

THE STATUS AND CONSERVATION OF THE BIRD COMMUNITY IN DOI SUTHEP-PUI NATIONAL PARK, NORTH-WEST THAILAND

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ABSTRACT

A total of 326 bird species have been recorded from Doi Suthep-Pui National Park, Chiang Mai Province, since 1928. Of 265 species listed for the mountain by DEIGNAN (1945), 50 species were not found during 1978-84. It is suggested that more species were absent than can be accounted for by natural species turnover and that 10 medium-to-large species may have been extirpated or greatly reduced by hunting and a further 12 species by the loss of mixed deciduous forest from the surrounding plains. The apparent absence of 4 small, formerly common montane species may be due to the gross disturbance of their high elevation, evergreen forest habitat.

Illegal hunting, forest burning and the felling of larger trees continues to be practised by both Thai and Hmong people resident on the mountain and is likely to further reduce bird diversity within the park. Recommendations for improved protection are made.

INTRODUCTION

Since birds are among the more conspicuous and easily identified inhabitants of tropical forests, they are highly suitable as indicators of habitat type and quality. The inventorying of bird communities is of great value to conservation planners and scientists, both in the selection of sites for nature reserves and in the formulation of conservation strategies (e.g. DIAMOND, 1980; WILCOX, 1980; TERBORGH & WINTER, 1980). In addition, much of the data used in the development of island biogeographic theory (MACARTHUR & WILSON, 1967) and its application to conservation has come from detailed studies on bird communities (DIAMOND, 1975, 1976; WILLIS, 1974).

In Thailand, bird species inventories have been published for very few sites (e.g. MCCLURE, 1974; WILES, 1980) and are best regarded as being only preliminary lists. There is almost no published information on the effects of man on bird communities in Thailand. Also, most of the information which does exist, especially for nature reserves, has been collected only in the last 20 years and detailed historical records are few.

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Doi Suthep-Pui National Park covers a mountain which is still mostly forested, the highest summit of which (Doi Pui, 1685 m) lies only 6.5 km WNW of the city of Chiang Mai. It is unusual in that its ornithology was studied in detail half a century ago, during 1928–1937, and a species list together with comments on species' status was compiled (DEIGNAN 1945).

This study updates the list of birds known from Doi Suthep-Pui National Park (henceforth referred to as Doi Suthep), examines changes or apparent changes in the status of some species since DEIGNAN (1945) and outlines the present conservation situation and future prospects for bird populations in the park.

THE STUDY AREA

Doi Suthep is a more-or-less isolated mountain massif, connected by narrow ridges above 1000 m elevation to Doi Daen and Doi Khom Rong to the west and north-west. These three peaks are isolated from other mountains by the Chiang Mai plain (ca. 300 m) to the east and south, by the valley of the Nam Mae Samoeng to the west and the valley of the Nam Mae Raem to the north. Doi Daen and Doi Khom Rong are outside the National Park (162 sq. km), which is bounded by the valley of the Nam Mae Sa to the north and by that of the Nam Mae Tha Chang to the south and west (Fig. 1). The park was declared in 1981.

The substratum is of prepermian gneiss and micaschist (BROWN, 1953). Rainfall, measured at Doi Pui, averaged 1715 mm per year during 1976–81, most of the total falling during May to October. Mean temperatures, measured at Chiang Mai, are in the range 28–30° C in the hottest months (April and May), falling to 20–22° C in December and January (Data from the Meteorological Department, Bangkok).

The vegetation has been described in detail by KUCHLER & SAWYER (1967) and its classification is simplified here, following NEAL (1967). Mixed deciduous woodland, characterised by the presence of *Butea monosperma*, *Caesaria grewiaefolia* and *Tectona grandis*, covered the Chiang Mai plain and parts of the extreme lower mountain slopes in the past, but has been almost completely removed and replaced with houses and with the planted trees and shrubs of suburban gardens. Deciduous dry dipterocarp forest, in which *Shorea obtusa*, *S. siamensis* and *Dipterocarpus obtusifolius* predominate, occupies the lower mountain slopes. With increasing elevation there is a greater evergreen component, especially along stream valleys, and above 900–1000 m a hill evergreen formation, in which *Quercus* spp., *Lithocarpus* spp. and *Castanopsis* spp. predominate, occurs. Pines, *Pinus kesiya* and *P. merkusii*, occur in small stands on the drier ridges.

The vegetation has been greatly modified, owing to the extensive human settlement of the mountain, mostly within the last 90 years. Two Hmong villages, at least four Buddhist monasteries and a great many Thai households are situated within or very close to the park boundaries. Undergrowth and a few standing trees are burnt annually by man over an estimated 60 percent of the park area (pers. observation) in all vegetational zones. Disturbance of the habitat is greatest above 900–1000 m, where Hmong villagers have cleared large areas of forest for their shifting cultivation. Many areas now support a mosaic of successional habitats (open grassland, scrub and secondary growth) alternating with relict stands of forest trees on the steepest slopes. Agricultural and forestry developments have led to small areas being planted with *Eucalyptus* sp., exotic conifers, herbs and fruit orchards. The largest areas of intact forest remain on the east-facing slopes of Doi Suthep and Doi Pui. A road was constructed linking Chiang Mai with Wat Phrathat (1100 m) in 1935 and was extended as far as Phuphing Palace (1400 m) in 1962, and subsequently to a point near the summit of Doi Pui.

METHODS

During December 1978 to February 1984, the author spent 41 days searching for birds on Doi Suthep-Pui. Representative areas in all habitats and altitudinal zones were visited, although coverage was most intensive at elevations of 1000 to 1685 m. Visits were made in all months of the year except June and August. The author's observations were supplemented by sightings made during this period by visiting ornithologists who filed their records at the Association for the Conservation of Wildlife. All observations were made with binoculars; no netting or collecting of specimens was carried out. Most observations were made on the eastern slopes of the mountain, which correspond with the areas worked intensively by DEIGNAN (1945) and with those visited during the work of the Migratory Animal Pathological Survey during 1964–71 (DICKINSON & CHAIYAPHUN, 1967; KING, 1966; MCCLURE & LEELAVIT, 1972; THONGLONGYA, 1968).

RESULTS

To date, a total of 326 bird species have been recorded from Doi Suthep and these are listed, together with their observed habitats and altitudinal ranges on the mountain, in Appendix 1. The bird community is highly diverse and in number of species is comparable with that on Doi Inthanon (343 species so far known; ROUND, in prep.), in spite of the greater height (2590 m) and greater montane area of the latter. With a maximum elevation of only 1685 m, Doi Suthep lacks a small number of species (e.g. Chestnut-tailed Minla, *Minla strigula*, and White-browed Shortwing, *Brachypteryx montana*), known only from a very few of the highest peaks. In addition, certain other montane species (e.g. Rufous-winged Fulvetta, *Alcippe castaneiceps*) are very scarce on Doi Suthep at elevations where they are common on Doi Inthanon.



Figure 1. Doi Suthep-Pui National Park, Chiang Mai Province. Map was traced from Royal Thai Survey Dept. sheet 4746 I, Series L 7017.

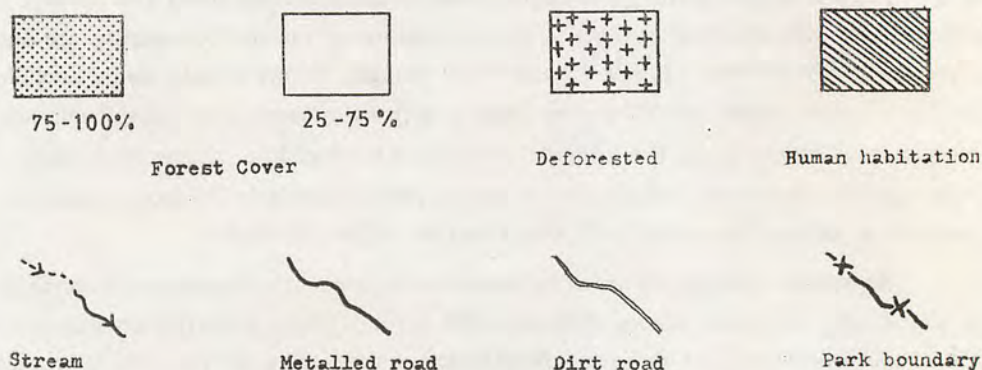


Figure 2. Key to map shown in Fig. 1.

