ANNUAL REPORT 2004-05

भारतीय वन्यजीव संस्थान
Wildlife Institute of India

जहाँ है हरियाली ।
वहाँ है खुशहाली ॥

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Cover: WII in field

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Back Cover: WII's campus biodiversity

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Butterfly Paintings: Asha Jain

Contents

The Institute continued to receive valuable guidance from the WII-Society, the Governing Body and the Training, Research and Academic Council. It also received requisite support from the State Forest Departments, sister organizations, scientific institutions and civil society organizations for carrying out its activities in a collaborative manner. The Institute's faculty, technical and administrative staff have worked hand-in-hand in successfully accomplishing the mandated activities and in making this Institute an ideal place of learning. I take this opportunity to thank them all.

(P.R. Sinha)
Director

Swallowtail (*Papilio machaon*)

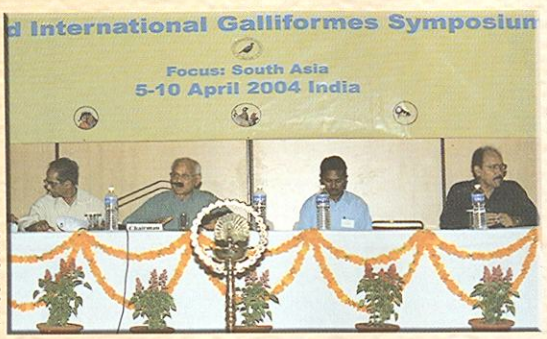
The Year at a Glance

Regular Courses

- IX M.Sc. (Wildlife Science,) *July 2003- July 2005*
- XXV Post Graduate Diploma Course concluded, *September 1, 2003 - May 31, 2004*
- XXVI Post Graduate Diploma Course commenced, *September 1, 2004 - May 31, 2005*
- XX Certificate Course in Wildlife Management concluded, *November 1, 2004 - January 31, 2005*

Short Courses, Workshops, Seminars, Conferences and Meetings

- Third International Symposium on Galliformes, Dehradun, *April 5-10, 2004.*
- Vacation Training Programme on Bioresources for School Children, Dehradun, *June 5-22, 2004.*
- National Workshop of ENVIS Nodes and Centres, Dehradun, *June 25-27, 2004.*
- One-Week Compulsory Training Course for IFS Officers on "Wildlife Management: Issues and Concerns", *July 19–23, 2004.*
- Nature Guide Training Programme, *August 16-20, 2004.*
- Health Management of Captive Wildlife, *August 26-27, 2004.*
- National Seminar on World Heritage Properties, *September 23, 2004.*
- Workshop on Himalayan Biodiversity, Dehradun, *October 2-4, 2004.*
- One-Week Compulsory Training Course for IFS Officers on Current Trends in Wildlife Management, Dehradun, *November 1-5, 2004.*
- Training Course on 'Environment and Wildlife Conservation' for the officers of the Indian Army, *December 13-15, 2004.*
- Training on animal immobilization, restraint and transportation techniques, Dehradun, *January 5-8, 2005.*
- Training of Trainers (ToT) Workshop for Capacity Building in Elephant Management, Kalagarh Training Centre, Corbett National Park, *January 14-21, 2005.*
- 2-Day Attachment Training on Wildlife Protection, Law and Forensics for Inspectors of Customs & Central Excise, Dehradun, *January 24-25, 2005.*



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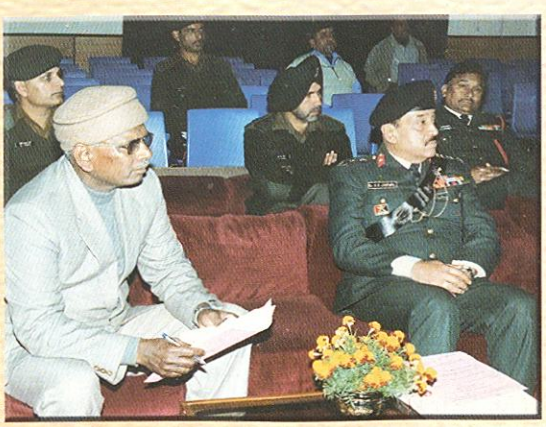
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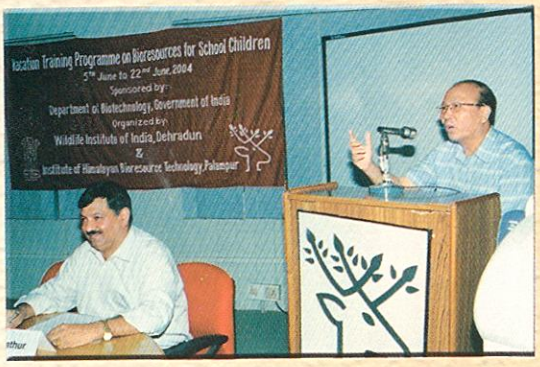

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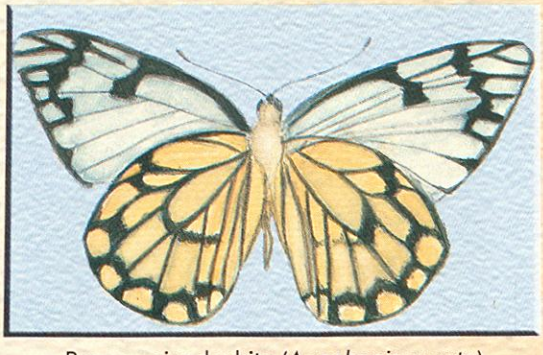
- Orientation Programme for Research Fellows, *January 24 - February 5, 2005.*
- Workshop on Health Monitoring of Wild Animals, Dehradun, *February 7–9, 2005.*
- Workshop on Wildlife Immobilization and Restraint, Dehradun, *March 8–10, 2005.*

Seminar

- XVIII Annual Research Seminar, *September 20-21, 2004.*

Meetings

- XII Meeting of Training, Research & Academic Council, September 22, 2004
- XLV Governing Body Meeting, *October 29, 2004.*
- XII Annual General Meeting of WII-Society, *December 7, 2004.*



Brown-veined white (*Anaphaeis aurota*)

WII - A Profile

The early eighties of the last century brought about the realization of rapidly diminishing natural resources and imminent environmental disasters in all spheres of life. During that time, the understanding of environmental issues was a little hazy and the remedial responses to environmental problems were fraught with inherent weaknesses.

In India, forests have traditionally been inhabited by people, who have been dependent on its resources for food, shelter and for a variety of other sustenance needs. It is obvious that conservation of natural resources cannot be achieved in isolation nor the people living in and around the protected areas be wished away.

The shortcoming of the early initiatives has brought into focus the shortage of trained manpower for wildlife management and of wildlife biologists to conduct research. The paucity of researched data and information constrained the proper understanding of the issues and problems and thereby limited proper conservation planning. A need was felt for an organization which could through multi-disciplinary research, appreciate and address the realities on ground, seek answers to the issues in wildlife conservation and accordingly implement a holistic approach to manage wildlife and its habitats across the country and the region.

From its inception, WII has had the benefit of collaboration with international organizations such as UNDP, FAO, USFWS, IUCN, UNESCO, etc. These have allowed the Institute to build a competent faculty through rigorous training and exposure to modern research techniques, and broaden its research, teaching and training base. The collaborations have also helped the Institute to equip itself with the most advanced laboratory and field equipment including state-of-the-art computer hardware and software.

Wildlife Institute of India has achieved recognition as a premier regional institution for training and research in wildlife conservation. Foresters and wildlife managers from countries in south and south-east Asia, have regularly been attending WII's courses in wildlife management. Special customized courses in Wildlife Management have also been conducted for protected area managers in Sri Lanka.

WII is striving to provide a more practical and realistic direction to the concept and practice of wildlife conservation, by seeking the involvement and cooperation of the local communities. However, the problems and challenges are immense and diverse and are compounded by a constantly changing scenario. By learning from its own and others' experiences, WII is traversing a path of hope and aspiration, which will help strengthen its inputs and efforts to find answers to better address wildlife conservation issues and challenges in the country as well as in the South Asian region.

Wildlife Institute of India (WII), at Dehradun was setup in 1982 and has emerged as an eminent institute in the South Asian Region. The IUCN has recognized WII as one of the six regional institutions for capacity building in protected area management.

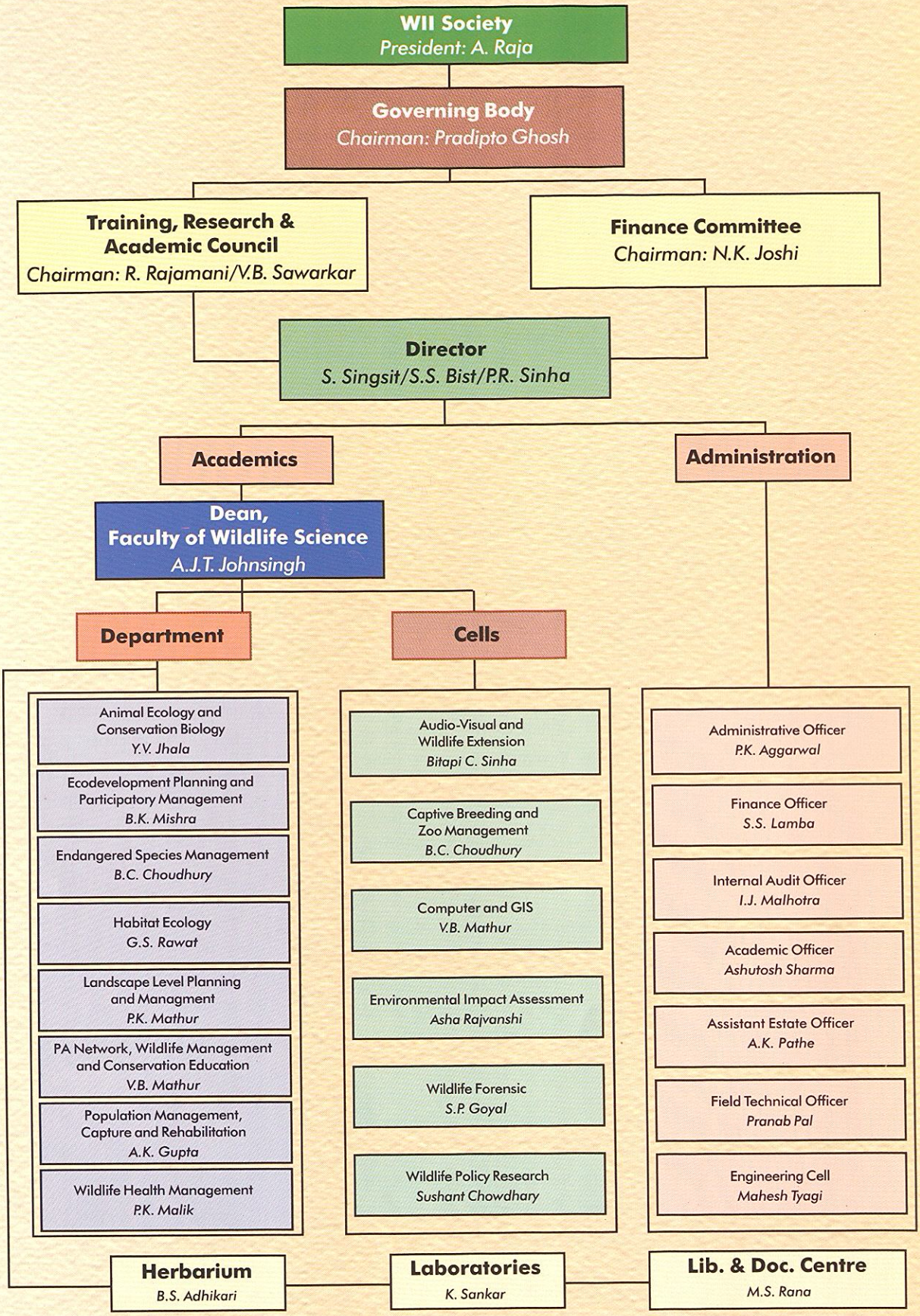
AIMS AND OBJECTIVES

- *To build capacity and develop human resources in wildlife science.*
- *To develop as a centre of excellence in wildlife science.*
- *To provide consultancy and advisory services in wildlife conservation.*
- *To advocate issues relevant to wildlife science and conservation.*
- *To develop as a regional centre for South Asia and South-East Asia for training and research in wildlife conservation.*
- *To develop as a Deemed University in wildlife science.*

OUR MISSION

The WII's mission is to nurture the development of wildlife sciences, and promote its application in the field in a manner that accord with our economic and socio-cultural milieu.

Organizational Structure of WII

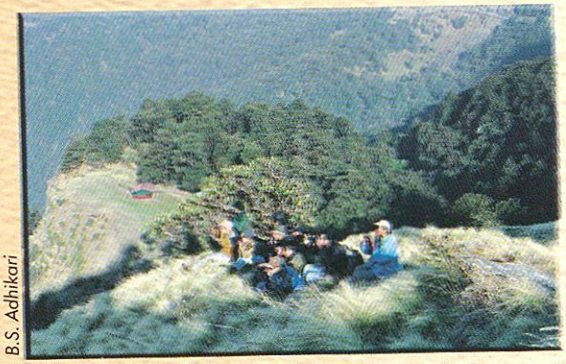


Academic Programme

M.Sc. (Wildlife Science)

As part of M.Sc. (Wildlife Science) programme all eight students of the IX batch developed field based dissertation projects in the IV semester (November 04-July 05) and completed their field work. The list of dissertation topics is given below:

Name of the Student	Title of dissertation topic	Supervisor (s)
Chandrima Home	Resource utilization and parental investment in the Indian fox (*Vulpes bengalensis*) in Kutch, Gujarat.	Dr. Y.V. Jhala
Amit John Kurien	Response of tiger (*Panthera tigris*) and prey populations to varying magnitudes of human disturbance in Chilla Wildlife Sanctuary, Uttaranchal.	Dr. S.P. Goyal Dr. B. Pandav
Hari Sridhar	Patterns in mixed species flocking of birds in rainforest fragments of the southern Western Ghats.	Dr. K. Sankar
Abishek Harihar	Population, food habits and prey densities of tiger in Rajaji National Park, Uttaranchal, India.	Dr. B. Pandav Dr. S.P. Goyal
Rohit S. Naniwadekar	Patterns in diversity of amphibians along an elevation gradient in the Western Ghats, South India.	Dr. Karthikeyan Vasudevan
Rishi Kumar Sharma	Estimation of tiger (*Panthera tigris*) densities through pugmark sets and camera traps in a mark-recapture framework.	Dr. Y.V. Jhala
Vidhyadhar M. Atkore	Conservation status of fishes in tributaries of Ramaganga upstream with special reference to Golden mahseer (*Tor putitora*).	Dr. K. Sivakumar Dr. A.J.T. Johnsingh
Tamo Dada	Relative sensitivity of mammalian carnivores to disturbance.	Dr. S.A. Hussain



B.S. Adhikari

Status of Doctoral Research in WII

No.	Thesis Title	Name	University	Supervisor (s)
A	**Thesis Submitted**			
1.	Assessment of the diversity, successional changes and forest management in *jhum* influenced forest ecosystem of South Garo Hills, Meghalaya	Shri Ashish Kumar	FRI (DU), Dehradun	Dr. P.S. Roy (Supervisor) Dr. A.K. Gupta (Co-supervisor)
B	**Registered**			
1.	Land Use, Forest Fragmentation and River Dynamics in Dudhwa Landscape and their Conservation Implications	Ms. Neha Midha	Saurashtra University, Rajkot	Dr. P.K. Mathur
2.	Analysis of landscape features in part of Kumaun Himalaya with special reference to woody vegetation	Shri Neeraj Sharma	FRI (DU) Dehradun	Dr. G.S. Rawat (Supervisor) Dr. A.K. Tiwari (Co-supervisor)
3.	Study on the ecology and systematics of orchids in Uttaranchal, India	Shri Jeewan S. Jalal	Kumaun University, Naini Tal	Dr. G.S. Rawat (Supervisor)
4.	Ecology and Management of Alpine Landscape in Khangchendzonga National Park, Sikkim Himalaya	Shri Sandeep Tambe	FRI (DU) Dehradun	Dr. G.S. Rawat (Supervisor)
5.	Studies on the systematics and some aspects of the ecology of orchids in the state of Jharkhand, India	Shri Pankaj Kumar	FRI (DU) Dehradun	Dr. G.S. Rawat (Supervisor)
6.	Tiger habitat quality and connectivity in Kanha-Pench landscape.	Shri Shirish K. Kyatham	FRI (DU) Dehradun	Sh. Q. Qureshi (Supervisor) Dr. Y.V. Jhala, Dr. Rajesh Gopal (Co-supervisor)
7.	Resource use and habitat management strategies for the barasingha in Kanha Tiger Reserve.	Shri K. Nayak	Dr. H.S. Gour University, Sagar (M.P.)	Dr. Y.V. Jhala
8.	Interactions between forage, recruitment and activity patterns of Blackbuck (*Antelope cervicapra*).	Ms. Priyadarshini, K.V.R.	Saurashtra University, Rajkot, India	Dr. Y.V. Jhala
9.	Social organization and reproductive strategies of male Asiatic lions (*Panthera leo persica*).	Ms. Meena V.	FRI (DU) Dehradun	Dr. Y.V. Jhala

Masters' Thesis

Sl.No.	Thesis Title	Name	University	Supervisor(s)
1.	Density and biomass estimation of tiger prey: developing habitat specific detection models.	Shri A. Mitra	FRI (DU) Dehradun	Dr. Y.V. Jhala
2.	Comparison of different methodologies for extraction of DNA.	Ms. S. Gupta	C.C.S. University, Meerut, U.P	Dr. Y.V. Jhala
3.	Food habits and resource utilization by the Indian fox, in Abdasa, Kutch.	Ms. C. Home	Saurashtra University, Rajkot	Dr. Y.V. Jhala
4.	Comparing tiger densities obtained by pugmarks and camera traps.	Shri R. Sharma	Saurashtra University, Rajkot	Dr. Y.V. Jhala
5.	Vulture breeding status and diclofenac use in Kutch, Gujarat.	Ms. P. Sinha	FRI (DU) Dehradun	Dr. Y.V. Jhala
6.	Developing prey density estimation models for Kuno.	Shri K. Bannerjee	FRI (DU) Dehradun	Dr. Y.V. Jhala
7.	Ungulate and Tiger occupancy models for the Satpura Tiger Reserve.	Shri S. Basu	FRI (DU) Dehradun	Dr. Y.V. Jhala
8.	Perception of local people towards services provided by forest ecosystems: A study from *Terai Bhaber*	Ms. Tripti Sah	FRI (DU) Dehradun	Dr. S.A. Hussain Dr. Ruchi Badola
9.	Human wildlife conflicts around Corbett Tiger Reserve: A case study of six villages	Ms. Bidyarani Konthujam	FRI (DU) Dehradun	Dr. Ruchi Badola Dr. S.A. Hussain
10.	Developing software for Activity Records and Book Management	Shri Yogesh Banik	Graphic Era Institute of Technology, Dehradun	Dr. A.K. Gupta
11.	Impact of habitat fragmentation on hoolock gibbon in Gibbon Wildlife Sanctuary, Assam	Shri Debojyoti Chakraborty	FRI (DU) Dehradun	Dr. A.K. Gupta
12.	Resource utilization by three species of primates in Gibbon Wildlife Sanctuary, Assam	Ms. Reenema Hazarika	FRI (DU) Dehradun	Dr. A.K. Gupta
13.	Pesticide pollution and its impact on the greater adjutant stork in Assam	Shri Debojyoti Chakraborty	FRI (DU) Dehradun	Dr. A.K. Gupta
14.	Impact of urbanization on wetland ecosystem of Deepor Beel, Assam	Ms. Reenema Hazarika	FRI (DU) Dehradun	Dr. A.K. Gupta

XXV Post Graduate Diploma Course concluded

The XXV Post Graduate Diploma course commenced on September 1, 2003. During the reporting period, the officer trainees were taken to Jaldapara Wildlife Sanctuary for Management Term Paper Exercise from March 27-April 6, 2004. The objective of this tour was to familiarize the officer trainees in the collection of field data and for writing a scientific report based on the data collected through both primary and secondary sources. The officer trainees were taken to Gir Conservation Area during April 23-May 11, 2004 for the Management Plan writing exercise. The objective of this exercise was to develop skills among the officer trainees in writing a management plan. Under the guidance of faculty members, the officer trainees conducted field surveys to collect first-hand information on all aspects of Gir Conservation Area. The sports events were held from May 26-27, 2004. The WII team won cricket and the tug-o-war events while the diploma officers were the winners in Volleyball. The *viva-voce* examination was held on May 28-29, 2004.

Shri Manoj Kumar bagged the Institute's Gold Medal for the 'Top Trainee'. He also won the Wildlife Preservation Society Silver Medal for the 'Top Trainee' and Silver Medal for the 'Best All Round Wildlifer'. NR Nair Memorial Silver Medal for 'Best Management Plan' was jointly won by Shri N.B. Debnath and Shri Manoj Kumar. Best Management Term Paper (Book Prize) was shared by Shri K.V. Uthaman and Shri Prabhat Tyagi. Shri Manoj Kumar was declared the Top Trainee in Wildlife Biology (Book Prize). Institute's Gold Medal for 'Top Foreign Trainee' was jointly bagged by Shri Bed Kumar Dhakal and Shri Namgay Dendup.

The valedictory function was held on May 31, 2004. Dr. R.B. Lal, IGF (Wildlife) GOI, was the Chief Guest of the function. All the officer trainees successfully completed the course. Shri Manoj Kumar (Karnataka), Shri N.B. Debnath (Tripura), Shri K.V. Uthaman (Kerala), Shri Anil Kumar Ratan (Karnataka), Shri Namgay Dendup (Bhutan) and Shri Bed Kumar Dhakal (Nepal) received the Honours Diploma.

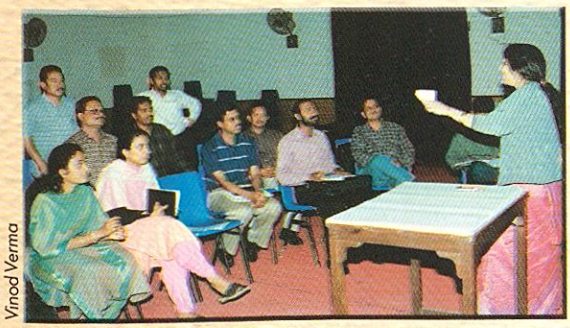
Vinod Verma

XXVI Post Graduate Diploma Course commenced

The XXVI Post Graduate Diploma Course in Wildlife Management commenced from September 1, 2004. In all 28 officer trainees joined the course, of which 19 candidates, *viz.* three were from Rajasthan, two each from Mizoram, West Bengal, Andhra Pradesh, Madhya Pradesh and one each from Arunachal Pradesh, Bihar, Karnataka, Kerala, Meghalaya, Nagaland, Orissa. In addition, 9 foreign nationals, 4 under SAARC fellowship, one each from Bangladesh, Nepal, Bhutan & Sri Lanka and one each from Bhutan and Nepal have been sponsored by the Global Tiger Forum, New Delhi under its capacity building program for tiger conservation. The PA Management and Wildlife Conservation Project, Sri Lanka sponsored one candidate. Two candidates from Bangladesh were sponsored by Nishorgo Project funded by USAID. The officer trainees were taken for their Orientation tour to Corbett Tiger Reserve from September 30, 2004 to October 4, 2004. The trainees were shown indirect evidences of wild animals, birds, plant identification and vegetation of the park. They went on High Altitude Tour to Kedarnath Wildlife Sanctuary and Nanda Devi Biosphere Reserve from November 16-21, 2004. In this tour, the officer trainees were exposed to various aspects of Himalayan ecology, its conservation and management. The techniques tour for the diploma course was conducted at Sariska Tiger Reserve from November 27, 2004 to December 12, 2004.

Bitapi C. Sinha

Management Tour to South & Central India was conducted from January 29 to February 19, 2005. The tour was conducted to expose the officer trainees to a variety of management practices across several Protected Areas and *ex-situ* conservation areas in the southern and central parts of the country. The tour covered the areas of Banerghatta National Park; Ranganthitu Bird Sanctuary; Rajiv Gandhi National Park; Nagerhole; Bandipur Tiger Reserve; Mudumalai Wildlife Sanctuary; Mukurthy National Park; Indira Gandhi Wildlife Sanctuary; Botanical Garden & Arboretum, Ooty; Parambikulum Wildlife Sanctuary and



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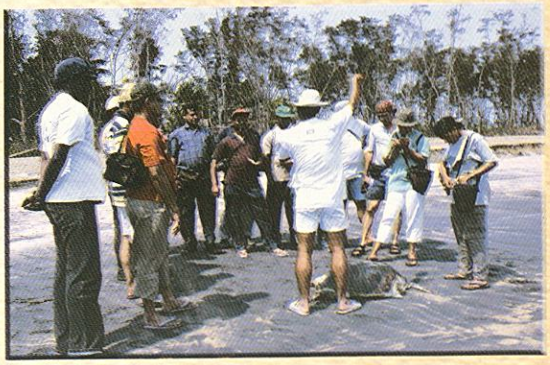


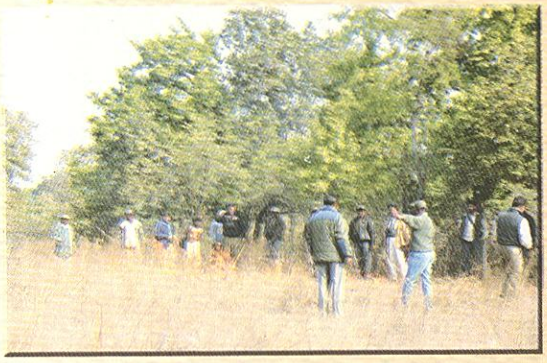
B.C. Choudhury

Kanha Tiger Reserve. During the tour, the officer trainees learnt about the conservation values of the areas, management issues, practices and strategies. Eco-development; Man-animal Conflict; Interpretation and Wildlife Tourism were also discussed.

Management Term Paper Tour to Kaziranga National Park, Assam and Bhitarkanika Wildlife Sanctuary, Orissa was conducted from March 12–24, 2005. The officer trainees were assigned specific topics. Fourteen officer trainees undertook the management term paper exercise in Kaziranga National Park, Assam and the remaining fourteen officer trainees undertook the same exercise in Bhitarkanika Wildlife Sanctuary, Orissa.

The information and data collected from the field was analysed. The officer trainees presented their findings and recommendations in presentations, which were attended by faculty members and site managers.

XX Certificate Course in Wildlife Management



Bitapi C. Sinha

The Certificate Course in Wildlife Management is one of the regular courses of the Wildlife Institute of India, that is aimed at training Range Forest Officers in practical day-to-day management of Protected Areas. Twenty officer trainees joined this 3-month course that began on November 1, 2004. Of these, one officer from Arunachal Pradesh had to leave this course after three weeks, due to medical reasons and so it remained a class of 19 officers. Of the total, 15 officers were from Indian States and four were from abroad. The officer trainees from India included three from Jammu & Kashmir, two each from Arunachal Pradesh, Manipur, Orissa, West Bengal; and one each from Madhya Pradesh, Maharashtra, Mizoram and Punjab. The four officer trainees from abroad included two from Nepal and one each from Bhutan and Vietnam. The foreign trainees were sponsored by Global Tiger Forum, New Delhi.

Vinod Verma

The teaching and training inputs for the course units were in the form of lecture sessions, workshops, practical sessions in computer and research laboratory, seminar presentations, guest lectures and film shows. The following field visits were conducted during the course: (i) Orientation-Cum-Techniques Tour to Rajaji National Park (Beribada) from November 22-28, 2004; (ii) One-day field visit to Van Chetna Kendra, Deer Park, Asan Barrage on December 18, 2004; (iii) One-day field visit to Wetland Bird View, Asan Barrage on December 25, 2004; and (iv) Management Tour to Corbett National Park, Uttaranchal, National Museum of Natural History (NMNH), New Delhi, Sultanpur National Park, Haryana, Keoladeo National Park, Bharatpur and Sariska Tiger Reserve, in Rajasthan, Delhi Zoo, Panna National Park and Kanha National Park in Madhya Pradesh from December 27, 2004 to January 13, 2005.

The performance of officer trainees were assessed by theoretical examination that were held from January 18-20, 2005 and by evaluation of the tour journals for the Techniques and Management Tour. Seminar presentations based on Management tour were also made by the officer trainees and these were also evaluated by a committee. A *viva-voce* was held on 27th January 2005 and the Valedictory Function was organized on January 31, 2005. All 19 officer trainees successfully completed the course, with ten of them passing with Honours Certificate. Dr. J.K. Rawat, Addl. PCCF, Haryana gave prizes and certificates to the officer trainees during the Valedictory Function.

Shri Ashish Mondal (West Bengal) and Shri Manjur Ahamad (Nepal) were the toppers of the course and were awarded Gold Medals. Shri Ashish Mondal also won the Book Prize for Best Wildlife Management and Shri Manjur Ahamad won the Book Prize for the 'Best All Round Wildlifer' and the 'Best Foreign Trainee'.

Short Courses, Workshops, Seminars, Training Programmes

Third International Symposium on Galliformes, Dehradun, *April 5-10, 2004.*

The symposium was organized at WII by the World Pheasant Association and the IUCN/SSC Specialist Group for Pheasants, Partridges, Quails, Francolins and Megapodes. The WII and the Uttaranchal State Government were the co-hosts of this symposium. Over 150 delegates from 25 countries participated in this symposium.

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His Excellency, Governor of Uttaranchal, Shri Sudarshan Agarwal was the Chief Guest during the inaugural function. He released a set of posters, books and education material and delivered the key note address to the delegates on this occasion. Shri S. Singsit, Director, WII and Shri Samar Singh, President, WPA-India welcomed the delegates. Mr. Dick Potts, Chairman, WPA; Shri Vinod Rishi, ADG(WL), MoEF, GOI and Dr. R.S. Tolia, Chief Secretary, Uttaranchal Government addressed the delegates. The formal sessions on the first-day included presentations on the conservation status of Galliformes by the Chief Wildlife Warden(s) or representatives, of some of the States of India, and representatives from the SAARC countries. Next two days had formal sessions and poster sessions that included over a hundred papers/posters covering a wide range of topics. The final session of the symposium was chaired by Shri Nav Prabhat, Hon'ble Minister for Forests and Urban Development, Govt. of Uttaranchal during which resolutions were passed. The delegates were then taken to Corbett National Park for field visit from April 8-10, 2004. Following this, delegates participated in the post symposium tours *viz.*, Sarahan Pheasantry, Himachal Pradesh for conservation breeding; Scientists tour to IVRI, Mukteswar campus and to Kumaun for bird watching.

Vacation Training Programme on Bioresources for School Children, Dehradun, *June 5-22, 2004.*

The National Bioresource Development Board (NBDB), Department of Biotechnology, Government of India is engaged in promoting awareness among school children about the importance of environment, biodiversity, biotechnology and their relationship with everyday life. In pursuance of this objective, the third 'Vacation Training Programme on Bioresources for School Children' was jointly organized by the Wildlife Institute of India, Dehradun and the Institute of Himalayan Bioresources Technology, Palampur.

Vinod Verma


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The objectives of the training programme were: (a) to inculcate among school students an appreciation of the importance of biological resources of the country, their use and management; (b) to create opportunities for students for hands-on experience in the laboratory/field on the subject of bioresources; (c) to study locally available bioresources, their sustainable use and conservation, and (d) to bring about interaction of students with leading experts in the field from a pool of core and visiting faculty.

Twenty-six students from ten schools of Uttaranchal and five schools of Himachal Pradesh participated in this training programme. The training schedule included classroom interactions, laboratory exercises and visit to various scientific institutions. All students participated in the project work on: (a) Understanding and documenting bird diversity, (b) Understanding and documenting herpetofaunal diversity, and (c) Designing individual websites. The valedictory session was organized on the concluding day in which Ms. Shanti Varma, Former Principal, Welham Girls School delivered the valedictory address and presented certificates to all the students for successfully completing the course and book prizes were awarded to the winners.

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National Workshop of ENVIS Centres and Nodes, Dehradun, *June 25-27, 2004.*

A National Workshop of an Environmental Information System (ENVIS) Centres and Nodes was organized by the Wildlife Institute of India on behalf of the Ministry of Environment and Forests, Government of India. The objective of the workshop was to take stock of the achievements, shortcomings and preparing a road map for the future of the Environmental Information System in the country. The workshop was inaugurated by Shri Namo Narain Meena, Hon'ble Minister of State for Environment and Forests, Government of India. Shri Nav Prabhat, Hon'ble Minister for Forests and Urban Development, Government of Uttaranchal was the Guest of Honour. Over 175 participants from 75 ENVIS Centres and Nodes, technical experts, representatives from scientific institutions participated in the workshop.

