cheung Commune, Kampong Speu province, south west Cambodia. We established the presence of six Galliformes species through surveys and a further two through questionnaires. All species occurred at low densities, with scaly-breasted partridge and red junglefowl being the most numerous. By recording the chestnut-headed partridge we confirmed its presence throughout the entire Cardamom Mountain range. Also we recorded this species below its previously reported altitudinal range. Information provided on the number of birds hunted shows that the current population estimate for the species is likely to be an underestimate. We established that there is a small population of green peafowl occupying the lowland areas of the Roleak Korng Cheung commune, away from the strongholds for this species, which are thought to be in the north and north-east of Cambodia. The main threats to all Galliformes appeared to be uncontrolled hunting, habitat degradation and disturbance, possibly making this group of birds the most threatened within the country. Future work needs to assess fully the range and status of the chestnut-headed partridge throughout the Cardamom Mountain range and the green peafowl throughout the lowland forests of southern Cambodia. Conservation action to protect Galliformes throughout Cambodia should include increased legislation and enforcement to control hunting and logging, the education of local people about the value of wildlife conservation, the founding of community-based conservation groups and the establishment of a market for the agricultural products of local people to generate income in place of hunting.

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INTRODUCTION

The Indochina region, comprising Cambodia, Laos and Vietnam, is globally important for Galliformes, with 25 species occurring (Brickle *et al.*, *in prep*). Within Cambodia, 14 species of Galliformes have been recorded (Tan Setha & Pech Bunnat, 2001, Davidson & Walston, 2003), of which four (orange-necked partridge *Arborophila davidi*, chestnut-headed partridge *Arborophila cambodiana*, Germain's peacock-pheasant *Polyplectron germaini* and green peafowl *Pavo muticus*) are globally threatened (IUCN, 2003) and have Conservation Action Plans (Fuller *et al.*, 2000). In addition the Siamese fireback *Lophura diardi*, which also occurs, is listed as near threatened (IUCN, 2003).

Within Cambodia one of the most important areas for Galliformes is the Cardamom Mountain Range in south-west of the country, where nine species of Galliformes have been recorded (Daltry & Momberg, 2000, Tan Setha & Pech Bunnat, 2001). These include the near-endemic chestnut-headed partridge and the green peafowl. The Cardamom Mountain range, which extends to over 1,435,513 ha, comprises two wildlife sanctuaries, two protected forests, one multiple use area and two national parks.

Following years of conflict and political instability the infrastructure and economy of Cambodia is severely compromised. This has resulted in increasing pressure, by a variety of unsustainable patterns of consumption, on the natural habitats of the country. Forest ecosystems are particularly threatened, primarily by illegal logging operations. Vulnerable populations of many animal and plant species are threatened by illegal hunting and collecting for the wildlife trade. Habitat loss and degradation continues through unplanned conversion of land for agriculture and settlements. Galliformes, owing to their desirability as food or for the pet trade, have suffered particularly from illegal hunting, habitat degradation and fragmentation and disturbance from local people entering the forests to collect non-timber products (e.g. resin, fish, fruit). Additionally, because of the internal security problems in Cambodia, very little is known about the birds (and other wildlife) in the country. A recent review on the status and distribution of pheasants and partridges (Tan Setha & Pech Bunnat, 2001) identified that hunting is the major problem for ground-living birds in Cambodia, and that research to understand the needs of the globally threatened pheasants and partridges is urgently needed.

Endemic to Cambodia and currently listed as Endangered on the IUCN Red List (IUCN, 2003), the chestnut-headed partridge is known to inhabit the dense forests and plateaux of the Cardamom Mountain ranges (Central Cardamom, Phnom Somkos and Aural wildlife sanctuaries), around Bokor National Park and Sampling Forest Concession in Koh Kong (Daltry & Momberg, 2000, Tan Setha & Pech Bunnat, 2001, Net Neath, 2001, Swan & Long, 2002, Seng Kim Hout *et al.*, 2003). The population is thought to number between 100 and 1000 individuals (BirdLife International, 2000, 2001), although virtually nothing is known about the species with only a few observations, mainly in the 1930s, and during some recent surveys. Further information on the ecology, habitat requirements, status and distribution of the species is urgently required so that a targeted approach to its conservation can be designed.