Of 265 species listed for Doi Suthep by DEIGNAN (1945), 215 (81.1 percent) were recorded during the present survey. Of the 61 additional species found since that time, all but 12 were noted during the present study (Appendix 1).

Differences in the composition of the present species list and that of DEIGNAN may be the result of a number of factors. Firstly, any apparent change in status may be due to differing detection abilities among observers, especially for inconspicuous birds which haunt dense cover. DEIGNAN relied to a great extent on collecting specimens with a gun, while this study was based entirely upon field observations. In fact, improved field techniques and equipment and increased knowledge have greatly facilitated detection and identification and this alone may account for the large number of additional species recorded. Other explanations must be sought, however, to account for the 50 species recorded by DEIGNAN which were not seen in the present study. While chance may have contributed, it cannot account for the apparent absence of all these species, including many large and conspicuous birds such as hornbills, and the evidence indicates that some real changes in species' status have occurred. Changes in status may be due to demographic reasons: species may have become more or less abundant due to natural immigration and emigration or become extinct due to chance (MACARTHUR & WILSON, 1967). Species turnover is a well recognised phenomenon and average annual turnover rates have been measured at 0.9% to 13.0% for islands (JONES & DIAMOND, 1976; DIAMOND & MAY, 1976). On Barro Colorado Island (17 sq. km), 48 of 208 breeding birds have become extinct in the 60 years since the island was isolated by floodwaters from surrounding forests (WILLIS, 1974). However, it is most unlikely that 50 species could have become extinct on Doi Suthep, a much larger area (162 sq. km), in less than 50 years due to turnover. While some changes may be due to species

turnover, in a situation where gross human interference is evident, as on Doi Suthep, it is more likely that observed changes in the composition of the bird community are due primarily to disturbance. I will discuss these changes. Direct effects would include hunting pressure, which would be most likely to affect the larger, more conspicuous and less numerous species while the principal indirect effect would be habitat modification. Deforestation removes or restricts the amount of habitat available for some species but creates new habitats (e.g. grassland) which may be utilised by others.

Because the criteria on which subjective assessments of status such as 'abundant' or 'uncommon' will differ among observers, this paper is based primarily on examination of species' presence or absence. Nonetheless, among the great majority of species recorded both by DEIGNAN and subsequently, there is a fairly close correspondence in recorded status so that where major changes (e.g. from 'common' to 'rare') are evident, they have been used to support arguments.

Species Which Have Become More Common

As already mentioned, the large number of new species recorded is due almost solely to improved and intensified coverage and few species are thought to have become genuinely more common. Five species found during this survey, *Columba livia*, *Cacomantis merulinus*, *Centropus sinensis*, *Pycnonotus blanfordi* and *Passer montanus* may not have been mentioned for Doi Suthep by DEIGNAN owing to the fact that all were extremely common in lowland areas so that their presence on or absence from Doi Suthep was not relevant in the context of his (1945) work, "*The Birds of Northern Thailand*". However, two of these species, *Columba livia* and *Passer montanus*, are commensals of man and may well have colonised the mountain or increased in numbers there with the growth of the human population. Neither *Tephrodornis pondicerianus* nor *Prinia hodgsonii*, both found during the present survey, were recorded by DEIGNAN who specifically commented on the absence of the latter species from the mountain. The former is a bird of open deciduous woodlands of the lowlands and the latter an inhabitant of scrub and open areas, and both may have colonised the mountain along the corridor of disturbed, dry edge habitats along the road. The occurrence of 2 *T. pondicerianus* in disturbed evergreen forest at 1100 m on 21 May 1981 (so far, the only record for the mountain) deserves particular mention. *Alcippe poiocephala* was stated to be rare by DEIGNAN on the basis of three records from the lower slopes of the mountain. Above 900–1000 m, it usually is replaced by the closely similar *A. morrisonia* but, in fact, both these species were found commonly in areas of disturbed evergreen forest at 1000–1100 m. *A. poiocephala* may have become more common or

been able to extend its altitudinal range due to habitat disturbance, or it may conceivably have been overlooked by DEIGNAN. Another rather drab babbler, *Trichastoma tickelli*, previously described as rare on Doi Suthep was also found commonly during this study.

Species Which Have Become Less Common or Extirpated

Any changes in the bird community which may be attributable to man or to the present isolation of the forest habitat on Doi Suthep should be sought among resident rather than migrant species, assuming that no migrant species is any more restricted to any particular component of the habitat or area than is any resident species. Sedentary species should be more vulnerable to local extinction or reduction in population than should migrant species which have greater dispersal capacity and which might more easily recolonise the mountain from elsewhere. Migrant species, in any case, are dependent upon Doi Suthep for only a portion of their yearly cycle, in most cases during the temperate winter. Aerial feeders (swifts and swallows) were excluded from the analysis. Of 188 resident species detected by DEIGNAN, 151 were found during this study, as were 59 of 71 migrant or partly migrant species. The proportion of residents to migrants does not differ significantly between our surveys ($\chi^2 = 0.258$, $p > 0.5$). To some extent, any differences which may occur may be offset by the lower probability of encountering any individual migrant species, some of which are irregular or irruptive in occurrence or may winter predominantly to the south and only occur in NW Thailand while making brief stops during passage.

The rest of this analysis deals only with the 37 resident species recorded by DEIGNAN which were not found during this study and with those other resident species where a decline is evident. These may be divided into groups as follows.

Species affected by hunting or other direct disturbance: *Gyps bengalensis*, *Sarcogyps calvus*, *Arborophila rufogularis*, *A. brunneopectus*, *Syrnaticus humiae*, *Ptilolaemus tickelli*, *Aceros nipalensis*, *Rhyticeros undulatus*, *Anthracoceros albirostris*, *Buceros bicornis*. These are all medium-to-large-sized birds, most of which are shot for food by rural people (game birds, hornbills) or which are vulnerable to direct disturbance or persecution (birds of prey). Both vultures were common in the 1930s in open lowlands around Chiang Mai, when small numbers roosted on the lower slopes of the mountain. CHEKE (1972) was the first to comment on their disappearance and suggested that poisoning of stray dogs with strychnine may have been implicated along with a general reduction in the availability of carrion and perhaps a shortage of undisturbed nesting trees. K. KOMOLPHALIN (pers. comm.) has also mentioned that vulture bones are used in the Chinese medicine trade and there is such a widespread possession of firearms that many may have been shot.

Arborophila rufogularis was still fairly common on the mountain in the 1960s (KING, pers. comm.) but has now certainly been reduced or extirpated. All the *Arborophila*, though difficult to see, are easily detected by their calls in the early morning which greatly facilitates detection by hunters. It is noteworthy that the only species recorded, *A. charltonii*, frequents lower elevations than *A. rufogularis* or *A. brunneopectus*, below the main areas of occupation by the Hmong people, where it would be subject to less intense hunting pressure. *Syrmaticus humiae* frequents small clearings and open woodlands and may be especially vulnerable to hunters. It was already rare by DEIGNAN's time and he did not record it after 1935. The species is listed as 'rare' in the ICBP Bird Red Data Book (KING, 1981).

Of the 5 species of hornbill formerly occurring on Doi Suthep, 2 of which were listed as common to fairly common, none remain. Hornbills are widely shot for food by rural people and appear to have been extirpated in all the more accessible parts of the Northwest. The only species encountered by the author in over 130 days observation in Chiang Mai Province was *Anthracoceros albirostris*, the smallest and probably the most tolerant and adaptable species, at only one locality. However, Great Hornbill, *Buceros bicornis*, was still present on Doi Inthanon until at least 1963 (DICKINSON, 1964).