During the inaugural ceremony award was given to the Centre of Ecological Sciences, Indian Institute of Science, Bangalore for the "Best ENVIS Centre". The first, second and consolation prizes in the ENVIS Logo Competition were given to Centre for Advanced Studies in Marine Biology, Parangipettai, Tamil Nadu; Disaster Management Institute, Bhopal; and Department of Zoology, University of Madras, Chennai, respectively. A digital compilation in a compact disc of all eight ENVIS thematic bulletins published by the WII-ENVIS Centre was released by Shri Namo Narain Meena, Hon'ble Minister of State for Environment and Forests, Govt. of India. Shri Vinod Rishi, Additional Director General (Wildlife); Ms. Meena Gupta, Additional Secretary, MoEF; Shri R.P.S. Katwal, Director General, ICFRE; Shri Sudhir Mital, Joint Secretary, MoEF; Dr. Indrani Chandrasekharan, Director (ENVIS), MoEF; and Dr. V.B. Mathur, WII chaired/co-chaired various technical sessions.

Techniques for Population Estimation of Nilgai in Haryana, *July 12-13, 2004.*

The workshop was organized by WII in collaboration with the Haryana Forest Department to impart training to Wildlife Inspectors and Sub-inspectors in the techniques of estimating Nilgai population across the State. A total of 24 wildlife inspectors and sub-inspectors participated in the workshop. The workshop contained both theoretical and practical inputs. At the end of the workshop, a questionnaire was devised to collect information on various aspects pertaining to the numbers, depredation status and possible mitigation measures for Nilgai. A plan was also drawn to conduct population estimation exercise by the Haryana Forest Department in the ensuing season.

One-Week Compulsory Training Course on "Wildlife Management: Issues and Concerns", *July 19–23, 2004.*

This training course was held at the Institute for IFS officers as a part of their compulsory training programme. Eleven officers from Karnataka, Assam, Tamil Nadu, Gujarat, Sikkim, Andhra Pradesh, Uttar Pradesh, West Bengal and Kerala attended the course. The course was meant to sensitize the field officers in issues dealing with wildlife management and biodiversity conservation.

Vinod Verma


Vinod Verma

The course curriculum included: An Overview of Wildlife Management in India during last two decades; Biodiversity Convention; Forensic Science; Eco-tourism; National Wetland Policy; Interpretation and Conservation Education – A tool for eliciting public support for conservation; Forestry as climate change mitigation option; Convention on International Trade in Endangered Species (CITES) and Wildlife Trade; Role of Non-Wood Forest Produce (NWFP) in Wildlife Conservation, International Conventions, Biodiversity Conservation status in India, and two Panel discussions on: (i) Dealing with enclave settlements, and (ii) Improvement in the working of Forest Department – need for Career Development through training and improvement of skills. Besides this, one day visit to Rajaji National Park and adjoining areas was organized with special focus on various habitat management approaches and strategies including Elephant conservation, *Gujjar* rehabilitation, Buffer Zone Management and Ecodevelopment.

Nature Guide Training Programme, *August 16-20, 2004.*

A week long training programme was organized in collaboration with Uttaranchal Forest Department for building capacity of local hill people in tourism and conservation activities. A total of 23 youths from Uttarkashi District participated in the course and were taught about the ecology and wildlife of the region in a manner that they could disseminate information to the visitors.


S. Wilson

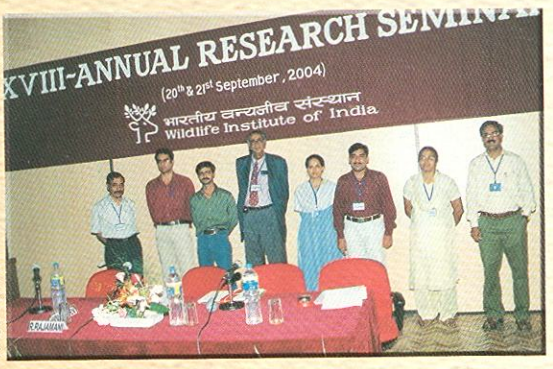
Apart from classroom sessions and guest lectures, emphasis was given on practical field demonstration. The trainees were taken to Dodital from August 21-27, 2004 with a group of trainers to gain specific information of the region.

Health Management of Captive Wildlife, *August 26-27, 2004.*

The two-day training workshop was organized for field veterinarians from M.C. Zoological Park, Chattbir, Punjab on various aspects of wild animal immobilization and restraint. The participants were exposed to various physical and chemical restraint techniques, management of wild animals in distress, transportation/ translocation of wild animals. Hands-on training on immobilization equipment was also provided.

XVIII Annual Research Seminar (ARS) of WII, *September 20-21, 2004.*

Shri R. Rajamani, Chairman, Training, Academic and Research Council (TRAC), chaired the Seminar. In total, 21 presentations were made by the researchers, collaborators and faculty members during seven sessions, *i.e.* Studies on Carnivores, Avifaunal Studies, Wildlife Forensics, Studies on Ungulates, Studies on Herpetofauna, Studies on Primates, Animal-Habitat Interactions & GIS and New Initiatives. About three hundred internal and external delegates attended the ARS including several Principal Chief Conservator of Forests (PCCFs), Chief



Vinod Verma

The research presentations made by the following researchers were adjudged as the best presentations. Award winners received book award worth Rs. 1,000/- each.

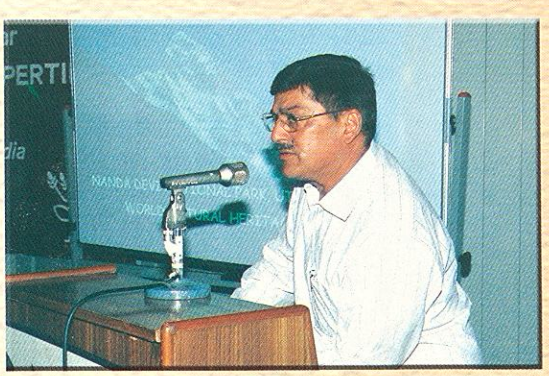
Rank/Name	Topic of Presentation
I. Rina Rani Singh	Characterization of ivory using morphometry, physical, chemical and isotopic techniques.
II. Dr. Anil Kumar	Vocal repertoire in two species of *Pycnonotus* bulbuls: Acoustical features, behavioural correlates and variations.
III. Swati Kittur	Himalayan Tahr (*Hemitragus jemlahicus*) – Livestock interactions at Kedarnath Wildlife Sanctuary, Uttaranchal.
IV. Chitaranjan Dave	Density, activity patterns and foraging of chital (*Axis axis*) and livestock in Gir.
V. Vivek Sahajpal	Wildlife Forensic Cell: Activities and development of a novel approach for identifying species from hair using keratin protein profiles.

Wildlife Wardens and other senior officials representing State Forest Departments, NGOs, scientists, conservationists and wildlife experts, WII's faculty members, researchers, M.Sc. students and Post-Graduate Diploma officer trainees.

The chairman also recommended a Consolation Book Prize worth Rs. 1,000/- to Mr. Sabyasachi Dasgupta for his presentation entitled "Habitat occupancy and co-occurrence of non-human primates in Trishna Wildlife Sanctuary, Tripura", as this was the only presentation during the ARS from the north-eastern India and also considering the difficult field conditions in which the study was carried out. There were two presentations in the session on the New Initiatives. One was on 'the research and development agenda of the National Institute of Coastal and Marine Bio-diversity (NICMB)' and the other was on 'rehabilitation of Star tortoises illegally exported to other countries'.

In the concluding session, WII's efforts were appreciated as more projects were undertaken in a networking mode with the support of other organizations like DST, CCMB, etc. It was also suggested that in future it would be useful to have some brief presentations on recently completed research projects.

S. Wilson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National Seminar on World Heritage Properties, *September 23, 2004.*

A National Seminar on World Heritage Properties was organized by the Wildlife Institute of India on behalf of the Ministry of Environment & Forests, Government of India. A total of 43 participants comprising Principal Chief Conservator of Forests, Additional Principal Chief Conservator of Forests, Chief Wildlife Wardens, World Heritage Site Managers, PA Managers, Representatives of MoEF, Scientific Organizations, NGOs and WII faculty members participated in the seminar.

Shri Vinod Rishi, Additional Director General (Wildlife), MoEF stressed upon the need to protect and conserve the natural heritage of the country and re-iterated that the identification of the natural heritage properties was the logical step in this direction. Representatives of all States present in the seminar made presentations on the natural heritage sites that could be placed in India's Tentative List of Natural Heritage Properties.

Based on the presentations made by the State representatives and the documents submitted by them, a list of tentative natural heritage sites for nomination as 'Serial Sites' and for 'Single Site' nomination has been prepared and submitted to MoEF for review and submission to the UNESCO World Heritage Centre.

Workshop on Himalayan Biodiversity, Dehradun, *October 2-4, 2004.*

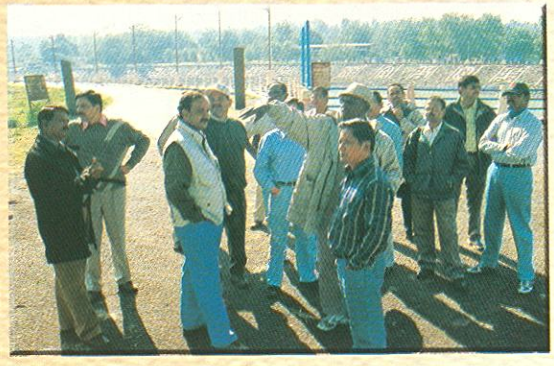
The workshop was organized by Wildlife Institute of India at Songtsen Library, a Centre for Tibetan and Himalayan Studies, Dehra Dun. A total of 40 graduate

and post-graduate students from different colleges of Himalayan States and Bhutan participated in this workshop.

The objective of the workshop was to orient the young students towards the conservation of biodiversity and its environment in Himalayan region. As a part of the programme lectures on faunal diversity were delivered. Later, the participants were taken on a field trip to Rajaji National Park to learn about wildlife biology.

Training Course on Current Trends in Wildlife Management, Dehradun, *November 1-5, 2004.*

The Wildlife Institute of India organized the training course for Indian Forest Service Officers. The objective of the course was to acquaint the forest managers, who have not had the benefit of formal training, with principles, practices and current trends in wildlife management. Thirteen participants from Andhra Pradesh, Jharkhand, Madhya Pradesh, Maharashtra, Mizoram, Orissa, Rajasthan, Tamil Nadu, Tripura, Uttar Pradesh and West Bengal attended the course.



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The programme included a field visit to Rajaji National Park. A range of learning resources including a 'Compendium of Selected Readings', Manuals on Wildlife Census and Management Planning Techniques, a CD-ROM containing eight ENVIS Bulletins prepared by the WII-ENVIS Centre were provided to the participants.

Training Course on 'Environment and Wildlife Conservation' for officers of the Indian Army, *December 13-15, 2004.*

The Wildlife Institute of India in collaboration with the Environment and Ecology Cell, Army Headquarters, New Delhi organized a training programme on 'Environment and Wildlife Conservation' for the officers of Indian Army. The objective of the course was to sensitize the army officers about various facets of environment and wildlife conservation issues and to prepare a road map for participation of the armed forces in the initiatives to conserve the environment and wildlife resources of the country. 18 officers participated in the training programme. Brigadier K.S. Jaswal, Deputy General Officer Commanding, 14 Infantry Division and Dr. Ravi Chopra, Director, People's Science Institute, Dehradun addressed the participants on the Environmental Conservation Issues in the country. WII faculty members and external resource persons provided inputs in the training programme, which also included a field visit to Rajaji National Park.

Vinod Verma

Training on Animal Immobilization, Restraint and Transportation techniques, Dehradun, *January 5-8, 2005.*

The training workshop was organized with the objective to sensitize field veterinarians from Uttar Pradesh on wild animal capture and restraint technique. Four officers participated in this workshop. The participants were sensitized to various issues like techniques for animal restraint and immobilization (physical and chemical), approach and handling of animals in distress, transportation/ translocation of animals and biological sampling. Hands-on training on immobilization equipment was also provided.

Training of Trainers (ToT) Workshop for Capacity Building in Elephant Management, Kalagarh Training Centre, Corbett National Park, *January 14-21, 2005.*

On the request from Project Elephant, MoEF, GOI, Wildlife Institute of India in collaboration with Uttaranchal Forest Department organized a ToT workshop for building capacity in elephant management of various field level officers from northern and eastern India. The workshop helped in enhancing the capabilities of participating officers in elephant estimation work, which will be carried out in the month of May 2005 in Elephant Reserves/Ranges. The workshop included several aspects of lectures and field demonstration on elephant ecology and behaviour, conservation, population estimation techniques, habitat and corridor management, conflict management & mitigation, immobilization, health monitoring and captive management.

In all seventeen officers from four States – Orissa (6), Jharkhand (3), Uttar Pradesh (1) and Uttaranchal (7) participated in the workshop. On behalf of the Chief Wildlife Warden, Uttaranchal Shri D.V.S. Khati, CCF & Field Director, CTR inaugurated the workshop, which was then followed by a need based theme talk presented by Dr. A.J.T. Johnsingh, Dean, FWS, WII. Shri S.S. Bist, IGF & Director, Project Elephant enumerated the achievement of the Project Elephant in declaring 24 Elephant Reserves (out of 27 planned) in 11 Elephant Ranges covering an area of 61,000 km^2 habitat and protection to 20,000 elephants. Three more Reserves in U.P, Arunachal Pradesh and Nagaland were in process of declaration. Ten resource persons from Wildlife Institute of India, Uttaranchal Forest Department, Ministry of Environment & Forests and REFORM, Kolkata provided inputs in the ToT workshop.

A greater emphasis was given to field demonstrations for explaining several techniques of population estimation of elephants through direct and indirect methods. The general guidelines provided by the Project Elephant, Ministry of Environment and Forests for the enumeration of elephants through direct and indirect methods (dung count) were explained to the trainee officers.

Vinod Verma

2-Day Attachment Training on Wildlife Protection, Law and Forensics for Inspectors of Customs & Central Excise, Dehradun, *January 24-25, 2005.*

Nineteen participants attended the training course conducted at WII. For this purpose one and a half days were slated for theoretical aspects concerning legal aspects of Wildlife (Protection) Act, 1972 and Wildlife Trade, Enforcement and CITES and half a day was set aside for the practical demonstration on identification of various parts of wild animals and birds and their artifacts being illegally traded.

Orientation Programme for Research Fellows, *January 24 - February 5, 2005.*

An Orientation Programme followed by Techniques Tour was conducted at the Institute for the newly engaged research personnel (JRF/SRF/TA/RA). In total, 27 researchers attended the course. The Orientation Programme included classroom lectures, laboratory and computer practicals. The classroom lectures included different aspects of wildlife conservation and management issues.

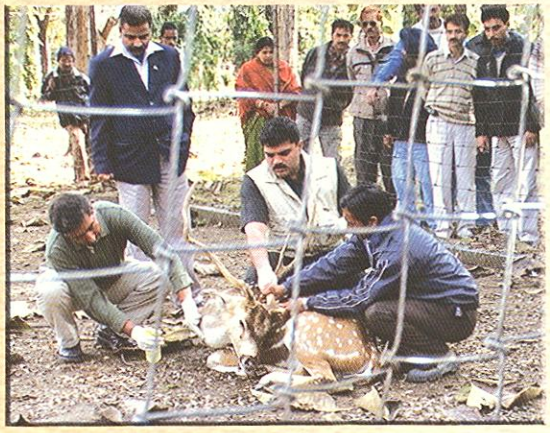
The laboratory practical included collection and preservation of biological samples, epidermal derivatives, age estimation of animals, dung/pellet analysis, scat analysis, population growth rate, and application of GIS.

The Techniques Tour was conducted in Sariska Tiger Reserve, Rajasthan, which included vegetation and animal quantification, habitat mapping, demonstration of various field equipments, traps, mist-nets, radio-telemetry, track plots, age and sex determination of ungulates and animal health monitoring .

Vinod Verma

Workshop on Health Monitoring of Wild Animals, Dehradun, *February 7–9, 2005.*

The training was organized with the objective to sensitize PA managers/ veterinarians to various health management issues in free ranging and captive wild animals. The training workshop was attended by 21 participants from different State forest departments, *viz.* Andhra Pradesh, Chhattisgarh, Himachal Pradesh, Jammu & Kashmir, Jharkhand, Madhya Pradesh, Orissa, Punjab, Tamil Nadu, Uttaranchal and UT of Dadra & Nagar Haveli. Deliberations were held on various aspects of health management, *viz.* surveillance and monitoring of wildlife health, general health assessment in free ranging populations, epidemiology and ecology of diseases, wildlife health: current and emerging problems, major wildlife diseases (infectious and non-infectious) and their management (diagnosis, prevention and control), emerging and re-emerging diseases in wildlife. Field demonstration of immobilization, general field procedures and biological sampling was provided at Van Chetna Kendra (Deer park), Rampur Mandi, Asan Barrage, Dehradun.



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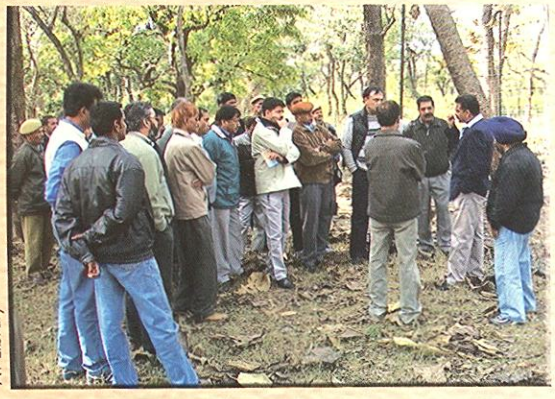
Workshop on Wildlife Immobilization and Restraint, Dehradun, *March 8–10, 2005.*

The objective of the workshop was to sensitize PA Managers/Veterinarians on recent advances in the field of chemical immobilization and restraint. The training workshop was attended by 28 participants from different states, *viz.* Andhra Pradesh, Bihar, Kerala, Delhi, Goa, Haryana, Himachal Pradesh, Jammu & Kashmir, Jharkhand, Madhya Pradesh, Maharashtra, Punjab, Tamil Nadu and Uttaranchal. The participants were sensitized to various issues like legalities with respect to immobilization and restraint, approach and handling of animals in distress, techniques for animal restraint and immobilization, with special emphasis towards restraint and immobilization of carnivores, ungulates and elephants, transport and translocation strategies. Hands-on training on immobilization equipment and demonstration of field procedure in wildlife was provided at Van Chetna Kendra (Deer park), Rampur Mandi, Asan Barrage, Dehradun.



AV Library

Attended by WII Personnel

Visit to Bhutan, Thinleygang, Toeb Geog (block), Thimphu Dzongkhag, *April 18 - May 9, 2004.*

The objective of the visit was to conduct a detailed assessment of the status of dholes (*Cuon alpinus*) in Bhutan through a training programme to the staff of Nature Conservation Division, Ministry of Agriculture, Royal Government of Bhutan. The visit was sponsored by Nature Conservation Division. Dr. A.J.T. Johnsingh gave a series of lectures to the participants on dhole ecology and

behaviour and methods to monitor wildlife abundance at Thinleygang, Toeb Geog (block), Thimphu Dzongkhag (district). A questionnaire to gather information on dhole depredation was developed and a pilot survey was conducted in Toeb Geog.

International Congress on "Silvopastoralism and Sustainable Management", Lugo (Spain), *April 18-24, 2004.*

Dr. P.K. Mathur attended the International Congress and presented a paper entitled "Transhumance and Silvopastoral Dependence on the Great Himalayan National Park Conservation Area – A Landscape Level Assessment".

Wildlife Techniques tour for IGNFA Probationers (2001-2004 Batch), *April 19-22, 2004.*

Dr. K. Sankar and Dr. B.S. Adhikari participated in the Wildlife Techniques Tour for IGNFA Probationers in Corbett National Park. The objective of the tour was to orient the probationers towards animal tracks and signs, animal abundance estimation and monitoring, vegetation sampling, identification of individuals, use of camera traps, data analyses and interpretation of results.

International Conference on the Vulture Crisis, New Delhi, *April 20, 2004.*

Dr. Y.V. Jhala and Shri B.C. Choudhury attended the International Conference, which was organized by the MoEF at IIC, New Delhi. The conference aimed at obtaining a consensus and developing a future plan of action regarding the veterinary use of diclofenac drug that has been held responsible for vulture declines. Pharmaceutical companies, NGOs, researchers, scientists, ministry officials and the Controller General of Drugs participated in the conference.

24th Annual Conference of the International Impact Assessment Association, Vancouver, Canada, *April 24-30, 2004.*

The conference had the following objectives: (i) Stimulate and enhance effective use of impact assessment tools; (ii) Strengthen the role of different thematic areas under EIA; and (iii) Exchange information and strengthen professional relationship.

The conference was organised by the International Association for Impact Assessment and the theme was Industry and Impact Assessment. The conference involved 100 concurrent sessions, a poster session, and several practitioners' forum sessions. The above conference was attended by 840 participants from 78 countries. Dr. Asha Rajvanshi presented a paper on 'Strengthening biodiversity conservation through community oriented development projects: An environmental review of the India Ecodevelopment Project' in this conference. She was also invited to Chair the technical session – 'Biodiversity and Impact Assessment Practice'.

Workshop at Kalesar, Haryana, *May 17, 2004.*

Dr. Y.V. Jhala attended a workshop at Kalesar, Haryana to train Foresters in population estimation techniques and design of wildlife monitoring protocols for Kalesar Sanctuary.

Meeting at UNESCO-World Heritage Centre, Paris, *May 17-21, 2004.*

The UNESCO World Heritage Centre invited Dr. V.B. Mathur, Professor and Nodal Officer, WII-UNESCO Project to participate in a meeting on project "Building Partnerships to Support a UNESCO World Heritage Biodiversity Programme in India". Representatives from United Nations Foundation (UNF), UNESCO-World Heritage Centre, IUCN, Ford Foundation, ATREE, America-India Foundation participated in this meeting. Dr. Mathur made a presentation on 'World Heritage Biodiversity Programme for India'.

Workshop on 'Learning from India Ecodevelopment Project' Dehradun, *June1-2, 2004.*

Dr. B.K. Mishra participated in the workshop, which was organized by IIFM, Bhopal. The workshop was aimed at compiling lessons from seven GEF sites of India Ecodevelopment project.

Training workshops on Techniques of Survey and Mapping of Medicinal and Aromatic Plants, Pithoragarh & Munsiary, *May 24-27, 2004 & June 1-3, 2004.*

Dr. G.S. Rawat worked as a key resource person during the training workshops on the techniques of survey and mapping of medicinal and aromatic plants for the frontline staff of Uttaranchal Forest Department. In all 30 participants attended the workshop organized at Pithoragarh and 25 participants attended the workshop organized at Munsiary. The participants were trained in the techniques of preparing herbarium sheets of wild medicinal plants for later identification and preservation for future reference, stratification and systematic sampling of medicinal plants to estimate density, frequency and cover of various species and preparation of crude distribution and density maps.

Meeting with officials of Rajaji National Park and Power Corporation, *June 23, 2004.*

The objective of the meeting was to discuss about the problems of killing of animals by use of electricity in and around Rajaji NP. It was organised by Power Corporation and officials of Rajaji Natinal Park. Dr. A.J.T. Johnsingh helped in identifying several locations in and around Rajaji NP for taking corrective measures.

Development of interpretive facilities in Jammu Region, *June 27 – July 1, 2004.*

On the request of Jammu & Kashmir Forest Department, Smt. Bitapi C. Sinha and Shri Kuldeep Chauhan visited Jammu region to assess the existing interpretive facilities. The team visited Indira Gandhi Visitor Centre at Jammu, Jasrota Deer Safari, Mansar Wetland Park in Udhampur District and Kishtwar City Forest in Doda district along with Shri N.A. Kitchloo, Regional Wildlife Warden, Headquarters and Shri L.K. Sharma, Regional Wildlife Warden, Jammu. In consultation with the officials, a tentative plan for future development of interpretive facilities was prepared.

Kuldeep Chauhan

Workshop on Rapid Mapping Exercise (RME) for Medicinal and Aromatic plants, *June, 2004*.

The workshop was organized by Uttaranchal Forest Department for the forest staff from 6 circles of Nainital Forest Division. Dr. B.S. Adhikari attended the workshop and delivered lectures to the forest staff. A trip to nearby field area was organized to demonstrate the techniques for data collection on medicinal and aromatic plants.

Workshop on "Professionalizing the Indian Forest Service", Dehradun, *July 14-16, 2004*.

Dr. A.K. Gupta attended the workshop, which was organized by the Indira Gandhi National Forest Academy, Dehradun at IGNFA. He presented a paper on "Personal Career Plan for Forest Officers" in this workshop and presented the recommendation of the working group on "Encouraging Officers for Developing Expertise".

Visit to Kedarnath Wildlife Sanctuary, *July 16-19, 2004*.

The visit was funded by Norwegian Agency for Development (NORAD) Programme. As part of the NORAD project Dr. A.J.T. Johnsingh visited Kedarnath Wildlife Sanctuary accompanied by Dr. K. Ramesh and Ms. Swati Kittur. Several issues related to the musk deer holding facility in Kanchulakharakh were studied. The objective of this visit was also to check whether the *tal* has any introduced trout and whether it could be used for stocking trout as angling could be profitably combined with the ongoing trekking and camping programmes around the *tal*.

S. Sathyakumar

WII team visits Afghanistan, *July 17-21, 2004*.

In response to a request from the Transitional Government of Afghanistan, a three members WII team comprising Sh. S. Singsit, Dr V.B. Mathur and Dr. S. Sathyakumar went on a UNEP sponsored visit to Afghanistan.

The WII team had wide ranging discussions with representatives of various ministries and international agencies such as UNEP and FAO on strengthening wildlife conservation and management. The status of wildlife and rangelands has deteriorated as a result of over two decades of conflict. Based on the field visit and discussions a 'Concept Paper for Building Capacity of Managers and Biologists in Afghanistan' has been submitted by the Institute to the UNEP. The Institute would be assisting in capacity building initiatives in Afghanistan in the field of wildlife and biodiversity conservation.

Senior Foresters' Workshop, *July 28, 2004*.

Dr. A.K. Gupta attended "Senior Foresters' Workshop" organized by the IGNFA. He presented a paper on "Personnel Management at the Circle and Divisional Level". He also chaired a session of Personnel Action Plan.

Rapid techniques to monitor Floral and Faunal diversity, *August 3-21, 2004*.

Dr. B.S. Adhikari participated in a workshop on 'Rapid techniques" to monitor floral and faunal diversity in Sakteng Wildlife Sanctuary, Bhutan.

Meeting of WWF-US, Washington-DC, 18th Annual Meeting of the Society for Conservation Biology in New York and a meeting on Tiger Distribution, Wildlife Conservation Society, New York, *July 28 - August 3, 2004.*

Dr. A.J.T. Johnsingh made a presentation on the findings of Terai Arc Tiger Survey on July 28, 2004 in the office of WWF-US, Washington- DC. He attended the 18th Annual Meeting of the Society for Conservation Biology held from July 30 - August 2, 2004 and received the Society's 2004 Distinguished Service Award. He also attended a meeting on evaluation of tiger distribution conducted by Wildlife Conservation Society, New York on August 3, 2004.

Meeting of the Consultative Group on International Conventions, New Delhi, *August 27, 2004.*

Dr. A.K. Gupta attended the meeting of the "Consultative Group on International Conventions constituted by the Ministry of Environment and Forests" for the 13th conference of parties of the CITES in Bangkok. The meeting was held in the MoEF, New Delhi under the chairmanship of the Secretary, MoEF.

Meeting of the Sub-Group-II of the "Consultative Group on International Conventions, New Delhi, *September 1, 2004.*

Dr. A.K. Gupta attended the meeting of the Sub-Group-II of the "Consultative Group on International Conventions constituted by the Ministry of Environment and Forests" for the 13th conference of parties of the CITES in Bangkok. The meeting was held in the MoEF, New Delhi under the chairmanship of the Joint Secretary, MoEF.

Terai Arc Meeting at Mussoorie, *September 1-2, 2004.*

The objective of the meeting was to focus on issues related to problems in Terai Landscape. It was organised by World Wide Fund – India, New Delhi. The meeting was attended by Dr. A.J.T. Johnsingh, Sh. Qamar Qureshi and Dr. K. Ramesh from the Institute. Dr. Johnsingh made a presentation on "Tiger Conservation in Terai Arc Landscape: Issues requiring immediate attention".

Course in Environmental Sciences, Srinagar, *September 4, 2004.*

The refresher course was organized by H.N. Bahuguna Garhwal University for University teachers. Dr. B.K. Mishra participated in the refresher course as a resource person and delivered a guest lecture entitled "Social issues of wildlife conservation".

Meeting of the "Consultative Group on International Conventions, New Delhi, *September 14, 2004.*

Dr. A.K. Gupta attended the meeting of the "Consultative Group on International Conventions constituted by the Ministry of Environment and Forests" for the 13th conference of parties of the CITES in Bangkok. The meeting was held in the MoEF, New Delhi under the chairmanship of the Secretary, MoEF. Dr. Gupta made a presentation on behalf of the Sub-Group-II.

International Tiger Conference, Paro, Bhutan, *September 14-16, 2004.*

The objective of the conference was to discuss issues related to large mammal conservation, human dimensions, tiger conservation in Bhutan and to evolve Tiger Action Plan for Bhutan. It was organised by Ministry of Agriculture, Royal Government of Bhutan with assistance from WWF - US and Save the Tiger Fund, USA.

Several tiger biologists and conservationists from USA, Europe, India and Bhutan attended this conference. Dr. A.J.T. Johnsingh made a presentation on "Evaluation of tiger landscapes for site specific and large scale conservation planning". He also moderated the presentations on Tiger Conservation in Bhutan.

Meeting of the 'Syllabus Review Committee for IFS Probationers", New Delhi, *September 18, 2004.*

Dr. A.K. Gupta attended the meeting, which was organized by the IGNFA at Van Vigyan Bhawan, New Delhi under the chairmanship of the Director General (Forests), MoEF. Subsequent meetings held in December 2004 and February 2005 were also attended by Dr. A.K. Gupta. The syllabus for the IFS Probationers at the IGNFA was reviewed and enabling changes in its various components were made to make the syllabus more responsive to the present needs in the field of forestry and wildlife conservation.

Meeting of the "Consultative Group on International Conventions, New Delhi, *September 20, 2004.*

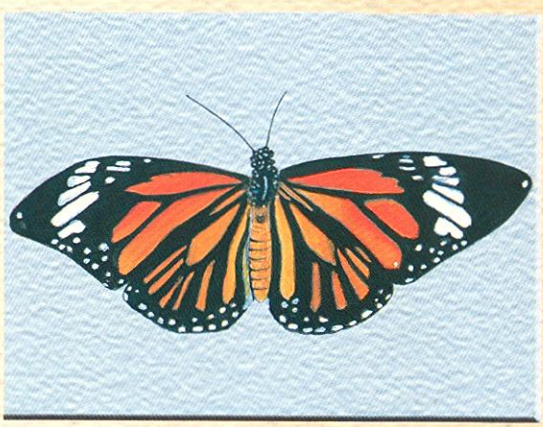
Dr. A.K. Gupta attended the meeting of the "Consultative Group on International Conventions constituted by the Ministry of Environment and Forests" for the 13th conference of parties of the CITES in Bangkok. The meeting was held in the MoEF, New Delhi under the chairmanship of the Secretary, MoEF.

Meeting on Development of Sepahijala Wildlife Sanctuary, Tripura, Agartala, *September 29, 2004.*

Dr. A.K. Gupta attended the meeting at Civil Secretariat, Agartala under the chairmanship of the Chief Minister, Tripura. He made presentations on "Primate Project in Tripura"; "Creation of Development Funds in the Protected Areas of Tripura"; and "Constitution of Tripura Biodiversity Foundation".

National stakeholder consultation workshop on Conservation and Management of Pollinator for Sustainable Agriculture through an Ecosystem Approach, *October 8-9, 2004.*

The objective of the workshop organised by G.B. Pant Institute of Himalayan Environment and Development, Kosi, Almora was the conservation of natural pollinators in Himalayan regions. One of the expected outcomes of the workshop was to develop a project proposal for GEF funding with consultation of resource persons working on different group of pollinators in Himalayan region. Dr. V.P. Uniyal attended the workshop.



Striped Tiger (*Danaus genutia*)

National Workshop on Training Curriculum and Effectiveness Review, IGNFA, Dehradun, *October 12-13, 2004.*

Dr. A.K. Gupta attended the workshop, which was organized by Indira Gandhi National Forest Academy, Dehradun under the chairmanship of the Secretary, MoEF. This workshop was organized to discuss the effectiveness of the existing training curriculum being followed for the Probationers of Indian Forest Service. A consensus was reached among the participants on the need to revise the curriculum to enable all round development of the officers as true professional including definite plans for Personal Career Development. Dr. Gupta made a presentation on 'Personal Career Plan for Probationers' in the workshop.

Meeting of the State Board for Wildlife, Government of Sikkim, Gangtok, Sikkim, *October 27, 2004.*

Dr. A.K. Gupta attended the meeting of the 'State Board for Wildlife, Government of Sikkim" at Gangtok. The Hon'ble Chief Minister of Sikkim chaired the meeting. Various issues related to wildlife conservation in the State of Sikkim were discussed. Main discussion centered on creation of Conservation Reserve and release of land for establishment of the Army camp around Kanchanjanga National Park. Discussion on the provision of the amended WL (Protection) Act 1972 as on 2002 also took place.