We established this study to start working on the methods to do this, and at the same time provide more information on the status of the chestnut-headed partridge, and the threats facing it. This study, which initially set out to undertake a pilot project on the chestnut-headed partridge, aimed to develop and test methods for determining the distribution, status and abundance of the partridge. However, this was expanded to consider all Galliformes occurring in the area.

METHODS & STUDY SITE

This study was undertaken from mid-February 2004 to mid-March 2004 in the Roleak Korng Cheung Commune (11° 45' N, 103° 48' E), Aural District, Kampong Speu Province in the central Cardamom Mountains, southwest Cambodia. Within this area is the Domrey Mountain Range, with a maximum altitude of about 1000 m. Two methods were used to record the presence of Galliformes, assess their numbers and establish their threats. These were ornithological surveys and questionnaire surveys of local people and hunters

Ornithological surveys

A combination of transect surveys and point-count surveys (Bibby *et al.*, 2000) was used to record Galliformes. These surveys were undertaken from immediately before sunrise and sunset for approximately three hours (0630 to 0930h and 1530 to 1830h), when Galliformes were most active. The transects walked varied in length from 2 to 10 km and were at a range of different altitudes (100 to 1000 m). The duration at each point count site was approximately 20 minutes, with point count sites being about 500 m apart. Due to the impenetrable nature of the forest and the disturbance caused whilst attempting to walk through it, only forest tracks, usually made by ox carts, were used for the surveys. At each point count location, the following was recorded; species, whether seen or heard, numbers present, location (recorded by GPS) and direction and distance from observer.

Questionnaire survey of local people and hunters

The commune leaders, village elders and senior hunters specifically and, more generally, other village people and hunters were shown pictures of Galliformes with Khmer names (Poole *et al.*, 2004) and asked the following questions:

- How many of these species are there in the area?
- How many individuals of each species are there in the area?
- How many individuals of each species are hunted in the area?
- How many hunters are there in the area?
- How many hunters come from outside the area?
- What hunting methods do they use?
- Are they familiar with the calls of each species and can they imitate them?
- How many traps are set in the area?

RESULTS

The results from the ornithological and questionnaire surveys are summarised in tables 1 & 2, and notes on each species follow.

Chinese francolin *Francolinus pintadeanus*

In the appropriate habitat this species was common and was regularly recorded during our surveys at the lowest elevations, (< 200 m), in secondary forest, forest edge and surrounding cultivations. Individuals were recorded in 20 separate locations. Displaying birds were heard calling throughout the day, but were more vocal immediately after sunrise and before sunset. Several birds were heard and seen calling from trees (up to c. 7m height).

The villagers and hunters reported that this species was very common and numerous around cultivation, at the lowest elevations, and they thought that many thousands of birds were present in the area surrounding the villages. None of the people or hunters from the commune hunted this species as they are very difficult to catch. The call is difficult to accurately reproduce, with birds not responding to imitated calls and being very wary of traps. A few hunters from outside the commune were able to catch this species and were thought to have killed many hundreds of birds in recent years. These birds are sold for about 1500 riel (US\$0.38) per bird.