A number of other species appear to have been greatly reduced in numbers. Both *Gallus gallus* and *Lophura nycthemera*, described as 'common' and 'rather common', respectively, are now very scarce on Doi Suthep. *Ducula badia*, described by DEIGNAN as 'very common on all the higher peaks of the North' is now seldom seen and only infrequently heard on Doi Suthep, while it is still common at similar elevations in other national parks which lack hilltribes within their boundaries and where hunting pressure is less intense (e.g. Phu Rua, Loei Province; Khao Yai, Northeast Thailand).

Species affected by loss of mixed deciduous woodland and urbanisation around the base of the mountain: *Butastur liventer*, *Polihierax insignis*, *Psittacula eupatria*, *P. alexandri*, *Caprimulgus asiaticus*, *Picus vittatus*, *P. erythropygius*, *Dinopium javanense*, *Muelleripicus pulverulentus*, *Dryocopus javensis*, *Dendrocitta vagabunda*, *Sitta castanea*. This group is composed mainly of species which inhabit lowland deciduous forests. Although many of these birds still occur in dry dipterocarp forests elsewhere in Chiang Mai Province, in Thailand as a whole they tend to be commoner in areas where there is also a mixed deciduous component (pers. observation). While they have almost certainly been reduced in numbers, some probably still occur at low density on the lower slopes of the mountain. *Butastur*, *Polihierax*, *Picus erythropygius*, *Muelleripicus*, *Dryocopus*, *Dendrocitta* and *Sitta* are all still found in similar habitat on Doi Inthanon, the foot of which is much less urbanised than Doi Suthep while *Urocissa erythrorhyncha*, which often occurs in association with *Dendrocitta vagabunda*, still occurs on Doi Suthep. Both *P. vittatus* and *Dinopium javanense* may well frequent suburban gardens.

A noteworthy absence is that of the two *Psittacula* spp. *P. alexandri* formerly occurred around Chiang Mai in flocks of many hundreds, while *P. eupatria* was irregularly common. Because both species tend to be colonial breeders and roosters, they may be especially vulnerable to direct disturbance as well as habitat destruction. Large numbers have almost certainly been taken for the cage-bird trade.

Species inhabiting lowland evergreen forest: Megalaima australis, Corydon sumatranus, Melanochlora sultanea, Dicaeum chrysorrheum. As already indicated, there is very little evergreen habitat below 900–1000 m, so that the above species would necessarily have very small populations on Doi Suthep, and all were listed as 'rare' by DEIGNAN. At least some of the above species probably still occur and may have been overlooked by chance. However, with repeated annual burning, evergreen forest at lower elevations may have become further degraded and fragmented in recent years so that these species would be especially vulnerable. *Melanochlora sultanea*, though found in evergreen by DEIGNAN, is actually quite common in lowland mixed deciduous elsewhere in Thailand, so that the complete denudation of this habitat surrounding Doi Suthep has probably also contributed to its disappearance.

Species inhabiting hill evergreen forest: Sitta magna, Certhia discolor, Garrulax erythrocephalus, Niltava grandis. The apparent absence of these 4 species during the present study is particularly noteworthy. *Sitta magna* and *Certhia discolor* were described as 'not uncommon', *Garrulax erythrocephalus* as 'numerous' on Doi Inthanon... 'rather less common on Doi Suthep' and *Niltava grandis* as 'common or very common... on the higher hills' (DEIGNAN, 1945). All except *G. erythrocephalus* were still present on Doi Suthep in the 1960s when their status was not commented on. *S. magna* appears to be particularly associated with pines (ROUND, 1983) and may have a naturally small population on the mountain. *C. discolor* is usually associated with mature broadleaved trees, and *G. erythrocephalus* and *N. grandis* with dense undergrowth and middle storey vegetation in moist, shady forest areas. All 3 species are still common on Doi Inthanon but are now either absent or very rare on Doi Suthep. As all 3 species are small, they are unlikely to have been affected by hunting; none appear to be especially sought after as cage-birds. They may, however, have been affected by habitat disturbance, especially the use of fire by man to destroy forest undergrowth. In addition, many villagers on the mountain, both Thai and Hmong, illegally cut mature trees in order to satisfy both timber and fuel needs. Though quantitative data are lacking, it is evident that this is gradually degrading the remaining areas of standing evergreen forest which are becoming drier and more open, with more grassy and thorny undergrowth. B. KING (pers. comm.), who has known the mountain for over 15 years, commented on observed vegetational changes and stated that many birds of the moist understory appeared less numerous in 1982 than formerly.

Other things being equal, montane birds must necessarily have smaller areas available to them, and hence smaller populations, than birds which inhabit lower slopes. They may therefore be more vulnerable to local extinction.

Other species not detected: Hieraaetus kienerii, Falco severus, Turnix tanki, Macropygia ruficeps, Streptopelia tranquebarica, Abroscopus albogularis, Sturnus nigricollis. These species were not found during this survey for a variety of possible reasons, but most probably still occur on the mountain. *Hieraaetus kienerii, Falco severus, Macropygia ruficeps* and *Abroscopus albogularis* have probably always been rare on Doi Suthep and were recorded by DEIGNAN on only 1-3 occasions. While a large raptor such as *H. kienerii* would be vulnerable to shooting or habitat destruction, the larger Black Eagle, *Ictinaetus malayensis*, which has similar habitat requirements, was still found. *Turnix tanki* and *Sturnus nigricollis* should both be fairly common in areas of grass and scrub. The former is secretive and easily overlooked, while the latter is predominantly a bird of lowlands and was also probably missed by chance.

DISCUSSION

It is clear that while Doi Suthep has been subjected to intensive use by man, resulting in a substantial loss of forest cover and a gradual degradation of remaining habitat, it nevertheless continues to support a rich and diverse bird fauna. Of the 264 species recorded during 1978-84, many species were ecologically relatively tolerant Sino-Himalayan montane species, frequenting forest edge and secondary growth. The only species of birds which can be said with certainty or near certainty to have disappeared are those large and conspicuous species such as hornbills, vultures and also some gamebirds which have been hunted out. Hunting has also led to the extirpation of many mammals from Doi Suthep (e.g. gibbon, *Hylobates lar*; leaf monkey, *Presbytis phayrei*; Sambar Deer, *Cervus unicolor*; and possibly Barking Deer, *Muntiacus muntjak*). The absence of a number of other, smaller birds may be attributed to habitat disturbance, in particular the reduction of moist undergrowth due to the repeated use of fire and the selective cutting of larger trees, together with the complete denudation of areas of mixed deciduous forest which formerly occupied areas around the foothills. Some of these species may possibly still occur on the mountain but have been overlooked owing to a great reduction in their populations.

All three deleterious activities, hunting, burning and forest clearance, are continuing more or less unchecked in Doi Suthep-Pui National Park and may be further expected to reduce bird species diversity. Hunters may be encountered almost any

early morning and having extirpated hornbills, most gamebirds and pigeons, now seek ever smaller species as quarry. Red-headed Trogon, *Harpactes erythrocephalus*, and even minivets, bulbuls and thrushes are shot (pers. observation). With continued burning and forest clearance, the most sensitive species are likely to be those dependent upon intact forest with large trees or with lush undergrowth, such as trogons, some woodpeckers, broadbills, *Serilophus lunatus*, *Psarisomus dalhousiae*, pittas, *Pitta* spp. and ground-thrushes *Zoothera* spp. CRONIN (1979) discussed the effects of intensive human use of relict forest patches in Nepal and concluded that selective cutting and the regular use of fire had resulted in the local extinction of many small birds (e.g. *Cochoa viridis*, *Tesia cyaniventer*) from parts of the Arun Valley.