Field visit to Bharat Ratna Pandit Gobind Ballabh Pant High Altitude Zoo, *October 31 - November 2, 2004.*

At the request of Uttaranchal Forest Department, Dr. A.J.T. Johnsingh, visited the High Altitude Zoo to evaluate its functioning and the needs. The cleanliness of the Zoo was complimented. It was suggested to the Zoo Director that a large oak tree close to the visitors' path should be selected and 15-20 important events in the history of the High Altitude Zoo relating to the age of the oak tree could be put up both in Hindi and English. It was recommended that the Zoo should take up serow breeding programme and reintroduction in Uttaranchal Mountains. A programme could be initiated for 'Friends of the High Altitude Zoo' involving school children of the area.

Workshop on Man-Wildlife Conflict Mitigation, Ramnagar, *November 15-18, 2004.*

Dr. A.K. Gupta attended the workshop on "Man-Wildlife Conflict Mitigation" at Infinity Resort, Ramnagar, UA. This workshop was organized by the World Wildlife Funds, New Delhi. Dr. Gupta also presented a paper on "Compensation packages of different States for mitigating conflict: a comparison and assessment on effectiveness".

International Conference on Bird and Environment, *November 21-24, 2004.*

The objectives of the conference were to: (i) discuss recent developments in the field of ornithology; and (ii) promote ornithological studies in India. The conference was organised by the Department of Zoology and Environment Science, Gurukul Kangri University, Haridwar and sponsored by Department

of Science & Technology (DST), Department of Biotechnology (DBT), Council of Scientific & Industrial Research (CSIR), Indian National Science Academy (INSA) and India Tourism-Incredible India programme.

177 scientists from sixteen countries participated in the conference. The conference brought together scientists, conservationists, naturalists and wildlife managers to discuss the impact of environmental changes/ factors on bird life. Dr. Anil Kumar participated in the conference.

Seventh Annual Environmental System Research Institute (ESRI) India User Conference, Noida, *December 2-3, 2004.*

The conference was organized by ESRI India – NIIT GIS Limited, New Delhi at Noida and was attended by Sh. Panna Lal, Dr. Manoj Kumar Agrawal, Shri Dinesh Singh Pundir and Shri Shirish K. Kyatham. Shri Panna Lal presented a paper on "Developing a Spatial Database and Assessment of Land cover Changes in Bandhavgarh Tiger Reserve" and Shri Kyatham presented a paper on "Habitat Analysis of Endangered Indian Wolves Using Remotely Sensed Data in a GIS Domain" in this conference.

Joint International Workshop on Biodiversity Informatics: An INDO-US Initiative, National Chemical Laboratory, Pune, *December 7-9, 2004.*

Major objective of the workshop was to have in-depth and detailed discussion on potential areas of cooperation and collaboration between India and USA in the field of biodiversity informatics. Workshop came up with the draft Joint Statement on Biodiversity Informatics, which endorsed the commitment to a continuing cooperation between biodiversity communities in the two countries.

Workshop recognized the common interest and expressed that developing cooperation will best be achieved through a commitment to share resources, funding, and commitment to international standards. During the three-day long event seven themes of potential collaboration were brainstormed. It was attended by eight delegates, seven from US and one from the Global Biodiversity Information Facility (GBIF) and 45 Indian delegates representing various academic and research agencies participated in the workshop. Dr. K. Vasudevan represented WII in this workshop.

One-week compulsory course, Goa, *January 10-14, 2005.*

Dr. A.K. Gupta attended one week compulsory course for IFS Officers on "Leadership" at Indian Institute of Management, Training and Research, Goa.

International Workshop on Population & Habitat Viability Assessment (PHVA) for Western Hoolock Gibbon (*Bunopithecus hoolock hoolock*), BIAM, Dhaka, Bangladesh, *February 14-18, 2005.*

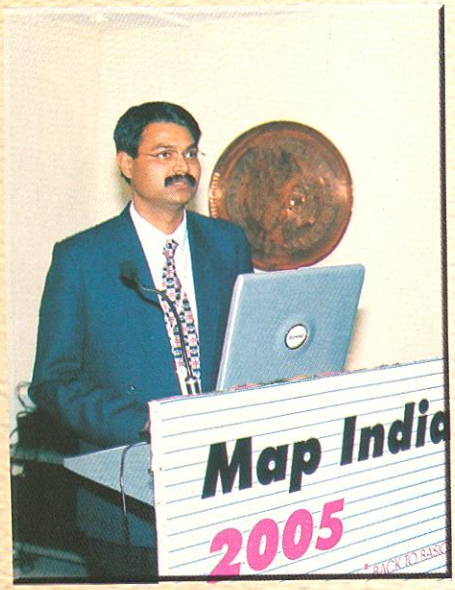
Dr. A.K. Gupta attended the PHVA workshop which was jointly organized by the Wildlife Trust of Bangladesh; Wildlife Information Liaison Developmen

(WILD); Forest Directorate, Government of the People's Republic of Bangladesh and Zoo Outreach Organization, Coimbatore, India. The workshop was also supported by the IUCN SSC Primate Specialist Group (PSG SAPN) and IUCN SSC Conservation Breeding Specialist Group (CBSG).

A total of 53 participants from five countries attended the workshop to assess the current status of Hoolock Gibbon throughout its range in the forests of South Asia. The participants were drawn from different fields of activities – forest officials, scientists, researchers, NGOs, University students and CBSG experts from USA, besides many primate experts from Bangladesh and India.

A special workshop methodology called Population & Habitat Viability Assessment, which employs computer simulation modelling, was used. The Western Hoolock Gibbon (*Bunopithecus hoolock hoolock*) is found to be Critically Endangered in Bangladesh and Endangered in India based on IUCN Red List Criteria, Regional and National Guidelines.

The participants were of the view that more effective policies and legislative support is urgently required to counter this loss. The workshop ended with a resolution to undertake trans (international) boundary issues for a holistic approach towards Hoolock Gibbon conservation at a landscape level and specific tasks were recognized to be undertaken by identified institutions/ organizations and individuals.



8th Annual International Conference – Map India 2005, Taj Palace, New Delhi, *February 7-9, 2005.*

The conference was jointly organized by Centre for Spatial Database Management and Solutions (CSDMS) and Survey of India. A total of 1300 delegates from 22 countries participated in the conference. Dr. Manoj Agarwal presented a paper on "Managing Human-Leopard Conflict in Pauri Garhwal, Uttaranchal, India using GIS and Remote Sensing".

Project inception workshop on "India's National Capacity Needs Self Assessment (NCSA) for multilateral environmental agreement" New Delhi, *February 10-11, 2005.*

Dr. B.K. Mishra participated in the workshop on "National Capacity Needs Self Assessment (NCSA) for global environmental management in India" organized by MoEF and UNDP. The objectives of the two-day workshop were: (i) to launch the project while seeking the participation and commitment of key stakeholders, (ii) to create awareness on the NCSA approaches and tools, (iii) to review the terms of references developed for the three thematic focal areas (climate change, biodiversity and land degradation), and (iv) to agree on the common outputs of the NCSA process and action plan.

Workshop on Elephant conservation, management, man-elephant conflict in Jharkhand, *February 26, 2005.*

Concerned with the increasing human-elephant conflicts in Jharkhand and in

adjoining areas of Orissa and southern West Bengal, Department of Forest & Environment, Jharkhand organized one-day workshop at Ranchi. Dr. Sushant Chowdhary participated in this workshop to share his experiences on several conservation and management issues of elephant. The workshop was inaugurated by the Hon'ble Justice of Jharkhand Shri R.K. Marathia. Other distinguished persons, who participated in the deliberations were: Shri Shiv Prasad, Principal Secretary, Department of Forests and Environment, Shri J.L. Shrivastava, PCCF, Jharkhand, Shri S.S. Bist, IGF & Director, Project Elephant, MoEF, GOI, Shri U.R. Biswas, CCF (Wildlife)/ CWLW, Jharkhand and Dr. D.K. Lahiri, Choudhary and Shri S.K. Patnaik, members Project Elephant Steering Committee. Three working groups constituted from the participants drafted actionable agenda for elephant conservation, management and human-elephant conflicts which were then presented before Shri H.K. Mandal, Principal Secretary/ Development Commissioner, Jharkhand.

X Administrative Meeting of the Central Zoo Authority, New Delhi, *March 9, 2005.*

Dr. A.K. Gupta attended the X Administrative Meeting of the Central Zoo Authority, which was chaired by the DG (F), MoEF. The meeting finalized the issues related with budgetary allocation, confirmation of contractual staff and finalization of the annual work plan.

UNESCO Expert Meeting on 'World Heritage Convention Contribution to Forest Conservation and Sustainable Development BERASTAGI +7', *March 9-11, 2005.*

The UNESCO World Heritage Centre organized an expert meeting to consider forest protected areas and their integration into the landscape. A group of 40 international experts in forest conservation, protected area financing, sustainable development and capacity building, met at the National School of Forestry in Nancy, France. Shri R.P.S. Katwal, Additional Director General (Wildlife), MoEF and Dr. V.B. Mathur participated in this expert consultation.

Shri R.P.S. Katwal and Dr. V.B. Mathur made presentations on 'Biological Heritage of Western Ghats, India: Identification of Potential World Heritage Sites for Serial Nomination' and 'Integrating World Heritage Site Management into broader Landscape: Challenges and Prospects for Kaziranga National Park, India' respectively.

Broad bordered grass yellow (*Eurema brigitta*)

Regional Workshop on "Natural Resourse based Sustainable Rural Development", Srinagar, *March 21-23, 2005.*

Dr. B.K. Mishra attended the Regional Workshop, which was organized by G.B. Pant Institute of Himalayan Environment and Development at HNB Garhwal University, Srinagar and presented a paper titled "Sustainable Management of Protected Areas: An eco-institutional perspective".

Making Conservation Work: Attempting Solutions to Biodiversity Loss in India, *March 11-12, 2005.*

The objective of the seminar was to bring attention to important developments

in environmental conservation and to ensure that new thinking amongst the field researchers and conservationists, policy makers, educationists, activists and academics from a wide range of disciplines. It was organised by Centre for Social Development, New Delhi. Dr. Johnsingh was invited to participate as a senior observer at this seminar. He shared his vast experiences with the participants in the area of wildlife conservation.

Dissemination Workshop on "R&D Projects on Environmental Issues Pertaining to Non-Coal Mining Sector", Dhanbad, *March 11-12, 2005.*

The workshop had the following objectives: (i) Identify the gaps and prioritization of thrust areas as to bring best mining practices for overall environmental management in the Indian Mining Sector; and (ii) Disseminate the information on all the completed R&D projects to users for their benefit.

It was sponsored by the Ministry of Environment & Forests, Government of India and executed by the Centre of Mining Environment, Indian School of Mines, Dhanbad. Under Task 4, Activity II A: Mining Sub-component of the World Bank assisted Environmental Impact Assessment Capacity Building Project of Ministry of Environment & Forests, Govt. of India, 14 R&D Projects in identified priority areas of mining environment have been carried out by different institutions across the country. It was envisaged that these completed R&D projects should be disseminated to appropriate users for their benefit and also to work out the scope of its extension for continuous support in decision making in mining sector. Dr. Asha Rajvanshi attended the above workshop and participated in deliberations on different project outputs. The workshop helped in identifying the information gaps and in the prioritization of thrust areas to develop best mining practices for overall environmental management in the Indian Mining Sector.

Faculty exchange visit to University of Tromso, Norway including a field visit to Finnmark under the Norwegian Agency for Development, *March 23–April 3, 2005.*

The visit was sponsored by Norwegian Agency for Development Programme. Dr. A.J.T. Johnsingh and Dr. K. Sankar visited Finnmark in Norway to study the reindeer herding practices of Sami tribes. The conclusion was that the Sami tribes are able to maintain reindeer herds largely because of the enormous amount of subsidy given by the Norwegian Government.

IFS Probationers Wildlife Techniques Tour, Corbett Tiger Reserve, *March 28, 2005 – April 2, 2005.*

Dr. S. Sathyakumar, Dr. B.S. Adhikari and Dr. Bivash Pandav provided training inputs to the IFS probationers (2003 batch) in wildlife techniques at Corbett Tiger Reserve. The training included orientation, animal tracks and signs, animal abundance estimation and monitoring, habitat evaluation, identification of individuals, use of camera traps, data analysis and interpretation of results.

Meeting on "Professionalizing the Indian Forest Service", New Delhi, *March 29, 2005.*

Dr. A.K. Gupta attended the meeting at Van Vigyan Bhawan, New Delhi. The meeting was chaired by the Director General (Forests), MoEF. The participants in the meeting discussed and elaborated on needs and modalities to bring in the professionalism in the Indian Forest Service. The need for specialized training and Personnel Career Development Plan's was also felt. It was also resolved that enabling changes in the approach right from the entry level are to be introduced to prepare the officers to tackle contemporary issues exhibiting high level of professionalism.

Study Tours and Visits

Study tour, *June 1, 2004 – May 31, 2005.*

Dr. G. S. Rawat proceeded on one-year study leave to study the Ecology of Alpine Vegetation in the Western Himalaya with special reference to status of rare, endemic, medicinal and aromatic plants. During this period Dr. Rawat travelled a distance of over 2500 km. in the alpine region on foot and collected more than 3000 plant specimens, many of which are likely to be new to the science and the region. The study was conducted in collaboration with Uttaranchal Forest Department and funded by the Herbal Research and Development Institute, Government of Uttaranchal. Based on this study a comprehensive report has been brought out which is titled "Alpine Meadows of Uttaranchal: Ecology, Landuse and Status of Medicinal and Aromatic Plants". The report also deals with the status of wildlife (especially mammalian fauna and habitat in the alpine region of Uttaranchal.

Meeting for approval of Management Plans, *June, 2004.*

Dr. P.K. Mathur attended the meeting for approval of Management Plans for different National Parks and Wildlife Sanctuaries of Gujarat (Velavador NP, Gir NP and WLS, Narayan Sarovar Wildlife Sanctuary and Sakkarbaugh Zoo).

Visit of IUCN Expert Team, *September 1-10, 2004.*

IUCN Expert Team for the Evaluation of Valley of Flowers NP as a candidate site for inclusion in the "World Heritage List" visited Valley of Flowers National Park and Nanda Devi National Park and Biosphere Reserve. Dr. S. Sathyakumar represented WII in this Expert Team and provided the necessary inputs.

The Institute conducted three regular courses, continued one M.Sc. Wildlife Science course, 17 short courses, workshops, meetings, symposium and an Annual Research Seminar during the reporting year. Faculty members of the Institute also participated in a large number of workshops, seminars and conferences conducted by other organizations.

COMPLETED PROJECTS

DST Sponsored Project

Acoustic signals in two avian species: their characterization and importance

Investigator: Dr. Anil Kumar
Date of initiation: January 28, 2002
Date of completion: January 27, 2005
Budget allotted: Rs. 10.96 lakhs

Bulbuls are commonly known songbirds distributed in southern Asia and Africa. Twenty species are found in Indian subcontinent including some endemic and/or rare species. Some aspects of behavioural ecology and sociobiology have been documented in some species, but the information on communication systems remains scanty. In the present investigation, an effort has been made to characterize and document the vocal repertoire in two sympatric, congeneric species of bulbuls, *viz*. the Red-vented bulbul, *Pycnonotus cafer* and Himalayan bulbul, *P. leucogenys*.

The objectives of the project were: (i) to record and analyze the physical characteristics of acoustic signals in Red-vented bulbul (*Pycnonotus cafer*) and Himalayan bulbul (*P. leucogenys*) species, (ii) to understand the biological function of these signals in both species, and (iii) possible role of acoustic signals in species isolation.

Behavioural observations and acoustical analysis of the vocalizations revealed that both species used their own vocal repertoires composed of different types of acoustic signals, with or without visual displays. On the basis of acoustical features and context of production, it seems that both species used two categories of songs. Type-A songs were discrete, simple, loud, stereotyped, mostly spontaneous and commonly sung throughout the year, probably to maintain pair bonds. Individuals used their own song phrases mostly ranged 2 to 6 types in song bouts. In a song bout, usually same types of strophes were repeated several times in stereotyped manner with minor structural variations of elements before switching on to another type of strophe. Most strophes were composed of 2 to 6 elements often dissimilar in structure. While, Type-B songs

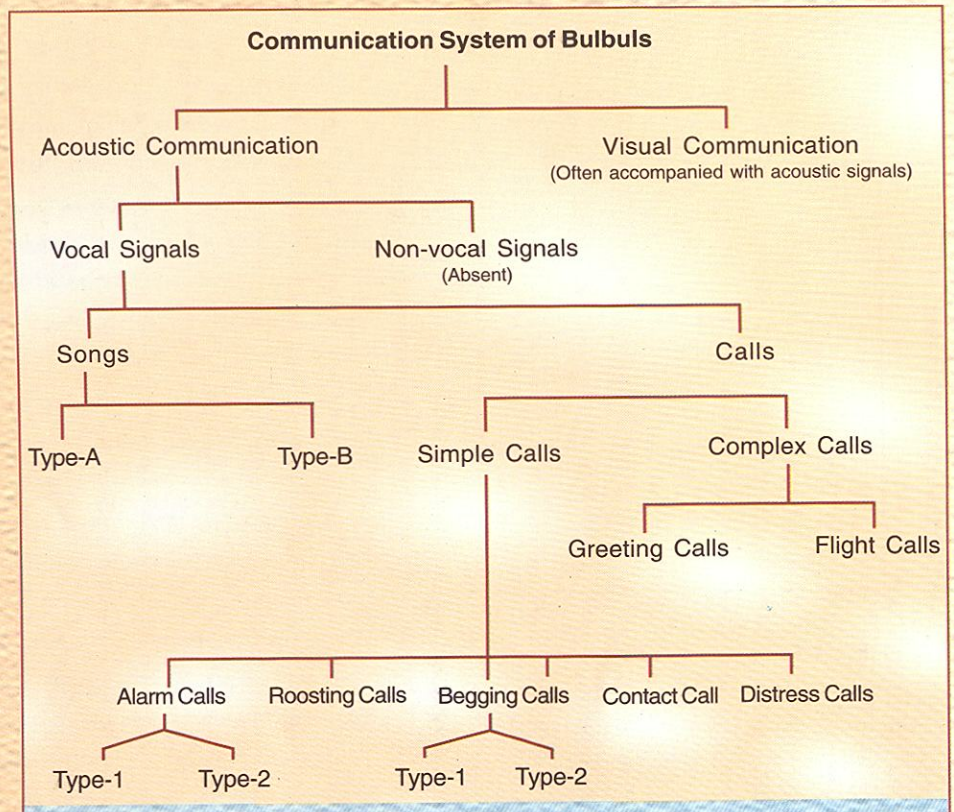


Figure 1: Bulbuls use both acoustic and visual signals in their communication. Non-vocal signals are absent in these species, while vocal signals can be classified into songs, simple calls and complex calls.

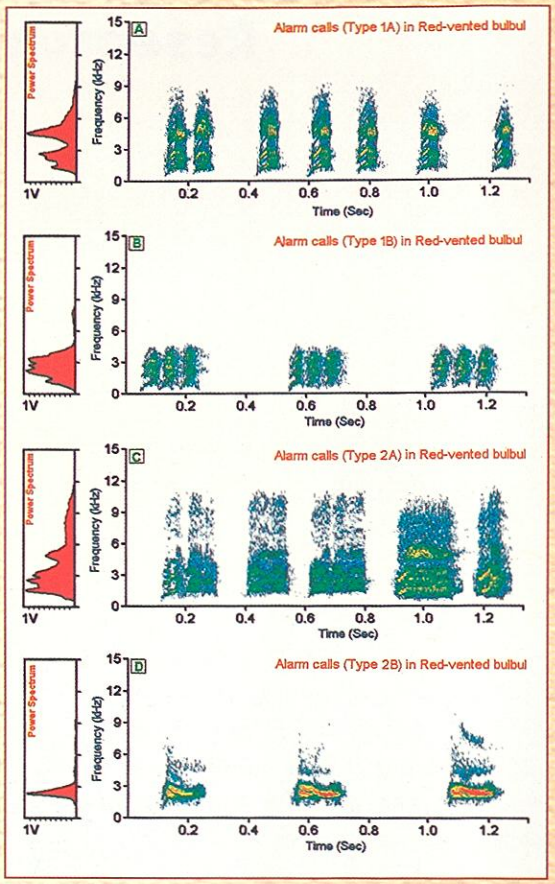


Figure 2: Spectrograms of the different types of alarm calls in Red-vented bulbul

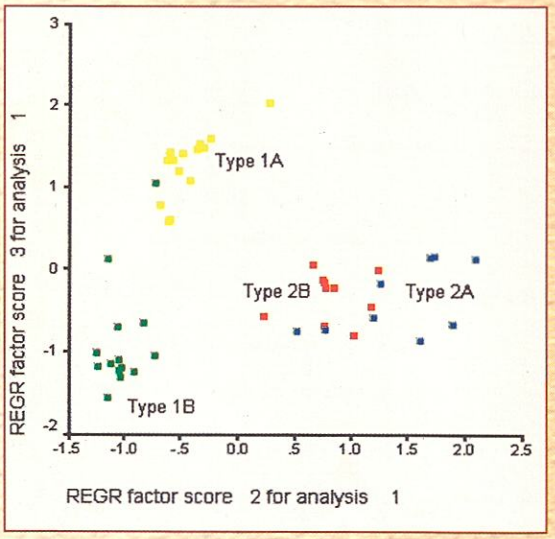


Figure 3: Principal Component 1 (34.6%), PC2 (34.15%) and PC3 (17.1%) scores of Red-vented bulbul from the acoustical characteristics of alarm calls type 1A, 1B, 2A and 2B. On the basis of factor 2 and 3, the alarm calls emerged into two distinct categories.

were rare, complex with irregular inter-phrase gaps and low amplitude, mate oriented, along with mate acquisition/courtship displays and most likely used for mating purposes. Territory guarding or territorial conflicts were not seen. Playback of songs elicited no aggressive response. Individuals allowed con-specifics/hetero-specifics in close vicinity. However, mate guarding was frequent.

Different types of context-specific calls were identified (figure 1). Individuals produced type-1 alarm calls (fast and wide band) under low risk and type-2 calls (loud and narrow band) under high risk (figure 2 & 3). Playbacks of alarm calls suppressed begging calls of nestlings/fledglings. Roosting calls were very similar to alarm calls type-1. It seems that roosting calls have evolved from alarm calls. Nestlings were observed using begging calls along with gaping and postural displays. Distress calls were produced by nestlings and fledglings when captured by a predator and adults when handled for colour banding. Greeting calls and flight calls were composed of complex phrases, like song but were short and low pitched and used for proximate functions.

Present investigation provides substantial information on the vocal communication of bulbuls. It is believed that congeneric or closely related species exhibit quite similar social organizations/communication systems. So the data collected on a species of *Pycnonotus* bulbul, such as in Red-vented bulbul or Himalayan bulbul may be useful to understand the social organization and communication of some other rare and unstudied species of bulbuls, such as Straw-headed bulbul, *P. ceylanicus*, Spot-necked bulbul, *P. tympanistrigus*, Dusky greenbul, *Phyllastrephus tenebrous*, Streak-breasted bulbul, *Ixos siquijorensis* and Mauritius bulbul, *Hypsipetes olivaceus*. These species can also be used as suitable model to solve a wide array of questions related to communication, evolution, behavioural ecology and socio-biology, such as (i) how birds use acoustic features of their vocalizations in individual recognition (ii) mode of information transfer through simple and complex vocal signals and (iii) behavioural adaptations/alterations in rapidly changing landscapes such as urban/urban habitats.

Studies carried out during last five decades on the acoustic communication of birds provide deep insights in understanding the evolution of song in temperate birds. It is now well-understood that the structural complexity of songs in passerines play important conceptual, theoretical and empirical role. Studies on the singing behaviour of Indian birds have recently been initiated. It reveals that most tropical birds exhibit quite different social systems than temperate species. Communication systems of most tropical birds cannot merely be understood using information available on temperate birds. Extensive long term investigations are needed for the characterization and proper documentation of vocal repertoire of Indian birds to understand the evolution of song in these species. Present study is a base-line effort in this direction and may possibly enable more detailed studies to be carried out in the future, especially on repertoire size, individual variations, and regional dialects, ecological and behavioural constraints on the evolution of song in tropical birds.

ONGOING PROJECTS

WII Grant-in projects

Ecology of Otters in Corbett Tiger Reserve: Impacts of Kalagarh reservoir on habitat use pattern

Investigator: Dr. S.A. Hussain
Researcher: Shri Asghar Nawab
Date of initiation: November 2000
Date of completion: November 2004 extended to November 2005
Total budget allotted: Rs. 10, 70, 566.00 (Rs. 7, 82,400.00 – original budget + Rs. 2, 40,000 – Additional fund allocated + 48,166 given by IUCN SSC Otter Specialist Group).

The objectives of the study are: (i) to determine the status of otters in the Corbett Tiger Reserve (CTR) and in the adjacent areas between Yamuna and Sharda river systems, (ii) to identify the factors governing their distribution, (iii) to examine habitat use patterns along the Ramganga main stream and the reservoir, (iv) to compare the feeding habits of otters between Ramganga main stream and the reservoir, and (v) to examine associated threats to otter populations, such as cases of poaching and destruction of stream habitats in the region.

The field survey and fish sampling have been completed for the intensive study site of Corbett Tiger Reserve and the data collected is being analyzed.

During the reporting period, the survey was repeated along the major perennial water bodies within the CTR and the adjacent areas such as Lansdowne Forest Division. Presence of otters was recorded along the rivers Ramganga, Mandal, Palain and Kolhuchaur. A total of seven otter groups have been identified in CTR, based largely on indirect evidences and a few direct sightings. The current situation of otter population in CTR is encouraging; however, the area occupied by the species is small. No signs of otter presence were detected from areas beyond the boundary of the protected sites as several villages lie in close proximity and a great deal of disturbance from illegal fishing, boulder and sand extraction and grass collection were recorded. Fish sampling was carried out in the restricted (core) areas of CTR. A total of 50 km of river stretch was covered. For river Mandal the stretch covered areas between Maidavan downstream to Domunda, for river Palain the stretch covered areas between Adnala downstream to Kakridhang and for river Ramganga the stretch covered areas between Domunda downstream till the reservoir. Cast nets of mesh size 1 inch were used for catching fish. Thirty efforts (each effort comprising of 10 throws) were done at respective sites. Fish caught were carefully handled while making species identification and taking measurements. Only one specimen of each species caught was stored in 10% formaldehyde solution. The specimens have been deposited in the laboratory. From the catch, one specimen from each size category was kept for the purpose of making the reference collection. These were boiled for approximately 5 to 30 minutes and washed by keeping in a sieve with iron mesh under tap water so as to remove the digestible portions. The vertebrae, eyeballs and the scales were collected and kept labeled in a polythene cover for reference. Scales were pulled out from the sides of the body of the fish and slides were prepared by mounting them in a

drop of glycerin. The slides were sealed and kept labeled to be used at a later stage during scat analysis. A total of 20 fish species were recorded that belonged to 5 families. Of this record 2 species remain unidentified. Catch per unit effort (CPUE) was calculated to determine the fish availability. River Mandal recorded (457.13 gm/hr/trap), river Palain recorded (502.23 gm/hr/trap) while river Ramganga recorded (1965 gm/hr/trap). Size class (cm) of fish species caught ranged between 3.9 ± 0.9 and 53 ± 2.08.

It is stressed that conservation programmes and monitoring activities be extended by the management staff of CTR to determine the trend in the otter population giving special attention to areas that show otter presence and lie in close proximity to human habitations.

The ecology of the leopard (*Panthera pardus fusca*) in Satpura National Park and Bori Wildlife Sanctuary

Investigators: Sh. Ravi Chellam & Shri Qamar Qureshi
Researcher: Shri Advait Edgaonkar
Date of initiation: July 2001
Date of completion: July 2006
Budget allotted: Rs. 38.72 lakhs

The objectives of the project are: (i) to investigate leopard habitat use and preference, (ii) to examine the role of seasons, habitat, sex and social status on territory, ranging and habitat selection, (iii) to quantify the food habits and prey preferences of the leopard, and (iv) to validate and test various methods for estimating leopard numbers, densities, indices of abundance, and to recommend an effective technique for monitoring their population.

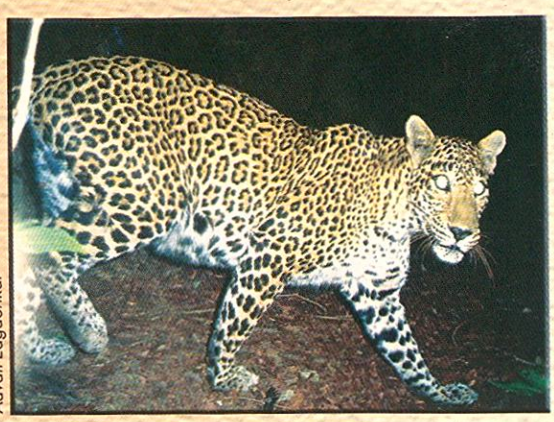
Quantification of leopard (*Panthera pardus fusca*) prey and habitat in Satpura National Park and Bori Wildlife Sanctuary was done during the reporting period. A 280 sq. km intensive study area was chosen, mostly within the Bori Wildlife Sanctuary and some portion in Satpura National Park.

In all, 230 vegetation plots of 10 m radius were laid along the transects to attempt to characterize them into different habitats. Woody tree species were counted and cluster analysis done on these plots in order to stratify transects into different vegetation categories. The vegetation was found to be mostly teak dominated dry and moist deciduous forest, with some teak plantations. The habitat with respect to tree species and also major ungulate species did not seem to be very heterogeneous.

From earlier scat analysis, it was known that major leopard prey in the area was, in order of importance: Chital (*Axis axis*) Muntjac (*Muntiacus muntjak*), Peafowl (*Pavo cristatus*), Langur (*Trachypithecus entellus*) and Sambar (*Cervus unicolor*). Estimation of leopard prey was done using the transect method. In all 20 line transects (10 of 2 km and 10 of 3 km) were walked to get densities of major leopard prey. A total of 743 km distance was walked. Variables measured included angular distance, angle to middle of the cluster and transect bearing. Data was analysed using program Distance 4.1 release 2 (Thomas L. *et. al.* 2003). Vehicle transects along roads were also done to estimate ungulate abundances along roads.

An indirect assessment of leopard prey was done in two ways. Perpendicular to the transects, 50 m x 2 m plots every 200 m to obtain pellet densities for major

leopard prey, 10 or 15 plots per transect (n=230 plots, 10 transects). Along transects, track plots every 200 m, to obtain a track frequency index (n=99 plots, 1195 pseudo replicates, 10 transects). It was concluded that it may be possible to use pellet counts for estimating densities of the more common species: chital, sambar and peafowl in the study area. Track counts seemed to work only for the most uniformly distributed species like chital. Monsoon monitoring of ungulates was done by 9 trails, which are being walked in the monsoons to estimate prey encounter rates. This is the fourth year in which these trails are being walked and will give temporal trends in encounter rates to compare with absolute abundances of prey.


Advait Edgaonkar

The effect of sample size on precision of estimates was obtained for various species of major leopard prey. The sample size required to obtain acceptable levels of precision differs according to species. Langur density estimation required about 12 transects, while chital required more than 20. About 50 detections for chital and 100 detections for langur give stable CVs. The number of detections required for each species may therefore be different and needs to be investigated further.

Estimation of habitat use by leopards and sympatric carnivores: Indirect evidences are being gathered systematically along trails to give a quantified estimate of use of areas. This will be compared with last years data gathered similarly so that changes in habitat occupancy, if any can be determined. This is being done for tiger, leopard, dhole and sloth bear.

Capture of leopards and camera trapping: 245 trap-nights were attempted using box traps to capture leopards for the purpose of radio-telemetry. There was no success. Further trapping was suspended because of unavailability of a veterinarian. In all, 140 trap nights of camera trapping were done to finalize the protocol to be used to estimate densities of leopards after the monsoons.

Characterization of species from bone, tusk, rhino horn and antler to deal wildlife offence cases

Investigator: Dr. S.P. Goyal
Researchers: Smt. Rina Rani Singh and Shri Sudhanshu Mishra
Date of initiation: July 2, 2001
Date of completion: July 1, 2006
Budget allotted: Rs. 42.6 lakhs

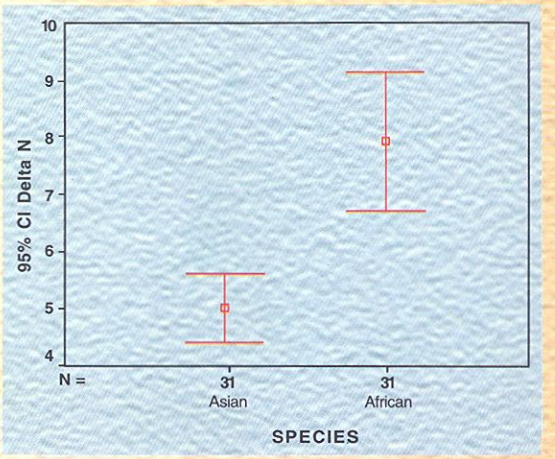
Scanning Electron Microscopy (SEM) technique was used to characterize surface (dorsal and ventral) structure of Rhino horn (n=2) and antler of Swamp deer (n=2) and Hog deer (n=1). Growing hairs have been noticed on the dorsal surface of wild rhino horn, which is absent in case of domestic rhino horn. Both wild as well as domestic rhinoceros horns have pores on its ventral portion. Differences have been observed in surface topography and various sections (outer, cortex and core) of antler among different deer species and may serve as a tool for identifying species from small samples.