Table 1. Summary information from the ornithological surveys undertaken around Roleak Korng Cheung Commune, Kampong Speu province, south west Cambodia during 25th February to 25th March 2004

Species	Number of records	Abundance	Habitat	Elevation
Chinese francolin <i>Francolinus pintadeanus</i>	20	Common	Secondary woodland, near cultivations	Lowest elevations 100-200 m
Chestnut-headed partridge <i>Arborophila cambodiana</i>	5	Locally common	Dense primary forest, Bamboo forest at lower elevations	Highest elevations 200-1000 m
Scaly-breasted partridge <i>Arbophilia chloropus</i>	50+	Very common	Dense primary forest and Bamboo forest	Mid-elevations, usually below 400 m
Red junglefowl <i>Gallus gallus</i>	50+	Very common	Primary, secondary and bamboo forest, most common near cultivations	Low to mid-elevations 100-400 m
Silver pheasant <i>Lophura nycthemera</i>	2 (incl. 1 killed bird)	Uncommon	Dense primary forest	Low to mid elevations 100-400 m
Green peafowl <i>Pavo muticus</i>	5	Locally uncommon	Secondary forest near cultivations	Lowest elevations 100-200 m

Table 2. Summary information from the questionnaire surveys undertaken around Roleak Korng Cheung Commune, Kampong Speu province, south west Cambodia during 25th February to 25th March 2004

Species	Numbers thought to occur	Perceived habitat and altitudinal range	Number of hunters	Numbers hunted
Chinese francolin <i>Francolinus pintadeanus</i>	Many 100s	In cultivated areas, near trails, not in mountainous areas	None in commune, four from outside	100s
Chestnut-headed partridge <i>Arborophila cambodiana</i>	Many 1000s in 1950s, now 100s	Dense forest in mountainous areas, lower elevations in dry season	2-3 large-scale hunters, 80% of villagers undertake small-scale hunting	20-30 birds per month
Scaly-breasted partridge <i>Arbophilia choropus</i>	1000s in 1950, now many 100s	Dense forest in mountainous areas, but at lower elevations	2-3 large-scale hunters, 80% of villagers undertake small-scale hunting	100-200 birds per month
Red junglefowl <i>Gallus gallus</i>	Many 100s	Found everywhere at lower elevations	40 hunters throughout commune	100s per year
Silver pheasant <i>Lophura nycthemera</i>	100s live around commune	Dense forest in mountainous areas	2-3 large-scale hunters, 80% of villagers undertake small-scale hunting	4-5 birds per month
Siamese fireback <i>Lophura diardi</i>	100s	Dense forest in mountainous areas, but at lower elevations	2-3 large-scale hunters, 80% of villagers undertake small-scale hunting	1-2 birds per month
Germain's peacock-pheasant <i>Polyplectron germaini</i>	Unknown	Dense forest in mountainous areas	2-3 large scale hunters, 80% of villagers undertake small-scale hunting	Apparently the odd bird has been caught
Green peafowl <i>Pavo muticus</i>	60-70 individuals around commune	Riparian habitats, woodland edge, cultivations	2-5 hunters, 50-60 villages collect eggs	4-5 birds hunted monthly 30-40 eggs collected per year

Chestnut-headed partridge *Arborophila cambodiana*

This species was recorded infrequently during our surveys, usually at the higher elevations above 400 m. However, at one site we did record this species at about 200 m, near one of the only remaining pools of water in the area. This species was heard calling mostly during the early morning.

The villagers and hunters reported that this species was very common during the 1950s, when they thought many thousands of individuals occupied the mountains surrounding the villages. However, more recently they thought that the species was less common and probably numbered in the 100s. They thought that the species occurred primarily in the dense forests at the highest elevations, but during the dry season when water supplies were limited, they had caught them at much lower elevations, even around the cultivations at around 150 m. Chestnut-headed partridge were thought to form small coveys of between two to four birds throughout much of the year, but after breeding larger coveys of up to 20 had been recorded. Two or three hunters were able to imitate the call of this species and undertook high-intensity hunting, by attracting entire coveys into nets or by setting large numbers of traps. About 80% of villagers undertook low-intensity untargeted hunting, usually setting traps whilst in the forest for other reasons. The annual catch in the commune was estimated at 200-350 individuals.

Scaly-breasted partridge *Arborophila chloropus*

This species was heard daily during our surveys and was common throughout dense primary forest and bamboo forests at elevations lower than 400 m. Although birds were heard calling throughout much of the day, they were most frequent during the early morning and late afternoon.