The problems identified on Doi Suthep are not unique to this area and, indeed, occur in almost every national park or wildlife sanctuary in Thailand. Their severity is, however, greater in the North-west, particularly in upland areas, owing to the high population density of hilltribes living in and around nature reserves there and there is consequently a more urgent need to find solutions. The degree of further damage sustained will depend upon the extent to which the hilltribes can be weaned away from their traditional lifestyle in favour of alternative, less damaging and potentially more remunerative activities. Considerable progress has already been made in Thailand with establishing stable agriculture on already cleared areas, bringing about a decrease in the areas under shifting cultivation, both on Doi Suthep and elsewhere. In addition, the Hmong on Doi Suthep already benefit from tourism there; many own stalls and sell food and handicrafts to visitors. At least on Doi Suthep, hunting is probably more of a recreational activity than a means of subsistence owing to the relative prosperity of the Hmong there. There is, therefore, a good case for the National Parks Division to institute more effective protection measures, including penalisation of hunters and those who cut trees, provided that this is offset with direct benefits to the Hmong which may accrue directly from the area's status as a National Park. One way in which this might be done is through the employment of rural people as park guards and as skilled guides, conducting visitors on short walks and forest treks.

The shortcomings of this paper are obvious. Though changes in the structure of the bird community are evident, the reasons for this can only be inferred in the light of observed trends and precise data on the effects of habitat disturbance on birds are lacking. Yet Doi Suthep, owing to its accessibility and proximity to the campus of Chiang Mai University, presents unparalleled opportunities for carrying out such detailed ecological research. Projects which could yield valuable data relating to bird conservation are:

(1) Line transect or capture-recapture studies to determine the density and composition of the bird fauna in different habitats or in similar habitats with differing degrees of disturbance.

(2) Monitoring of the nesting and fledging success of birds in disturbed and undisturbed areas.

(3) Feeding behaviour and dietary studies.

(4) Long term monitoring of populations.

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Appendix 1. A systematic list of bird species recorded from Doi Suthep-Pui National Park, Chiang Mai Province, together with information on habitat and past and present status. N = resident; M = migrant or winter visitor; C = abundant or common; U = fairly common to uncommon; R = rare, fewer than five records; X = present, status not assessed. Habitats: D = deciduous forest; E = evergreen forest; S = secondary growth, scrub or grassland. Records for 1964-71 from KING (1966 and pers. comm.), DICKINSON & CHAIYAPHUN (1967), McCLURE & LEELAVIT (1972), THONGLONGYA (1968).

Common name	Scientific name	Deignan (1945)	1964 - 71	1978 - 84	Season- ality	Habitat
Jerdon's Baza	<i>Aviceda jerdoni</i>				R M	E, 1400m
Black Baza	<i>Aviceda leuphotes</i>	C			U NM	D, E, 400-1200m
Crested Honey Buzzard	<i>Pernis ptilorhyncus</i>	U			U NM	D, E
White-rumped Vulture	<i>Gyps bengalensis</i>	C			N	mostly plains; extirpated
Red-headed Vulture	<i>Sarcogyps calvus</i>	C			N	mostly plains; extirpated
Crested Serpent Eagle	<i>Spilornis cheela</i>	C			R N	D, E
Northern Goshawk	<i>Accipiter gentilis</i>	R	X		R M	
Besra	<i>Accipiter virgatus</i>		X		N	
Crested Goshawk	<i>Accipiter trivirgatus</i>		X	X	N	D, E
Chinese Goshawk	<i>Accipiter soloensis</i>		X	X	M	
Shikra	<i>Accipiter badius</i>	C	X	X	N	D, E, S
Rufous-winged Buzzard	<i>Butaster liventer</i>	U	X		N	D
Grey-faced Buzzard	<i>Butastur indicus</i>	U	X		M	D, E, S
Common Buzzard	<i>Buteo buteo</i>		X	X	M	D, E, S
Black Eagle	<i>Ictinaetus malayensis</i>	R			R N	E
Rufous-bellied Eagle	<i>Hieraetus kienerii</i>	R			N	E
Changeable Hawk-Eagle	<i>Spizaetus cirrhatus</i>		X		N	E
Mountain Hawk-Eagle	<i>Spizaetus nipalensis</i>	R			M	E
White-rumped Falcon	<i>Polihierax insignis</i>	U			N	D

Appendix 1. (Continued)

Common name	Scientific name	Deignan 1964 1978 Season-				Habitat
		(1945)	- 71	- 84	ality	
Collared Falconet	<i>Microhierax caerulescens</i>	C	X	U	N	D, E, S 300-1400 m
Eurasian Kestrel	<i>Falco tinnunculus</i>	U			M	S
Northern Hobby	<i>Falco subbuteo</i>		R		M	
Oriental Hobby	<i>Falco severus</i>	R			N	
Chinese Francolin	<i>Francolinus pintadeanus</i>	C		U	N	D, S
Rufous-throated Partridge	<i>Arborophila rufogularis</i>	C	U		N	E, above 1200 m; possibly extirp.
Bar-backed Partridge	<i>Arborophila brunneopectus</i>	C			N	E, 1050-1350 m; possibly extirp.
Scaly-breasted Partridge	<i>Arborophila charltonii</i>	R		R	N	E, 800-1350 m
Silver Pheasant	<i>Lophura nycthemera</i>	C		R	N	E
Red Junglefowl	<i>Gallus gallus</i>	C		R	N	D, E, 300-1350 m; greatly reduced
Humes's Pheasant	<i>Syrnaticus humiae</i>	R			N	E, 1200-1685 m; extirpated
Yellow-legged Buttonquail	<i>Turnix tanki</i>	R			N	S
Woodcock	<i>Scolopax rusticola</i>	U	X	U	M	D, E, 300-1685 m
Pin-tailed Pigeon	<i>Treron apicauda</i>	U		U	N	E, 1000-1200 m
Wedge-tailed Pigeon	<i>Treron sphenura</i>	U	X	U	N	E, 900-1500 m
Mountain Imperial Pigeon	<i>Ducula badia</i>	C		U	N	E, above 900 m; greatly reduced
Rock Pigeon	<i>Columba livia</i>			X	N	
Barred Cuckoo-Dove	<i>Macropygia unchall</i>	U	X	R	N	E, above 800 m; reduced
Little Cuckoo-Dove	<i>Macropygia ruficeps</i>	R			N	E, above 1050 m
Oriental Turtle Dove	<i>Streptopelia orientalis</i>	U			NM	S, D, lower slopes
Red Turtle Dove	<i>Streptopelia tranquebarica</i>	R			N	mostly plains
Emerald Dove	<i>Chalcophaps indica</i>	C	X	U	N	E, up to 1500 m; reduced
Alexandrine Parakeet	<i>Psittacula eupatria</i>	U			N	D, plains; probably extirp.
Red-breasted Parakeet	<i>Psittacula alexandri</i>	C			N	D, S, up to 1400 m; prob. extirp.
Grey-headed Parakeet	<i>Psittacula finschii</i>	U		R	N	D, S, up to 1200 m
Vernal Hanging Parrot	<i>Loriculus vernalis</i>	C		U	N	D, E, plains to 1300 m

Appendix 1. (Continued)