Lack of wildlife forensics and standardized protocols for identifying species were major constraints in implementing Wildlife (Protection) Act 1972 for controlling illegal trade in India. To bridge the gap, the present project is aimed to: (a) develop morphometric, crystallographic and DNA based techniques to characterize species from bones of major animals such as tiger, leopard, chital, sambar, barking deer and swamp deer, (b) establish species-specific characteristics of raw and finished products of Asian ivory and prepare protocols to differentiate from other similar products, used in the trade, (c) investigate source-area of Asian elephant ivory, (d) determine characteristics of rhino horn, and (e) establish species characteristics and keys to identify antler of deer species.

More samples were added for X-ray diffraction (XRD) analysis *viz.* antlers of hog deer (n=5), chital (n=5), sambar (n=6), barking deer (n=1), and swamp deer (n=4), Asian ivory (n=3), African ivory (n=4), rhino horn (n=2), leopard bone (n=5) and tiger bone (n=4). Though, composition of ivory, antler and bone are almost similar but minute differences have been noticed in their diffractograph which are useful in distinguishing these items from each other. Further data analysis is under progress to differentiate these items at species level. Density measurements were undertaken for Asian and African ivory (n=4 and n=3 respectively). This density measurement indicates that African ivory (2.35 g/cm^3) is denser than Asian ivory (2.27 g/cm^3).

Schreger angles were measured at three-portions, central, middle and outer of Asian elephant ivory (n=29) and African elephant ivory (n=12). It was noted that the circumference of the tusk does not affect the Schreger angle value. Outer Schreger angle values were found to be distinct in case of African and Asian ivory.

Morphometry study was undertaken for major bones of tiger, chital, leopard, barking deer, rhinoceros horn, elephant ivory and antler of deer species (chital, sambar, barking deer, swamp deer and hog deer). These measurements would allow developing keys for identifying species.



Forty elements in African ivory (n=4), Asian ivory (n=5), leopard bone (n=7), tiger bone (n=4), antlers (n=2 to 8) of chital, sambar, hog deer, swamp deer, barking deer and rhino horn (n=2) were analysed using XRF, ICP-AES and ICP-MS. Differences were found in the quantity of elements present in these wildlife products for developing species specific element profiles.

Isotopic analysis was undertaken for determining source of origin of Asian Elephant ivory. Isotopic ratio of carbon (n=31) and nitrogen (n=31) indicates that young elephants usually feed more on grasses than adult. Published data of $\delta^{15}N$ for African ivory (7.9 ± 0.59) (Merwe *et al.*, 1990) are higher than Asian ivory (5.03 ± 0.29) with no overlapping (Fig. 1). Hence, this parameter may be used to get species-specific signature and variation is due to differences in rainfall between the two continents.

Table (1). Quality of DNA observed by using "Gene Clean Kit for Ancient" in ground antler samples"

Species	No. of samples examined	Samples	
		Core	Cortex
Chital (*Axis axis*)	1	+	–
Sambar (*Cervus unicolor*)	1	+	+
Swamp Deer (*Cervus duvauceli*)	1	++	–
Hog Deer (*Axis porcinus*)	1	–	–

+ *Satisfactory;* ++ *Good;* - *No result*

A researcher specialized in Biotechnology joined the project in January 2005 for developing DNA profiles for identifying species. Preliminary work on DNA isolation was undertaken for identification of sambar, chital, swamp deer and hog deer using Phenol-Chloroform method. Since the quality of DNA was not good, therefore, there was a need for some modifications in the protocols for extracting DNA. "Gene Clean Kit for Ancient DNA" (Bio 101® Systems, QBIOgene, USA) was also tried for isolating DNA from core and cortex regions of antlers for sambar, chital, swamp deer and hog deer. Table (1) indicates that DNA quality was good in sambar antler (cortex and core region) and swamp deer antler (core region) whereas, smeared DNA found in chital antler (core region). The work is in progress for PCR amplification.

Social Organization and Dispersal in Asiatic Lions

Investigators: Dr. Y.V. Jhala, Dr. Ravi Chellam and Shri B.J. Pathak, IFS, CF (Wildlife) Junagadh Circle, Gujarat
Researcher: Ms. V. Meena
Date of initiation: March, 2002
Date of completion: March, 2007
Budget allotted: Rs. 62.4 lakhs

The project aims to understand the social organization of male lion coalitions and the role they play in the population dynamics of Asiatic Lions. Data were collected on 4 coalition male lions during the past year as a prelude to their capture and subsequent telemetry. Data on their ranging patterns, mating opportunities and behaviour during courtship and mating was recorded. Data was collected from 9 different mating observations.

The major objectives of this project are to understand the factors that influence the social organization in Asiatic Lions and determine the dispersal patterns of sub-adult male lions using radio-telemetry.

The Ministry of Environment and Forests, New Delhi has granted approval to radio-collar 20 lions but permissions for commencing this important component of work is awaited from the Chief Wildlife Warden, Gujarat State. To determine the habitat parameters that determine lion distribution, the intensive study area of western and central Gir was sampled by a 1 km grid. Forest type, road, ness and drainage were considered as the independent variables in the model. Lions were found to respond to Moist Mixed forest type, density and distance from roads and nesses. Data was also collected on the livestock kills by lions in and around western Gir.

Developing a spatial conservation protocol for central Indian highlands through a biogeographical analysis of birds and existing protected area network: A Geographical Information Systems approach

Investigators: Shri Qamar Qureshi and Dr. Ravi Chellam
Researcher: Shri R. Jayapal
Date of initiation: February 9, 2001
Date of completion: February 8, 2006
Budget allotted: Rs. 33.92 lakhs

During the reporting period, extensive field surveys for birds, vegetation and land-use patterns were carried out in central and western ranges of the study area including Betul Plateau, Satpura Plateau, Nimar Hills, Malwa Plateau and Vindhya Ranges in Sagar-Damoh Plateau. Besides these field-based components, various analytical tasks were also completed at WII. These include development of bird distribution datasets at a spatial scale of both 15'X15' grids and eleven sub regions, construction of vegetation databases at tehsil and district levels and procurement of climate data (1961-90 monthly mean normals) from New *et al* (2000) project at University of East Anglia, UK.

The main objectives of the project are: (i) to analyse patterns of species richness in birds of the central Indian highlands, and to study interaction among biological, environmental and socio-economic correlates of biodiversity using birds as reference taxa, (ii) to sub-regionalize the biogeographical province of the central Indian highlands based on these ecological interactions and patterns, to assist in identifying landscape units of unique biodiversity value, and (iii) to develop a spatial framework of conservation protocol for the region through a complementary analysis of existing PA network and bio-geographical constructions using GIS.

With almost all the primary and secondary data now in place, the project is into final phase of data analysis. Some of the salient findings are summarized below: (i) species richness of breeding land birds in Central Indian Highlands peak early with reference to area, as evidenced by the species–area curve with a low slope value. However, the avian assemblages are found to be largely unsaturated with local species richness increasing at a rate of about 70% of the regional species pool, (ii) species accumulation curves identify Satpura Plateau and South Maikal Range as the hotspots of bird diversity that require more measures of protection, (iii) though some sub-regions like Betul Plateau and East Maikal have larger species pools, they are characterized by unsaturated species assemblages pointing to the loss of several area-sensitive bird species and species-rich forest pockets from these sub-regions in the recent past. The field survey also revealed checkerboard distribution for a number of forest birds in Central India especially Malabar Pied Hornbill, Forest Eagle-Owl, Bonelli's Eagle, Malabar Whistling Thrush, Spotted Creeper, Brown-cheeked Fulvetta and Indian Scimitar Babbler, and (iv) the nestedness of avian assemblages in the region is found to be much lower, warranting use of taxonomic distinctness as a better measure of biodiversity assessment than conventional diversity indices. For example, our computations show that avian assemblages in some localities turn out to be phylogenetically unique, though they are low in species diversity or richness. The complete grid-wise mapping of taxonomic diversity of Central Indian birds is currently under way and will be extensively used to identify areas of unique biodiversity value.

Intensive analysis of spatial data in GIS will be taken up during 2005-06 to develop various thematic layers that will assist conservation planning for the region.

Diversity and rarity in floral and avifaunal assemblages in the Western Himalaya: A study of patterns and mechanisms to devise viable conservation strategies

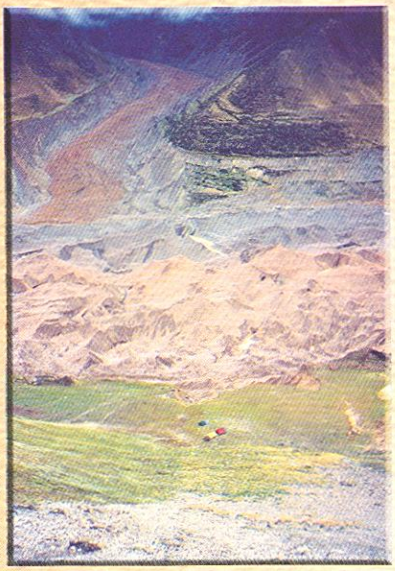
Investigators: Dr. V.B. Mathur and Dr. Kevin J. Gaston
Researcher: Shri Rashid H. Raza
Date of initiation: July 2001
Date of completion: July 2005
Budget allotted: Rs. 19.92 lakhs

The objectives of this project are: (i) to determine the patterns and relationships of plant and bird diversity and rarity along a complete altitudinal gradient (from foothills to 5000 meters), (ii) to identify and investigate the relative role of different mechanisms in generating the observed patterns of diversity and rarity, (iii) to identify altitudinal zones and habitats of high diversity and rarity, hence of conservation importance, and (iv) to develop guidelines for meeting biodiversity conservation goals based on understanding of the processes generating diversity and rarity patterns.

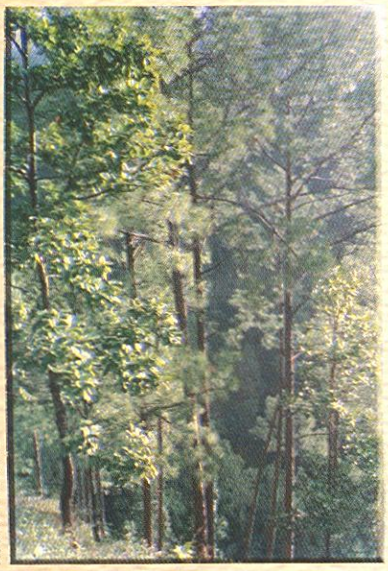
Gori-Ganga valley captures the entire gradient of Himalayan habitats ranging from subtropical Sal to Alpine meadows within a distance of about a hundred km of the river from its confluence to source. A total of 246 (212 Summer resident, forest dependent bird species in 34 families and 135 genera, representing more than 45% of the breeding bird diversity of the Western Himalaya and nearly 55% of breeding bird species of the Kumaun Himalaya have been recorded in the region. Analysis of zonation pattern of birds reveals distinct ecological groups corresponding to Subtropical, Temperate and Alpine bioclimatic zones. The Temperate zone is the largest group and is further subdivided into lower temperate, mid-temperate and sub-alpine zones. T

bird zonation corresponds well with vegetation zones. Bird composition seems to linearly track woody vegetation composition. In other words, the bird similarity between a pair of sites is linearly proportional to woody vegetation similarity between the same pair. Thus distinct bird communities can be well predicted based on vegetation communities.

Upper Temperate and Sub-alpine habitats (representing Oaks and Conifers) have the largest number of birds (112 species) closely followed by lower temperate broad-leaf habitats (102 species.). Subtropical broad-leaf habitats have 69 species followed by Chir pine dominated habitats (50 species). Alpine and Temperate scrubs have 42 species each and subtropical scrub has 32 species. Along the 1200 m altitude gradient (2300–3500 m), bird diversity peaks at 2800 m. However, this is a result of ecotonal effect as the high diversity coincides with greater than expected number of species at their range limits. Thus, only considering diversity can be a misleading indicator of biodiversity value. Plant diversity is a poor predictor of bird diversity. Bird diversity peaks at intermediate plant diversity along this gradient. Analysis of rarity patterns reveals that species rare in frequency are also less abundant, such that there is a positive inter-specific correlation between frequency of occurrence and abundance of species.


Rashid H. Raza

Systematic searches in 23 localities distributed all along the Gori-Ganga valley (from the confluence with Kali river at Jauljibi to source of the river at Milam glacier) reveal that out of 176 bird species located in these searches nearly 50% of species occurred in less than 10% (2 or less) of localities. Ten most frequent species (occurring in more than 40% of sites) are: Blue whistling Thrush (*Myophonus caeruleus*), Grey hooded warbler (*Seicercus xanthoschistos*), Whiskered Yuhina (*Yuhina flavicollis*), Ashy-throated warbler (*Phylloscopus maculipennis*), Yellow bellied greenfinch (*Carduelis spinoides*), Grey headed flycatcher (*Culicicapa ceylonensis*), Oriental dove (*Streptopelia orientalis*), Himalayan griffon (*Gyps himalayensis*), Great barbet (*Megalaima virens*) and Grey headed woodpecker (*Picus canus*).


Rashid H. Raza

Less than 4% of the area falls under the Subtropical zone, however a number of bird species are altitudinal migrants and depend on this zone. Area between Jualjibi and Baram-Bangapani is especially important for this zone. This zone is notable for presence of White-bellied Yuhina (*Yuhina zantholeuca*) an uncommon species. This zone also faces a high level of pressure from anthropogenic factors and occurs patchily. In the Temperate zone, forests of Ghana-Dhura are exceptional for their intact Oak dominated forests. Two species of uncommon occurrence Cutia (*Cutia nipalensis*) and Forest eagle-owl (*Bubo nipalensis*) were found here. The Chiplakot slopes provide a large contiguous gradient of Himalayan habitats ranging from Subtropical to Alpine and hence are of high importance for conservation of a representative floral and bird communities. This area is notable for presence of white-throated tit (*Aegithalos niveogularis*) a restricted range species and species of uncommon occurrence such as Spotted bush-warbler (*Bradypterus thoracicus*), Yellowish-bellied bush-warbler (*Cettia acnthizoides*) and Great parrotbill (*Canostoma aemodeum*). The alpine areas in the Milam area are drier and are notable for the presence of species like Tickell's leaf warbler (*Phylloscopus affinis*), European

goldfinch (*Carduelis carduelis*) and Yellow billed chough (*Phyrrocorax graculus*). Conservation of the contiguity of this exceptional biological gradient fro Subtropical to Alpine zones is of prime concern.

Gori-Ganga valley forms a part of Askot Wildlife Sanctuary and Nanda De Biosphere Reserve. The Birdlife International under the Important Bird Are programme has listed it as an 'Important Bird Area'. Cheer Pheasant (Vulnerable and Satyr Tragopan (Near Threatened) occur in the area, in addition to th 'Restricted Range', White throated Tit.

The area is well represented by species restricted to different global biome ('Biome Restricted Species' the Important Bird Area Programme criterion) with 9 species representing *Eurasian High mountain, Sino-Himalayan Temperate Forest* & *Sino-Himalayan subtropical forest* - biomes. The assemblage represents 46% o the *Sino-Himalayan Temperate Forest,* species found in India and is particular important for them. Detailed analyses and interpretation of the field data currently underway and the final report will be ready by June, 2005.

Conservation ecology of an isolated population of gau (*Bos gaurus*) in Trishna Wildlife Sanctuary, Tripura

Investigators: Dr. A.K. Gupta and Dr. K. Sankar
Researcher: Shri Sabyasachi Dasgupta
Date of initiation: November 13, 2001
Date of completion: December 2004 extended to July 12, 2005
Budget allotted: Rs. 18.34 lakhs

The objectives of the project are to: (i) study the status, distribution, population structure, habitat use and food plants of endangered mammals in the Trishna Wildlife Sanctuary (TWS), (ii) prepare land cover and vegetation maps of TWS, (iii) identify major threats to the endangered mammals, and (iv) suggest management recommendations for the conservation of the target species.

The field data collection in the project continued till June 200 Six line transects were monitored over a period of two years coverin winter and summer. In total, 359.1 km of effort was made alon the line transects. The seasonal group size of capped langu (*Trachypithecus pileatus*) varied from 2 to 13 individuals with mea (±SE) group size (excluding solitary animals) of 6.3±1.07 for winte 2002-03 and 5.17±1.02 for summer 2004. Their total populatio decreased from 76 to 62 individuals during the study perio Mixed deciduous habitat was largely used by capped langur. O the three primate species studied, the detection probability was the highest f capped langur with low occupancy and maximum variability across habita and seasons. The seasonal group size of pigtailed macaque (Maca *nemestrina)* varied from 10 to 34 individuals with mean (±SE) group size 21.4±4.57 for winter 2002-03 and 16±2.14 for summer 2004. The to population of pigtailed macaque decreased from 107 individuals to individuals during the study period. It was observed that the mixed bamb forest was occupied only by pigtailed macaque. Though in the beginning the study, there were three hoolock gibbon (*Bunopithecus hoolock*) groups w a total of 13 individuals observed, by the time, the study was completed th population decreased to 5 individuals.

The seasonal group size of hoolock gibbon varied from 2 to 9 individu with mean (±SE) of 4.33±2.33 for winter 2002-03 and 2.5±0.5 for summ

2004. Hoolock gibbon was observed to be intermediate in terms of detection probability but highest in terms of habitat occupancy. The savannah woodlands remained unoccupied by all the studied primate species but it was used by gaur (*Bos gaurus*). It was observed that the non-human primate communities in TWS are not competitively structured in any of the six habitats. Sympatric primate species guild may co-exist spatially but do not co-occur temporarily. Results suggest that niche limitations are not likely to constrain co-existence of hoolock gibbon, pigtailed macaque and capped langur. When species diversity is high and individual density is low, the detection probability is likely to be the result of species behaviour, not habitat type. As site occupancy of studied primate species in a habitat decreases (largely due to restriction of species range of movement), detection probability increases. For maintaining primate species diversity in the study area the most important forest type identified was semi-evergreen.

Two sub-populations of gaur, one inside the Sanctuary and other outside (Siddinagar and around) Sanctuary were observed. Group size of gaur varied from 2 to 10 individuals with estimated mean (±SE) group size (excluding solitary animals) of 4.2±0.2. The estimated mean encounter (±SE) rate of gaur calculated from transect walk was 0.7±0.09 individual/km and 0.16±0.02 group/km respectively for inside and outside Sanctuary gaur populations. Highest individual encounter rate was observed in mixed bamboo forest, whereas highest group encounter rate was observed in mixed deciduous forest. The semi-evergreen type of forest was the only habitat occupied by all the study species and observed to be the best habitat for area based conservation approach.

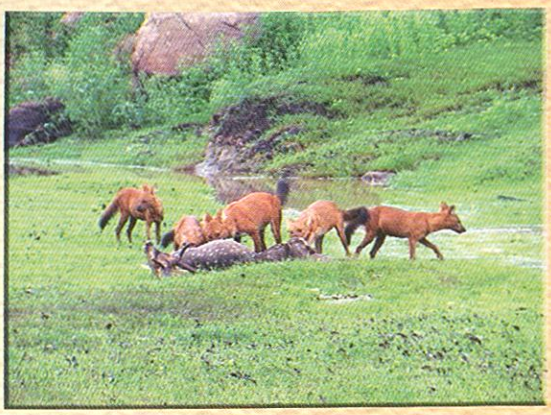
Ecology of the dhole (*Cuon alpinus* Pallas) in Central India

Principal Investigators: Dr. A.J.T. Johnsingh and Dr. K. Sankar
Researcher: Shri B. Bhaskar Acharya
Date of initiation: January 2001
Date of completion: January 2005 extended to July 2005
Budget allotted: Rs. 15,47,550.00

The project aims to study dhole (*Cuon alpinus*) habitat use and ranging patterns, food habits, behaviour, social organisation and prey species abundance in Pench Tiger Reserve, Madhya Pradesh.

During the reporting period, one adult male dhole (pack: 1 male, 1 female) that was radio-collared in August 2003, was tracked (88 locations: April-July 2004) within the Karmajhiri Range (144 km^2) of Pench Tiger Reserve, Madhya Pradesh and the East Pench Range (127 km^2) of Pench Tiger Reserve, Maharashtra. One adult female dhole (pack: 14 dholes) that was radio-collared in March 2004, was tracked (328 locations: April-October 2004) in the Karmajhiri (144 km^2) and Gumtara (147 km^2) Ranges of Pench Tiger Reserve, Madhya Pradesh.

Ecological information, such as pack characteristics and dynamics, behaviour, activity and movement were recorded for two packs and also for other non-radio-tagged dhole packs within the study area. GPS locations of radio–collared dholes were recorded only by 'homing in'. Systematic estimation of prey abundance was conducted on twenty line transects located within the approximate home range areas of the two radio-tagged dhole packs. Within these same



B. Bhaskar Acharya

strata, data regarding the encounter rates of dhole prey species were also recorded using vehicle-based counts. Carnivore scats and kills were recorded whenever encountered, for dietary analyses.

Preliminary results indicate that home ranges of the dhole pair during the denning (December-February) and post-denning (March-July) season encompassed 25.6 km^2 & 33.2 km^2 (95% MCP) respectively. The corresponding home range of the pack of 14 dholes for the post-denning period was 68.5 km^2 (95% MCP). On the whole, it was observed that dhole packs range over much less area during denning period, with a slight increase of post-denning, and increasing during monsoon (pre-denning) period (based on data from preceding years). The most encountered dhole prey species, in both dhole home ranges, was chital (*Axis axis*) with densities of 67.9 per km^2 and 96.7 per km^2 within the two dhole home ranges, respectively. The majority (85%) of dhole kills recorded (n=53) were that of chital. However, 58 % of dhole scats (n=393) contained sambar (*Cervus unicolor*) remains. With regard to chital kills (n=45), nearly half the kills were that of juveniles. Moreover, male chital were killed more often than females.

Five dhole packs (64 dholes) including the radio-tagged packs were identified within Pench Tiger Reserve (756 km^2) during the reporting period. Based on direct sightings and indirect evidences, 6-8 dhole packs (80-110 dholes - 0.1 - 0.3 dholes/km^2) were estimated within the entire Tiger Reserve.

An ecological reconnaissance of colonial nesting birds in Bhitarkanika mangroves, Orissa, India

Investigators: Dr. Bivash Pandav and Dr. S.K. Kar
Researcher: Shri Gopi G.V.
Date of initiation: January 2004
Date of completion: December 2007
Budget allotted: Rs. 4,84,400.00

The objectives of the project are : (i) to enumerate the number of bird species and individuals nesting in the heronry, (ii) to study the breeding biology of the birds in the heronry, (iii) to find out resource partitioning in terms of food and nesting requirements among breeding birds in the heronry, and (iv) to study the dependency of birds breeding in the heronry on areas outside the sanctuary limits.

Fieldwork for the project was initiated in August 2004. Enumeration of birds nesting in the heronry was carried out during August-September 2004.

Eleven species of water birds were found to be breeding in the Bhitarkanika heronry with an approximate area of 30 ha. Enumeration of breeding birds in this heronry revealed a total of 13,704 nests on 3843 nesting trees. The Asian Openbill (*Anastomus oscitans*) is the most abundant species (66%) nesting in the heronry. Vertical stratification of nest building was evident in the heronry with breeding birds showing certain amount of preference and avoidance to nest in particular trees. Bird species nesting in the heronry also showed association/dissociation patterns with other species while nesting in the same tree.

An evaluation of endemism of amphibian assemblages in the Western Ghats using molecular techniques

S.U. Saravanakumar

Investigators: Dr. Karthikeyan Vasudevan (WII), Dr. Ramesh Aggarwal (Centre for Cellular & Molecular Biology) and Dr. Kartik Shanker (ATREE)
Date of initiation: January 17, 2003
Date of completion: January 17, 2005 extended to July 16, 2005
Budget allotted: Rs. 7.98 lakhs

The objectives of the project are (i) to ascertain whether the taxa recognized at present are true natural assemblages, and (ii) to evaluate the species richness and distribution patterns of *Ranidae* and *Rhacophoridae* using molecular techniques.

The study made progress in the extraction of DNA from toe clip samples of amphibians particularly those belonging to the genera *Philautus* and *Rhacophorus*. Along with mitochondrial genes two nuclear genes were also targeted and sequenced.

The study has focused on new species descriptions. So far descriptions for four new species of amphibians from the Western Ghats have been compiled. Three new species belonging to the Family *Rhacophoridae* (arboreal frogs) and one belonging to the Family *Bufonidae* are being described. Further, five new species of *Philautus* were described from the Western Ghats and those descriptions had many mistakes. The methodological problems in such species descriptions and the lacunae in ICZN norms were pointed out through a publication.

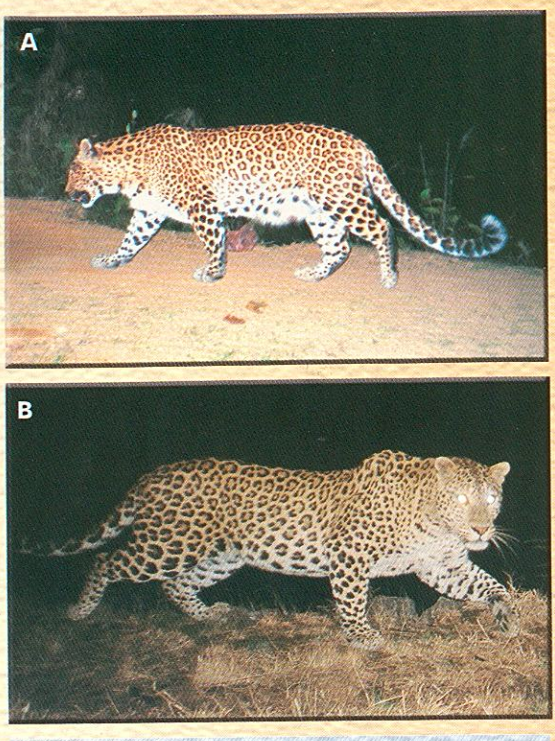
The study was able to successfully isolate and sequence DNA for four target regions from small toe clip samples.

Status and ecology of leopard in Pauri Garhwal. Phase-II: Ranging patterns and reproductive biology of leopard (*Panthera pardus*) in Pauri Garhwal Himalayas

Investigator: Dr. S.P. Goyal
Researchers: Shri Devendra Singh Chauhan and Shri Bibek Yumnam
Date of initiation: July 1, 2002
Date of completion: June 30, 2006
Budget allotted: Rs. 37,93,900.00

Pauri Garhwal in Uttaranchal has been one of the districts highly inflicted with leopard-human conflicts. The Institute has initiated a project for understanding the ecological and biological requirements of leopard in conflict zones for providing mitigatory measures to minimize such conflicts. The objectives of the study on leopard (*Panthera pardus*) are: (i) to determine ranging patterns and home range of females under three conflict zones and correlate with respect to topography, vegetation, prey (wild & domestic) abundance, land use patterns and human dimension, (ii) understand reproductive biology with reference to frequency of pregnancy/lactation in three conflict zones, and (iii) to suggest mitigatory measures to minimize conflict in hills. As proposed, radio collaring of leopard will be undertaken for understanding ranging patterns once the permission is obtained from Govt. of India.

Assessing relative abundance and intensity of use by leopards in reference to availability of prey species (wild and domestic) were undertaken in an intensive study each of 20 km^2 in classified three conflict zones, *viz.* low, medium and high. Four trails ranging from 2 to 4 km were identified and monitored in each conflict zone. Leopard (tracks and scats) and prey species (wild and domestic) signs were collected systematically on each trail. To determine the relative abundance of domestic prey species across the different human-leopard conflict zones. Road side transects were also monitored for estimating relative abundance of domestic



Devendra Singh Chauhan

Leopards captured in high (A) and medium (B) human-leopard conflict zones.

prey in three conflict zones. Population of most favoured prey species, *i.e.* dog was estimated in and around villages through walking on the paths.

A total of 76 scats were collected and average scats encounter rate was highest (1.6/km) in high conflict zone against medium (1.1/km) and low (0.97/km) conflict areas. Estimated abundance of wild and domestic prey species based on track index was low (0.22 wild prey species and 0.2 domestic) as compared to the medium (0.25 wild prey species and 0.3 domestic) and low (0.28 wild prey species and 0.36 domestic) conflict zones. Encounter rates with livestock showed similar trend with 22, 13 and 6 individuals per km walk in low, medium and high conflict zones respectively.

A total of 60 scats (20 scats in each conflict area) were analyzed and prey items were identified by macro analysis of undigested portion present in scats. Large proportion (> 80%) of prey for leopard includes domestic species such as livestock and dogs in all human-leopard conflict zones.

Camera traps were intensively used in an area of 10 km^2 for population status and relative abundance of leopards in three conflict zones, *viz.* low (Adwani), medium (Mandakhal) and high (Puakhal) having 62 to 70 trap nights in each area. Photographic capture rates of leopards revealed that high conflict zones had higher capture rates (16 leopard photographs per 100 trap nights) in comparison to medium (9 leopard photographs per 100 trap nights) and low (8 leopard photographs per 100 trap nights) conflict areas. Based on the individual photographs recorded, leopard population was estimated around 3 to 4 individuals/10 km^2 in high and medium conflict areas than 2 to 3 individuals/10 km^2 in low conflict zones.

A researcher having experience in using DNA techniques initiated the work on using non-invasive based DNA techniques for estimating population and tracking leopard movements. One of the problems in non-invasive based technique is the success rate of extracting DNA from scats exposed to varied conditions in field. Standard published protocols of using Qiagen Stool kit (Qiagen, Germany) and Phenol-Chloroform (P/C) (Sambrook *et al.*, 2001) methods were used for extracting DNA from scats. Table 1 indicates that though DNA isolation success rate was low in using Qiagne stool kit than the P/C method. Most of the time DNA isolated from scat (n =7) was always degraded (~200- 400bp) and consequently the region targeted for PCR amplification must be suitably small. The primers of Farrell *et al.* (Mol. Ecol., 2000(9)1583-1590) were successfully used to amplify a short (~180 bp) stretch of the carnivore mitochondrial cytochrome b gene. A higher PCR success rate was observed in samples processed with Qiagen Stool kit than P/C method probably due to presence of PCR inhibitors.

Table 1. Success rate of DNA extraction and PCR amplification using leopard scats.

Method	Sample size(n)	DNA yield	DNA isolation success	DNA Quality (PCR success rate)
Qiagen Stool kit	11	+Low	~ 40%. Depends on scat age and storage.	++ Good ( ), satisfactory ( ) for PCR.
Phenol Chloroform (PC)	8	+++ Medium to high	>90%. Robust method, works with scats of nearly ages.	+ Variable (often poor). Gel/column purification before PCR in many samples.

Protocols of distinguishing leopard scats from tiger, based on restriction enzymes were standardized. The preliminary analysis of digesting PCR products of tiger and leopard with restriction enzymes Hae III and Hinf I indicates the presence of restriction sites in leopard DNA only but not in tiger. The resulting size difference in the DNA fragments of the two species clearly identifies leopard from tiger scats.

Funded by WII, ISLT, SLC, USFWS and additional funding support by International Bear Association

Strengthening field conservation through ecological studies, capacity building and conservation awareness in Ladakh Trans-Himalaya: A collaborative initiative

Investigators: Dr. V.B. Mathur and Dr. Y.V. Bhatnagar
Participating faculty: Dr. G.S. Rawat, Dr. S. Sathyakumar, Dr. S.A. Hussain, Shri Qamar Qureshi, Dr. V.P. Uniyal, Dr. B.S. Adhikari, Dr. Karthik Vasudevan, Dr. Bivash Pandav and Dr. K. Sivakumar
Researcher: Ms. Shivani Chandola
Date of initiation: August 2002
Date of completion: March 2007
Budget allotted: Rs. 28 lakhs

The Trans-Himalaya has unique biodiversity values, of which precious little is known. Recognizing this and the long-term interest in the region, the Wildlife Institute of India (WII) and its collaborating agencies, the International Snow Leopard Trust (ISLT) and the United States Fish and Wildlife Service (USFWS) initiated a collaborative programme to enhance conservation and research activities in the Trans-Himalaya, with a focus on the Ladakh region that constitutes the bulk of the Trans-Himalaya in India. Certain aspects of Ladakh's unique biodiversity have remained largely unexplored. It was also felt that there was tremendous scope and need for conservation activities in Ladakh. It was thus decided to work on a collaborative effort that would provide basic infrastructure in Ladakh and allow work by a multidisciplinary team.

In collaboration with the Centre of Environmental Education (CEE), Ahmedabad and as an activity of the 'Conservation Awareness' component of the project, a poster series 'Hardy Mountains, Fragile Environments' was brought out in 2003. Planning for implementing the conservation education component for the school teachers in Ladakh has been done and 'Training of Trainers Workshops in collaboration with CEE, Ladakh Autonomous Hill Development Council, J&K Wildlife Department and NGOs will be organized in May-June, 2005.

An assessment of eco-development initiatives in Periy Tiger Reserve

Investigator: Dr. Ruchi Badola
Co-investigator & researcher: Shri Anil Kumar Bhardwaj
Date of initiation: April 1, 2002
Date of completion: March, 2006
Budget allotted: Rs. 1.00 lakh

The main objective of this project is to investigate the impacts of implementation on eco-development programme in and around Periyar Ti Reserve. The project seeks to understand the changes, both qualitative quantitative terms, in the socio-economic conditions of the local communi (EDC members), resource use, mutual relations between park and the peo and the attitude of the main stakeholders that is local communities and staff. The project is also trying to investigate the issues related to sustainab of these initiatives and the critical factors for the success or failure of programme.

