NATIONAL SYMPOSIUM ON GALLIFORMES

FEBRUARY 20-22, 2002

sponsored by

Department of Science & Technology, Government of India

Ministry of Environment & Forests, Government of India

Department of Environment, Government of Tamilnadu

Bharathidasan University, Tiruchirapalli

Ambanathapuram Vahaira Charities [A.V.C] Education Committee

ABSTRACTS

organized by

Division of Wildlife Biology

A.V.C. College [Autonomous]

Mannampandal, Mayiladuthurai 609 305

Tamilnadu

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SYMPOSIUM PROGRAMME

Wednesday, 20 February 2002

Session - I: Inaugural Session

09:00	Registration	
10:00	Welcome	
10:05	Introduction to the Symposium	
10:15	Inaugural Address	
10:25	Keynote Address	
11:00	Vote of Thanks	
11:05	**TEA**	

Session - II: Conservation Status of Galliformes

11:30	**Theme Presentation:** Status and Distribution of Pheasants in India	*Rahul Kaul*
12:10	Is the Current Status of Pheasants in Great Himalayan National Park (Himachal Pradesh) an Eye Opener? - A Reality Check.	*K. Ramesh, S. Sathyakumar & G.S. Rawat*
12:30	Distribution and Current Status of Western Tragopan (*Tragopan melanocephalus*) in Himachal Pradesh, India	*Shahid B. Khan, Salim Javed, Rahul Kaul & Phillip McGowan*
12:50	Status, Distribution and Conservation of Galliformes in Chail Wildlife Sanctuary, Himachal Pradesh	*Naim Akhtar & M.L Narang*
13:10.	**LUNCH**	

14:15	Distribution and Status of Cheer Pheasant in Garhwal Himalaya	*M.S.Bisht, B.S.Kathait, Archana Bhatt & Anupama Rawat*
14:35.	Distribution, Status and Relative abundance of Grey Junglefowl in Theni Forest Division, Tamil Nadu	*P. Kambarajan, C. Subramanian & M.C.Sathyanarayana*
14:55	Distribution of Galliformes in Selected Areas of Tamil Nadu.	*A.S. Priscilla, & Jasmin Richard*
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Session - III : Field Techniques

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16:20	A note on the Capturing Techniques Used by Villagers and Domestication of Grey Francolin (*Francolinus pondicerianus*) observed in Southern Tamil Nadu	*A.S. Priscilla, & Jasmin Richard*
16:40	Concluding Remarks	
16:55	Demonstration of equipment / film show / Popular Talk	

Thursday, 21 February 2002

Session - IV : Habitat Utilization by Galliformes

09:30	**Theme Presentation :** Studying Habitat Utilization by Pheasants in India : A review	*S.Sathyakumar, Q.Qureshi & K.Ramesh*
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10:30	Resource Utilization by the Grey Junglefowl (*Gallus sonneratii*) in Anaikatty Hills, Coimbatore	*Sr.T.Nirmala & Lalitha Vijayan*
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11:20	Roosting Tree Selected by Grey Junglefowl, (*Gallus sonneratii*) in Alagar Koil Valley, Srivilliputtur Grizzled Giant Squirrel Sanctuary, Kamarajar District, Tamil Nadu	*N. Ramesh & M.C. Sathyanarayana*
11:40	Habitat Ecology of Cheer Pheasant i n Garhwal Himalaya	*B.S.Kathait, Archana Bhatt, Anupama Rawat & M.S.Bisht*
12:00	Habitat Preferences by Grey and Black Francolins in Yamuna Nagar District, Haryana - Preliminary Results	*Rajiv S. Kalsi, Sarita Rana & Randeep Singh*
12:20	Concluding Remarks	
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14:20	A Study on the Ecology (Population) and Behaviour of the Indian Peafowl (*Pavo cristatus*) in Vembakkotai, Virudhunagar District, Tamil Nadu	*K.Sundaramurthy K.Moorthy & S.Murali*
14:40	A Study on the Population and Behaviour of the Indian Peafowl (*Pavo cristatus*) in Ketchilapuram Village, Tuticorin District,Tamil Nadu	*A.Solaiappan, S.Karuppasamy & S.Murali*
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15:30	Study on the Grey Francolin (*Francolinus pondicerianus*) from three Habitats of Therkukaraseri, Chithambaranar District, Tamil Nadu.	*A.S. Priscilla & Jasmin Richard*
15:50	Social Organisation of the Nicobar Megapode (*Megapodius nicobariensis)* in the Great Nicobar Island	*K.Sivakumar & R.Sankaran*
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10:30	Conservation Issues Relevant to Important Bird Areas for Galliformes	*Supriya Jhunjhunwala, Farah Ishtiaq, Asad Rahmani & Zafar ul Islam*
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11:40	Breeding of Indian Peafowl (*Pavo cristatus*) in Arignar Anna Zoological Park, Chennai	*A.Manimozhi, N.Baskar & M.Sekar*
12:00	Turkey Farming under Semi-Intensive System of Rearing in Thanjavur District, Tamil Nadu	*N.Punniamurthy & S.Satheshkumar*
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14:00	People's Participation in Conservation of Galliformes	*S.Sathyakumar*
14:15	Environmental Education and Galliformes Conservation	*M.C.Sathyanaryana*
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16:15	Welcome Address
16:30	Valedictory Address
17:00	Vote of Thanks