The villagers and hunters reported that this species was very common during the 1950s, when they thought that tens of thousands of individuals occupied the mountains surrounding the village. However, more recently they thought that the species was less common and probably numbered in the thousands. They thought that the species occurred primarily in the dense forests but generally at the lower elevations. Two or three hunters were able to imitate the call of this species and undertook high-intensity hunting, either by attracting birds into nets, or by setting large numbers of traps. About 80% of villagers undertook low-intensity, untargeted hunting, usually setting traps whilst in the forest for other reasons. Between 1,200 and 2,500 individuals were reported as being caught per year within the commune.

Red junglefowl *Gallus gallus*

This species was heard and seen daily throughout the day, but most frequently during the early morning and late afternoon. It occurred in a range of habitats but usually at the lower elevations and particularly around cultivated areas.

The villagers reported that this species was very common and occurred everywhere around the commune, but not high up the mountain. The villagers thought that this species was generally difficult catch as birds tended to be wary of traps. However, around 40 hunters from within the commune caught thousands of red junglefowl each year. Birds were sold for 5000 riel (US\$1.25) per bird.

Silver pheasant *Lophura nycthemera*

We had brief views of a bird, which was most likely a silver pheasant, drinking from a small pool within dense primary forest at about 200 m. Additionally we found a large number of feathers from a recently predated silver pheasant in dense forest at around 550 m.

The villagers reported that hundreds of individuals of this species occurred in the mountainous areas from the lowest to the highest elevations. This species was not

targeted by hunting, but was caught incidentally when low-intensity hunters set traps for a range of ground dwelling species whilst in the forest for other reasons. It was estimated that 45-60 silver pheasants were caught each year in the commune.

Siamese fireback *Lophura diardi*

We did not definitely record this species, although we did hear an unknown pheasant call, which we were told was a Siamese fireback.

The villagers thought that hundreds of individuals of this species occurred in the mountainous areas around the commune. Very few of the hunters had caught this species and none targeted it specifically. It was estimated that only 10-25 individuals were hunted each year.

Germain's peacock pheasant *Polyplectron germaini*

This species was not recorded by our surveys.

One of the hunters we interviewed was certain that he had caught some individuals of this species and although we stressed that the area we were in was well outside its recorded range, he was adamant.

Green peafowl *Pavo muticus*

We heard this species calling daily at three locations usually just before or after sunrise, and again around sunset. All records were at the lowest elevations (around 150 m) in and around cultivated areas.

The villagers thought that there were 60-70 individuals living around the commune. They stated that this species usually lived within riparian habitats during the day and fed on the edges of cultivated areas, primarily rice fields. This species was targeted specifically by a few (two to five) hunters, being caught both as food and for their feathers. Occasionally some green peafowl were caught accidentally in traps originally set for wild pigs. Villagers also collected green peafowl eggs, which were hatched under chickens so that the resultant young could be sold. It was estimated that 45-60 green peafowl were hunted per year and between 30-40 eggs were collected each year.

DISCUSSION

We recorded the presence of six Galliformes through the surveys and a further two species by the questionnaire surveys. Three of the species we recorded (Chinese francolin, scaly-breasted partridge and red junglefowl) appear to be maintaining healthy populations, as they were regularly recorded by our surveys. The other species we recorded occurred at much lower numbers. The information provided by the local villagers concurred with these findings.

Previous surveys and records have confirmed the presence of Chestnut-headed partridges in the central and western areas of the Cardamom Mountain range (Daltry & Momberg, 2000), in Kiriron NP to the south of the range (Poole, 1999, Tan SETHA & Pech BUNNET, 2001) and at Bokor NP in the extreme east (Net Neath, 2001) and this study recorded the species in the extreme north east of the range, which confirms that it is present throughout the entire Cardamom Mountain range. Additionally, we recorded birds present in an area below the previously reported altitudinal range of the species, at approximately 200 m. Information supplied to us by local hunters implied that they had regularly caught this species at these lower altitudes, but only during the dry season. A bird was also heard calling in Kirirom NP at an altitude of 140 m during February 2000 (Tan SETHA & Pech BUNNET, 2001). It is therefore possible that limited water availability high up the mountain in the dry season between February and April forces chestnut-headed partridges to move to lower elevations to find water. This may provide evidence