The fieldwork for the project could be actively started during 2002. Initially review of existing information was carried out and later on the 72 EDCs w put to stratification with respect to identified criteria. Then sample EDCs w selected from each cluster and detailed investigations were started. So far, EDCs have been sampled through administering of questionnaire and carry out the detailed interviews. Similarly, the field data regarding the resource has also been collected during last year and current year. The investigat regarding the change in attitudes of the main stakeholders is continuing.

Ecological Monitoring of Gir

Investigators: Dr. Y.V. Jhala and Shri Q. Qureshi
Researchers: Shri C. Dave and Shri K.S. Chauhan
Date of initiation: January 2004
Date of completion: January 2007
Budget allotted: Rs. 29.16 lakhs & US$ 6,000 from USFWS

The tasks addressed during the reporting period were: (a) design and d collection to address the issue of impact of livestock on native wild ungula especially chital, (b) survey of the potential habitat in east Gir t is being used by the satellite population of lions to evaluate la use patterns and connectivity within the landscape of lion movem and use between the PA and these habitats, and (c) developing software in visual basic to store, sort and analyze data individually identified lions using their vibrissae patterns and oth body markings. This software will be useful for long-term monitor of individual lions and for population estimation done in a m recapture framework.

The primary objectives of the project have been to continue with the monitoring activities proposed in the consultancy project done by WII for the Gujarat Forest Department. The specific objectives are: (i) to map the entire greater Gir region for land use and potential for lion movement between the protected area and the satellite populations of lions, and (ii) to further refine and continue with the population monitoring of lions, leopards and ungulates.

Monitoring changes in biological diversity after relocation of *gujjars* in Rajaji Corbett Conservation Area

Investigators: Dr. B.S. Adhikari, Dr. Bivash Pandav, Dr. Karthikeyan Vasudevan, Dr. K. Sivakumar and Dr. V.P. Uniyal
Date of initiation: November 7, 2003
Date of completion: November 7, 2008
Budget allotted: Rs. 8.87 lakhs

A study was carried out to estimate the density of tiger and its prey species after relocation of *gujjars* in Chilla Range of Rajaji National Park. The tiger population density was estimated using photographic capture-recapture analysis and density of prey species were estimated using line transects with distance sampling methods. Food habits of tiger were studied by analyzing the scats collected from the area. A comparison of the use of habitat by tiger and its prey species in areas evacuated and inhabited by *gujjars* was also taken up. A study on grassland habitat was initiated in the beginning of the year 2004. Grasses and other herb species in Chilla Range were documented. The Chilla-Motichur corridor was surveyed in order to document the change since 1986, when the first survey was done by WII. Point counts for bird diversity were made during the reporting period in the identified areas. Water and soil samples were analyzed for 19 and 25 parameters, respectively from various parts of Chilla Range.

The objective of the project is to monitor the changes in biological diversity after relocation of *gujjars* in Rajaji Corbett Conservation Area (RCCA).

A total of 895 trap nights yielded 25 captures of four individual tigers within an effective sampling area of 132 km^2. The estimated density of tiger was 3.01 (±0.128) per 100 km^2. The total ungulate density (chital, sambar, nilgai and wild pig) was estimated to be 90.8 (±4.57) per km^2. From a total of 44 scats analysed, it was estimated that sambar, cattle, chital, wild pig and buffalo were being preyed upon. Among the wild ungulate prey species consumed, tiger selectively fed on large bodied prey species (Sambar). The estimated off-take of standing wild prey biomass was 2.78% suggesting that higher densities of predators (tigers) can be sustained in Chilla Range. A comparison of palatable species of plants between areas inhabited and evacuated by *gujjars* showed significant regeneration which the tiger prey species utilized. Miscellaneous vegetation type was utilized intensively by the *gujjars*. In Chilla Range, a total of 240 plant species were recorded from the grasslands. The richness of plant groups were: herbs (141), grass (43), tree (25), shrub (15), climbers (10) and ferns (6). Majority species belong to *Poaceae* (43) followed by *Fabaceae* (26), *Asteraceae* (21) and *Lamiaceae* (12). Bird counts revealed that 64 species used Chilla Range. Analyses of soil and water parameters are in progress.

The study found that tiger density can be estimated in an area having few tigers with precision using photographic capture recapture method.

Bivash Pandav

Collaboration between WII & USFWS

Conservation of Hoolock Gibbon in Meghalaya, Mizoram and Tripura

The objectives of the project are to: (i) survey the States of Meghalaya, Tripura and Mizoram for fragmented gibbon habitats, record information on type of isolation and distance to nearby forest patches, (ii) using loud calls of gibbons and actual sightings on randomly selected line transects carry out a population survey of the hoolock gibbon on each identified site of three States, (iii) using data gathered from sample plots within occupied gibbon habitat, estimate the vertical structure of the forest, total density, presence of vines and lianas, canopy cover and canopy continuity. Also record presence of food trees and areas under forestry plantations, and (iv) conduct a workshop to disseminate project information.

Investigator: Dr. A.K. Gupta
Researcher: Shri Narayana Sharma
Date of initiation: April, 2002
Date of completion: August, 2004 extended to August, 2005
Budget allotted: Rs. 13,58,136.00

The field work of this project has been completed and data analysis and final report preparation is underway. Preliminary analysis of data suggests that gibbon populations in Meghalaya and Mizoram are found more outside the protected areas in the private and village forests. However, in Tripura more gibbon populations are in the reserved forests. The habitat fragmentation is turning out to be one major reason for the conservation risk to the gibbons. A terminal workshop to disseminate the results and fill in the gaps in the data is proposed involving forest officers/NGOs from Assam, Meghalaya Mizoram and Tripura.

Funded by Ministry of Environment & Forests, Govt. of India

Studies on animal-habitat interactions in the buffer zones of Nanda Devi Biosphere Reserve

The objectives of the project are to: (i) assess the status of wildlife habitats along gradients of human use, (ii) study the distribution, abundance and habitat use patterns of large mammals and pheasants, and (iii) identify threats to large mammalian and pheasant species and their habitats and suggest possible mitigation for long-term conservation and management.

Investigators: Dr. S. Sathyakumar and Dr. G.S. Rawat
Date of initiation: February, 2002
Date of completion: February, 2005 extended to March, 2006
Budget allotted: Rs. 4.49 lakhs

The field activities of this research project were temporarily suspended as the researcher had left the Institute. A Junior Research Fellow has been selected to work in this project and the field work is likely to commence from spring 2005.

Jeewan S. Jalal

All India coordinated research project on taxonomy of Indian Orchids

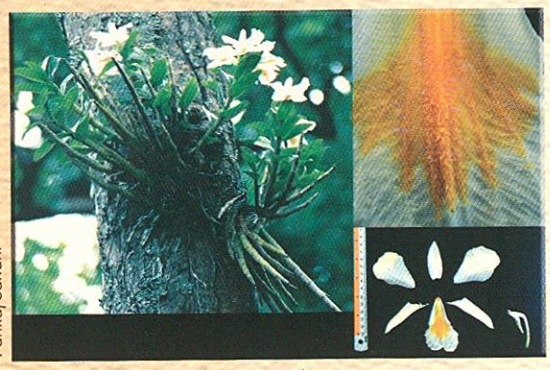
Investigator: Dr. G.S. Rawat
Project Coordinator: Dr. Sathish Kumar (TBGRI, Kerala)
Researchers: Shri Jeewan S. Jalal and Shri Pankaj Sahani
Date of initiation: June 3, 2002
Date of completion: June 2, 2007
Budget allotted: Rs. 22.25 lakhs

The Wildlife Institute of India has been conducting extensive surveys of orchi in the States of Uttaranchal and Jharkhand since last two years. Owing to planned developmental activities, resultant degradation and fragmentation

the forests, many species of orchids are feared to have become locally extinct in these States. Efforts are on to relocate and study their morphology as the past descriptions are based on one or two gatherings and at times doubtful.

The objectives of the project are: (i) status survey, collection, identification and preservation of orchids, (ii) maintain collection and taxonomic databases, (iii) develop user-friendly identification manuals, (iv) train college students, teachers and local communities in para-taxonomy, and (v) to bring out volumes on Indian Orchids.

During the reporting period, extensive surveys were conducted in various eco-climatic zones of Uttaranchal and Jharkhand. The survey resulted in the identification of several interesting species and new records. Detailed taxonomic treatment for various groups is underway. The herbarium specimens are being maintained at the Institute. Taxonomic data banks are being updated individually by the research fellows in the form of cards and electronically in CDs. A total of 89 species have been collected so far from Uttaranchal State. The following species have been recorded for the first time in the State: (i) *Bulbophyllum secundum* Hook. *f.*, (ii) *Eulophia hormusjii* Duthie, and (iii) *Poneorchis nana* (King & Pantl.) Soo. In addition, *Herminium pugioniforme* Lindl. ex Hook. f. has been recorded after a gap of more than 50 years.



Pankaj Sahani

As per the project objectives "An Orchid Conservation Awareness Programme" has been initiated in the eastern part of Uttaranchal, Gori Valley, which is recognized as one of the orchid hotspots in the State. Posters and picture collections were displayed at schools and community centres. Slide talks were organized in the primary schools and middle level schools.

A total of 50 species have been collected so far from Jharkhand. This includes one variegated form of *Habenaria longicorniculata*, which has a different flowering period as opposed to the normal (non-variegated species). Hence it is being proposed to raise to a level of variety. Further communication for this is in progress. An erect form of *Dendrobium transparens* has been recorded, which is also being proposed as a new variety. Expert consultation is in progress. Localities of *Dendrobium moschatum* (Buch.-Ham.) Sw., *Dendrobium crepidatum* Lindl., *Dendrobium transparens* have been confirmed. Occurrence of these species in Jharkhand had been recorded by earlier workers without specific locations.

International Collaborative Project (Funding agency: NORAD)

WII-University of Tromso, institutional cooperation programme in natural resource ecology and management in the Himalaya

Investigators: Dr. S. Sathyakumar, Nodal Officer (WII), Dr. J.L. Fox, Coordinator (UiTo); Dr. A.J.T. Johnsingh, Dr. G.S. Rawat, Dr. K. Sankar and Dr. B.S. Adhikari

Research Associates: Dr. Anjali Awasthi and Dr. Sanjay Kumar Uniyal

Researchers: Mr. Ashwini Upadhyay and Ms. Swati Kittur

Date of initiation: March, 2002

Date of completion: January 2005 extended to April, 2006

Budget allotted: Rs. 154.00 lakhs

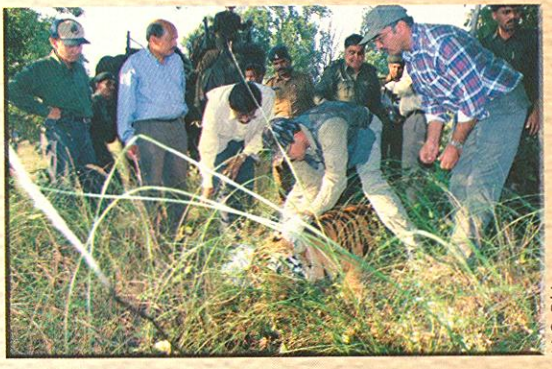
The objectives of the project are to: (i) develop WII as a Centre of Excellence in mountain ecology and wildlife management, (ii) produce a state-of-the-art report on Himalayan Wildlife Conservation and sustainability of pastoralism in the region, (iii) enhance WII's laboratory facilities for wildlife food habit analysis, and (iv) continue ongoing collaboration on wild herbivores and predator research in the Himalaya.

The field study on wild ungulate–livestock interactions at Tsokar Basin continued during all the seasons of the reporting period. The short study on Himalayan tahr- livestock interactions was completed and the draft report was submitted. Plant and dung sample analyses were carried out in WII research laboratory during the reporting period. Planning of field and laboratory working schedules for the remaining period of the programme has been completed. The terminal workshop of this programme is scheduled in February/March 2006.

Collaborative Project between Project Tiger Directorate, M.P. Forest Department & WII
Funding Source: Project Tiger Directorate through Kanha Tiger Reserve

Tiger Population and Habitat Status Evaluation

Investigators: Dr. R. Gopal, Director, Project Tiger, Shri K. Nayak, Field Director, Kanha Tiger Reserve, Dr. Y.V. Jhala and Shri Q. Qureshi
Date of initiation: April, 2003
Date of completion: December, 2009
Budget allotted: Rs. 53.00 lakhs


N.C. Dhingra

The project aims to develop simple but scientifically robust protocols for monitoring tiger status, population trends, habitat occupancy, tiger prey status, habitat and anthropogenic pressures. Several workshops were conducted in Kanha and Pench with senior officers of the Madhya Pradesh Forest Department to develop field friendly protocols. A booklet "Monitoring Tiger Status and Habitat: A Field Guide" was published based on these workshops. About 48 thousand square kilometers covering 3150 beats and 178 ranges were sampled by the frontline staff of the M.P. Forest Department in the Satpura-Maikal Landscape based on these protocols. The first phase of data collection, data entry and analysis has been completed. The second phase of intensive research level data collection for developing effective strip width models for different habitats, and calibrating tiger sign index with actual population estimates is under way. The promising results of this exercise have served as a precursor for proposing an All India Tiger Population and Habitat Evaluation System. For in-depth monitoring of source tiger populations, radio-telemetry, camera trap method, digital photography of pugmarks and intensive photography were used in Kanha to evaluate various study designs. Two tigresses were radio-collared with VHF transmitters and intensively monitored for studying ranging patterns, habitat use, activity patterns and predation.

PROJECTS INITIATED

Collaborative Project between BNHS, WII and Royal Society for the Protection of Birds (RSPB)

Funding Source: Bombay Natural History Society

Diclofenac Project for Vulture Conservation

Investigators: Dr. A. Rahmani, Director, BNHS and Dr. Y.V. Jhala
Date of initiation: April, 2004
Date of completion: December, 2007

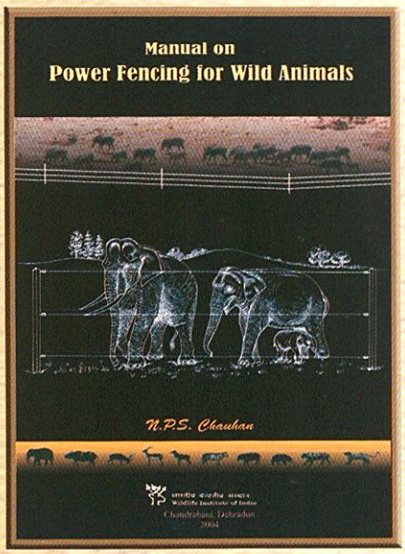
Y.V. Jhala

The project aims to assess the prevalence of diclofenac, a non-steroidal anti-inflammatory drug (NSAID) in vulture foods throughout India.

Diclofenac is being used extensively as veterinary medication. It has been implicated as the major cause for the catastrophic decline in vulture populations throughout South-East Asia. A simulation study has shown that if 0.1 percent of carcasses eaten by vultures had substantial diclofenac concentration, then it would be sufficient to cause the catastrophic mortality observed in vultures. The preliminary analysis of over a thousand carcasses that could potentially be eaten by vultures collected from a large geographical area of western and central India shows a prevalence of diclofenac in 4-6% of the carcasses. It is a serious cause for concern. Data are now being collected from central and eastern India.

Developing power fence manual for teaching and training purposes

Faculty: Dr. N.P.S. Chauhan
Date of initiation: July 23, 2004
Date of completion: July 22, 2005
Budget allotted: Rs. 80,000.00



N.P.S. Chauhan

The power fencing system is a psychological barrier increasingly being used for protection purpose and management of wildlife in and around protected areas to reduce man-wildlife conflicts. Species-specific fences are used around crop fields, orchards, nurseries, store houses and human settlements, which gives unpleasant electric shock to animals without causing any physical damage.

The work on developing manual 'Power Fencing System' is in progress. Most of the information and literature pertaining to use, construction and maintenance of power fences have been collected and are being compiled. Besides foreword, the manual has sub-heads, *viz.* contents, introduction, use, animal behaviour to power fence, fence components, energizers, posts, insulators, accessories (wire, tightner), batteries, solar panel, earthing system, tools, specifications of components, design, construction, solar power fence system, portable fence, fence monitoring, maintenance, costs, dealers comparison, addresses and power fence. The required text, graphs and tables etc. have been fed into computer and necessary corrections and editing are being done. Drawings showing equipment, accessories and fence designs are being prepared for incorporation in the manual. The power fence manual will be completed by September 2005.

Comparison of tiger (*Panthera tigris*) population estimated using non-invasive techniques of pugmark, camera trap and DNA based analysis of hair and scat in Ranthambhore Tiger Reserve. Tools for identifying free ranging individual tigers: A Pilot Study

Investigator: Dr. S.P. Goyal
Co-investigators: Dr. K. Sankar and Shri Q. Qureshi
Date of initiation: December 28, 2004
Date of completion: June 27, 2007
Budget allotted: Rs. 18,614,00.00

The objectives of the project are : (i) Determine suitable sampling design, sample size and level of saturation in pugmark characteristics, if any, for identifying free ranging individual tigers based on pugmarks and camera traps, (ii) Validate identity of individual tiger determined based on pugmark using photo identity; (iii) Standardize techniques for remotely collection of tiger hair using from hair snares; (iv) Develop protocols for extracting DNA from hair and scat and determine number of polymorphic satellite needed for identifying individual tigers, and (v) Prepare Phase – II proposal based on standardized protocols tiger population estimated by three methods.

Reliable data on the distribution and abundance of a number of carnivore species have always been problematic as the species are secretive, elusive or highly dispersed. Estimating number reliably has been one of the most crucial aspects for the wildlife managers throughout its range. For the first time, a pilot study of eighteen months under Phase –I has been planned to standardize protocols and sampling design for identifying free ranging individual tigers based on pugmark, camera trap and DNA techniques in Ranthambhore Tiger Reserve (RTR). Track plots (TP) popularly used for carnivore survey will be randomly placed on preferred tiger trails in Intensive Study Area (ISA) having uniform soil depths (ca. 1 cm). Pugmarks obtained on each TP will be traced as well as photographed using digital camera following standard protocols. Multivariate statistics will be used to identify individuals on various pugmark measurements determined using Scan Pro–Software. It was also planned to determine number of track plots needed to validate tiger identity based on pugmarks using photo identity and if there is any saturation level in pugmark measurements in relation to tiger numbers. Standard Camera Trap will be placed on randomly selected ten track plots and individuals photographed will be identified based on stripe patterns. DNA based micro-satellite techniques developed recently to know about population-using scat by Ernest *et al.* (2000) and hair collected remotely using baited hair snares (hair combs) (Foran *et al.*, 1997) will be tried in ISA.

The objectives of the project are: (i) to prepare habitat maps of Ranthambhore National Park and peripheral areas in relation to wild boar occurrence and quantify vegetation composition and structure within each habitat, (ii) study the spatial and temporal distribution of wild pigs, (iii) population status and socio-biology of pigs, (iv) to develop capture techniques, (v) quantify habitat use and ranging patterns and study the diurnal activity on seasonal basis, (vi) feeding habits and reproductive biology, (vii) study health parameters of pigs, (viii) assess the man-wild pigs conflict, (ix) to evaluate the use and efficacy of power fence in controlling crop damage, and (x) suggest cost-effective methods to control wild pigs and mitigate agricultural crop damage.

Developing management capabilities for wild pig damage control in agro-ecosystems in and around protected areas of India. Task: Ecology and Management of wild pigs in Ranthambhore Tiger Reserve

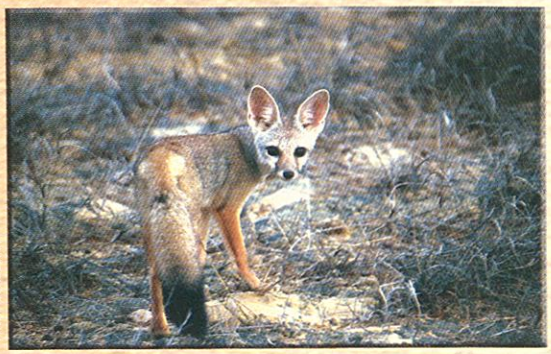
Faculty: Dr. N.P.S. Chauhan
Researcher: Shri Kuldeep Singh Barwal
Date of initiation: December 6, 2004
Date of completion: December 5, 2008
Budget allotted: Rs. 33,11,000.00

The research fellow joined the project in December 2005. All the preparatory work, *viz.* obtaining permission for conducting study in

Ranthambhore Tiger Reserve from the Chief Wildlife Warden, Rajasthan, collection of literature, developing data formats and orientation/training of researcher have been completed. The study area maps and essential equipment/items etc. are being procured. For establishment of the base camp, accommodation has been hired in Sawai Madhopur and necessary facilities are developed. Reconnaissance survey of the study area was initiated. Based on direct sightings and local information, distribution and abundance of wild pigs is being collected.

Research and conservation of endangered and threatened fauna of Kutch: An integrated approach

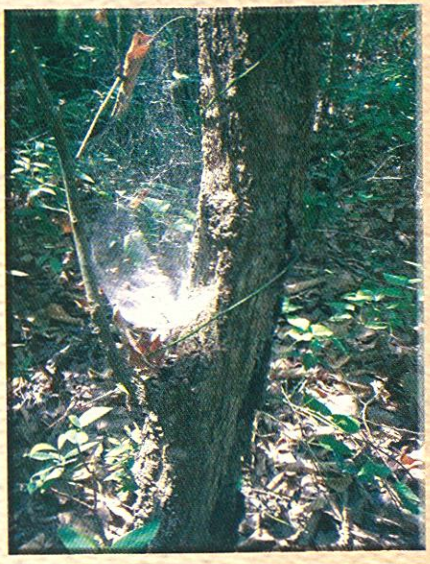
Investigators: Dr. Y.V. Jhala, WII, Dr. A. Rahmani, Director, BNHS, Dr. R. Sankar, Scientist, SACON
Researchers: Shri Bopanna I.P. (Technical Assistant), Ms. K. Mandalia (Volunteer), Ms. C. Home (M.Sc. Student, WII) and Ms. P. Sinha (M.Sc. Student, FRI)
Date of initiation: December 10, 2004
Date of completion: December 9, 2009
Budget allotted: Rs. 43.87 lakhs


K.S. Chauhan

The objectives of the project are: (i) to study the ecology and seasonal movement patterns of the Great Indian Bustard so as to develop an effective conservation strategy for the species in Kutch, (ii) to monitor the wolf, hyena, and caracal populations and evaluate the role of different mortality factors and dispersal in their population dynamics, (iii) to study the ecology of the Indian fox, (iv) to monitor the visiting populations of lesser floricans and Houbara bustards and study the migratory pathways and wintering habitats of the lesser florican, (v) to monitor the roosts and breeding status of vultures, (vi) to sensitise the local communities to the conservation needs of their endangered and threatened fauna, and (vii) to evaluate the ecological and economic sustainability of traditional pastoral practices, and evaluate the impact of wolf livestock depredation on the economics of these communities.

The project has several components including continuation of the work undertaken earlier as part of the USFWS funded project "Conservation of the Indian Wolf" *i.e.* radio-telemetry studies on wolves and striped hyenas. During the year, data was collected on radio-collared wolves and hyenas in Abdasa Kutch. The other aspects that the project addresses are: (i) studies on the Great Indian Bustard to be conducted in collaboration with the Bombay Natural History Society, (ii) studies on the lesser florican to be conducted in collaboration with Salim Ali Center for Ornithology and Natural History, (iii) study of the ecology of the Indian fox, (iv) estimating and monitoring the status of vultures in Kutch, and (v) understanding the ecological impact of livestock grazing by nomadic pastoralists and evaluating the sustainability of the current practices of livestock rearing.

A technical assistant was appointed for the project and several of the objectives were addressed with the use of a volunteer and M.Sc. students. Ranging patterns, predation and data on conflicts of radio-collared wolves with pastoralists were collected. A study of the vulture status and breeding success of vultures in Kutch is under way. Simultaneously, a media campaign and interview survey was conducted to evaluate the prevalence and use of diclofenac as veterinary medication in Kutch. The data suggests that there is a monthly consumption of over 2000 vials of diclofenac by private practitioners in Kutch. The Animal Husbandry Department has officially discontinued the use of diclofenac due to the awareness campaign and persuasion based on dissemination of scientific information. Work on the ecology of Indian fox was commenced and an M.Sc. thesis is addressing the food habits and resource availability aspects. Permission to radio-collar the Indian Fox is awaited from the Chief Wildlife Warden, Gujarat State. Study on the Great Indian Bustard and Lesser Florican are yet to commence and will be addressed in the coming year.



V.P. Uniyal

Grant-in-aid Research Project

Effect of management practices on spider diversity in Terai Conservation Area (TCA)

Investigator: Dr. V.P. Uniyal
Researcher: Mr. Upamanyu Hore
Date of initiation: December 9, 2004
Date of completion: December 8, 2008
Budget allotted: Rs. 10,24,000.00

Reconnaissance survey was conducted in the study area. Methodology and sampling technique have been designed and sampling plots were marked in different ecosystem in TCA. Field base camp for the project study was established at Dudhwa.

The objectives of the project are: (i) to evaluate species diversity of spiders in all ecosystem of TCA, (ii) to examine the occurrence of spiders in burning and non-burning grassland area, (iii) to observe the habitat and species associations in different vegetation community, and (iv) to suggest appropriate measures for the management of grassland, woodland and wetland etc. on the basis of spider diversity.

The main aim of the proposed study is to evaluate species diversity of spiders in different ecosystem of TCA and to examine the occurrence in non-burning and burning grassland areas. Spiders are an integral part of global biodiversity, since they play many important roles in ecosystem as predator and source of food for other creatures. Many spiders' species may be threatened but research on them is lacking. Without appropriate baseline information on status, distribution and abundance, it is difficult to target appropriate habitats for the protection and conservation of spider diversity.

Conservation ecology of Sangai *Cervus eldi eldi* and its wetland habitat

Investigator: Dr. S.A. Hussain
Researchers: Ms. Sangeeta Angom, Mr. Ngailian Vaiphei and Mr. Kimjahlai Kipgen
Date of initiation: December 1, 2004
Date of completion: November 30, 2009
Budget allotted: Rs. 64,56,000.00

The major objectives are to: (i) monitor the extent and quality of habitat (*phumdis*) within the Keibul Lamjao National Park, (ii) estimate the seasonal availability of browsing biomass for Sangai and associated grazers, (iii) monitor the population of Sangai in the Keibul Lamjao National Park so as to derive the population parameters such as density, demography and spacing, (iv) quantify the basic needs of the species in terms of food, space and cover for sustained reproduction, (v) determine the stocking rates of Sangai and associated grazers in the Park, (vi) examine the variation in the mitochondrial DNA as well as nuclear DNA using control region and micro-satellite primers to gain a better understanding of the genetic population structure, and (vii) explore the possibility of establishing a second home for Sangai in wild within Manipur State.

The brow-antlered deer *Cervus eldi eldi* known as sangai is considered as one of the most endangered species of deer. Once believed to be extinct, a small population of around fourteen animals was re-discovered in the south-eastern fringe of the Loktak Lake in 1975. This area was protected and declared a National Park, known as Keibul Lamjao National Park. Since then the population of sangai has started growing and the present population is around 180 animals. The total area of the Park is 40 km^2, of this 26 km^2 is covered by thick and almost contiguous mat of floating mass called *phumdi* and remaining 14 km^2 is open water. Within the Park, the deer population is largely confined to 15-20 km^2 area in southwestern part of the Loktak Lake. The adult male to adult female ratio in the Park is 100 stags: 124 hinds and adult female to fawn ratio is 100

hinds: 36 fawns. The overall intrinsic rate of increase in the population between 1975 and 2003 is approximately 10% per annum. The overall ecological density thus has increased from 0.54 animal/km^2 to 6.92 animal/km^2 within last 28 years. Such a high rate of increase in the population is due to stringent protection measures taken by the State Forest Department, high rate of juvenile survival and high fecundity of females typical of most cervids.

The project was launched in December 2004 with the appointment of three JRFs. A reconnaissance of the field situation was made by the researchers. Detailed methodologies for achieving the objectives are being finalized. The base camp is being established at Keibul Lamjao National Park. The field work for the project will begin from October 2005.

WII-USDA Forest Service Collaborative Project

Management of forests in India for biological diversity and forest productivity – A new perspective – Phase-II

Investigators: Indian Team: Dr. P.K. Mathur and Dr. Atul K. Gupta
US Team: Mr. Tom L. Darden, Dr. Martin Raphael, Dr. John F. Lehmkuhl, Mr. Richard Holthausen and Dr. Bruce G. Marcot.
Researchers: Dr. Anshuman Tripathi and Shri Ashish
Date of initiation: Phase-I (January 18, 1996); *Phase-II* (September 1, 2004)
Date of completion: Phase-I (December 31, 2002); *Phase-II* (February, 2007)
Budget allotted: Rs. 168.86 lakhs
Total project expenditure upto December, 2002: Rs.122.79 lakhs
Budget allocated for Phase II: Rs. 38.10 lakhs

The Institute had implemented this major project from January, 1996 to December, 2002 in collaboration with the USDA Forest Service (USFS). Specific activities pertaining to the development of a proposal for 'no-cost-extension" as Phase-II of the project were undertaken during the reporting period.

The completed Phase-I project aimed to integrate the conservation of biological diversity with the sustained flow of forest products to support urban and rural lifestyle and was executed in four field demonstration sites called "Conservation Areas (CAs)". These CAs were significantly large landscapes including a mix of protected areas, managed forests and intervening community/private lands. Four project sites were Anamalai Conservation Area (ACA) in Tamil Nadu, Garo Hills Conservation Area (GCA), Meghalaya, Satpura Conservation Area (SCA), Madhya Pradesh and Maharashtra, and *Terai* Conservation Area (TCA), Uttar Pradesh.

Following were the specific objectives of this project: (i) Assess plant and animal diversity in each conservation area, (ii) Use existing information to set up baseline information systems on wildlife habitat relationships, (iii) From stand to landscape-levels, evaluate the impact of existing forestry practices and use of forest-based resources by local people, (iv) Rapidly assess the social and economic systems of surrounding villages in terms of varied land use and

Following are the objectives set-forth for Phase-II: (i) Convene site level workshops involving field managers for each of the four CAs, (ii) Prioritize issues and actions for each CA. Select a sub-set of issues for further work during the workshop, (iii) Develop specific approaches for implementation of management recommendations on select issues, (iv) Develop specific approaches for implement procedure for testing and monitoring management actions, and (v) Describe key-steps to implement/execute recommendations and potential pilot projects (including specific tasks, responsibilities, fund requirements and schedule).

forest resource dependency, (v) Use modern ecological concepts to develop landscape-scale management strategies and practices for integrating protected & managed forests and forest & village systems through sustainable land use practices, and (vi) Conduct workshops and seminars to disseminate knowledge and begin the process of training scientists and managers.

The project was implemented in active partnership of the USDA Forest Service, Indira Gandhi National Forest Academy and concerned State Forests Department in five States. The project promoted technologies and approaches relevant to the forest ecosystem management, landscape ecology, social forestry, remote sensing and mapping technology. The project has been successfully completed in December, 2002 with the delivery of a six volume final report cum management guide.

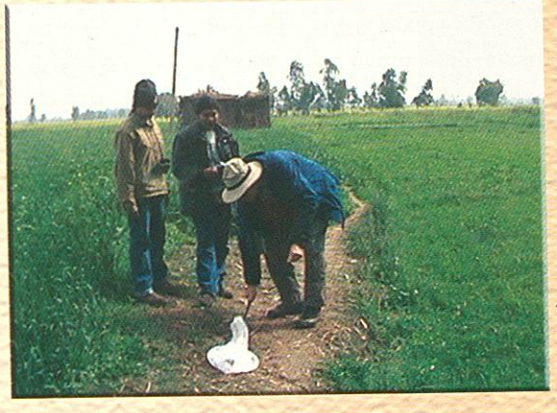
In order to bring the logical conclusion of the project and meaningful utilization of the research findings, the project team considered appropriate to continue the above project supported by FERRO, American Embassy as a 'no-cost-extension' (Phase-II). The goal of the proposed Phase-II of 2.5 year duration will be to work with state and site level field managers to develop specific plans and guidelines for implementing the recommendations presented in the six-volume project technical report.

The proposal for 'no-cost-extension' was considered by the TRAC in its meeting held on December 10, 2003 and was approved subject to necessary clearances by GOI. Accordingly, MoEF, GOI was requested to convey the concurrence of the Government of India. The field/site level activities of Phase-II could not be initiated during the reporting period from the balance funds of already obligated grant for the want of GOI concurrence. The MoEF conveyed its approval for Phase-II to be implemented *w.e.f.* September 1, 2004. Subsequently, one Research Associate and one Senior Research Fellow were engaged and necessary preparations for development of concept paper(s) and planning activities for the organization of site level workshops were initiated.