1. Status and Distribution of Pheasants in India

Rahul Kaul

World Pheasant Association - South Asia Field Office,
S-56/1, DLF Phase III, Gurgaon 122 003, Haryana

Of the 17 species of pheasants found in India, six are globally threatened as per IUCN threat categories of 1994(a). Global threat assessments do not necessarily reflect the true status of these birds on a national level and as a result several species of pheasants found in India have been accorded a lower threat category than warranted. A review of threat categories at a national level is suggested. An analysis of pheasant distribution in India based on their richness within a 1° x 1° grid square identified three areas of exceptional pheasant richness (8 or more species) and 11 areas of high pheasant richness (6-7 species). The paper presents information about important locations for each species with suggestions for their conservation.

2. Is the Current Status of Pheasants in Great Himalaya National Park (Himachal Pradesh) an Eye Opener - A Reality Chec

K. Ramesh, S. Sathyakumar & G.S. Rawat

Wildlife Institute of India,
Post Box # 18, Chandrabani, Dehradun - 248 001, Uttaranchal.

The Great Himalayan National Park (GHNP) is amongst the few areas in the world, known to support a substantial population of Western tragopan, along with four other Himalayan pheasants. Conservation attempts in GHNP have shown significant linkages with these pheasants, consistently projecting the Western tragopan as a 'flagship' species. As part of a multidisciplinary research project undertaken between 1995 and 1999, we assessed the conservation status of the pheasants in this area. A habitat model was developed in Geographical Information System using remotely sensed data of IRS LISS-II combined with Digital Elevation Model. The results revealed strikingly low availability of potential habitats for these pheasants. Within the entire area of GHNP (754.4 km^2), a maximum of 36.6 km^2 (4.9%) is only available to Western tragopan. Similarly, the maximum areas potentially available for Himalayan Monal, Koklass, Cheer and Kalij pheasants were estimated to be 92.5km^2 (12.3%), 41.9km^2 (5.6%), 1.0km^2 (0.13%) and 1.2km^2 (0.16%) respectively. Though the surrounding areas in Tirthan, Sainj Wildlife Sanctuaries and eco-development zone have considerable area as potential habitats, majority of which is unlikely to sustain pheasant populations. Resentment of people due to restriction on resource use following final notification of the Park and upcoming Parvati Hydroelectric Project in this area appear to have challenged the survival of the pheasants. Given such inevitable or inappropriate situations, species-specific approach has been suggested as an alternative or immediate option to ensure pheasant conservation. The current scenario, both in terms of available habitats and recent developments, has certainly provided a 'warning-signal' and the urgency to look beyond GHNP, at landscape level for long-term conservation of the pheasant species.

3. Distribution and Current Status of Western Tragopan (*Tragopan melanocephalus*) in Himachal Pradesh, India

Shahid B. Khan[1], Salim Javed[2], Rahul Kaul[3] & Phillip McGowan[4]

[1] Department of Wildlife Sciences, Aligarh Muslim University, Aligarh - 202 002

[2] Environmental Research and Wildlife Development Agency, P.O Box 45553, Abu Dhabi, UAE.

[3] WPA-SAFO, S-56/1 DLF-3, Gurgaon - 122 002, Haryana

[4] WPA, PO Box 5, Lower Basildon, Reading Berks RG8 9 PF, UK

Western tragopan (*Tragopan melanocephalus*) is a restricted range species, confined to the north-west Himalaya. It is one among the most threatened Himalayan avifauna and is considered vulnerable to extinction. Fundamental information on the distribution and population status of the species in its distribution range is scanty. As an attempt to bridge the gap, extensive surveys were carried out between November 1998 and June 1999 to document the distribution and status of this species in Himachal Pradesh. The methods adopted include trail walks and call counts. Of the total of 14 sites surveyed in the districts of Chamba, Kullu and Shimla in Himachal Pradesh, we ascertained its presence in seven sites and additionally, confirmed reports from five sites. The highest encounter rate was obtained at Bangori (0.36 birds/km) in Chamba district. During the spring call counts conducted in Chamba at 13 locations in four sites, a total of 43 calling birds were counted. The mean density index was estimated to be 8.55 ± 1.08. Specka, an adjoining forests in Chamba district, have Western tragopan populations that are comparable to the best areas and hence, need immediate protection.