that the altitudinal range of the species at certain times of year is actually larger than previously reported. The information provided on the number of birds hunted, if correct, clearly shows that the current world population estimate for the species of 500-1000 individuals is likely to be an under-estimate. Given that this species occurs within a larger range, both in terms of area and possibly altitude, and is likely to have a larger population size than previously estimated, there is clearly a pressing need to fully assess its current population status and distribution by undertaking surveys that allow an accurate population estimate to be calculated.

Although we only recorded one possible sighting of silver pheasant, evidence of a predated silver pheasant and anecdotal evidence from local villagers on this species and Siamese fireback would appear to indicate that both species are not uncommon in the area we surveyed. Hunting data suggest that Siamese fireback is less numerous than silver pheasant. If the information regarding the Siamese fireback is correct, this constitutes some of the first evidence of this species occurring in the forests of south-western Cambodia (Tan SETHA & Pech Bunnet, 2001). However, more scientifically rigorous evidence, either camera traps, observations during surveys or birds caught and photographed by licensed bird ringers, is required to confirm this.

The information we obtained about Germain's peacock pheasant clearly extends the range of this species within Cambodia greatly, however, as with the information obtained for Siamese fireback, scientifically rigorous evidence is required before this can be considered a confirmed record.

Our survey information and that provided by the local villagers confirms that there is a small population of green peafowl occupying the lowland areas of the Roleak Korng Cheung commune. The strongholds for this species are thought to be those in the north and north-east of Cambodia, although there have been a small number of sightings of this species in the south of the country (Tan SETHA & Pech Bunnet, 2001). Clearly there is a need to undertake detailed surveys in the lowland forests of southern Cambodia to provide further information on the range and population status of this species in this area.

The information we provide on the numbers of Galliformes hunted in the Roleak Korng Cheung area clearly shows that illegal hunting and trapping is a major threat to the conservation status of many species. High-intensity hunting is undertaken by a very few hunters during periods when food is in short supply, to provide a source of protein for the village and an income. To undertake high-intensity hunting a hunter will stay in the forest for between three to five days per week during the three to four month long dry season, during which time up to 800 leg-hold snare traps are set in lines along forest trails and around water pools. High-intensity hunting of the partridge species also involves setting lines of leg-hold snare traps or nets into which birds are enticed by imitations of their calls. These methods can be very effective with some hunters catching entire family groups or coveys of partridges. Low-intensity trapping is undertaken by about 80% of the villagers to provide supplementary food whilst working or gathering food in the forest. This usually involves setting about 10-20 traps around the base camp to opportunistically trap any ground dwelling animals or birds. Not all species are equally affected by hunting, with those that are easy to catch (chestnut-headed partridge, scaly-breasted partridge), or are desirable for meat, eggs and feathers (green peafowl) being especially targeted by the hunters.

Another threat to Galliformes in the area we surveyed is habitat degradation by illegal logging to provide wood for house construction by local people and to generate some income. Forest clearance is also undertaken to provide areas for cultivation. Possibly of greater concern was the fact that not only does logging destroy habitats, but it also opens up access to the forest and causes disturbance. Loggers also hunt Galliformes for food and start cooking fires, which may spread and cause further forest damage.

Additionally, the forests are also used for the collection of non-timber products (yellow vine, resin, Kraesna wood) and food (plants, fish, etc), which principally causes disturbance but additionally, these foraging parties often hunt Galliformes for food whilst in the forest and start cooking fires. They are usually accompanied by dogs and frequently take domestic chickens into the forest as food. This adds to the disturbance problems, whilst the chickens may spread disease and could cause genetic contamination of red junglefowl.