DST Funded Research Project

Ecological study of tiger beetles (*Cicindelidae*) as indicator for Biodiversity Monitoring in Shivalik Landscape

Investigators: Dr. V.P. Uniyal and Dr. K. Sivakumar
Researchers: Ms. R. Padmawati and Ms. Swati Kittur
Date of initiation: September 1, 2004
Date of completion: August 31, 2007
Budget allotted: Rs. 13,80,960.00



V.P. Uniyal

The objectives of the project are: (i) to assess species richness, distribution and abundance of tiger beetles in different vegetation types, and (ii) to establish correlation of tiger beetles with the diversity of birds and butterflies along altitudinal gradient.

Reconnaissance survey was conducted in the study area, viz Simbalbara and Pong Dam Wildlife Sanctuary of Himacha Pradesh. Methodology and sampling technique have been designe in the study area. Sampling plots were marked in different vegetatio types in the study area. Base camp for the project was establishe at Paonta Sahib Forest Colony, Himachal Pradesh.

The main aim of the research study is to establish relationship between species diversity of tiger beetle, butterflies and bird diversity in the landscape. The tiger beetle has been designated as indicator for biodiversity monitoring.

V.P. Uniyal

EXTERNALLY FUNDED RESEARCH PROJECT

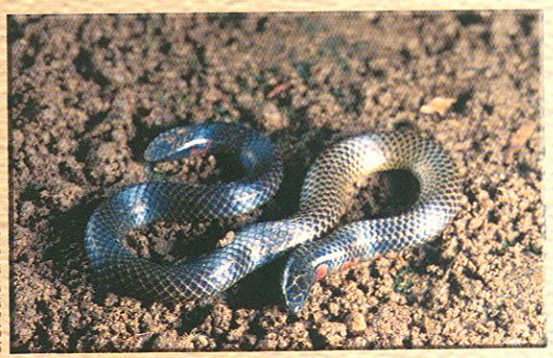
Department of Biotechnology, Ministry of Science and Technology Sponsored Project

An evaluation of endemism of the herpetofaunal assemblages from the Western Ghats using molecular techniques

Investigators: Dr. Karthikeyan Vasudevan (WII) and Dr. Ramesh Aggarwal (CCMB)
Researcher: Shri M.S. Chaitra
Date of initiation: April 19, 2004
Date of completion: April 18, 2007
Budget allotted: Rs. 11.95 lakhs

Estimating the diversity and identifying regions of high endemism is an important requirement to assign conservation priorities in a region. Due to the high level of endemism and rarity of the Uropeltid snakes (burrowing snakes) they are ideal for examining the reasons for the evolution of diversity and endemism of life forms in the Western Ghats. The Western Ghats has 93 species of endemic reptiles, of which 58 are snakes. Among snakes, the burrowing shield tailed snakes belonging to the family Uropeltidae has seven genera and 34 species. These are subterranean snakes that show unique burrowing adaptations. The family Uropeltidae consists of 43 species of highly specialized snakes found in the mountain ranges of Sri Lanka and the Western Ghats of India. All known species were described between 1821 and 1896. More than 70% of the species have been recorded from less than 5 localities. The southern Western Ghats (8°-10°N) harbours 24 species that are confined only to this region. Only two species have confined distribution above 13°N latitude in the Western Ghats. The field study was initiated in four sites, Anamalais, Wynaad-Kottiyur Forests, Kuduremukh, Sharavathi valley and Kodigadde-Mavinagundi where intensive sampling will be carried out. 'Litter beds' of the dimension 3m x 3m x 1m were made on the forest floor and allowed to decay for 30 days, after which they were opened and checked for Uropeltids. After the inspection the litter beds were refilled and left undisturbed for the next 30 days. In all, 16 litter beds were laid and checked four times, during which, six *uropeltids* belonging to three species were found. Interestingly, 29 caecilians (limbless amphibians) belonging to the genus *Ichthyophis* were also found in the same effort. Through the improvised litter beds for finding *uropeltids* and *caecilians* has not yielded enough information, it is the first attempt to systematically sample subterranean herpetofauna. The underground hereptofauna, in forest areas and other areas under different land use offers interesting prospects to contrast diversities and infer the effect of land use practices in the Western Ghats.

The objectives of the project are: (i) to ascertain whether currently recognized taxa represent true natural assemblages/ species using DNA typing approaches, (ii) to evaluate the species richness and distribution patterns of Rhacophoridae and Uropeltidae using DNA sequencing of phylogenetically informative genomic domains, and (iii) if feasible, to develop few frog specific micro-satellite markers and use the same for understanding population structure of some members of the genus *Philautus* and *Uropeltis*.



S.U. Saravanakumar

Status and distribution of Malayan sun bear in North-Eastern region (Manipur), India

Faculty: Dr. N.P.S. Chauhan
Research fellow: Shri Jagdish Singh
Date of initiation: Mid-September, 2004
Date of completion: Mid-September, 2005
Budget allotted: Rs. 1,12,500.00

The objective of the project is to determine status and distribution of the Malayan sun bear (*Helarctos malayanus*).

The sun bear is the smallest of the bears and adapted to climb trees. In Manipur, the survey work to find status and distribution of the Malayan sun bear (*Helarctos malayanus*) was carried out in Ukurul and Chandel districts and in and around Yangaoupokpi Lokchao Wildlife Sanctuary. The sun bear has been found to occur in tropical rainforests of Manipur. There were 24 and 14 villages/forest areas of occurrence of sun bear in Chandel and Ukurul districts respectively. Occurrence of sun bear has been reported in forests adjoining several villages located in and around the Yangaoupokpi Lokchao Wildlife Sanctuary. Bear's body parts were illegally sold in few villages. Two bear cubs were captured by villagers and kept in their houses. Bears were found to cause injuries to people mainly in crop field and forest areas. Agricultural crop raiding by the bear was common. The data is being analysed for preparation of the project report.

WII-NNRMS Project Funded Research Project
Funding Agency: Ministry of Environment & Forests

Mapping of national parks and wildlife sanctuaries: A pilot project

The pilot study aims to generate accurate, reliable and latest base line spatial information on forest types and density (using satellite imagery) and topographic features (supplemented by latest satellite imagery), which will be of direct relevance for preparation/revision of management plans of wildlife sanctuaries and national parks. Efforts will also be made to incorporate the compartment-wise plant and animal density, that wildlife managers could use the information directly for conservation and management purposes.

Principal investigator: Dr. V.B. Mathur
Co-principal investigator: Dr. P.K. Mathur, WII; Dr. S.P.S. Kushwaha, IIRS; Dr. A. Khan, AMU; and Dr. S. Sudhakar, NRSA
Research Associate: Dr. Hitendra Padalia
Junior research fellows: Ms. Ambica Paliwal, Ms. Neha Midha, Shri Amit Kumar Srivastava, Shri Shijo Joseph and Shri Pebam Rocky
Date of initiation: April 1, 2004
Date of completion: March 31, 2007
Budget allotted: Rs. 1,38,63,500.00

The Ministry of Environment & Forests (MoEF) under the National Natural Resource Management System (NNRMS) project awarded a pilot project on 'Mapping of National Parks and Wildlife Sanctuaries'. The five pilot sites are Corbett Tiger Reserve, Uttaranchal, Dudhwa Tiger Reserve, Uttar Pradesh, Tadoba-Andhari Tiger Reserve, Maharashtra, Annamalai Wildlife Sanctuary, Tamil Nadu and Kaziranga National Park, Assam. Spatial database at 1:25,000 scale will be prepared for the project sites for which topographical data would be provided by the Survey of India. During the reporting period recruitment of one Research Associate and five Junior Research Fellows was done and satellite data was indented from NRSA, Hyderabad. The field studies for the project will be initiated shortly.

During the reporting period the Institute completed one research project, there were twenty ongoing projects while twelve new projects were initiated.

COLLABORATIONS

Collaboration with USDA Forest Service

The Institute has successfully completed a major project in collaboration with the USDA Forest Service in December, 2002. Details on major achievements of this project were furnished in the previous reporting period. During the current year, the collaborative efforts were continued with USFS (US Forest Service) so as to develop a proposal for the 'no-cost Phase-II project' from the balance funds of already obligated grant. The Phase-II proposal aims to develop an implementation plan based on the research findings of the Phase-I project. This was achieved through extensive consultations with the US scientists' team of the project. The Phase-II plans to have site specific workshops and full involvement of concerned site managers. Thus, a 2.5 year Phase-II proposal was considered by the TRAC and approved subject to the GOI concurrence.

UNESCO-UNF project on 'Enhancing our heritage: monitoring and managing for success in World Natural Heritage Sites'

The UNESCO World Heritage Centre (WHC) in collaboration with the IUCN World Commission on Protected Areas (WCPA), the University of Queensland, Australia and with funding support from the United Nations Foundation (UNF) have initiated a project 'Enhancing our heritage: monitoring and managing for success in World Natural Heritage Sites'. The project aims to improve the management of World Heritage Sites through the development of better assessment, monitoring, reporting systems and the application of the results of the systems to adopt/enhance site management as required. Based on the results of the project, IUCN will provide recommendations to the World Heritage Committee on a consistent approach to assessment, monitoring and reporting on the state of conservation and management effectiveness of the World Heritage Sites.

Ten World Heritage Sites in Africa, Latin America and South Asia have been included under this project. The three South Asian pilot sites are Kaziranga National Park, Assam, Keoladeo National Park, Bharatpur, Rajasthan and the Royal Chitwan National Park (RCNP), Nepal. The Ministry of Environment and Forests, Government of India has entrusted the responsibility of project implementation to the Wildlife Institute of India (WII) as a Regional Partner Institution for the 4-year project (2002-2005). The WII has signed contracts with the UNESCO and the University of Queensland and Memorandum of Understanding (MoU) with the State Governments of Assam and Rajasthan for implementation of the project activities at the two sites. A MoU was signed

between WII and the Department of National Parks and Wildlife Conservation (DNPWC), Nepal for project implementation in the Royal Chitwan National Park. The international project management team comprising Dr. Marc Hockings, Ms. Nigel Dudley and Ms. Sue Stolton visited Kaziranga and Keoladeo National Parks in November-December, 2004 and reviewed the project activities.

Based on the gaps identified during the 'Initial Management Effectiveness Evaluation', short-term studies on: (i) Review of protection strategies and suggestion to enhance their effectiveness, (ii) Development of a comprehensive capacity building plan for frontline staff, and (iii) Opportunities and limitations for resource sharing with local communities were initiated in three project sites. A short-term study on 'Water Quality Assessment in and around Keoladeo National Park, India', was also initiated on Keoladeo National Park, Bharatpur.

Professionalizing Protected Area Management for the 21st Century – A World Heritage Biodiversity Programme for India

The United Nations Educational, Scientific and Cultural Organization (UNESCO) in collaboration with the United Nations Foundation (UNF) had given a planning grant in 2001 to the Ministry of Environment and Forests (MoEF), Government of India, to develop a ten-year World Heritage Biodiversity Programme for India (WHBPI). The goal of this WHB Programme is to strengthen biodiversity conservation in protected areas by building replicable models at World Heritage Sites that emphasize law enforcement, promote habitat integrity, connectivity and improve the professional, social and political profile of the protected area management community and its civil society partners. The MoEF entrusted the responsibility of developing a framework proposal for identifying priorities, actions, activities, their time frame and budget requirement under this project jointly to the Wildlife Institute of India and the Ashoka Trust for Research in Ecology and Environment (ATREE), Bangalore. The WHBP proposal was finalized in consultation with representatives from UN foundation, UNESCO, Ford Foundation and ATREE. The UN Foundation and its partners have agreed to provide funds amounting to US $ 5 million for the 4-year implementation phase of the WHBPI. Formal clearance for the project from Ministry of Human Resource Development, Ministry of Finance and Ministry of External Affairs are being obtained and it is expected that the project will be initiated in July, 2005.

SERVICES

Consultancy

WII-HPFD Project

The Institute was entrusted a short-term consultancy assignment by the Himachal Pradesh Forest Department (HPFD). This assignment involved formulation of two Conservation Projects: (i) Conservation of flora and fauna in and around the Great Himalayan National Park (GHNP), and (ii) Conservation of endangered wildlife species in Himachal Pradesh.

During the reporting period, draft report of the Conservation Project-I "Sustainable livelihoods based approach to conservation in the Great Himalayan Conservation Landscape" was developed and submitted to the HPFD which was accepted and approved by the HPFD.

Field Survey for Albino Sambar in Kolasib Reserve Forest (WII Advisory services), Mizoram

Dr. S. Sathyakumar carried out a field survey (March 6-11, 2005) to confirm the reports of the occurrence of the albino Sambar in Kolasib Forest Division, Mizoram. Hair samples were collected and meetings were held with officers and staff of the Mizoram State Forest Department. The samples are under analyses in WII laboratory.

Wildlife Health Services

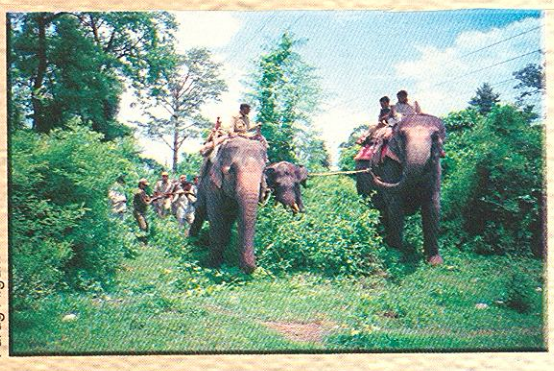
- A captive elephant at Jwalapur near Haridwar was reported to be in musth and had become a threat to life and property. The elephant was successfully immobilized and restrained. Field operation was conducted by Dr. Parag Nigam on July 17, 2004.
- A wild elephant had strayed into Laljiwala forest patch adjacent to Haridwar on July 21, 2004. Though efforts were made to push the animal back to the forest area, it was futile. It was finally decided to chemically immobilize the elephant and relocate it to the Chilla range of Rajaji National Park. The elephant was successfully immobilized, restrained and relocated on July 24, 2004. This was a joint effort between WII and Uttaranchal Forest Department. Dr. Sushant Chowdhary and Dr. (Capt.) Parag Nigam provided technical assistance.
- A captive elephant was reported to be in musth and had become a threat to life and property at Saharanpur in Uttar Pradesh. The elephant was successfully immobilized and restrained on November 19, 2004. Field operation was conducted by Dr. Parag Nigam.
- Dr. P.K. Malik and Capt. (Dr.) Parag Nigam coordinated with Ministry of Defence and participated in Republic Day Parade 2005 to deal any emergency and distress to participating elephants.

Environmental Impact Assessment

The Environmental Impact Assessment (EIA) Cell of WII continued to provide professional support in capacity building initiatives at WII, sister organizations,

Wildlife Surveys in Sakteng Wildlife Sanctuary (Institutional Consultancy Programme), Bhutan

Dr. S. Sathyakumar and Dr. B.S. Adhikari carried out field surveys (June 2-22, 2004) for vegetation, birds and mammals at Sakteng Wildlife Sanctuary, Bhutan and also provided training to the wildlife staff in field survey methodology and monitoring. The report submitted to WWF-Bhutan and the Nature Conservation Division, Royal Government of Bhutan.



Parag Nigam

other institutions, professional bodies and Government and Corporate organizations. The following are the specific tasks accomplished by EIA Cell in the reporting year:

- **Environmental Impact Assessment Studies**

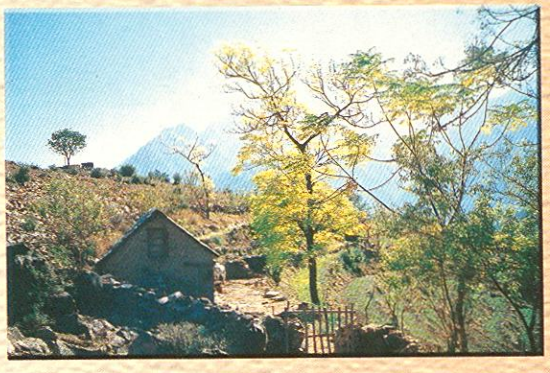
Asha Rajvanshi

(a) EIA Study of the area under consideration for the renewal of mining lease of M/s Narmada Cements Company: The above study was initiated in February 2004 with the following specific objectives: (i) Assessment of the impacts of mine renewal on distribution of lions in and around the mine lease areas, (ii) Assessment of habitat suitability for lions and wild ungulates in the mine lease areas, (iii) Evaluation of importance of the mine lease area for long-term viability of lion population in the area, and (iv) Provide recommendations arising out of the study to facilitate environmental decision making.

The study is being jointly supervised by Dr. Y.V Jhala and Dr. Asha Rajvanshi. Field work for the above project has been completed and the draft report has been prepared for consultative meeting with Gujarat Forest Department and M/s Narmada Cements Company prior to finalization of the environmental action plan.

Asha Rajvanshi

(b) Preparation of the Forest Scheduling Plan for Omkareshwar Hydroelectric Project: The WII team comprising Dr. V.B. Mathur and Dr. Asha Rajvanshi, Principal Investigators of the project and Dr. N.M Ishwar, Project Associate (ENVIS) undertook field studies for the preparation of forest clearance plan for the proposed Omkareshwar Project. Subsequently, based on detailed information collected during field surveys within forest compartments falling under submergence, spatial depictions of areas to be clear felled and the scheduling of forest felling in the submergence zone of the proposed Omkareshwar project was generated by WII team with inputs from Shri J.J. Dutta, Former Principal Chief Conservator of Forests and Shri R.C. Sharma, Retired Conservator of Forests, Madhya Pradesh Forest Department. The final technical report detailing the forest clearance plan was submitted to Narmada Valley Development Authority in July 2004 and has been approved for implementation.



Asha Rajvanshi

(c) Ecological Impact Assessment of Cement Plant and Captive Limestone Mine Sundernagar, Himachal Pradesh: In pursuance of the directives of MoEF to conduct impact assessment for evaluation of the impacts of mining activities of the above project on Bandli Wildlife Sanctuary and other areas of conservation significance located in and around the project site, WII undertook the EIA studies under the consultancy offer of M/s Harish Cements. WII decided to undertake these studies in collaboration with Himachal Forest Department so that mitigation develop plan can be developed in consultation with State level agency that would be subsequently responsible for coordination and implementation of the conservation plan and conditions stipulated by MoEF for strengthening conservation measures in project site. The following was the scope of work agreed upon for the studies to be undertaken by WII: (i) Evaluate the impacts of mining activities within km of Bandli Sanctuary, (ii) Prepare conservation plan for Bandli Wildlife Sanctuary, and (iii) Address issues raised by MoEF in the site report.

The fieldwork for the environmental impact assessment of the proposed project on biodiversity components was jointly undertaken by WII team comprising t

faculty members - Dr. Asha Rajvanshi, Dr V.P. Uniyal, research scholars of the EIA Cell – Ms. Malvika Onial and Ms. Parichay and the officials of the Himachal Pradesh Forest Department during December 2005. The final EIA report prepared by WII in consultation with the Additional PCCF, Himachal Pradesh Forest Department was submitted to the project authorities.

- **Placement of students for academic support in post-graduate and doctoral research**

The EIA Cell of WII has been providing academic support to several universities within the country by providing opportunities to graduate and post-graduate students for undertaking dissertation work and summer training. This year, request was received from Department of Civic Design, University of Liverpool for seeking placement opportunity for Ms. Urmila Jha Thakur, a Ph.D. student pursuing her doctoral research in EIA. She interacted with Dr. Asha Rajvanshi on matters related to EIA, perused the EIA reports database for last 10 years and received guidance on reviewing current practices and monitoring protocols for EIA follow up in India, in relation to open cast coal mining.

- **Contributions in International EIA Initiatives**

The Capacity Building for Biodiversity and Impact Assessment (CBBIA) project, which is part-funded by the Dutch Government, is one of the recent initiatives of the International Association for Impact Assessment (IAIA) towards promoting capacity building in EIA.

Dr. Asha Rajvanshi has been identified as one of the country-representatives and resource person to play a role in taking the CBBIA-IAIA project forward in the home country and in the region. Dr. Rajvanshi participated in the project initiation meeting held in Vancouver, Canada during April 23–26, 2004 along with 25 other EIA professionals from developing countries to discuss the needs of capacity building for different regions and made presentations on 'Status of biodiversity and impact assessment in India' and 'Capacity building for integrating biodiversity in impact assessment'.

As a follow up of the above meeting, a proposal for training "Mainstreaming Biodiversity in Environmental Impact Assessment (EIA)" has been developed by Dr. Asha Rajvanshi and Dr. V.B. Mathur in collaboration with Technical Project Manager, CBBIA Project.

- **Preparation of guidelines for the integration of biodiversity in Strategic Environmental Impact Assessment (SEA)**

In response to the directives of the Convention on Biological Diversity (CBD), the Netherlands Commission for Environmental Impact Assessment (NCEIA) undertook the preparation of 'Guidelines for the integration of biodiversity in Strategic Environmental Impact Assessment (SEA)'. In order to produce these guidelines on how to integrate biodiversity in Strategic Environmental Assessment, NCEIA sought inputs from EIA and SEA community across the globe in the preparation of the case studies. Dr. Asha Rajvanshi and Dr. V.B. Mathur contributed case studies on SEA. They prepared the report entitled 'Integrating Biodiversity into Strategic Environmental Assessment: Case Studies from India' for submission to the Netherlands EIA commission. The case studies have also been uploaded on the official website of CBD.

- **Advisory Support to MoEF**

WII continued to provide advisory services to MoEF on matters related to environmental decision making. WII is represented on the Expert Committee for mining projects. In this capacity, WII is advising the Environment Division of MoEF in the evaluation of EIA reports on mining projects for decision making with respect to environmental clearance. The nature of work involved extensive review of EIA documentation, attending Expert Committee Meetings at MoEF for environmental appraisal of projects and review of project specific Conservation Plans prepared as part of Environmental Management Plans (EMP). Dr. Asha Rajvanshi continued to provide this as a member of the Expert Committee (mining).

• Global Millennium Ecosystem Assessment Process

The Millennium Ecosystem Assessment (MA), a 4-year international and multi-scale assessment was initiated to meet the needs of decision-makers for scientific information on the links between ecosystem change and human well-being. Divided into four working groups, the scientists from across the globe assessed the current and future capacity of ecosystems to provide services to humankind including the impacts of ecosystem change on well-being. Dr. V.B. Mathur and Dr. Asha Rajvanshi provided inputs as contributing authors for the chapter (Responses: 05 – Biodiversity) of the Millennium Ecosystem Assessment Report "Biodiversity and Human Well–being: A Synthesis Report for the Convention on Biological Diversity" that is being published by Island Press.

Wildlife Forensic Cell

Vinod Verma

The Wildlife Forensic Cell was set up with a primary goal to develop and standardize techniques for identifying species, varied wildlife parts reported in wildlife trade for implementing Wildlife (Protection) Act-1972. During the reporting period, the Cell received 83 cases related to wildlife offences from various enforcement agencies, *viz.* Forest, Police, CBI and RPF, Courts, Govt. of India and Customs. The biological parts and products received were of elephant ivory, meat, blood, feathers, bones, skins, hair, bear bile, musk deer pod, live turtles, drawing brushes, trophies, wool, shawls and fur coat. These samples were sent from various States, *viz.* Bihar, Daman & Diu, Delhi, Goa, H.P. Haryana, Karnataka, J & K, Kerala, M.P., Maharashtra, Orissa, Punjab Rajasthan, Tamil Nadu, Uttar Pradesh, Uttaranchal and West Bengal.

Table 1. The accession numbers of mitochondrial cytochrome b and 16s rRNA gene sequences examined and submitted to NCBI database

Species	Family	Cytochrome b Accession No.	16s rDNA Accession No.
Antilope cervicapra (Blackbuck)	Bovidae	AY286429 AY286430 AY286431	AY256826 AY286429 AY286442
Naemorhedus goral (Goral)	Bovidae	AY286434 AY286435 AY286436	AY256827 AY286432 AY286433
Boselaphus tragocamelus (Nilgai)	Bovidae	AY286438 AY286440 AY286441	AY256828 AY286437 AY286439
Cervus eldi (Thamin deer)	Cervidae	AY456909 AY540849	AY391771 AY391772
Cervus axis (Chital)	Cervidae	AY456910 AY456911 AY456912 AY540850 AY540851	AY391762 AY391763 AY391764 AY391765 AY391766
Cervus unicolor (Sambar)	Cervidae	AY456905 AY456907	AY391769 AY391770
Axis porcinus (Hog deer)	Cervidae	AY540848 AY540847	AY391767 AY391768
Moschus crysogester (Musk deer)	Moschidae	AY395686 AY684631	AY504958 AY504959

Under a collaborative program between WII and DNA Typing Unit, Central Forensic Science Laboratory, Kolkata it has been possible to document the extent of species-specific variation within mitochondrial cytochrome b and 16s rRNA gene in eight endangered Pecora species endemic to Indian peninsula for differentiation of species. The study has proposed following two unique approaches for identification of species: (i) Haplotype Block Identification (HBI) using combination of a set of species-specific mutation sites, and (ii) Repeat Motif Identification (RMI) exploiting combination of species-specific repeat sequence motifs. The collaborative study has also examined two mitochondrial genes viz. 16s rRNA and Cytochrome b to resolve the phylogentic position of the species belong to the family Bovidae, Cervidae and Moschidae of Pecora infra-order endemic to Indian subcontinent. Phylogenetic analysis based on different algorithms, Neighbour joining, Maximum parsimony, Bayesian inference, Maximum likelihood, Minimum evolution, Median joining network along with Multi-dimensional scaling and DNA word analysis clearly establish the basal position of Tragulidae and monophyly of Pecora infra-order within suborder Ruminantia. The results also demonstrate that the families Bovidae, Cervidae and Moschidae are allied with the placement of musk deer close to bovids rather than to cervids. The molecular dating based on studied sequences show that the radiation of Pecora occurred at the Early/Late Oligocene transition and most of the Pecora families radiated or dispersed rapidly during the Oligocene/Miocene transition.

Teaching inputs provided to other institutions in Dehradun/Outside

Dr. V.B. Mathur (April 21, 2004): **IFS Compulsory Course, FSI, Dehradun.** GIS application in wildlife conservation.

Dr. V.B. Mathur (May 26, 2004): **IFS Compulsory Course, FSI, Dehradun.** Resource mapping of protected areas using remote sensing & GIS.

Dr. Parag Nigam (May 22-24, 2004 and February 11-13, 2005): **Corbett (Wildlife) Training Centre, Kalagarh.** Captive elephant health management.

Dr. A.K. Gupta (June 9, 2004): **Indira Gandhi National Forest Academy, Dehradun.** Indian Forest Service: Issues and Challenges.

Dr. A.K. Gupta (June 10, 2004): **Forest Research Institute, Dehradun.** Improvement in the working of forest department for career development through training and enhancement of skills.

Dr. V.B. Mathur (June 10, 2004): **Refresher Course for University Teachers, IIRS, Dehradun.** Environmental impact assessment studies using remote sensing & GIS.

Dr. P.K. Mathur (June 11, 2004): **Shri Guru Ram Rai Post-Graduate College, Dehradun.** Orientation training programme of education section of N.S.S. programme.

Dr. Sushant Chowdhary (June 12 & 13, 2004): **Kalagarh Training Centre, Kalagarh.** Two lectures on chemical restraint method & management of captive elephants.

Dr. V.B. Mathur (June 23, 2004): **IFS Compulsory Course, Indian Institute of Remote Sensing, Dehradun.** Application of remote sensing & GIS in forest & wildlife management.

Dr. B.K. Mishra (June 25, 2004): **Indian Institute of Remote Sensing, Dehradun.** "Applications of GIS and remote sensing in ecodevelopment planning" to IFS capsule course participants.

Dr. A.K. Gupta (June 30, 2004): **Indira Gandhi National Forest Academy, Dehradun.** New trends in eco-development: Issues of sustainability.

Dr. A.K. Gupta (July 18, 2004): **Indira Gandhi National Forest Academy, Dehradun.** Professionalizing forest service.

Dr. Asha Rajvanshi (July 30, 2004): **Indira Gandhi National Forest Academy, Dehradun** (1st Advanced Forest Management course for IFS officers of 1987 batch). Environment impact assessment for biodiversity conservation.

Dr. Parag Nigam (August 10, 2004): **Indira Gandhi National Forest Academy, Dehradun.** Recent technologies in wildlife restraint and immobilization.

Dr. Asha Rajvanshi (August 12, 2004): **Indira Gandhi National Forest Academy, Dehradun** (1st Advanced Forest Management course for IFS officers of 1983 batch). Integration of biodiversity conservation concerns in EIA.

Dr. P.K. Malik (August 13, 2004): **Indira Gandhi National Forest Academy, Dehradun.** Monitoring wildlife health in PAs.

Dr. A.K. Gupta (August 23, 2004): **SFS College, Dehradun.** Wildlife protection act.

Dr. S. Sathyakumar (August 23, 2004): **Rashtriya Indian Military College, Dehradun.** Conservation of wildlife of Western Himalaya: Issues and challenges.

Dr. A.K. Gupta (August 24, 2004): **SFS College, Dehradun.** National Wildlife Action Plan.

Dr. A.K. Gupta (August 25, 2004): **SFS College, Dehradun.** PA management and conservation of biodiversity.

Dr. A.K. Gupta (August 26, 2004): **SFS College, Dehradun.** Importance of wildlife research and its relevance to managers.

Dr. A.K. Gupta (August 30, 2004): **SFS College, Dehradun.** Ecotourism.

Dr. B.K. Mishra (August 31, 2004): **Indira Gandhi National Forest Academy, Dehradun.** "People's participation for integrating biodiversity conservation and sustainable development" to participants of IFS induction course.

Dr. A.K. Gupta (September 2, 2004): **SFS College, Dehradun.** Wildlife Protection Act.

Dr. A.K. Gupta (September 2, 2004): **Indira Gandhi National Forest Academy, Dehradun.** Ecodevelopment: Issue of sustainability.

Dr. Ruchi Badola (September 2, 2004): **Indira Gandhi National Forest Academy, Dehradun.** 'Stakeholders identification and issues related to stakeholder participation in conservation' to participants of the IFS induction course.

Dr. Ruchi Badola (September 3, 2004): **Garhwal University, Srinagar.** 'Environmental economics-need and basic principles' to participants of the UGC sponsored refresher course.

Dr. B.K. Mishra (September 3, 2004): **Garhwal University, Srinagar.** "Social Concerns in Wildlife Conservation" to the participants of UGC sponsored PG Teacher's refresher course.

Dr. A.K. Gupta (September 3, 2004): **Indira Gandhi National Forest Academy, Dehradun.** Role of NGOs in forestry sector.

Dr. S.A. Hussain (September 3-4, 2004): **Department of Environmental Science, HNB Garhwal University, Srinagar, Uttaranchal.** Indian Wetlands: Classification, values and conservation status.

Dr. A.K. Gupta (September 6, 2004): **SFS College, Dehradun.** Wildlife Management.

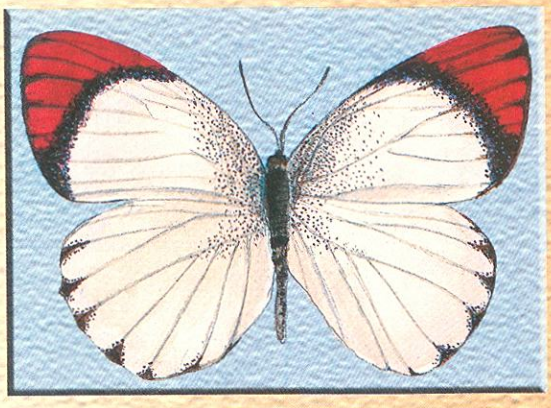
Dr. Asha Rajvanshi (September 8, 2004): **Indira Gandhi National Forest Academy, Dehradun.** Advanced Forest Management course for IFS officers of 1987 batch. Environmental impact assessment and biodiversity conservation.

Dr. A.K. Gupta (September 9, 2004): **Indira Gandhi National Forest Academy, Dehradun.** Ecodevelopment: Issue of sustainability.

Dr. A.K. Gupta (September 16, 2004): **Indira Gandhi National Forest Academy, Dehradun.** Professionalizing the forest service.

Dr. V.B. Mathur (September 21, 2004): **Skill Upgradation Course for IFS Officers, IGNFA, Dehradun.** Review of protected area network in India.

Dr. V.B. Mathur (September 23, 2004): **IFS Compulsory Course, FSI, Dehradun.** Resource mapping of protected areas using remote sensing & GIS.



Crimson Tip (*Colotis donae*)

Dr. A.K. Gupta (September 23, 2004): **SFS College, Dehradun.** PA management and conservation of biodiversity.

Dr. A.K. Gupta (September 24, 2004): **Indira Gandhi National Forest Academy, Dehradun.** Landscape approach to wildlife conservation.

Dr. V.B. Mathur (September 24, 2004): **Skill Upgradation Course for IFS Officers, IGNFA, Dehradun.** Management planning for protected areas.

Dr. S. Sathyakumar (October 4, 2004): **Dayanand Girls Inter College, Dehradun.** Wildlife of Western Himalaya.

Dr. A.K. Gupta (October 4, 2004): **Indira Gandhi National Forest Academy, Dehradun.** Leadership attributes for managers.

Dr. Asha Rajvanshi (October 4, 2004): **MDS University, Ajmer (Training of trainers programme for teachers of Rajasthan University).** Relevance of biodiversity conservation and significance of EIA in biodiversity conservation.

Dr. Asha Rajvanshi (October 4, 2004): **MDS University, Ajmer.** Global best practices in EIA.