4. Status, Distribution and Conservation of Galliformes in Chail Wildlife Sanctuary, Himachal Pradesh

Naim Akhtar [1] & M.L Narang[2]

[1] Wildlife Insitute of India, Post Box # 18, Chandrabani, Dehradun -248001, Uttaranchal

[2] University of Horticulture and Forestry, Nauni, Solan -173230, Himachal Pradesh

The Chail Wildlife Sanctuary in Himachal Pradesh a major tourist attraction and is well known for supporting high abundance of Cheer pheasant (*Catreus wallichi*). The sanctuary is interspersed with more than 120 villages and is under high biotic pressure. Bouldary spaces and oak trees in the steep gullies of grassland were observed to be suitable roosting sites for pheasants. All seven species of Galliformes are resident in this region, but few were locally isolated and confined to specific areas. Peafowl (*Pavo cristatus*) and Red junglefowl (*Gallus gallus*) were recorded only in lower part of the sanctuary along the Ashani and Giri River. Kalij (*Lophura leucomelanos*) were sighted between 1,500-2,200 m in the oak forest. On a few occasions, Kalij were seen with Cheer, but Cheer usually avoided dense oak forest and confined to the grassland. Koklass (*Pucrasia macrolopha*) were less abundant among all pheasants, one pair each was seen in Blossom and Khari-un forest and showed preference to oak forest. Although Cheer is an endangered species, but widely distributed in Blossom as well as in Khari-un, one more grassland site of cheer was found near to Bhagairh village. Chukor partridge were isolated and less abundant, and encountered only in scrub forest of Blossom. Kalij were widely distributed and most abundant among all pheasant. Black francolin (*Francolinus francolinus*) were sighted and heard commonly near crop fields and human settlement. Although the Sanctuary area is not very large (10,500 ha), the observed richness and abundance of pheasant was very high. Presently all pheasant species are facing serious threats and need reduction in biotic pressure for their survival.

5. Distribution and Status of Cheer Pheasant in Garhwal Himalaya

M.S.Bisht, B.S.Kathait, Archana Bhatt & Anupama Rawat

Department of Zoology,
H.N.B Garhwal University Campus, Pauri-246 001, Uttaranchal

Extensive surveys were conducted to document distribution and status of the threatened Cheer pheasant (*Catrus wallichii*) in the Chamoli and Pauri Garhwal Districts, Uttaranchal (29° 36'N-31° 5'N & 78° to 80° E). Cheer pheasants were sighted at 16 sites across 13 surveyed areas, majority of which (13 sites) had very small populations of not more than five individuals. The threats and possible causes of population decline of this species in Garhwal will be presented and discussed.

6. Distribution, Status and Relative abundance of Grey Junglefowl in Theni Forest Division, Tamil Nadu

P. Kambarajan, C. Subramanian & M.C.Sathyanarayana

Division of Wildlife Biology, A.V.C. College,
Mayiladuturai 609305,Tamil Nadu

A rapid survey was carried out to understand the distribution and status of Grey junglefowl (*Gallus sonneratii*) in Theni Forest Division (9° 31'- 10° 10'-N, 77° 20'-77° 40' E), Meghamalai, Tamil Nadu. Other objective of the survey was to identify areas for intensive field investigation. Parts of Gudalur and Meghamalai ranges were chosen as intensive study sites on the basis of relatively high abundance of Grey junglefowl and adequate representation of various habitat types found in these ranges. Line transects were laid in five different habitat types: (1) Southern Deciduous Scrub Forest (SDSF), (2) Southern Dry Mixed Deciduous Forest (SDMDF), (3) Southern Moist Mixed Deciduous Forest (SMMDF), (4) Miscellaneous + Plantation forest (MISC+PL) and (5) Southern Sub-Tropical Hill Forest (SSTHF). Density estimates were obtained from counts made during morning and evening transect walks. Of the habitat types sampled, SDSF had the highest density (18.2 birds/km^2) followed by MISC+PL (17.59 birds/km^2). There was no sighting of Grey junglefowl in SSTHF, which represents the hill forests. The possible reasons for variations in the density estimates of Grey junglefowl and potential threats will be presented and discussed.

7. Distribution of Galliformes in Selected Areas of Tamil Nadu

A.S. Priscilla[1] *& Jasmin Richard*[2]

[1] Government Arts College for Men, Nandanam, Chennai 600 035 , Tamil Nadu

[2] Bharathi Women's College, Chennai 600 108, Tamil Nadu

The indiscriminate use of land for development activities has driven most of the delicate species to extinction. Land dwelling birds such as pheasants are among the first one to face serious danger from human developments. During the course of developmental activities, natural populations get fragmented and consequently, the future existence of the populations remains uncertain. Conservation of the existing populations of ground dwelling avifauna of India is a matter of serious concern. dentifying the present status of distribution is the fundamental nowledge essential for conservation of any species. Avian tudies mostly confine to the Protected Areas (PA), while the study f the manipulation zones is generally neglected. We realized the need for such information for areas outside the PA network and the present study deals with the distribution and diversity of the Family *Phasianidae* that includes the economically important ground dwelling birds. Eight species of Galliformes were recorded from seven different Ecotopes across 40 surveyed areas. Further results are presented and discussed.