Common name	Scientific name	Deignan 1964 1978 Season-				Habitat	
		(1945)	- 71	- 84	ality		
Large Hawk-Cuckoo	<i>Cuculus sparverioides</i>	C	X	X	N	D, E, 800-1685 m	
Hodgson's Hawk-Cuckoo	<i>Cuculus fugax</i>			R	N	E, 1600m	
Indian Cuckoo	<i>Cuculus micropterus</i>	C		X	NM	E, 800-1685 m	
Common Cuckoo	<i>Cuculus canorus</i>	R			M	900m	
Oriental Cuckoo	<i>Cuculus saturatus</i>	R		X	M	600-1100 m	
Banded Bay Cuckoo	<i>Cacomantis sonnerati</i>	U	X	U	N	D, E, up to 1400 m	
Plaintive Cuckoo	<i>Cacomantis merulinus</i>			X	N	S, mostly plains	
Asian Emerald Cuckoo	<i>Chrysococcyx maculatus</i>	R		U	NM	E, 700-1685 m	
Violet Cuckoo	<i>Chrysococcyx xanthorhynchus</i>			R	NM	D, 800 m	
Drongo Cuckoo	<i>Surniculus lugubris</i>	U		U	M	D, E, plains 1200 m	
Green-billed Malkoha	<i>Phaenicophaeus tristis</i>	C		C	N	D, E, plains 1500 m	
Greater Coucal	<i>Centropus sinensis</i>			X	C	N	S, plains-summit
Lesser Coucal	<i>Centropus bengalensis</i>	C		X	U	N	S, plains-summit
Bay Owl	<i>Phodilus badius</i>			R		E	
Mountain Scops-Owl	<i>Otus spilacephalus</i>			X	X	N	E, 1000-1400 m
Asian Scops-Owl	<i>Otus sunia</i>			X	X	NM	D, E
Collared Scops-Owl	<i>Otus bakkamoena</i>			X	X	N	D, E, S, 1000 m
Collared Owlet	<i>Glaucidium brodiei</i>	C		X	X	N	E, above 800 m
Asian Barred Owlet	<i>Glaucidium cuculoides</i>	R			C	N	D, E, plains-1400 m
Brown Wood-Owl	<i>Strix leptogrammica</i>	R			R	N	E, 1400-1685 m
Hodgson's Frogmouth	<i>Batrachostomus hodgsoni</i>			X	X	N	E, 1000-1600m
Grey Nightjar	<i>Caprimulgus indicus</i>			X		M	E, S, summit (1685 m)
Large-tailed Nightjar	<i>Caprimulgus macrurus</i>			X	X	N	D, E, S, plains-1400 m
Indian Nightjar	<i>Caprimulgus asiaticus</i>	X				N	D, S, plains
Himalayan Swiftlet	<i>Aerodramus brevirostris</i>	C		X		N	
Brown Needletail	<i>Hirundapus giganteus</i>	C		X	C	NM	

Appendix 1. (Continued)

Common name	Scientific name	Deignan (1945)	1964 - 71	1978 - 84	season- ality	Habitat
Dark-rumped Swift	<i>Apus acuticaudus</i>		R		M	
Fork-tailed Swift	<i>Apus pacificus</i>	U	X	U	NM	
House Swift	<i>Apus affinis</i>			U	N	
Crested Treeswift	<i>Hemiprogne coronata</i>	U		U	N	D, plains-1000 m
Orange-breasted Trogon	<i>Harpactes oreskios</i>	C		U	N	E, plains-1100 m
Red-headed Trogon	<i>Harpactes erythrocephalus</i>	C	X	U	N	E, 750-1685 m
Banded Kingfisher	<i>Lacedo pulchella</i>	U		R	N	E, 600-1150 m
Ruddy Kingfisher	<i>Halcyon coromanda</i>			R	M	E
White-throated Kingfisher	<i>Halcyon smyrnensis</i>	C		C	N	D, S, lower slopes
Chestnut-headed Bee-Eater	<i>Merops leschenaulti</i>	C	X	C	N	D, E, 600-1685 m
Green Bee-Eater	<i>Merops orientalis</i>	C	X	C	N	D, S, lower slopes
Blue-bearded Bee-Eater	<i>Nyctyornis athertoni</i>	U	X	U	N	E, 850-1685 m
Dollarbird	<i>Eurystomus orientalis</i>				R	D, lower slopes
Hoopoe	<i>Upupa epops</i>	R		R	N	D, S, plains-1350 m
Brown Hornbill	<i>Ptilolaemus tickelli</i>	R			N	E, 1050 m; extirp.
Rufous-necked Hornbill	<i>Aceros nipalensis</i>	U			N	E, 1000-1685 m; extirp.
Wreathed Hornbill	<i>Rhyticeros undulatus</i>	R			N	E, plains-1685 m; extirp.
Pied Hornbill	<i>Anthracoceros albirostris</i>	U			N	D, E, plains-650 m; extirp.
Great Hornbill	<i>Buceros bicornis</i>	C			N	E, 1050-1685 m; extirp.
Great Barbet	<i>Megalaima virens</i>	C	X	C	N	E, 800-1685 m
Lineated Barbet	<i>Megalaima lineata</i>	C		X	N	D, plains-800 m
Golden-throated Barbet	<i>Megalaima franklinii</i>	C	X	X	N	E, above 1350 m
Blue-throated Barbet	<i>Megalaima asiatica</i>	C	X	C	N	E, 800-1400 m
Blue-eared Barbet	<i>Megalaima australis</i>	R			N	
Speckled Piculet	<i>Picumnus innominatus</i>	C	X	C	N	E, 800-1400 m
White-browed Piculet	<i>Sasia ochracea</i>		X	R	N	E, 1400 m

Appendix 1. (Continued)

Common name	Scientific name	Deignan (1945)	1964 - 71	1978 - 84	Season- ality	Habitat
Rufous Woodpecker	<i>Celeus brachyurus</i>		X	R	N	D, E, 800 m
Laced Woodpecker	<i>Picus vittatus</i>	U			N	D, plains-600 m
Grey-headed Woodpecker	<i>Picus canus</i>	U	X	U	N	D, E, lower slopes-1350 m
Black-headed Woodpecker	<i>Picus erythropygius</i>	C			N	D, plains-800 m
Greater Yellownape	<i>Picus flavinucha</i>	U	X	U	N	D, E, 800-1685 m
Lesser Yellownape	<i>Picus chlorolophus</i>	C	X	U	N	E, 700-1685 m
Common Goldenback	<i>Dinopium javanense</i>	C			N	D, plains-600 m
Great Slaty Woodpecker	<i>Muelleripicus pulverulentus</i>	R			N	D, up to 850 m
White-bellied Woodpecker	<i>Dryocopus javensis</i>	U			N	D, plains-600 m
Stripe-breasted Woodpecker	<i>Picoides atratus</i>	C	X	U	N	E, 1200-1685 m
Grey-capped Woodpecker	<i>Picoides canicapillus</i>	C	X	C	N	D, E, plains-1400 m
Bay Woodpecker	<i>Blythipicus pyrrhotis</i>	U	X	U	N	E, 1000-1685 m
Greater Goldenback	<i>Chrysocolaptes lucidus</i>	C		U	N	D, E, plains-1685 m
Dusky Broadbill	<i>Corydon sumatranus</i>	R			N	E, 750-1000 m
Silver-breasted Broadbill	<i>Serilophus lunatus</i>	R	X	U	N	E, 800-1600 m
Long-tailed Broadbill	<i>Psarisomus dalhousiae</i>	R	X	U	N	E, 1000-1600 m
Rusty-naped Pitta	<i>Pitta oatesi</i>	R	X	R	N	E, 900-1685 m
Blue Pitta	<i>Pitta cyanea</i>	R	X	U	N	E, 800-1500 m
Dusky Crag Martin	<i>Hirundo concolor</i>	U		U	N	
Barn Swallow	<i>Hirundo rustica</i>		X	C	M	
Red-rumped Swallow	<i>Hirundo daurica</i>	C	X	C	NM	
Asian House Martin	<i>Delichon dasypus</i>	C	X	C	N	
Bar-winged Flycatcher-Shrike	<i>Hemipus picatus</i>	C	X	C	N	E, 600-1500 m
Large Wood-Shrike	<i>Tephrodornis virgatus</i>	C	X	C	N	E, 600-1200 m
Common Wood-Shrike	<i>Tephrodornis pondicerianus</i>			R	N	E, (disturbed), 1100 m

Appendix 1. (Continued)