Dr. A.K. Gupta (October 8, 2004): **Indira Gandhi National Forest Academy, Dehradun.** Challenges before the forest service.

Dr. Sushant Chowdhary (October 9, 2004): **Gurukul Kangri University, Haridwar.** Protected area profile and species conservation in India.

Dr. Sushant Chowdhary (October 10, 2004): **Gurukul Kangri University, Haridwar.** Elephant conservation in India.

Dr. A.K. Gupta (October 12, 2004): **Indira Gandhi National Forest Academy, Dehradun.** 'CITES' and 'Challenges before the forest service'.

Dr. Asha Rajvanshi (October 28, 2004): **Forest Research Institute, Dehradun in Training course on Ecorestoration of Wasteland.** Ecological impact assessment of forestry project.

Dr. V.B. Mathur (October 29, 2004): **Advance Forest Management Course for IFS Officers, IGNFA, Dehradun.** EIA for biodiversity conservation: Case study from Narmada project.

Dr. A.K. Gupta (November 4, 2004): **Indira Gandhi National Forest Academy, Dehradun.** Ecodevelopment: New initiatives.

Dr. A.K. Gupta (November 5, 2004): **Indira Gandhi National Forest Academy, Dehradun.** Indian Forest Service: Challenges ahead

Dr. V.P. Uniyal (November 17, 2004): **Building Pest and Mycology Department, Central Building Research Institute, Roorkee.** Spiders as conservation monitoring tools.

Dr. Parag Nigam (November 22, 2004): **Indira Gandhi National Forest Academy, Dehradun.** Management of wild animals in distress.

Dr. A.K. Gupta (November 23, 2004): **Indira Gandhi National Forest Academy, Dehradun.** Professionalizing the forest service.

Dr. A.J.T. Johnsingh (November 24, 2004): **Lal Bahadur Shastri National Academy, Mussoorie.** Getting inspired by nature.

Dr. A.K. Gupta (December 13, 2004): **Indira Gandhi National Forest Academy, Dehradun.** Professionalizing the forest service.

Dr. Asha Rajvanshi (December 13, 2004): **State Forest Service College (SFS), Dehradun.** Theory and practice of EIA.

Dr. Asha Rajvanshi (December 14, 2004): **State Forest Service College (SFS), Dehradun.** Conducting EIA: Hands-on experience.

Dr. A.K. Gupta (December 15, 2004): **Indira Gandhi National Forest Academy, Dehradun.** Panel discussion: Indian Forest Service: Issues and challenges.

Dr. A.K. Gupta (January 4, 2005): **Indira Gandhi National Forest Academy, Dehradun.** Panel discussion on 'Indian Forest Service: Issues and challenges'.

Dr. A.K. Gupta (January 4, 2005): **Indira Gandhi National Forest Academy, Dehradun.** Ecodevelopment: Issues of sustainability.

Dr. V.B. Mathur (January 12, 2005): **Refresher Course for IFS Officers (1983 Batch), IGNFA, Dehradun.** Review of protected area network in India.

Dr. Sushant Chowdhary (January 17, 2005): **ToT Workshop for Building Capacity in Elephant Management, Kalagarh.** Population estimation method based on direct and indirect counts.

Dr. Sushant Chowdhary (January 20, 2005): **ToT Workshop for Building Capacity in Elephant Management, Kalagarh.** An overview of elephant-human conflicts.

Dr. Sushant Chowdhary (January 21, 2005): **ToT Workshop for Building Capacity in Elephant Management, Kalagarh.** Chemical immobilization & translocation of wild elephants.

Dr. Asha Rajvanshi (January 24, 2005): **Indira Gandhi National Forest Academy (IGNFA), Dehradun. (Special Advanced Forest Management course for IFS officers of 1985 batch).** Tailoring environment impact assessment for biodiversity conservation.

Dr. A.K. Gupta (March 2, 2005): **Indira Gandhi National Forest Academy, Dehradun.** Professionalizing the forest service.

Dr. Asha Rajvanshi (March 7, 2005): **Indira Gandhi National Forest Academy (IGNFA), Dehradun. (IFS probationers 2003–06).** Environmental Impact Assessment framework for evaluating impacts of petroleum refineries on biodiversity.

Talks Delivered

Dr. S.A. Hussain (May 25-27, 2004): **Consultation on conservation of high altitude wetlands of Indian Himalayas. WWF – India's Large Himalayan Initiative, Gangtok, India.** Wetlands of Indian Himalayas: A review of their status and conservation initiatives.

Dr. S.A. Hussain (June 4-10, 2004): **IX International Otter Colloquium Frostburg State University, USA.** (i) The IUCN SSC Red List Programme: Background, history & application for Otter conservation, and (ii) Habitat use and conservation status of smooth-coated otter *Lutra perspicillata* in Corbett Tiger Reserve, India.

Dr. A.J.T. Johnsingh (August 14, 2004): **India International Centre, New Delhi.** On the man-eater hunting trail of Jim Corbett.

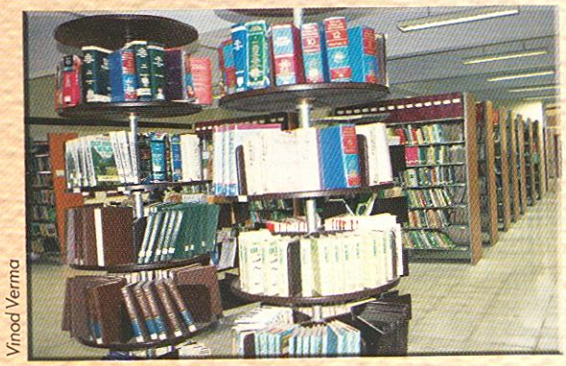
Dr. S.A. Hussain (October 27-29, 2004): **Review of Indian Antarctic Research, National Centre for Antarctic and Ocean Research, Goa.** Distribution and relative abundance of marine mammals and birds along the Princess Astrid Coast, East Antarctica.

Blue Triangle (*Graphiom sarpedon*)

FACILITIES

The Library & Documentation Centre

The Library and Documentation Centre (L&DC) plays a vital role in dissemination of information to scientists of research and training organizations and has been established in line with WII's mission as multi-disciplinary information and learning resource centre on biodiversity conservation and management. The L&DC has the following objectives:



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a. to serve as a repository of all wildlife related literature published in India,
b. to acquire, organize and disseminate all relevant world wide literature on biodiversity conservation and related fields,
c. to serve the user (reader) through normal and special library & information services, like circulation, reference, photocopy and documentation,
d. to establish and maintain links with other national information systems in India and other countries to ensure free flow of information at national and international levels,
e. to serve as a training center for information personnel and users,
f. To provide the above services to :
   - WII,
   - Protected areas all over the country,
   - Institutions engaged in nature conservation research in the country & abroad,
   - Universities & colleges,
   - Individual scholars working in related areas and NGOs etc.,
g. To bring out periodic publications on the following :
   - Current content of periodicals,
   - Research in progress,
   - List of unpublished research literature, covering dissertations and thesis etc.,
   - Compilation of bibliographies, and
   - Compilation of abstracts

The L&DC now holds over 24200 books, 15700 newspaper clippings, 7150 maps/toposheets and more than 5500 bound volumes of old and rare journals. The library also maintains good collection of scientific paper number to 9300. It subscribes to more than 300 periodicals. During this year, 1200 books, proceedings, thesis and reports, 300 scientific papers and 1800 press clippings, 25 new CD-ROM titles have been added to the library collection.

The L&DC is fully computerized, using LIBSYS Library Management Software, UNESCO'S WINISIS Software, CD Server, Barcode and related technologies. For optimum resource use by researchers, students, officer trainees and other users, 12 computer terminals

Services provided during 2004-2005

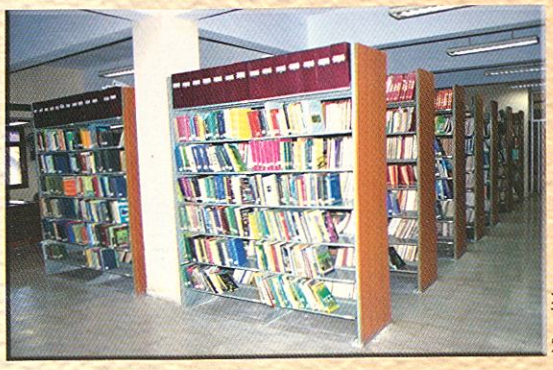
No.	Services	Numbers
1.	Photocopy exposure	406128
2.	Documents issued/consulted	36,000 documents approx.
3.	Value added service	167 clients
4.	Ready reference service	3500 clients
5.	Inter library loan	50 documents
6.	Document delivery	40 clients
7.	Document procurement request	14 articles
(Articles requested from NISCAIRE [Formerly INSDOC] & other libraries)		
8.	Articles added to WILD *(Indian Wildlife Abstract Service)*	255 articles
9.	Map/toposheets issue/consulted	500 approx.

Revenue Generation from services during 2004-2005

No.	Services	Amount (Rs.)
1.	Bibliographical/document delivery services	Rs. 6,304.00
2.	Photocopying service	Rs. 6,341.00
3.	WII publications	Rs. 2,11,656.00

Volume Added to Library Collection during 2004-2005

No.	Types of document	Numbers
1.	Books & monographs	1200
2.	Journals (bound volumes)	500
3.	Newspaper clippings	1800
4.	Reprints	300



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are available in the library premises and the faculty desks have been inter-connected with Local Area Network (LAN). Being connected to the library facility the users have the privilege of accessing all in-house databases like books, reprints, Indian wildlife abstract, map/toposheet collection, press clippings, specialized bibliographic databases on musk deer, application of telemetry in wildlife, wildlife and protected area management in Madhya Pradesh, mountain ungulates, rainforests conservation in India, etc. Users also have access to CD-ROM databases like Wildlife Worldwide 1935 -, E-CD and CAB Spectrum 1973 available on the LAN. The L&DC provides a variety of Library & Information Services to its user.

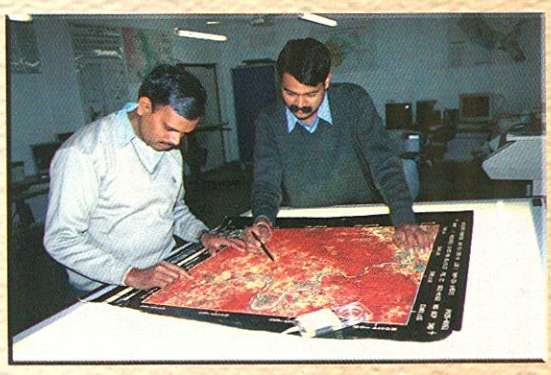
Computer & GIS Cell

The computer facility of the Institute has a very impressive array of computer hardware and software. This facility has been considerably strengthened with inputs from the Institute's own resources and those from various collaborative projects. At present, the computer facility of the Institute is well developed to serve research, training, database, GIS, remote sensing, cartographic and desktop publishing requirements of the Institute.

Computers are now used in every sphere of the Institute activities from simple word processing to complex data analysis. All eight departments and the library, administration and finance sections are equipped with a range of Pentium systems. Major scientific activities of the Institute, including database management, graphic analysis, statistical operations, mapping and desktop publications are carried out on these machines. There are four UNIX based Sun workstations with ArcGIS software for Geographical Information System (GIS) and ERDAS Imagine for digital image processing of remotely sensed data.

The Institute has a heterogeneous computer hardware setup connected to Local Area Network (LAN). There are two Pentium II file servers, two Pentium III internet servers and 175 plus nodes. The LAN is based on the state-of-the-art structured cabling with fibre optics as the backbone connecting all the office buildings. The computers are connected to LAN through network switches on UTP cable.

The Institute has 512-Kbps leased line internet connectivity with its own internet server hosting the Institute's website and mailing system. All the computers of the Institute are provided with internet and mailing services. The users are provided with individual email account on the Institute's server.



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Training: The Computer/GIS Cell conducted computer-training courses for the students, researchers and officer-trainees of the PG Diploma Course and Certificate Course in Wildlife Management. Inputs were given on concepts of computer, LAN/internet; software packages *viz.* MS Windows, MS-Office, SPSS, S-Plus and specialised software packages related to wildlife research. Hands-on training was also given on Arc/Info and ERDAS Imagine software packages for Geographical Information System, Remote Sensing and Global Positioning System technology.

Computer Hardware/Software Procurement & Upgradation: During the reporting year, the Institute made a major investment in procuring new computer systems, peripherals and software packages and upgrading the existing old 486s systems and dot matrix printers. The details are as following:

Hardware: (i) HP-Compaq d530 Pentium4 systems with 17" LCD flat monitors – 91 nos. including upgradation of existing 77 nos. 486s systems under buy-back scheme, (ii) HP-Compaq 9010nx notebook computers – 22 nos., (iii) HP-1300 laser printer – 39 nos. which includes upgradation of existing dot matrix printers under buy-back scheme, (iv) HP-3700DN colour laser printer – 1 no., (v) HP-5652 inkjet printers – 6 nos. which includes upgradation of existing 3 nos. of dot matrix printers under buy-back scheme, (vi) HP Scanjet 8200 scanner – 4 nos., (vii) HP SureStore External DAT drive 20/40GB – 1 no., (viii) Internal CD-writers – 2 nos., (ix) Iomega DVD Writers – 2 nos., (x) Multiport card – 1 no., (xi) Signal UPS system 750 VA – 24 nos., (xii) Uniline CVT 500 VA – 32 nos., and (xiii) Transcend Pen Drive of 1GB – 2 nos.

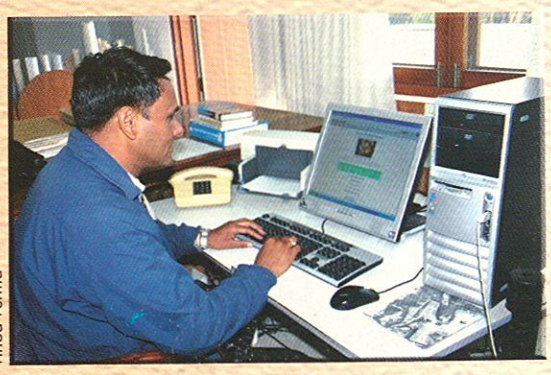
Software: (i) MS Windows 2003 server, (ii) MS Office 2003, (iii) ERDAS Imagine Professional 8.7 - 5 user HEAK license, (iv) Upgradation of ArcInfo licenses to ArcGIS 9.0 – 16 users, (v) Upgradation of ArcView 3.x licenses to ArcView 9.0 – 3 users, (vi) ArcIMS, (vii) IDRISI – Kilimanjaro with Cartalinx – Campus license, and (viii) McAfee Anti-Virus Defense.

Application of GIS/RS/GPS in Research Projects: Geographic Information System (GIS), Remote Sensing (RS) and Global Positioning System (GPS) technology is being used in most of the research projects of the Institute for wildlife research and conservation.

National Wildlife Database (NWD) Cell

The objectives of the computer-based National Wildlife Database are to: (i) provide readily accessible and comprehensive information on the conservation status of biogeographic regions, habitat types, individual animal species and the network of protected areas in the country, (ii) establish linkages with researchers, protected area managers and planners and also with other data centres, and (iii) facilitate research and training activities in wildlife by providing bibliographic references on protected areas, habitat types and animal species.

During 2004-2005, the main thrust of the activities was on the development of a web based database on Indian protected areas, species distribution and wildlife bibliography. The protected area database was updated further and presently there are 589 Protected Areas including 92 National Parks and 497 Wildlife Sanctuaries in India, covering 155,624.27 km^2 which is 4.73% of the total geographical area of the country. Species Database was corrected and updated by adding information on the distribution of mammalian species in various protected areas. Bibliographic Database was updated by addition of current literatures published on Indian wildlife in the various issues of journals and periodicals received during the said period. Trainees Database has information on 498 Diploma and 364 Certificate officers trained in the various Diploma and Certificate courses including 107 foreign nationals.



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Website of the National Wildlife Database has been modified and updated further by incorporating the latest information as on March 2005.

More than three hundred (including internal and external) queries were answered and outputs in various formats were provided during the reporting period.

Audio Visual & Wildlife Extension Cell

The Audio Visual & Wildlife Extension Cell of the Institute caters to the various requirements of academic activities. The unit maintains 16mm films, video films, synchronized programme, various audio-visual equipments, still camera & video camera with accessories and photo library.

This year two Hitachi LCD video projectors, four liberty OHP projectors, Ahuja ampli deck, Sony DV Cam and Cannon XL DV Cam were added and these are extensively being used for teaching and training purpose. The unit screened thirty shows of nine projectors synchronized programme of the Institute "We are Nature, Nature is our world" during the reporting period on different occasions. Photographic documentation of the activities of WII was done. The negatives and prints were classified and documented. Computerized database is being prepared for the quick retrieval of these photographs. Support was provided to the forensic cell for photo documentation of seized material & their packets.

Videography of various activities and transfer of videos from VHS to CD and Dv Cam to CD and its non-linear editing, digitization & documentation was done for the various activities of the Institute and also for the faculty researchers and trainees.

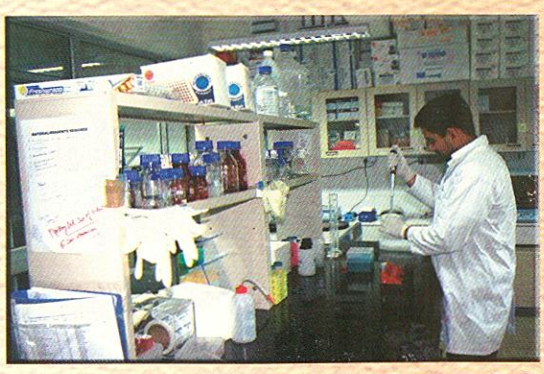
• Newsletters

As part of the information dissemination programme, the following issues of WII Newsletter were published during the reporting year:

- WII Newsletter Volume 11 No.1, Spring 2004
- WII Newsletter Volume 11 No.2, Summer 2004
- WII Newsletter Volume 11 No.3, Monsoon 2004
- WII Newsletter Volume 11 No.4, Winter 2004

Research Laboratory

The Research Laboratory of the Institute provided technical input to research projects, various ongoing courses in teaching, training and analytical work (various chemical and physical parameters) during the reporting year. In total 1,095 samples were analyzed, of which, 210 were plant samples (analyzed sodium, potassium, phosphorus, ADF, NDF, lignin, cellulose, crude protein Ca, Mg, Zn, Cu, Fe, Ni, and Mn) and 885 scat samples. The collection of soil and water samples was initiated in Chilla Range, Rajaji National Park, for monitoring soil and water quality under the research project 'Monitoring change in biological diversity after relocation of *gujjars* in Rajaji-Corbett Conservation Area'. In total, 20 soil samples and 20 water samples were collected and analysed for EC, pH, Cl, CO_3, HCO_3, Ca, Mg, Na, K, N, P, Fe, Zn, Cu, Mn



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Cr, Hg, Ni, Pb, OC, and COD. Extractions of 1200 meat and blood samples (livestock and vulture) were made for the determination of Diclophenac salt under the WII-Royal Society for Preservation of Birds (RSPB), UK & Bombay Natural History Society (BNHS), Mumbai, collaborative project.


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The laboratory staff provided technical input in field for various ongoing courses (M.Sc., Diploma and Certificate) and for the 'Orientation Programme for Research Personnel' for the demonstration of small mammal traps, leg-hold traps, mist-nets, camera traps and radio-telemetry. Teaching classes followed by practical for various ongoing courses were conducted at the laboratory. This included modern analytical techniques, collection and preservation of biological samples, herbivore pellet and carnivore scat analysis, age determination of animals, osteology of mammals, epidermal derivatives and taxidermy. The laboratory also conducted training programme in herbivore pellet and carnivore scat analysis for the officials/researchers of the J&K Forest Department, University of Jammu & Kashmir, Institute of Desert Ecology, Bhuj, Bhutan Forest Department, International Snow Leopard Conservancy and University of Himachal Pradesh. The laboratory is also recording the meteorological data from WII campus since last two years. During the reporting period, the recorded maximum and minimum temperature in Chandrabani campus was 43^{0}C (May 2004) and 3^{0}C (January 2005) respectively. The annual rainfall recorded was 1354.8 mm. A Research Associate (RA) has been engaged in the research laboratory to coordinate the analytical work. A water purification system was purchased for providing ultra pure grade water to all the laboratories of the Institute. Purchase procedure of a Microwave Digestion System (MDS) is in process.

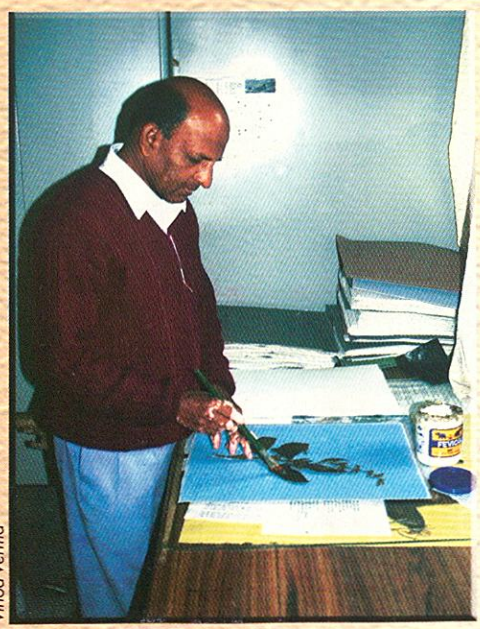
Conservation Genetics Laboratory

Amplification of DNA from blood, tissue and scats was done for wolves, jackals, lions and tigers. A M.Sc. thesis on "Comparing different methodologies for extraction of DNA" was submitted to M.M. Degree College, Modinagar based on the work done at this laboratory.

Herbarium

Plant specimens from Central and North-west Himalayas, Pakhui Wildlife Sanctuary, Arunachal Pradesh, Trishna WLS, Tripura and Rajaji National Park, Uttaranchal were received for identification and processing. The specimens were identified and processed. During the period 20 more plants were identified from WII campus and added to the checklist of the campus.

In connection with the Wildlife Week Celebrations, Herbarium staff delivered a talk on "Plants and their importance - How we will know them" at two schools in Dehradun. The herbarium section had given input in Diploma and Certificate courses and different visiting classes to familiarize them with campus plants and identification techniques. A new initiative was introduced to learn more about the campus flora, everyday trainees collected 5 specimens from the campus and brought it to the herbarium section. The section identified the specimens and displayed them outside the classroom for the officer trainees.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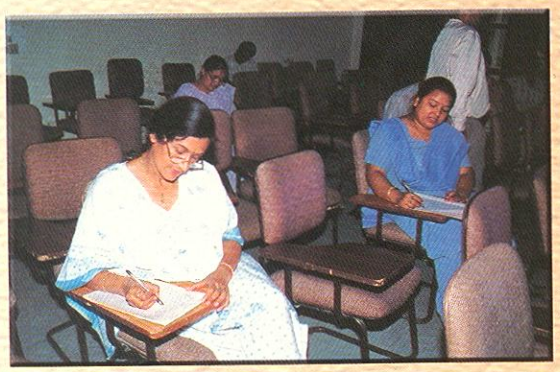
As a part of modernizing the herbarium, scanning of live specimens using *hp scanjet* was tested and is in progress. Slides of plants and plant specimens from different field areas brought by the faculty members and researchers were also identified. Herbarium section is also involved in the grassland surveys at Mundal in Chilla range of Rajaji National Park and prepared a checklist.

During the reporting period herbarium section has given inputs in Eco-guide training programme at the Institute and in the field (Dodital).

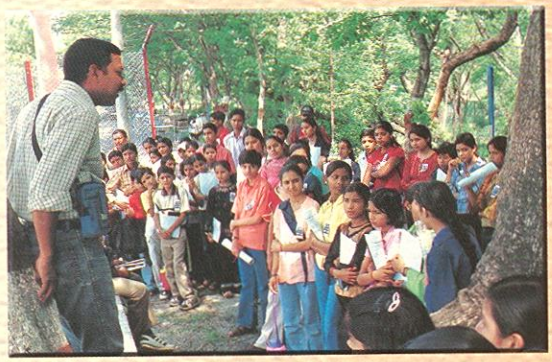


S. Wilson

Other Activities

• World Environment Day Celebrated

Like every year, this year also the Wildlife Institute of India celebrated the World Environment Day on June 5, 2004 to renew its commitment to protect the environment from devastation. The activities were organized keeping in view the theme for this year's World Environment Day, "Wanted Seas and Oceans – Dead or Alive", as declared by UNEP. An essay competition in Hindi on "Importance of Water and its Conservation" was organized for the staff members of the Institute.



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With a view of creating awareness about the importance of water and water bodies amongst children, a trip was organized to Asan Barrage near Dehradun. A total of 69 children of class 6-12 participated in the trip. The main points of discussion were the significance of water and water bodies for animals and human beings, rivers around Dehradun, their importance and threats to them. Although, there were not many birds in the man-made wetland, yet the children could watch a few. "My Water Activity Book", a booklet on water was prepared for the children. Word search, water web crossword puzzle, paper whale and frog preparation were some of the hands-on activities, which were conducted during the visit.

• Wildlife Week Celebrations

S. Wilson

Like every year, the 'Wildlife Week' was celebrated at the Institute during October 2-8, 2004. Activities were organized for the children of different age groups and class groups. An activity 'How to sketch animals' was organized for children of class I-VI from WII campus on October 5, 2004. 'Nature card preparation' activity was organized on October 6, 2004 for the children from nominated schools. Talks on different topics pertaining to wildlife conservation were delivered in different schools and in nearby villages by faculty and staff members during the week. 'Puppet making' activity was organized for WII staff, researchers, students and officer trainees on October 7, 2004. The same activity was also organized for the children of St. Paul's Orphanage on the same day. 'Wildlife quiz' was organized for WII staff on October 8, 2004.

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The prizes and certificates were presented by Shri P.R. Sinha, Director, WII to the winners of various competitions held during wildlife week on October 8, 2004. Prizes were also given to the winners of Hindi essay competition held on World Environment Day. The winners were Shri C.P. Sharma - Ist; Shri Y.S. Verma and Shri Pyar Chand Aswal - IInd; Shri Harendra Kumar - IIIrd and Shri Virendra

Sharma - Consolation. The prize winning nature cards were auctioned at the end of the prize distribution ceremony. The money received through the auction was given to the child, who prepared the card.

- **WII-Friends of the Doon (FoD) 'Wildlife and Environmental Quiz'**

In order to enhance conservation awareness amongst the school children, the WII in collaboration with the Friends of the Doon (FoD) conducted a 'Wildlife and Environmental Quiz' programme. A total of 14 schools in Dehradun participated in the programme, which was conducted in three rounds. The final round of the quiz was held in WII on October 4, 2004 in which teams from Scholar's Home, St. Joseph's Academy, Brightland, Riverdale, Welham Girls and RIMC participated. Scholar's Home, Brightland, St. Joseph's Academy bagged the first, second and third position respectively. Bro. J.C. Carroll, Principal St. Joseph's Academy gave the WII-FoD Rolling Trophy to Scholar's Home and distributed prizes to the winning teams.

- **Visit by Afghan Minister**

Dr. Yusuf Nuristani, Hon'ble Minister of Irrigation, Water Resources and Environment, Govt. of Afghanistan accompanied by Mr. Dave Ferguson, USFWS and Mr. M. Qaseem Naimi, Technical Advisor, Government of Afghanistan visited WII on April 21, 2004.

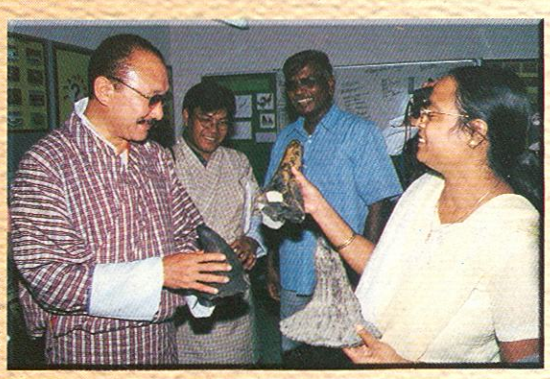
Vinod Verma

In a meeting at WII, Shri S. Singsit, Director gave a presentation on the activities and programmes of the Institute. The Hon'ble Minister shared the purpose of his visit. He said that during the upsurge of last two decades, the wildlife of the country has vanished or moved out of the country. The purpose of the trip was to send a few Afghan officers to train them in the field of wildlife conservation. The Afghan Government needs assistance and lot of education for creating awareness.

The dignitaries visited the Institute's Library, Computer & GIS Facilities and Forensic Laboratory. The Hon'ble Minister also planted a tree at *'Smriti Vatika'*. Director, WII presented a poster on the 'Siberian Crane' to the Hon'ble Minister during a dinner hosted by WII in his honour. The Siberian Crane poster was designed by the International Crane Foundation and provided by the US Fish and Wildlife Service, USA.

- **Visit by Bhutanese Minister**

A delegation led by Hon'ble Mr. Lyonpo Sangay Ngedup, Agriculture Minister of Bhutan visited WII on August 28, 2004. Director, WII gave a slide talk on 'An introduction to WII and its activities'. The minister said that his country is planning to develop a Rhododendron Park, 25 kilometer away from Thimphu. The policy of the government since 1974 was to keep Bhutan under 60% forest cover. In spite of strict conservation policy nature still punishes the country. Having all the wealth and far sighted policy is not enough. The biggest challenge is to maintain it through capacity building. The Hon'ble Minister emphasized the need to develop higher degree of professionals where they could reach a level of excellence. The country plans to upgrade the Forestry Training School. The country would continue to rely on WII to train their officials.



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Repatriation

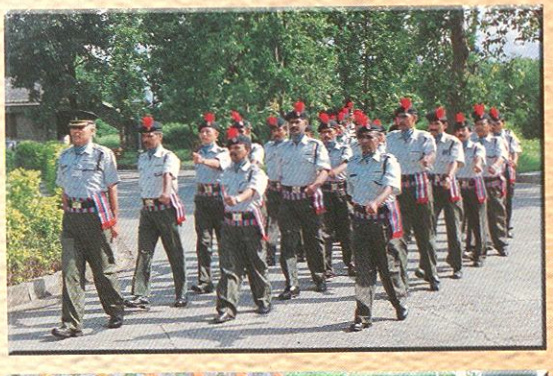
Shri Seiboi Singsit, IFS, Deputy Director General (Extension) ICFRE, who was holding the additional charge of Director, Wildlife Institute of India, Dehradun has been repatriated to his parent cadre on September 13, 2004.

Shri S.S. Bist, IFS, Inspector General of Forests and Director, Project Elephant in the MoEF, was given the additional responsibility of Director, Wildlife Institute of India during September 14-23, 2004.

Appointment

Shri P.R. Sinha, IFS, joined the Wildlife Institute of India, Dehradun as Director w.e.f. September 23, 2004 on a permanent absorption basis.

Jeewan S. Jalal



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The Hon'ble Minister also visited the facilities at the Institute such as Computer and GIS facilities, Library & Documentation Centre and Wildlife Forensic Laboratory. As a memory of his visit the Hon'ble Minister planted a tree at *'Smriti Vatika'*.

- **Visit by Shri Suresh Chandra, IAS, Special Secretary, MoEF**

Shri Suresh Chandra, IAS, visited WII on March 16, 2005. A brief presentation was made on the Institute's activities, which was followed by an interaction with the faculty members. While highly appreciating the efforts of the WII in imparting training to the in-service officers and officers from abroad, Shri Chandra opined that the fees being charged by the Institute against various courses is very modest as compared to the fees being charged for many such courses by other national and international organizations. He desired that the Institute may conduct such courses for non-forest officers as well, to make them aware of the importance of wildlife conservation. Sh. Chandra further emphasized that in view of the increased instances of man-animal interface and its subsequent deleterious effects on both the actors, the linkages of veterinary science with wildlife sciences assume much greater significance.

Shri Chandra also visited the Forensic laboratory, Computer and GIS laboratory and the library and highly appreciated the efforts put in by the Institute.

- **WII at the XIII All India Forest Sports Meet**

The Institute participated in the XIII All India Forest Sports & Games Meet held at Raipur (Chhattisgarh) from December 28, 2004 to January 1, 2005. The Institute's Hockey Team won the 'Silver Medal'. A contingent of 25 players from WII participated in Hockey, Billiards, Carom, Chess, Rifle Shooting, Lawn Tennis, Table tennis and Quiz.

- **Independence Day Celebrations**

The 58th Independence Day was celebrated in the Institute with enthusiasm. Shri S. Singsit, Director hoisted the National Flag. He observed the parade by security personnel. He said on the occasion that everyone should work with full dedication and honesty at his workplace. This would be the best service to the nation. He also distributed the Certificate of Appreciation and cash prize of Rs. 100/- each to the following staff members for excellence shown in the duties during the year 2003-04: (i) Smt. Shanti Devi, (ii) Shri Samuel Wilson, (iii) Shri Panna Lal, (iv) Shri Y.S. Verma, (v) Shri Naveen Chand Kandpal, (vi) Shri Vinod Bist, (vii) Shri Dhyan Singh, and (viii) Shri Shambhu Nawani.

- **WII Auditorium inaugurated**

Shri Namo Narain Meena, Hon'ble Minister of State, Environment & Forests, Government of India inaugurated the new auditorium in WII campus on June 25, 2004. The auditorium has seating capacity of 350.