8. Field Techniques to Capture and Radio-track Western Tragopan: A Case Study from the Great Himalayan National Park, Himachal Pradesh

K. Ramesh, S. Sathyakumar & G.S. Rawat

Wildlife Institute of India,
Post Box # 18, Chandrabani, Dehradun - 248 001, Uttaranchal

Attempts were made to radio-tag Western tragopan (*Tragopan melanocephalus*) to study the habitat use and movement pattern in the Great Himalayan National Park, Himachal Pradesh. Fall nets (n=6) with trigger based system and 'leg-hold noose' (n=9) were placed in predetermined localities (n=12) such as closed forests (n = 6), *thaches* (n=2) and *nullah* (n=4) for trapping the birds. Despite the intensive efforts of 256 man-days and 6694 trap hours in April-June 1999, the trap success was very low with just one female bird. Nonetheless, the traps were found to be effective and there were incidental trapping of 12 other bird species including Hill partridge (4), Koklass pheasant (1) and Eurasian woodcock (4), majority of which got trapped in 'fall nets' (70%). The Western tragopan, trapped in 'leg-hold noose', was radio-tagged with necklace type collar. Triangulation method was preferred over home-in to record radio-locations, and the sampling was done at three time scale (6 - 10 hrs, 11 - 15 hrs and 15 - 18 hrs) on every third day until November 1999. A total of 72 radio-locations represented by 52 in summer and 21 in autumn seasons were obtained, plotted on 1:50,000 topographic map and the home range was estimated based on 100%Minimum Convex Polygon in Arc/view software. Though conclusive inference could not be drawn based on just one individual, the findings

on home range and macro-habitat use seem to largely concur with the earlier studies on the species and its congeners. Moreover, the study also provided a positive indication suggesting that with slight changes in trapping approach, the trapping success could be increased, and there by will increase the sample size of radio tagged birds. Inference based on adequate number of birds would be persuasive and would significantly contribute to conservation of this species.

9. A Note on the Capturing Techniques Used by Villagers and Domestication of Grey Francolin (*Francolinus pondicerianus*) in Southern Tamil Nadu

A.S .Priscilla[1] *& Jasmin Richard*[2]

[1] Government Arts College for Men, Nandanam, Chennai 600 035

[2] Bharathi Women's College, Chennai 600 108

The birds of culinary value were cherished by human society and domesticated from time immemorial. Despite the large-scale production by poultry industry and availability of domesticated birds in village farms, poaching of wild galliformes for meat still continues. The Grey francolin (*Francolinus pondicerianus*) is one of the commonly poached species in Southern Tamil Nadu. The continuing poaching in the Kanyakumari districts will be discussed. Domestication of Grey francolin in the villages was observed during the study period (1994 to 1995). The urgent need to involve the local population in conservation programmes is emphasized.

10. Studying Habitat Utilization by Pheasants in India : A review

S.Sathyakumar, Qamar Qureshi & K. Ramesh

Wildlife Institute of India,
P.O. Box 18, Chandrabani, Dehradun 248 001, Uttaranchal

Quantifying habitat use by pheasants is often difficult due to problems associated with sampling these shy and elusive birds in dense cover and difficult terrain. Distribution pattern of pheasants, their specific habitat preferences, particularly micro-habitat features, and the inherent variation in ranging and movement patterns in different seasons are some of the major factors that cause difficulties in sampling and data collection Scientific studies on pheasants in India began in early 1980s in the form of status surveys and short studies, and were followed by intensive ecological studies using simple techniques and analyses until late 1980s. During the 1990s, studies on the ecology of pheasants made rapid advances study design, use of modern techniques and analyses.

Early studies on pheasants were initially dealt at the macro (habitat or vegetation type) and micro-levels by using analysis such as indices and testing for disproportionate use that included Chi-square test and/or availability-utilization analysis as proposed by Neu *et al.* (1974) and Marcum & Loftsgarden (1980). However, it was realized that availability-utilization analysis had drawbacks due to errors in defining study area limits and subsequently the proportions of resource type assumed to be "available" for a species by the researcher were not true. Moreover, there were problems with statistical assumptions involved in field data collection versus data analysis. Further, the

role of micro-habitat and environmental variables in the specific use of habitats by pheasants was realized. This led to the understanding that use of habitat factors and vegetation types cannot be considered in isolation and that there are additional problems due to auto-correlations amongst various factors at the macro and micro levels.

In the recent past, studying habitat use by pheasants included use of appropriate methodology and analytical procedures, particularly use of univariate and multivariate statistics and use of radio-telemetry as a tool. We present examples from recent studies where analysis have been carried out by using Factor Analysis, PCA, Discriminant Analysis and Compositional and Indices Analysis have been used by the researchers to explain habitat choice by pheasants. Another significant advancement is the awareness amongst researchers for possible errors and precautions in such analysis and interpretation of results.