Common name	Scientific name	Deignan (1945)	1964 - 71	1978 - 84	Season- ality	Habitat
Large Cuckoo-Shrike	<i>Coracina novaehollandiae</i>	C	X	C	N	D, E, plains-1685 m
Indochinese Cuckoo-Shrike	<i>Coracina polioptera</i>	C		X	N	E, 750-1350 m
Black-winged Cuckoo-Shrike	<i>Coracina melaschista</i>	C	X	C	MN	E, 1000-1685 m
Rosy Minivet	<i>Pericrocotus roseus</i>	U	X	C	M	D, E, plains-1400 m
Small Minivet	<i>Pericrocotus cinnamomeus</i>	U		X	N	D, plains-850 m
Grey-chinned Minivet	<i>Pericrocotus solaris</i>	C	X	C	N	E, 1000-1685 m
Short-billed Minivet	<i>Pericrocotus brevirostris</i>	C	X	C	N	E, 1200-1685 m
Long-tailed Minivet	<i>Pericrocotus ethologus</i>	U	X	U	N	E, 1000-1400 m
Scarlet Minivet	<i>Pericrocotus flammeus</i>	C	X	U	N	D, E, plains-1685 m
Common Iora	<i>Aegithina tiphia</i>	U	X	U	N	D, S, plains-750 m
Golden-fronted Leafbird	<i>Chloropsis aurifrons</i>	C	X	U	N	D, plains-750 m
Blue-winged Leafbird	<i>Chloropsis cochinchinensis</i>	C		C	N	E, 750-1000 m
Orange-bellied Leafbird	<i>Chloropsis hardwickii</i>	C	X	C	N	E, 900-1685 m
Striated Bulbul	<i>Pycnonotus striatus</i>	U	X	U	N	E, above 1500 m
Black-headed Bulbul	<i>Pycnonotus atriceps</i>	U		U	N	D, E, 800-900 m
Black-crested Bulbul	<i>Pycnonotus melanicterus</i>	C	X	C	N	D, E, plains-1685 m
Red whiskered Bulbul	<i>Pycnonotus jocosus</i>	C		C	N	S, plains-1685 m
Sooty-headed Bulbul	<i>Pycnonotus aurigaster</i>	C	X	C	N	S, plains-1685 m
Flavescent Bulbul	<i>Pycnonotus flavescens</i>	C	X	C	N	S, above 1050 m
Blanford's Bulbul	<i>Pycnonotus blanfordi</i>			X	N	S, D, plains and lower slopes
Puff-throated Bulbul	<i>Criniger pallidus</i>	C	X	C	N	E, 700-1150 m
Grey-eyed Bulbul	<i>Hypsipetes propinquus</i>	U	X	C	N	E, plains-1050 m
Mountain Bulbul	<i>Hypsipetes mcclllandii</i>	C	X	C	N	E, 800-1685 m
Ashy Bulbul	<i>Hypsipetes flavala</i>	C	X	C	N	E, 800-1200 m
Black Bulbul	<i>Hypsipetes madagascariensis</i>	C	X	C	NM	E, 900-1685 m
White-headed Bulbul	<i>Hypsipetes thompsoni</i>	U	X	R	N	E, 1150-1685 m

Appendix 1. (Continued)

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Common name	Scientific name	Deignan (1945)	1964 - 71	1978 - 84	Season- ality	Habitat
Black Drongo	<i>Dicrurus macrocercus</i>	C		X	NM	S, mostly plains
Ashy Drongo	<i>Dicrurus leucophaeus</i>	C	X	C	NM	D, E, 600-1350 m
Bronzed Drongo	<i>Dicrurus aeneus</i>	C	X	C	N	E, 900-1685 m
Lesser Racket-tailed Drongo	<i>Dicrurus remifer</i>	C	X	C	N	E, 800-1685 m
Spangled Drongo	<i>Dicrurus hottentottus</i>	C	X	C	NM	D, E, plains-1685 m
Greater Racket-tailed Drongo	<i>Dicrurus paradiseus</i>	C	X	C	N	D, E, plains-1050 m
Black-naped Oriole	<i>Oriolus chinensis</i>	R			M	1000 m
Slender-billed Oriole	<i>Oriolus tenuirostris</i>	C	X	X	M	E, 900-1685 m
Black-hooded Oriole	<i>Oriolus xanthornus</i>	C		U	N	D, plains-850 m
Maroon Oriole	<i>Oriolus traillii</i>	C	X	C	N	E, 1000-1685 m
Asian Fairy Bluebird	<i>Irena puella</i>	C	X	R	N	E, 1000 m
Eurasian Jay	<i>Garrulus glandarius</i>	C	X	C	N	D, E, plains-1685 m
Green Magpie	<i>Cissa chinensis</i>	C		C	N	E, plains-1500 m
Blue Magpie	<i>Urocissa erythrorhyncha</i>	C		R	N	D, plains-800 m
Rufous Treepie	<i>Dendrocitta vagabunda</i>	U			N	D, plains-450 m
Grey Treepie	<i>Dendrocitta formosae</i>	C	X	C	N	E, 950-1685 m
Large-billed Crow	<i>Corvus macrorhynchos</i>	C		C	N	S, plains-1000 m
Fire-capped Tit	<i>Cephalopyrus flammiceps</i>			R	M	[Feb. 1977; KING, pers. comm.]
Great Tit	<i>Parus major</i>	U	X	U	N	E, 1150-1600 m
Yellow-cheeked Tit	<i>Parus sibilans</i>	C	X	C	N	E, 1000-1685 m
Sultan Tit	<i>Melanochlora sultanea</i>	R			N	E, 850 m
Chestnut-vented Nuthatch	<i>Sitta nagaensis</i>	C	X	C	N	E, 1350-1685 m
Chestnut-bellied Nuthatch	<i>Sitta castanea</i>	C			N	D, plains-600 m
Velvet-fronted Nuthatch	<i>Sitta frontalis</i>	R	X	C	N	D, E, plains-1685 m
Giant Nuthatch	<i>Sitta magna</i>	U	U		N	E, 1200-1685 m

Appendix 1. (Continued)

Common name	Scientific name	Deignan (1945)	1964 - 71	1978 - 84	Season- ality	Habitat
Brown-throated Treecreeper	<i>Certhia discolor</i>	U	X		N	E, 1350-1500 m; possibly extirp.
Puff-throated Babbler	<i>Pellorneum ruficeps</i>	C	X	C	N	D, E, plains-1500 m
Spot-throated Babbler	<i>Pellorneum albiventre</i>	R	X	R	N	S, 1100-1685 m
Tickell's Babbler	<i>Trichastoma tickelli</i>	R	X	C	N	E, 1000-1400 m
White-browed Scimitar-Babbler	<i>Pomatorhinus schisticeps</i>	C	X	C	N	E, S, 1000-1685 m
Red-billed Scimitar-Babbler	<i>Pomatorhinus ochraceiceps</i>	U	X	U	N	E, 900-1600 m
Streaked Wren Babbler	<i>Napothera brevecaudata</i>	R	X	R	N	E, 1150 m
Eye-browed Wren-Babbler	<i>Napothera epilepidota</i>	U	X	C	N	E, 1350-1685 m
Rufous-fronted Babbler	<i>Stachyris rufifrons</i>		X	C	N	E, S, 1000-1600 m
Golden Babbler	<i>Stachyris chrysaea</i>	U	X	C	N	E, 1400-1685 m
Grey-throated Babbler	<i>Stachyris nigriceps</i>	C	X	C	N	E, 1050-1685 m
Striped Tit-Babbler	<i>Macronous gularis</i>	C	X	C	N	D, E, plains-1100 m
White-crested Laughingthrush	<i>Garrulax leucolophus</i>	C		C	N	D, E, plains-1100 m
Lesser Necklaced Laughingthrush	<i>Garrulax monileger</i>		X	R	N	D, E, 800 m
Greater Necklaced Laughingthrush	<i>Garrulax pectoralis</i>	C		U	N	E, 800-1500 m
White-necked Laughingthrush	<i>Garrulax strepitans</i>	U	X	U	N	E, 1000-1685 m
Black-throated Laughingthrush	<i>Garrulax chinensis</i>		X	X		E, 1400 m
Chestnut-crowned Laughingthrush	<i>Garrulax erythrocephalus</i>	U			N	E, 1400-1685 m; possibly extirp.
Silver-eared Mesia	<i>Leiothrix argentauris</i>	C	X	C	N	E, S, 1500-1685 m
Cutia	<i>Cutia nipalensis</i>	R		R	N	E, 1600-1685 m
White-browed Shrike-Babbler	<i>Pteruthius flaviscapis</i>	C	X	C	N	E, 1000-1685 m
Chestnut-fronted Shrike-Babbler	<i>Pteruthius aenobarbus</i>	U	X	U	N	E, 1100-1685 m
White-hooded Babbler	<i>Gampsorhynchus rufulus</i>	R	X	U	N	E, 900-1350 m
Blue-winged Minla	<i>Minla cyanouroptera</i>	R	X	C	N	E, 1400-1685 m
Rufous-winged Fulvetta	<i>Alcippe castaneiceps</i>	R		R	N	E, 1685 m
Brown-cheeked Fulvetta	<i>Alcippe poioicephala</i>	R		C	N	D, E, 1000-1100 m