There is still clearly a need to undertake a complete survey of Galliformes within Cambodia in order to provide a comprehensive assessment of the distribution and status of all Galliformes and the threats that they face. Two species of priority are the chestnut-headed partridge, which needs to be surveyed throughout its range to enable accurate population estimates to be calculated and its habitat requirements assessed, and the green peafowl, which needs to be fully surveyed throughout the lowland forests of southern Cambodia to assess its status and distribution.

The principal recommendation for conservation action to protect Galliformes throughout Cambodia is the establishment and development of a Cambodian Galliformes Conservation Programme. This programme would seek to work with other interested organisations to collect further information on the status, distribution and threats to conservation of all galliform species in Cambodia. This information would be used to develop conservation action plans for each species and used to lobby Government for improved wildlife protection legislation and enforcement. There is a pressing need to increase the awareness of the problems faced by many galliform species in Cambodia and the production of information leaflets and posters to educate local people and hunters about the value of wildlife conservation combined with school visits would help achieve this. It is important to establish community-based conservation groups within the Cardamom Mountains and throughout Cambodia and establish markets for the agricultural products of local people to generate income in order to replace hunting as a major source of food and income.

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REFERENCES

- Bibby, C.J., Burgess, N.D., Hill, D.A. & Mustoe S H. 2000. *Bird Census Techniques* (2nd edition). Academic Press, London.
- Brickle, N.W., Duckworth, J.W., Tordoff, A.W., MCGowan, P.J.K. & Poole, C.M. *in prep.* The status and conservation of galliformes in Indochina: Cambodia, Laos and Vietnam.

BirdLife International 2000. *Threatened birds of the world*. Lynx Edicions, Barcelona, Spain and BirdLife, International, Cambridge, UK.

BirdLife International. 2001. *Threatened Birds of Asia: the Birdlife International Red Data Book*. Birdlife international, Cambridge, UK.

Daltry, J.C. & Momberg, F. (eds) 2000. Cardamom Mountains Biodiversity Survey 2000. Fauna & Flora International, Cambridge, UK.

Davidson, P. & Walston, J. 2003. Endangered partridge discovered in Cambodia. *OBC Bulletin* 37: 61.

Fuller, R.A., Carroll, J.P. and McGowan, P.J.K. 2000. *Partridges, quails, francolin, snowcocks, guineafowl and turkeys: status survey and conservation action plans*. IUCN, Gland, Switzerland and Cambridge, UK, and World Pheasant Association, Reading, UK.

IUCN 2003. The IUCN red list of threatened species. www.redlist.org

Net Neath (ed) 2001. *A wildlife survey of Bokor National Park, Cambodia*. The Wildlife Conservation Society. Phnom Penh, Cambodia.

Poole, C.M. & Tan Setha 2003. *A Field Guide to the birds of Cambodia*. Wildlife Conservation Society Phnom Penh (WCS), Phnom Penh, Cambodia. [In Khmer]

Seng Kim Hout, Pech Bunnat, Poole, C.M., Tordoff., A.W., Davison, P. and Delattre, E. 2003. *Directory of Important Bird Areas in Cambodia: key sites for conservation*. Phnom Penh: Department of Forestry and Wildlife, Department of Nature Conservation and Protection, Birdlife International in Indochina and the Wildlife Conservation Society Cambodia Program.

Swan, S.R. & Long, B. 2002. Birds In: J.C. Daltry (ed). *Social and ecological surveys of Phnom Aural Wildlife Sanctuary, Cardamom Mountains, Cambodia*. Phnom Penh: Fauna and Flora International Cambodia Programme.

Tan Setha & Pech Bunnat 2001. Recent information on the status and conservation of Galliformes in Cambodia. Pp. 39-44 *In* Woodburn, M.I.A, McGowan, P.J.K., Carroll, J.P., Musavi, A.H. and Zhang, Z.W. (eds) *Galliformes 2000*. World Pheasant Association, Reading UK and King Mahendra Trust, Kathmandu, Nepal.