11. Habitat Utilization by Grey Junglefowl (*Gallus sonneratii*) in Theni Forest Division, Meghamalai, Tamil Nadu

C. Subramanian, M.C.Sathyanarayana & P. Kambarajan

Division of Wildlife Biology,
A.V.C. College, Mannampandal, Mayiladuthurai 609 305, Tamil Nadu

We assessed the habitat utilization pattern by Grey junglefowl (*Gallus sonneratii*) in Theni Forest Division (9° 31'- 10° 10'-N, 77° 20'-77° 40' E), Meghamalai, Tamil Nadu, from April 1999 to March 2001. Five major habitat types *viz.*, (1) Southern Deciduous Scrub Forest (SDSF), (2) Southern Dry Mixed Deciduous Forest (SDMDF), (3) Southern Moist Mixed Deciduous Forest (SMMDF), (4) Miscellaneous + Plantation forest (MISC+PL) and (5) Southern Sub-Tropical Hill Forest (SSTHF) were identified in the study area. A total of 88 records of Grey junglefowl were made and incidentally, the SSTHF which represent hill forests had only one sighting. Habitat use analysis performed using Neu *et al.* (1974) analysis revealed significantly higher use (preferred) of SMMDF relative to its availability, while MISC+PL was used less than its availability (avoided). The habitats SDSF and SDMDF were utilized in proportion to availability. There were seasonal differences in the habitat use by Grey junglefowl, showing preference to SMMDF and SDMDF in summer and premonsoon respectively. Irrespective of seasons, the Grey junglefowl used moderate shrub cover (41-60%), low grass cover (21-40%) and low litter cover (21-40%) with high litter depth (>5cm). It appears that canopy cover and tree number do not have any significant influence on Grey junglefowl habitat use. The results indicate that choice of habitat by Grey junglefowl largely depends on the interspersion of moderate shrub cover (41-60%), higher litter cover (>41%), high litter depth (>5 cm) and low grass cover (<40%). It was primarily because the shrub layer provide protection from predators (escape cover) and shade, while litter and grass or herb layers determined the invertebrate abundance which are food items of Grey junglefowl.

12. Resource Utilization by the Grey Junglefowl (*Gallus sonneratii*) in Anaikatty Hills, Coimbatore, Tamil Nadu

Sr.T.Nirmala[1] & Lalitha Vijayan[2]

[1] Department of Zoology, J. A. College for Women,Periyakulam, Theni 625 6012,Tamil Nadu

[2] Salim Ali Centre for Ornithology and Natural History, Coimbatore 641108,Tamil Nadu

This study was carried out during 1999-2001 in Anaikatty Hills (11° 5' N and 76° 47'E), the foothills of the Nilgiris in the Nilgiri Biosphere Reserve, Western Ghats at an elevation of about 560-750 m above mean sea level. The Dry Mixed Deciduous Forest was the predominant vegetation in the study area and was dominated by trees species such as *Acacia leucophloea, Ziziphus mauritiana, Chloroxylon swietenia, Albizia amara, Tamarindus indicus, Albizia lebbeck* and *Acacia polyacantha.* Major shrub species include *Chromolaena odorata, Clausena indica, Elaeodendron glaucum, Flacourtia indica, Lantana camara, Lantana wightiana* and *Randia dumetorum.* Succulents such as *Opuntia dillenii* and *Euphorbia antiquorum* are also common. The Grey junglefowl was recorded only from the Dry Mixed Deciduous Forest and not in the Scrub Forest. It is an omnivore feeding on insects, other invertebrates and grains with preference for insects and grains. It preferred to feed mostly on the ground. The proportional use of different ground layers by the species was 39% in litter cover, followed by barren ground (29%), herb cover (20%), and grass cover (11%). Method of feeding was mainly gleaning and probing. The percent prey attack maneuver was gleaning predominantly on ground and to a lesser extent on leaf and litter. This shows that the Grey junglefowl is a specialist in foraging dimensions, especially on foraging strata (J'=0) and substrate (J'=0.09). High overlap was observed with the Yellow-billed babbler (0.97) and lowest overlap with Malabar parakeet and Purple-rumped sunbird (0.19). Anthropogenic pressures form a major threat for Grey junglefowl, particularly the tribal populations in surrounding villages who involve in trapping and degrading habitats due to firewood collection.

13. Roosting Tree Selected by Grey Junglefowl, (*Gallus sonneratii*) in Alagar Koil Valley, Srivilliputtur Grizzled Giant Squirrel Sanctuary, Kamarajar District, Tamil Nadu.

N. Ramesh & M.C. Sathyanarayana

Division of Wildlife Biology,
A.V.C. College, Mayiladuturai 609 305, Tamil Nadu

Roost site selection by Grey junglefowl (*Gallus sonneratii*) was studied at Alagar Koil valley (9° 33' to 9° 36' N, 77° 33' to 77° 35' E) in Srivilliputtur Grizzled Giant Squirrel Wildlife Sanctuary, Kamarajar District, Tamil Nadu from December 1993 to March 1994. We recorded seven tree species that were selected for roosting by Grey junglefowl in the study area. However, the roost tree use was highly variable and majority of the birds utilized *Mangifera indica* (36.14%) and *Bambusca* sp. (30.12%) for roosting. The proportional use of tree species such as *Salmalia malabarica*, *Spondius mangifera* and *Strebulus asper* was very low with just 1.2% during the study. Apparently, the roost trees with tree height of 8-20m were found to be preferred for roosting, and in majority of the cases, the roost was located at 7 to 10 m height. Explanation on the possible reasons for relative preference to certain tree species and roost height will be discussed.