Appendix 1. (Continued)

Common name	Scientific name	Deignan (1945)	1964 - 71	1978 - 84	Season- ality	Habitat
Grey-cheeked Fulvetta	<i>Alcippe morrisonia</i>	C	X	C	N	E, 1000-1685 m
Rufous-backed Sibia	<i>Heterophasia annectens</i>	C	X	U	N	E, 1400-1685 m
Black-headed Sibia	<i>Heterophasia melanoleuca</i>	C	X	C	N	E, 1300-1685 m
Long-tailed Sibia	<i>Heterophasia picaoides</i>	C	X	C	N	E, 1350-1685 m
Striated Yuhina	<i>Yuhina castaniceps</i>	C	X	C	N	E, 1000-1685 m
White-bellied Yuhina	<i>Yuhina zantholeuca</i>	C	X	C	N	E, 800-1200 m
Black-throated Parrotbill	<i>Paradoxornis nipalensis</i>	R		R	N	E, 1500-1685 m
Grey-headed Parrotbill	<i>Paradoxornis gularis</i>	C	X	X	N	E, 1350-1685 m
Lesser Shortwing	<i>Brachypteryx leucophrys</i>		X	R	N	E, 1600 m
Siberian Rubythroat	<i>Erithacus calliope</i>	R	X	X	M	S, plains-1200 m
Siberian Blue Robin	<i>Erithacus cyane</i>	R	X	U	M	D, E, plains-850 m
Orange-flanked Bush-Robin	<i>Tarsiger cyanurus</i>	R	X	U	M	E, 1350-1685 m
Magpie Robin	<i>Copsychus saularis</i>			X		
White-rumped Shama	<i>Copsychus malabaricus</i>	C		C	N	D, E, plains-1400 m
Blue-fronted Redstart	<i>Phoenicurus frontalis</i>			R	M	[Dec. 1983; S. GAST pers. comm.]
Daurian Redstart	<i>Phoenicurus aureus</i>	R		U	M	E, 450-1685 m
White-bellied Redstart	<i>Hodgsonius phaenicuroides</i>			R	M	S, 1500 m
White-tailed Robin	<i>Cinclidium leucurum</i>	R	X	R	N	E, 950-1685 m
Black-backed Forktail	<i>Enicurus immaculatus</i>			U	N	D, 400-600 m
Slaty-backed Forktail	<i>Enicurus schistaceus</i>	C		U	N	E, 600-1100 m
White-crowned Forktail	<i>Enicurus leschenaulti</i>	U	X	U	N	E, 1050-1400 m
Purple Cochoa	<i>Cochoa purpurea</i>	R		R	N	E, 1000-1400 m
Green Cochoa	<i>Cochoa viridis</i>			R	N	E, 1400 m
Stonechat	<i>Saxicola torquata</i>	C		C	M	S, plains-1685 m
Grey Buschat	<i>Saxicola ferrea</i>	C	X	C	M	S, plains-1685 m

Appendix 1. (Continued)

Common name	Scientific name	Deignan (1945)	1964 - 71	1978 - 84	Season- ality	Habitat
River Chat	<i>Chaimarrornis leucocephalus</i>	R			M	
White-throated Rock-Thrush	<i>Monticola gularis</i>	R			M	450 m
Chestnut-bellied Rock-Thrush	<i>Monticola rufiventris</i>	U	X	U	M	E, 1200-1685 m
Blue Rock-Thrush	<i>Monticola solitarius</i>	C	X	C	M	S, plains-1685 m
Blue Whistling Thrush	<i>Myophonus caeruleus</i>	C	X	X	NM	D, E, plains-1685 m
Orange-headed Thrush	<i>Zoothera citrina</i>	R	X	U	NM	E, 1000-1685 m
Siberian Thrush	<i>Zoothera sibirica</i>			X	M	E, 1400 m
Long-tailed Thrush	<i>Zoothera dixonii</i>			R	M	E
Scaly Thrush	<i>Zoothera dauma</i>	U	X	U	M	E, 1000-1685 m
Dark-sided Thrush	<i>Zoothera marginata</i>	R	X	U	N	E, 1050-1400 m
Grey-winged Blackbird	<i>Turdus boulboul</i>	R		R	M	E, 1500-1685 m
Chestnut Thrush	<i>Turdus rubrocanus</i>			R	M	E, 1500-1685 m
Grey-sided Thrush	<i>Turdus feae</i>			R	M	E, 1100 m
Eye-browed Thrush	<i>Turdus obscurus</i>	C		C	M	E, plains-1685 m
Black-throated Thrush	<i>Turdus ruficollis</i>			R	M	E, 1500 m
Dusky Thrush	<i>Turdus naumanni</i>			R	M	E, 1400-1600 m
Golden-spectacled Warbler	<i>Seicercus burkii</i>	C	X	C	M	E, 800-1685 m
Chestnut-crowned Warbler.	<i>Seicercus castaniceps</i>		X	R	N	E, 1600 m
Yellow-bellied Warbler	<i>Abroscopus supercilii</i>	R		X	N	D, E, plains-1050 m
Rufous-faced Warbler	<i>Abroscopus albogularis</i>	R			N	E, 1350 m
Yellow-streaked Warbler	<i>Phylloscopus armandii</i>	R		U	M	S, D, 500-700 m
Radde's Warbler	<i>Phylloscopus schwarzi</i>	U	X	C	M	D, E, plains-1600 m
Orange-barred Leaf-Warbler	<i>Phylloscopus pulcher</i>	R	X	U	M	E, 1685 m
Inornate Warbler	<i>Phylloscopus inornatus</i>	C	X	C	M	D, E, S, plains-1685 m
Lemon-rumped Warbler	<i>Phylloscopus proregulus</i>	R	X	U	M	E, 1400-1685 m

Appendix 1. (Continued)