14. Habitat Ecology of Cheer Pheasant in Garhwal Himalaya

B.S.Kathait, Archana Bhatt, Anupama Rawat & M.S.Bisht

Department of Zoology,
H.N.B Garhwal University Campus, Pauri- 246 001, Uttaranchal.

An intensive study on the habitat ecology of Cheer pheasant (*Catreus wallichii*) in the district Chamoli and Pauri Garhwal, Uttaranchal (29° 36'N-31° 5'N & 78° to 80° E) was initiated in October 2000. Preliminary results indicate that the Cheer pheasant is very selective to Chir-pine and Pine mixed Oak forests (*Pinus roxburghii*, *Quercus* sp, *Rhododendron* etc.). Most of the Cheer sightings were recorded between 1,000 to 2,150 m altitude on the hill slopes having about 40% rocky cliffs, 40-75 slope angle, 70% forest canopy cover and 80% grass cover. Study is in progress to detect the response of the species to seasons and anthropogenic factors.

15. Habitat Preference of Grey and Black Francolins in Yamuna Nagar District, Haryana : Preliminary Results

Rajiv S. Kalsi, Sarita Rana & Randeep Singh

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The results presented here are a part of a three-year project on ecology of Grey francolin (*Francolinus pondicerianus*) and Black francolin (*Francolinus francolinus*) being carried out in Yamuna Nagar District (30° 12' N, 77° 18' E), Haryana. The study area was divided into nine blocks, which were further stratified into following four categories; forest, cultivation, grass and woody scrub. During October-December 2001, surveys were carried out to assess the habitat preference of these species, primarily using line transect and call count methods. The results revealed that both the francolin species appeared to show preference to agriculture areas dominated by sugarcane and wheat.

16. Group Size, Sex Ratio And Habitat Use Of Black Francolin (*Francolinus francolinus*) in Majathal Harsang Wildlife Sanctuary, Himachal Pradesh

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We studied the group size, sex ratio and the broad habitat use by Black francolin (*Francolinus francolinus*) in Majathal Harsang Wildlife Sanctuary between November 2000 and June 2001. The overall estimate of group size was 2.7 $\pm$ 0.17 (Mean $\pm$ S.E.), and it varied from 1.4 $\pm$ 0.68 in spring (breeding season) to 3.7 $\pm$ 0.19 in winter. The difference in the group sizes was found to be statistically significant ($F = 88.64$, $p < 0.001$). Pooled estimate of sex ratio across seasons was 1.7: 1 (male:female), whereas it was 1.3:1 in winter and 5.4:1 in spring. The bird's relative preference to scrub and cultivation was higher than expected while the use of oak and grassland habitats was less than expected ($p < 0.001$).

17. A Study on the Ecology (Population) and Behaviour of the Indian Peafowl (*Pavo cristatus*) in Vembakkotai, Virudhunagar District, Tamil Nadu

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A study on the ecology (population) and behaviour of the Indian peafowl (*Pavo cristatus*) was undertaken at Vembakkottai, a village situated at 14 km. south of Sivakasi, Virudhunagar District, Tamil Nadu. Twenty three visits were made from September 1995 to March 1996 and observations were made from 5.30 AM to 7.00 PM. The study period represented pre-breeding period (September), breeding period (October, November & December) and a post-breeding period (January, February & March). Four roosting sites were identified with in the study area. Sex ratio of adult male and female population at Vembakkkottai was found to be 100 :72. Harem formation, dancing, roosting, preening, standing, vocalization, feeding, breeding and tail shedding were the major behavioural activities of peafowl during the study period.

18. A Study on the Population and Behaviour of Indian Peafowl (*Pavo cristatus*) in Ketchilapuram Village, Tuticorin District, Tamil Nadu

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A study on the population and behaviour of Indian peafowl (*Pavo cristatus*) was undertaken in a 1 km^2 area in Ketchilapuram (9° 10'N-77° 52'E), a village in Kovilpatti Taluk, Tuticorin district, Tamil Nadu. During the 16 visits made between July 1998 and January 1999, a total of four roosting sites were identified within the area. Sex ratio of the species in the study area was estimated to be 1:0.76 (male: female). Seasonal variation in group composition and grouping pattern of peafowl in three different seasons of the study period was also observed. The breeding season of the peafowl started in the month of October. Harem formation, dancing, roosting, preening and vocalization were some of the behavioural activities of peafowl observed in the study area. Habitat destruction, poaching for meat and egg were the real threats to peafowl. In spite of the damage caused to the crops by peafowl, the villagers of Ketchilapuram tolerate the presence of the peafowl due to their religious sentiment. Suggestions for safeguarding our National bird at Ketchilapuram will be discussed.