Common name	Scientific name	Deignan (1945)	1964 - 71	1978 - 84	Season- ality	Habitat
Greenish Warbler	<i>Phylloscopus trochiloides</i>			X	M	E, 1000-1100 m
Pale-legged Leaf-Warbler	<i>Phylloscopus tenellipes</i>	R		R	M	E, 1500 m
Eastern Crowned Warbler	<i>Phylloscopus coronatus</i>	U			M	D, E, mostly lower elevation
Blyth's Leaf-Warbler	<i>Phylloscopus reguloides</i>	X	X	C	M	E, 800-1685 m
White-tailed Leaf-Warbler	<i>Phylloscopus davisoni</i>	C	X	C	N	E, 800-1685 m
Yellow-vented Warbler	<i>Phylloscopus cantator</i>		R	R	M	E, 1300 m
Sulphur-breasted Warbler	<i>Phylloscopus ricketti</i>	R		U	M	E, 800-1200 m
Thick-billed Warbler	<i>Acrocephalus aedon</i>	R		X	M	S, 400-650 m
Blunt-winged Warbler	<i>Acrocephalus concinens</i>	R			M	S, plains-700 m
Lanceolated Warbler	<i>Locustella lanceolata</i>	R			M	S, plains-1400 m
Common Tailorbird	<i>Orthotomus sutorius</i>	C	X	C	N	S, D, plains-1050 m
Dark-necked Tailorbird	<i>Orthotomus atrogularis</i>			U	N	D, E, 1000 m
Grey-breasted Prinia	<i>Prinia hodgsonii</i>			C	N	S, plains-1300 m; colonised
Rufescent Prinia	<i>Prinia rufescens</i>	C	X	C	N	D, S, plains-1685 m
Hill Prinia	<i>Prinia atrogularis</i>	C	X	C	N	S, 1300-1685 m
Slaty-bellied Tesia	<i>Tesia olivea</i>	R		R	N	E, 1400 m
Chestnut-headed Tesia	<i>Tesia castaneocoronata</i>			R	N	E, 1650 m
Stub-tailed Bush-Warbler	<i>Cettia squameiceps</i>	U	X	U	M	E, 800-1050 m
Spotted Bush Warbler	<i>Bradypterus thoracicus</i>	R		X	M	S, 1000-1400 m
Brown Bush Warbler	<i>Bradypterus luteoventris</i>	R		R	M	S, 1000-1400 m
Dark-sided Flycatcher	<i>Muscicapa sibirica</i>	R		R	M	E, 1550-1685 m
Asian Brown Flycatcher	<i>Muscicapa latirostris</i>	U		U	M	D, E, plains-1450 m
Ferruginous Flycatcher	<i>Muscicapa ferruginea</i>			R	M	E, 800 m
Verditer Flycatcher	<i>Muscicapa thalassina</i>	C	X	C	N	E, 1000-1658 m
Red-breasted Flycatcher	<i>Ficedula parva</i>	C		C	M	D, E, S, plains-1685 m
Rufous-gorgetted Flycatcher	<i>Ficedula strophitata</i>	U		U	M	E, 1200-1685 m

Appendix 1. (Continued)

Common name	Scientific name	Deignan 1964 1978 Season-				Habitat
		(1944)	- 71	- 84	ality	
White-gorgetted Flycatcher	<i>Ficedula monileger</i>	R	X	U	N	E, 1350 m
Snowy-browed Flycatcher	<i>Ficedula hyperythra</i>	R	X	R	N	E, 1400 m
Slaty-backed Flycatcher	<i>Ficedula hodgsonii</i>	R	X	U	M	E, 1400-1685 m
Little Pied Flycatcher	<i>Ficedula westermanni</i>	C	X	C	N	E, 1350-1685 m
Ultramarine Flycatcher	<i>Ficedula superciliaris</i>	R	X	R	M	D, E, 450 m-1300 m
Slaty-blue Flycatcher	<i>Ficedula tricolor</i>			R	M	E, 1600 m : S. GAST, pers. comm
Large Niltava	<i>Niltava grandis</i>	C	X		N	E, 1050-1685 m reduced or extirp.
Small Niltava	<i>Niltava macgrigoriae</i>	R	X	R	N	E, 1350-1400 m
Rufous-bellied Niltava	<i>Niltava sundara</i>	C	X	C	M	E, 1050-1685 m
Vivid Niltava	<i>Niltava vivida</i>	U	X	U	M	E, 1400-1685 m
Pale Blue Flycatcher	<i>Cyornis unicolor</i>	U	X	U	N	E, 1400-1685 m
Hill Blue Flycatcher	<i>Cyornis banyumas</i>	C	X	C	N	E, 800-1600 m
Pygmy Blue Flycatcher	<i>Muscicapella hodgsonii</i>		X		M	
Grey-headed Flycatcher	<i>Culicicapa ceylonensis</i>	C	X	C	N	E, 750-1685 m
White-throated Fantail	<i>Rhipidura albicollis</i>	C	X	C	N	E, 950-1685 m
Black-naped Monarch	<i>Hypothymis azurea</i>	C	X	C	N	D, E, 600-1100 m
Asian Paradise Flycatcher	<i>Terpsiphone paradisi</i>	U	X	C	NM	D, E, 800-1050 m
Grey Wagtail	<i>Motacilla cinerea</i>	C		C	M	S, plains
Forest Wagtail	<i>Dendronanthus indicus</i>	R		U	M	D, E, plains-1400 m
Olive-backed Pipit	<i>Anthus hodgsoni</i>	C	X	C	M	E, 800-1685 m
Ashy Wood-Swallow	<i>Artamus fuscus</i>	U		U	N	plains-800 m
Tiger Shrike	<i>Lanius tigrinus</i>			R	M	D, 400 m.
Grey-backed Shrike	<i>Lanius tephronotus</i>	U	X	U	M	S, 1000-1685 m
Long-tailed Shrike	<i>Lanius schach</i>	R		U	N	S, plains-1000 m
Chestnut-tailed Starling	<i>Sturnus malabaricus</i>	U		X	N	D, S, plains-1000 m

Appendix 1. (Continued)

Common name	Scientific name	Deignan (1945)	1964 - 71	1978 - 84	Season- ality	Habitat
Black-collared Starling	<i>Sturnus nigricollis</i>	U			N	S, plains-450 m
Hill Myna	<i>Gracula religiosa</i>	C		U	N	D, E, plains-1400 m
Ruby-cheeked Sunbird	<i>Anthreptes singalensis</i>	C		U	N	D, E, 600-1000 m
Olive-backed Sunbird	<i>Nectarinia jugularis</i>	C		C	N	D, plains-900 m
Purple Sunbird	<i>Nectarinia asiatica</i>			R	N	D, 400 m
Gould's Sunbird	<i>Aethopyga gouldiae</i>	U	X	U	M	E, 1350-1685 m
Black-throated Sunbird	<i>Aethopyga saturata</i>	C	X	C	N	E, 1000-1685 m
Little Spiderhunter	<i>Arachnothera longirostra</i>		X			E
Streaked Spiderhunter	<i>Arachnothera magna</i>	C	X	C	N	E, 1000-1685 m
Yellow-vented Flowerpecker	<i>Dicaeum chrysorrheum</i>	R			N	E, 650-1100 m
Plain Flowerpecker	<i>Dicaeum concolor</i>	C	X	C	N	D, E, plains-1685 m
Scarlet-backed Flowerpecker	<i>Dicaeum cruentatum</i>	C		C	N	D, plains-550 m
Buff-bellied Flowerpecker	<i>Dicaeum ignipectus</i>	C	X	C	N	E, 1000-1685 m
Chestnut-flanked White-Eye	<i>Zosterops erythropleura</i>	U	X	C	M	E, S, 1350-1685 m
Japanese White-Eye	<i>Zosterops japonica</i>	X	X	C	M	E, S, plains-1685 m
Oriental White-Eye	<i>Zosterops palpebrosa</i>	C	X	C	N	E, S, plains-1685 m
Tree Sparrow	<i>Passer montanus</i>			C	N	S, 1000 m
Pin-tailed Parrotfinch	<i>Erythrura prasina</i>		R		M	1300 m
White-rumped Munia	<i>Lonchura striata</i>	C	X	C	N	S, plains-1150 m
Black-headed Greenfinch	<i>Carduelis ambigua</i>			R	M	
Common Rosefinch	<i>Carpodacus erythrinus</i>		X	C	M	S, plains-1685 m
Spot-winged Grosbeak	<i>Mycerobas melanozanthos</i>	U		R	N	S, 1500-1685 m
Tristram's Bunting	<i>Emberiza tristrami</i>		R		M	S, 1600 m
Little Bunting	<i>Emberiza pusilla</i>	U	X	C	M	S, 900-1685 m
Chestnut Bunting	<i>Emberiza rutila</i>	U	X	C	M	S, plains-1685 m
Crested Bunting	<i>Melophus lathami</i>	R			M	S, 800-1600 m