19. Study on the Population of Grey Francolin (*Francolinus pondicerianus*) from Three Habitats of Therkukaraseri, Chidambaranar District, Tamil Nadu

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Grey francolin (*Francolinus pondicerianus*) inhabits semi arid areas interspersed with agriculture lands and human habitations. An intensive investigation on the habitat use of Grey francolin was conducted during November 1995 and October 1996 at Therkukaraseri of Chidambaranar District, Tamil Nadu. Habitats such as the open scrub with introduced flora and agricultural land are described with reference to the ecology of the species. Poaching by people has a serious negative impact on the population of Grey francolin. The importance of growing *Prosopis chilensis* which gives a natural environment for this species in the semiarid habitats, is highlighted.

20. Social Organisation of the Nicobar Megapode (*Megapodius nicobariensis*) in the Great Nicobar Island

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The Nicobar megapode (*Megapodius nicobariensis*) is a mound nesting bird, endemic to Nicobar Islands. It is a primarily monogamous species, although temporary pair bonds, change in partner and extra-pair copulation are also observed in this species. During our study, unpaired megapodes tried to steal the mate from an existing pair and it led to changes in partnerships, extra-pair copulation and temporary pair bonding. An egg-laying pair showed dominance over a non-egg laying pair. The dominant rank in the society of the Nicobar megapode was not consistent. Hierarchy varies temporally and spatially. Alpha pairs were more likely to show mound and territory fidelity than Beta pairs. Territories overlapped where a large number of pairs used a mound. The average size of the territory was 0.8ha. A major function of the territory of the Nicobar megapode was to protect the mound from neighbours or strangers. Both partners of a pair equally defended their territory from others. In this paper, we discuss why is the Nicobar megapode monogamous? and we also attempt to explain the reasons for extra-pair copulation.

21. Conservation of Red Junglefowl in India - Problems and Initiatives

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The Red junglefowl (*Gallus gallus*) is undoubtedly the single most important bird species that has ever lived in this world due to its economic and cultural importance to human civilization. It is the wild ancestor of all the domestic chickens that forms the multi-billion dollar poultry industry of the world today. The Red junglefowl has not received due attention from conservationalists although it is the only fall back option in the event of loss of domestic varieties and/or avian diseases that could spell doom to the poultry industry.

Recently, Peterson and Brisbin (1998) have expressed apprehensions that the wild Red junglefowl populations may have been genetically contaminated and that there may be no "pure" Red junglefowl in the wild. These observations were based on examination of 745 skins collected from various parts of Asia and preserved in various museums in America and Europe. The skins that were examined by the authors showed lack of phenotypic traits, which are characteristic to "pure" wild Red junglefowl. The phenotypic traits include: eclipse plumage, hen comb, leg colour, spur, tail carriage, male's crown and clutch size. The authors

contend that in the past, the wild Red junglefowl populations have hybridized with domestic or feral stock especially near the villages causing an introgression of domestic genes into the wild populations.

We review their observations and hypotheses in the light of sampling distribution and sampling inadequacy. Irrespective of the above contentious issue, the threat to hybridization to the Red junglefowl in India is possible and may have affected wild populations. We present our initiatives in addressing this problem which includes our observations on the phenotypic traits of captive and wild Red junglefowl, and the development of a research project proposal to address the various aspects of this issue.

22. Parasitic Diseases of Galliformes

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Parasitic diseases have high potential to control the galliformes population. Galliformes are exposed to a wide variety of pathogens and stress resulting in occurrence of infectious diseases and pathological conditions. The diseases like Marek's disease, staphylococcosis, tuberculosis, coccidiosis, trichomoniasis and heterakiasis were reported in captive pheasants and ascariasis in free ranging peafowls. Wildlife managers, biologists and other conservationists must have adequate knowledge of parasites, their ecology, behaviour, population dynamics as well as the diseases they cause, which enable them to control the parasites and thereby keeping a healthy stock of the galliformes. Not much is known about the parasitic infections of galliformes in wild conditions though we have some information on captive pheasant diseases. Dr.Woodford, Chairman, IUCN Species Survival Commission Veterinary Specialist Group opined that disease monitoring and Veterinary management should be integral components of the Action Plan of Species Conservation Groups and Environmental Agencies.

23. Conservation Issues Relevant to Important Bird Areas for Galliformes

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The BirdLife International-Important Bird Areas (IBA) Programme India, coordinated by the Bombay Natural History Society and sponsored by the Royal Society for the Protection of Birds, aims to identify, document and advocate the protection of internationally important sites for the long term protection of wild bird species in India. The IBA is a site based approach and the sites are being identified based on four globally uniform criteria covering a wide range of habitats and species ranging from (1) globally threatened bird species, (2) bird species with restricted ranges like *Tragopan melanocephalous*, (3) species largely restricted to biomes and (4) sites where birds congregate. Data has been gathered through an exhaustive literature review, workshops, consultation and surveys conducted by partners/members of the Indian Bird Conservation Network (IBCN). Several sites thus far identified are important for various species of Galliformes. The process of identification of IBAs is ongoing and about 350 sites have been prioritised. Ongoing research and surveys may result in additional sites qualifying as IBAs. Almost 99% of the IBAs identified face some form of direct or indirect threat due to anthropogenic pressures. While the protected area network forms the backbone of the programme, several sites are not under official protection. The scope of the programme, IBA criteria (for which the 49 Galliformes species reported from the Indian subcontinent qualify), the relevance of IBA and issues relevant to the conservation of galliformes will be presented and discussed.

24. Husbandry, Management and Breeding Problems of Pheasants in Arignar Anna Zoological Park,Vandalur, Chennai

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Pheasants are large gamebirds, their males having an ornamental and elaborate plumage and unfeathered legs. The order galliformes comprises more than 200 species of which Arignar Anna Zoological Park has been maintaining 10 in captivity since its inception. They are *Francolinus pondicerianus*, *Galloperdix spadicea*, *Gallus sonneratii*, *Nemida meleagaris*, *Lophura leucomelana*, *Phasianus colchinus*, *Lophura nycthemera*, *Pavo cristatus*, *Catreus wallichi* and *Chysolophus pictus*. This paper explains the housing pattern, diet and day to day management aspects of pheasants in Arignar Anna Zoological Park. It has also discussed in detail about breeding problems of pheasants in captivity.

25. Breeding of Indian Peafowl (*Pavo cristatus*) in Arignar Anna Zoological Park, Chennai

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The Indian peafowl (*Pavo cristatus*) is a common and well-known National bird in India. The Arignar Anna Zoological Park is maintaining and breeding peafowls (normal and white-coloured) since its inception. This article explain in detail about courtship behaviour, egg laying, incubation, rearing and management of peafowl in captivity.

26. Turkey Farming under Semi-Intensive System of Rearing in Thanjavur District, Tamil Nadu

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In Thanjavur District of Tamil Nadu, which is predominantly agriculture oriented, turkeys are generally reared under semi-intensive system of management. The types are mixed varieties of birds with full white and black-white admixture. Minimal housing facilities are provided with thatched roof and litter. Floor space ranges from 2 ft^2/bird, depending on the age of the birds. Perches are provided to help birds relax. Natural breeding is generally successful under good management. Hens start laying eggs when they are about 30 weeks of age. The maximum yield is about 100 eggs/year. Males are ready for breeding around 35-40 weeks of age. Incubation period is 28 days. Small-scale electrical incubators are used for hatching. However, foster incubation with country fowl is a common practice. Day-old turkey poults weigh around 40-60 grams, depending on the variety. Artificial brooding is done with electric bulbs as a source of warmth for a period of 15 days. The turkey poults are started off with broken rice or Bengal gram with the boiled and minced chicken-egg as a standard source. Broiler starter feed is offered with additional protein source such as groundnut oil cake. Medication is done minimally with vitamin and calcium preparations. Vaccinations are given to protect against New castle and pox diseases. Though there is no specific marking age, at about 6-7 months of age, turkeys attain 4 to 6 kg, for hens and toms respectively.

27. Call to Save Our National Bird, Indian Peafowl (*Pavo cristatus*)

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The Indian peafowl (*Pavo cristatus*) population is dwindling due to poisoning by farmers in some parts of India to save their crops, illegal removal of eggs and poaching for meat and feathers. Consumption of eggs by the local people for supposedly high medicinal value is one major threat. However, there is no scientific basis for such claims on its medicinal properties. In order to avoid the illegal killing of peafowl, awareness must be created among the public about the values and importance of this bird in the ecosystem. Strict action against poachers and scientific research are required for the conservation of this species.

28. People's Participation in Conservation of Galliformes

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Wildlife Conservation is not possible without the support and involvement of local people living in and near the Protected Areas. Conservation of Galliformes in India depends substantially on the protection afforded to the species and their habitats by the local people. In India, many species of Galliformes are under serious threat due to hunting/poaching for meat or feathers; by habitat degradation; and disturbances during breeding season by human activities. Examples of such threats are presented and discussed with suggestions for People's participation in Conservation. Suggestions include: development of eco-tourism, alternate source of animal protein, cultivated plants substituting for wild plants/products from habitats of Galliformes, and creating general public awareness.

29. Environmental Education and Galliformes Conservation

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Wildlife Biologists and Protected Area Managers are increasing aware of the importance of conserving Galliformes and their habitats. As part of conservation strategies, the Pheasant Specialist Group (IUCN) have taken initiatives to promote awareness among people at every level and it has emphasized the need to begin such initiatives at local level. Special programmes focussing on target groups at local scale have to be designed in such as way that the programme provides a persuasive effect. Such programmes enable the people to realise the negative consequence of species loss and provide options for their involvement in galliformes conservation. Considering the human population size, the awareness programmes require simultaneous approaches; visual media, nature camps, training workshops, mobilizing support for the conservation activities from policy makers and politicians. Establishment of Eco-clubs and Nature Clubs would form effective platform to carry out the above activities that will translate into long-term survival of the Gallifomes.

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