- **Release of Audio CD on Birds Songs and Calls**

An Audio CD on Songs and Calls of the birds of India was released by Shri R. Rajamani, Chairman, TRAC, during inaugural session of XVIII Annual Research Seminar 2004. Dr. Anil Kumar developed an audio guide covering 107 avian

species of India, including some endemic, endangered/rare species and primarily designed as a monitoring tool for the avian researchers. Most recordings are signature vocalizations and can be used for the identification of birds such as pheasants, doves, cuckoos, babblers, warblers and flycatchers. These songs and calls were recorded by him, during last four years, mostly in northern India. Most species are recorded in their natural habitats. For some species, such as Oriental magpie robin, Red-vented bulbul, Himalayan bulbul and Brahminy starling, wide range of vocalizations have been included.

- **Hindi Essay Competition**

An essay competition in Hindi was organized in the Institute on October 26, 2004 as a part of Hindi activities. The topic of the competition was *'Prakritik Sampadaon Ka Sanrakshan Evam Vikas'*. A total of nine staff members participated in it. The winners were given awards by Shri P.R. Sinha, Director in a function held on December 15, 2004 in the Institute.

- **Hindi Magazine *'Van Vaibhav'* Released**

As an effort to encourage the staff members to use Hindi more and more in official matters, a magazine in Hindi *'Van Vaibhav'* was published by the Institute. It was the maiden effort by the Institute of such type. Articles, poems and the other material on different topics were contributed by the WII family members. The magazine was released by Shri P.R. Sinha, Director, in a function held on December 15, 2004 in the Institute.

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- **Campus Development**

1. The works for providing and installation of air conditioning system for the Seminar Hall-cum-Interpretation Centre were completed in June 2004 at a cost of Rs. 36.14 Lakhs.
2. Repair work in Type IV and V Houses in Block I was completed in February, 2005 at a cost of Rs. 4.90 Lakhs.
3. Covering of water channel with RCC Slab and painting work in New Hostel Block was completed in December, 2004 at a cost of Rs. 1.97 Lakhs.
4. Rs. 13.61 Lakhs have been placed to CPWD for repairs of staff quarters at Block III, re-carpetting of roads inside the campus and construction of boundary wall in the staff quarters complex at Block III.
5. The works for providing and installation of seating arrangement in Auditorium-cum-Interpretation Centre were completed in November, 2004 at a cost of Rs. 23.16 Lakhs.
6. The works for providing conference system in Auditorium-cum-Interpretation Centre is in progress.
7. The works for providing Vinyl Flooring in Auditorium-cum-Interpretation Centre is in progress.

Contribution by WII family for Tsunami

On the appeal of Shri P.R. Sinha, Director of the Institute, the staff, officials and researchers of the Institute made contribution of Rs. 46,604.00 for the Tsunami victims. The contributions were sent to Prime Minister's Relief Fund by the Institute. The Prime Minister's Office has acknowledged the contribution.

Achievements

- **Carl Zeiss Award**

  Dr. A.J.T. Johnsingh received Carl Zeiss Award for a Lifetime Service to Wildlife Conservation.

- **Distinguished Service Award**

  Dr. A.J.T. Johnsingh was conferred with the prestigious "Distinguished Service Award" in conservation of biological diversity through scientific means by the Society for Conservation Biology, USA in 2004.

- **Chaturvedi Prize, 2004**

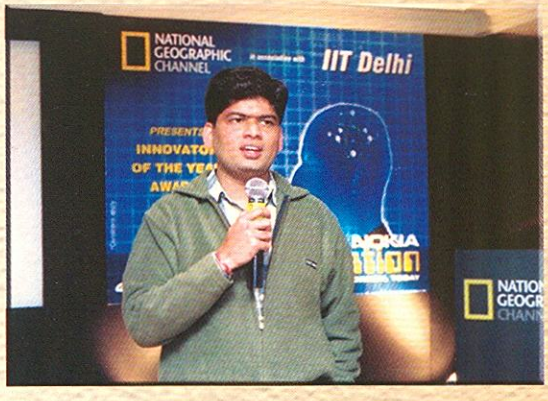
  The Indian Forester – a monthly journal of Forests & Forestry Research adjudged the best research paper of the year 2002 in the field of wildlife for the article "Human-elephant conflicts in changed landscapes of Southern West Bengal, India" Vol. 128, No.10, October 2002. His Excellency the Governor of Uttaranchal, Shri Sudarshan Agarwal felicitated and honoured Dr. Sushant Chowdhary along with other two authors (Shri Anil Kumar Singh and Smt. Rina Rani Singh) with Chaturvedi award in a function held at Forest Research Institute, Dehradun.

- **Fellow of National Academy of Sciences**

  Dr. G.S. Rawat has been elected a Fellow of National Academy of Sciences, India (Allahabad) in the year 2004 for his contributions in the field of Plant Taxanomy/ Natural Resource Ecology & Conservation.

- **Dr. (Capt.) Parag Nigam commended for his efforts**

  Dr. (Capt.) Parag Nigam was commended by the Uttaranchal government for his efforts is the field of wildlife conservation. His Excellency, the Governor of Uttaranchal, Shri Sudarshan Agarwal felicitated and honoured Dr. Nigam during the Wildlife Week on October 8, 2004.



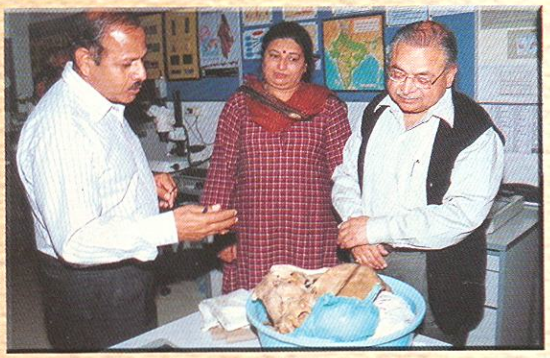
- **"The Innovator of the Year" award**

  National Geographic Channel (NGC) India in collaboration with IIT-Delhi and NOKIA has awarded Shri Sandeep Sharma "The Innovator of the Year" award for his software PUGMARK 1.0 and its use for population monitoring of tigers and other large felines. Shri Sharma has worked as a researcher in WII and he worked on the said software during his research period.

  His nomination was one of the top five, selected amongst 2500 entries received and his was the only entry that got selected in the category 'Ecology and Environment'. A panel of judges from IIT, Delhi; IIT, Kanpur; IIT Kharagpur and Apollo Hospital, Delhi adjudged the work for the award.

Welcome Guests

- His Excellency Governor of Uttaranchal Shri Sudarshan Agarwal on April 5, 2004.
- A batch of 27 Ranger Trainees from the Southern Forest Rangers College, Tamil Nadu Forest Department, Coimbatore on April 15, 2004.
- ENVIS Review Committee from MoEF on April 16, 2004.
- Students and faculty member of B.Sc. Forestry (IV-Semester), Allahabad Agriculture Institute, Deemed University, Allahabad on April 19, 2004.
- Dr. Yusuf Nuristani, Hon'ble Minister of Irrigation, Water Resource and Environment, Govt. of Afghanistan and Mr. M. Qaseem Naimi, Technical Advisor, Government of Afghanistan on April 21, 2004.
- Dr. Dave Ferguson, USFWS, USA on April 21, 2004.
- SFS Trainees, State Forest College, Dehra Dun on April 26, 2004.
- Students of PG Diploma in Plantation Technology and Biodiversity Conservation Course (2nd Semester), FRI on May 17, 2004.
- Students of B.V.Sc. and faculty members from College of Veterinary and Animal Science, Palampur (H.P) and IGNFA, Dehradun on May 19, 2004.
- Forest Ranger Trainees of SFS College, Burnihat, State Forest Service College, Burnihat on June 15, 2004.
- Shri Namo Narain Meena, Hon'ble Minister of State for Environment & Forests, Govt. of India on June 25, 2004.
- Shri Nav Prabhat, Hon'ble Minister for Forests and Urban Development, Government of Uttaranchal on June 25, 2004.
- IFS officers from "Advanced Forest Management Course" held at IGNFA visited on July 7, 2004.
- Students from RIMC, Dehra Dun on August 2, 2004.
- IFS officers from IGNFA, Dehra Dun on August 19, 2004.
- IFS Probationers 2004-2007 batch on September 3, 2004.
- Hon'ble Members of Parliament (MPs) of Manipur on September 12, 2004.
- Mr. Lyonpo Sangay Ngedup, Hon'ble Agriculture Minister of Bhutan along with a delegation on September 28, 2004.
- IFS Officers' Class on October 13, 2004.
- Dr. J.B. Sale on November 8, 2004.
- Students from Khalsa College, Mumbai on November 18, 2004.
- Chinmaya International School, Coimbatore on November 24, 2004.
- Students from KL DAV College, Roorkee on November 24, 2004.
- Prof. Peter Marler, USA on Birds call on November 25, 2004.



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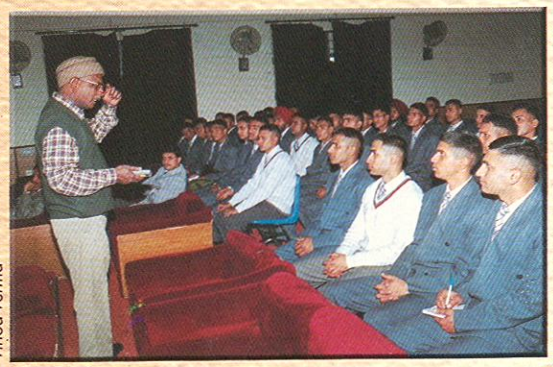

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- Mr. Jacques Villiard, Brazil on November 25, 2004.
- Group from Ranchi on November 25, 2004.
- IFS Officers' Class on December 1, 2004.
- Tinsukhia College Dibrugarh on December 6, 2004.
- Students from JNU Delhi on December 8, 2004.
- Thailand group (through IIRS) on December 9, 2004.
- IFS Officers (1994 Batch) on December 10, 2004.
- PCCF, J&K on December 11, 2004.
- Students of Jaswant Modern School, Dehra Dun on December 11, 2004.
- Forestry Class from Nepal on December 13, 2004.
- Students from Kerala University on December 19, 2004.
- Group from Bareily on December 21, 2004.
- Group from Mumbai on December 21, 2004.
- Students of B.V.Sc. & A.H. from Rajiv Gandhi College of Veterinary & Animal Sciences, Pondicherry on January 10, 2005.

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- Forest Guard Trainees from Pinjore (Haryana) on January 13, 2005.
- Students of M.Sc. from Mizoram University, Aizawl on January 15-16, 2005.
- Trainees from SFS College, Dehradun on January 17, 2005.
- IFS officers of 20 years of service from IGNFA, Dehradun on January 27, 2005.
- A team of masters and cadets from RIMC, Dehradun on January 28, 2005.
- Forest Ranger Trainees of Eastern Forest Rangers College, Kurseong on February 1, 2005.

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- Students of B.Tech. (Biotechnology) and M.Sc. from Shoolini Institute of Life Sciences and Business Management, Solan (H.P.) during February 9-11, 2005.
- Foresters (Trainees) from Chtterner, J&K on February 9-11, 2005.
- Gentleman Cadets, IMA on February 16, 2005.
- IFS Officers of 1987 Batch from IGNFA on February 17, 2005.
- Gentleman Cadets, IMA on February 19, 2005
- Forest Guard (Trainees) from Forestry Training Centre, Sundernagar (H.P.) on February 21, 2005.

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- Forest staff of Yamuna Circle, Chakrata Forest Division, Kalsi on February 21, 2005.
- Sh. Suresh Chandra, IAS, Secretary, MoEF on March 16, 2005.
- Students of H.N.B.G.U., Srinagar Garhwal on March 16, 2005.
- Teachers of Welham Girls' School, Dehradun on March 22, 2005.
- Community members living in the vicinity of GHNP (H.P.) on March 2, 2005.

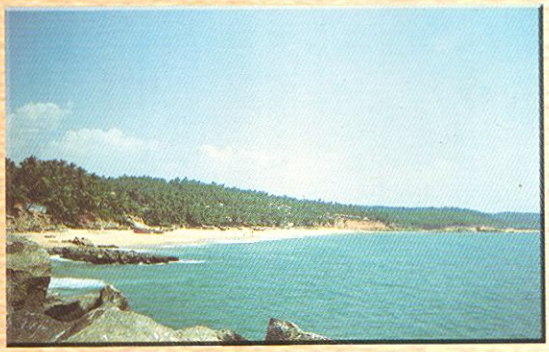
National Institute for Coastal and Marine Biodiversity (NICMB)

The National Institute for Coastal and Marine Biodiversity (NICMB) was set up at Kanyakumari, Tamil Nadu during October, 2003. The Ministry of Environment and Forests, Government of India has given the responsibility for setting up of NICMB to the Wildlife Institute of India. The major objectives of NICMB are to collate information on activities by various agencies on the coastal and marine environment in India and to coordinate the MoEF funded activities of conservation agencies along the coastal and marine habitats. Capacity building for marine biodiversity protection, conducting management oriented research, awareness education and transfer of state-of-art management methods to marine conservation practitioner are proposed to be the core activities of NICMB.

K. Sivakumar

During the reporting years (2004-05), various research organizations, Universities and NGOs in India have been contacted to prioritize the gaps in the coastal and marine biodiversity research. On behalf of NICMB, the Wildlife Institute of India has taken the task to prepare a management plan for the Gulf of Mannar Marine National Park and Biosphere Reserve and action in this regard has already been initiated. A research project 'Exploration of chemical ecology of secondary metabolites synthesis in chosen marine sponges' sponsored by Department of Science and Technology, supported by NICMB during this period was shifted to ICFRE, Bangalore by the DST. Apart from this, using the facilities at NICMB, two short-term studies have also been carried out on "Sea turtles status" and "Protected marine species in wildlife trade". The preliminary analyses of these studies show that there are more than 50 protected marine species still in the wildlife trade. The study on sea turtles could identify several potential nesting beaches in southern most part of India particularly in Kerala and Tamil Nadu. The output of the studies was published in the WII newsletter. As a part of awareness programme, scientists from NICMB have given a series of popular talks on marine biodiversity conservation in several colleges, workshops and in public gatherings at Kanyakumari and other places.

K. Sivakumar



K. Sivakumar

K. Sivakumar

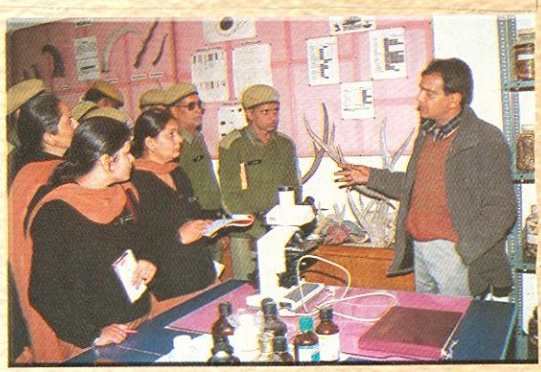
Perspective 2005-06

Wildlife conservation is at the cross road in India as well as in many countries in the world. The gains made in the earlier decades are somewhat being eroded by a wide range of extrinsic and intrinsic factors. Wildlife trade and poaching is on the rise and relationships between park managers and the resource dependent human communities continue to become more strained, on account of the increasing man-animal conflicts. New initiatives and a stronger resolve are needed to meet these challenges. One of the initiatives already underway is the collaborative partnership of this Institute with the Project Tiger Directorate, Government of India for the forthcoming All India Tiger and Leopard Population Estimation. The Institute's scientists and staff are engaged in refining the methodology for monitoring of prey and predator populations and evaluation of habitats. A number of training workshops are being planned to create a 'pool of trainers', who would further train the frontline staff in implementing the new protocol and methodology. We anticipate that this massive country wide exercise should generate comprehensive data, which can be subjected to rigorous scientific analyses in spatial domain. The outcomes would greatly improve our understanding of the species' and its dynamic relationship with the habitat.

A need has been felt to conduct an 'independent audit' of the national parks and wildlife sanctuaries in the country. The Institute would be assisting the MoEF in carrying out the management effectiveness evaluation of protected areas. In order to implement the National Wildlife Action Plan (2002-2016), a number of activities have been assigned to the Institute. The Institute will be mobilizing both manpower and financial resources to accomplish this onerous task.

A number of campus development activities are being planned to fulfill the long standing infrastructure needs. Construction of buildings to house wildlife forensic and other laboratories, new hostels for international students and women and residential accommodation are being planned in the coming year.

The Institute would continue to organize a wide array of its regular and customized training courses to meet the needs of various target groups. The Institute would be playing a major role in developing capacity of the various enforcement agencies to control wildlife trade and poaching in the country.



Joseph Vattakaven

The coming year would be full of activities and the Institute would need to have the full complement of its faculty, both permanent as well as on deputation, to accomplish its mandated responsibilities.

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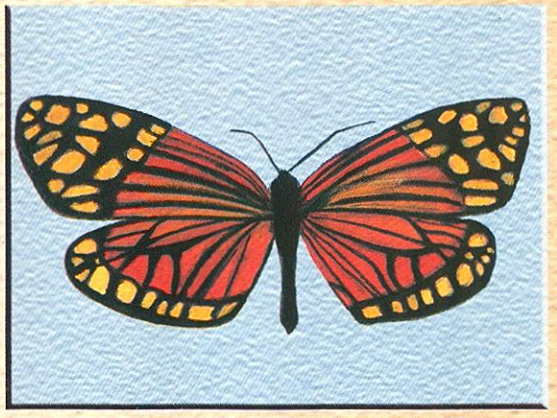
Gupta, A.K. and S. Dasgupta. (2004): **Feeding Ecology of Phayre's langur (*Trachypithecus phayrei*), Capped (*T. pilatus*) and Golden (*T. geei*) langurs in Tripura, Northeast India: A Comparison.** Abstract in XX Congress of the IPS. *Folia Primatol*, 75 (suppl 1): pp. 20.



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Asha Rajvanshi (2004): **Status of biodiversity and impact assessment in India.** In: **Proceedings of the meeting of the CBBIA Project of International Association for Impact Assessment.** North Dakota, June 2004.

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Uniyal, V.P. (2004): **Spiders as Conservation Monitoring Tools.** Proceedings of the Training Programme on Pest Management in Buildings for Pest Management Professionals (Eds. B.S. Rawat). Central Building Research Institute (CSIR) Roorkee: 102-108.

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Asha Rajvanshi and V.B. Mathur (2005): **Ecological Evaluation of the site proposed for Nuclear Power Station near Nagarjunasagar Tiger Reserve.** In: case studies database, website of Convention on Biological Diversity. *(http://www.biodiv.org/programme)*

Asha Rajvanshi and V.B. Mathur (2005): **SEA of Human Irrigation Project.** In: case studies database, website of Convention on Biological Diversity. *(http://www.biodiv.org/programme)*

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Chauhan, N.P.S. (2004): **Tiger conservation in India.** Paper presented in the "Natural areas conference: Emerging issues, Chicago, Illinois.

Gupta, A.K. (2004): Participated in National Workshop on **"Training Curriculum and Effectiveness Review"**, during October 12-13, 2004 at Indira Gandhi National Forest Academy, Dehradun, Uttaranchal, India.

Gupta, A.K. (2005): Participated in an International workshop on **"PHVA Workshop on Western Hoolock gibbon (*Bunopithecus hoolock*)"** during February 14-18, 2005 at BIAM, Dhaka, Bangladesh.

Gupta, A.K. (2004): **Personal (Career) Action Plan for Indian Forest Service Officers.** Participated and presented a paper in workshop on "Professionalizing the Forest Service and Developing Personal Action Plan for IFS Officers", during July 14-16, 2004 at Indira Gandhi National Forest Academy, Dehradun. Uttaranchal, India.

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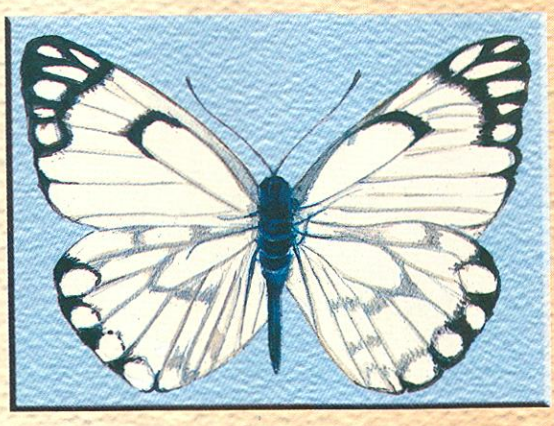

Brown-veined white (*Anaphaeis aurota*)

Gupta, A.K. (2004): **Man-Animal Conflict: Mitigation Vs. Management.** Paper presented in a Workshop on "Management of Human-Animals Conflicts" organised by Himachal Pradesh Forest Department in collaboration with Public Affairs Office of Embassy of United States of America, during November 28-29, 2004 at Shimla, Himachal Pradesh, India.

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Mathur, V.B. and Katwal, R.P.S. (2004): **Integrating World Heritage Site Management into broader Landscape: Challenges and Prospects for Kaziranga National Park, India.** Paper presented in the UNESCO Expert Meeting on 'World Heritage Convention Contribution to Forest Conservation and Sustainable Development BERASTAGI +7', Nancy, France, March 9-11, 2005.

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Great Orange Tip (*Hebomoia glaucippe*)

Governing Body

1 Chairman
Secretary,
Ministry of Environment & Forests,
Govt. of India, Paryavaran Bhavan, B-Block,
CGO Complex, Lodi Road,
New Delhi - 110 003

2 Vice- Chairman
Director General of Forests & Special Secretary,
Ministry of Environment & Forests,
Govt. of India, Paryavaran Bhavan, B-Block,
CGO Complex, Lodi Road,
New Delhi - 110 003

A representative of the Indian Board for Wildlife who is a member of WII-Society for a period of three years to be nominated by the President.
(The present membership tenure is valid upto 24.2.2005)

3 Shri Valmik Thapar,
19, Kautilya Marg, Chanakyapuri,
New Delhi-110 021

Five non-official persons from amongst eminent Members Scientists/ Naturalists/Conservationists for a period of three years to be nominated by the President from time to time who are members of WII-Society.
(The present membership tenure is valid upto 24.2.2005)

4 Shri Samar Singh,
(Former Director General, WWF-India)
P-1, Hauz Khas,
New Delhi-110 016

5 Shri H.S. Panwar,
(Former Director, WII)
M-22, South City,
Gurgaon-122 001

6 Dr. R. Sukumar,
Centre of Ecological Sciences,
Indian Institute of Science,
Bangalore (Karnataka)

7 Dr. Kanchan Chopra,
Institute of Economic Growth,
University of Delhi Enclave,
New Delhi-110 007

8 Shri S.B. Singh,
(Former Chief Wildlife Warden, Meghalaya)
House No. 18/494, Indira Nagar,
Lucknow-226 016

9 Financial Advisor & Joint Secretary
to the Government of India,
Ministry of Environment & Forests, Paryavaran Bhavan,
B-Block, CGO Complex, Lodi Road,
New Delhi - 110 003

10 Chief Secretary,
Government of Uttaranchal,
(or his/her nominee not below the rank of Secretary to the State Government) "Sachivalaya",
Dehradun-248 001

11-16. Chief Wildlife Warden in the State Govt. of Uttaranchal (permanent member) and five Chief Wildlife Wardens on a regional rotational basis at a time for a period of three years.

17 Addl. Director General (WL) &
Director Wildlife Preservation,
Ministry of Environment & Forests,
Paryavaran Bhavan, B-Block,
CGO Complex, Lodi Road,
New Delhi - 110 003

18 Director General,
Indian Council of Forestry Research &
Education, New Forest,
Dehra Dun - 248 006

19 The Chairman,
Training, Research and Academic Council, WII
Special Invitee,

20 Dr. P.K. Malik,
Wildlife Institute of India,
Dehra Dun - 248 001

21 Member-Secretary
Director,
Wildlife Institute of India,
Dehra Dun - 248 001

Training, Research & Academic Council (TRAC)

Nominated Members

1 Chairman
Shri R. Rajamani, Retd. IAS &
Former Secretary, MoEF
8-2-585/A/I, Road No. 9, Banjara Hills,
Hyderabad – 500 034

2 Shri H.S. Panwar,
(Former Director, WII)
M-22, South City,
Gurgaon-122 001

3 Dr. Asad R. Rahmani,
Director, Bombay Natural History Society,
Museum Compound, Shaheed Bhagat Singh Marg,
Mumbai-400 023

4 Dr. R.K. Sinha,
Professor and Head, Department of Zoology,
Patna University,
Patna

5 Prof. V.C. Soni,
Department of Biosciences,
Saurashtra University,
Rajkot

6 Prof. P.C. Bhattacharya,
Head of Department of Zoology,
Guwahati University,
Guwahati

Ex-Officio Members

7 The Director Wildlife Preservation,
Government of India, Ministry of Environment & Forests,
CGO Complex, Lodi Road,
New Delhi – 110 003

8 Chief Wildlife Wardens on a regional rotational basis at a time for a period of three years: -
Northern - Himachal Pradesh, Delhi
Eastern - Jharkhand, West Bengal
Central - Madhya Pradesh
Western - Rajasthan, Maharashtra
North Eastern - Sikkim, Arunachal Pradesh, Tripura
Southern - Karnataka, Andhra Pradesh
Permanent Invitee - Uttaranchal

9 The Director,
Salim Ali Centre for Ornithology and
Natural History (SACON), Anaikatty P.O.
Coimbatore - 641 108

10 The Director,
Botanical Survey of India,
Kolkata

11 The Director,
Zoological Survey of India
Kolkata

12 The Member-Secretary,
Central Zoo Authority,
New Delhi

13 A representative of Indian Council of Forest Research and Education (ICFRE),
Dehradun

14 The Dean,
Faculty of Wildlife Science
Wildlife Institute of India,
Dehrdun

15 The Chairman,
Internal Research Advisory Committee,
Wildlife Institute of India,
Dehradun

16 The Registrar,
Wildlife Institute of India,
Dehradun

17 Member- Secretary
The Director,
Wildlife Institute of India,
Dehradun

Finance Committee

1 **Chairman,**
Shri N.K. Joshi, IFS
Director General of Forests (WL),
Ministry of Environment & Forests,
CGO Complex, Paryavaran Bhavan,
B-Block, Lodi Road,
New Delhi – 110 003

2 Shri R. Rajamani, IAS (Retd.) &
Former Secretary, MoEF
(Chairman, TRAC, WII)
8-2-585/A/I, Road No. 9,
Banjara Hills,
Hyderabad - 500 034

3 Director
Wildlife Preservation
Ministry of Environment & Forests,
CGO Complex, Paryavaran Bhavan,
B-Block, Lodi Road,
New Delhi – 110 003

4 Shri S.B. Singh, IFS (Retd.)
(Former Chief Wildlife Warden, Meghalaya)
House No. 18/494, Indira Nagar
Lucknow – 226 016

5 Joint Secretary & Finance Advisor
Ministry of Environment & Forests,
Paryavaran Bhavan,
B-Block, CGO Complex, Lodi Road
New Delhi – 110 003

6 Dean, Faculty of Wildlife Science
Wildlife Institute of India
Dehradun

7 **Member Secretary,**
Director
Wildlife Institute of India
Dehradun

Building Committee

1 **Chairman,**
Director General,
Indian Council for Forest Research & Education,
P.O. New Forest,
Dehradun

2 Chief Engineer, CCU
Ministry of Environment & Forests,
Paryavaran Bhavan, B-Block
CGO Complex, Lodi Road,
New Delhi – 110 003

3 **Member-Secretary,**
Director
Wildlife Institute of India
Dehradun

Audit Certificate

I have examined the Receipts & Payments Account, Income and Expenditure Account for the year ended 31st March, 2005 and the Balance Sheet as on 31 March, 2005 of the Wildlife Institute of India (WII), Dehradun. I have obtained all the information and explanations that I have required and subject to the clarifications furnished in note attached to and forming part of accounts and observations in the appended Audit report which inter-alia contains the following major audit observations:

1. The Institute did not charge depreciation on prorata basis on assets acquired after September 2004, leading to under statement of assets of Rs. 21.26 lakh. **(Para 1.1.1.1)**

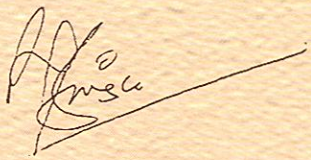
2. The Institute did not treat accrued interest of Rs. 16.08 lakh as income for the year 2004-05 resulting into understatement of income and assets. **(Para 1.1.1.2)**

3. The Institute did not depict the closing stock of publications and institute's products in Current Assets resulting into under statement of assets of Rs. 11.69 lakh. **(Para 1.1.1.4)**

4. The Institute did not reduce the book value of the computers disposed off under buy back scheme from the total cost of assets. This has resulted into cover statement of assets by Rs. 5.86 lakh. **(Para 1.1.2.1)**

5. Assets register was not maintained and physical verification of assets of Rs. 19.68 crore was not carried out. **(Para 3.3)**

I certify, as a result of my audit, that in my opinion these Accounts and Balance Sheet are properly drawn up so as to exhibit a true and fair view of the state of affairs of the Wildlife Institute of India, Dehradun according to the best of information and explanation given to me and so shown by the books of the organisation.



Place: New Delhi
Dated: 21-03-2006

PRINCIPAL DIRECTOR OF AUDIT
(SCIENTIFIC DEPARTMENTS)

WILDLIFE INSTITUTE OF INDIA, DEHRADUN
Receipt & Payment Accounts for the financial year 2004-05

Grant-in-Aid

Particulars	RECEIPTS			Particulars	PAYMENTS		
	Plan	Non Plan	Total		Plan	Non Plan	Total
To Opening Balance (Hand)		340,710.00	340,710.00	By Conveyance Charges		9,073.00	9,073.00
Opening Balance (Bank)		4,955,510.58	4,955,510.58	Electricity & Water Charges	3,845,375.00		3,845,375.00
CGEGIS		840.00	840.00	Entertainment Charges		103,825.00	103,825.00
EMD received		268,011.00	268,011.00	EPF Contribution	79,142.00		79,142.00
			-	Estate Maintenance	918,107.00		918,107.00
Employees Cont.		6,515.00	6,515.00	Estate Security	3,392,223.00		3,392,223.00
Hostel Caution Money		2,500.00	2,500.00	Fellowship	474,066.00		474,066.00
Security Deposit		61,856.00	61,856.00	Honorarium		47,863.00	47,863.00
Encashment of FDR	33,450,000.00		33,450,000.00	Lab Chemicals	551,085.00		551,085.00
Grant in aid accrued for 2003-04	35,700,000.00		35,700,000.00	Lab Expenses	418,676.00		418,676.00
Consultancy refund		54,840.00	54,840.00	Leave Salary & Pension Cont.	374,119.00		374,119.00
Grant in aid from MoEF	66,000,000.00	10,000,000.00	76,000,000.00	Legal Expenses	211,400.00	428,325.00	639,725.00
House Licence Fee		224,097.00	224,097.00	Library Expenses	409,778.00		409,778.00
Inst. Charges		77,850.00	77,850.00	Leave Travel Con	329,285.00		329,285.00
Interest Credited by Bank		1,970,048.15	1,970,048.15	M.Sc Course Exp.	534,605.00		534,605.00
Lab Testing Charges		129,100.00	129,100.00	Medical	2,016,863.00		2,016,863.00
Misc. Receipts		146,970.00	146,970.00	Newspaper & Magazine	39,272.00		39,272.00
Rent		287,003.00	287,003.00	Operational Exp.	2,190,235.00	30,290.00	2,220,525.00
WII Products		94,284.00	94,284.00	Over Time All.		478,403.00	478,403.00
Advance for Expenses (Project)		240,123.00	240,123.00	Pension Contribution	1,442,723.00		1,442,723.00
			-	POL for Vehicles	1,032,189.00		1,032,189.00
			-	Postage & Telegram	216,071.00		216,071.00
			-	Printing & Binding	449,567.00		449,567.00
			-	Publication	380,532.00		380,532.00

Particulars	RECEIPTS			Particulars	PAYMENTS		
	Plan	Non Plan	Total		Plan	Non Plan	Total
			-	Publicity & Adv.	91,693.00		91,693.00
			-	Repair & Maint. of Vehicles	821,202.00		821,202.00
			-	Research Project Exp.	15,894,885.00		15,894,885.00
			-	Salaries & Allowances	14,956,342.00	8,429,219.00	23,385,561.00
			-	Pension & EPF Exp.			
				(Pension Corpus Fund)	5,000,000.00		5,000,000.00
			-	Contigencies/ Misc. (Project)		240,123.00	240,123.00
			-	Sharing of Cost of K.V.	1,042,320.00		1,042,320.00
			-	Sports Goods	140,375.00		140,375.00
			-	Stationery	1,533,840.00		1,533,840.00
			-	Stipend	103,800.00		103,800.00
			-	Telephone & T.C.	787,915.00		787,915.00
			-	Training Cost Exp.	9,000,000.00		9,000,000.00
			-	Travel Exps.	2,042,480.00		2,042,480.00
			-	Uniforms	82,068.00		82,068.00
			-	Cable Charges	1,320.00		1,320.00
			-	Loan refunded	3,000,000.00		3,000,000.00
			-	Advance for Exp. to staff	479,323.00		479,323.00
			-	Loan & Advances to staff		248,608.00	248,608.00
			-	A.C. Plant	1,874,226.00		1,874,226.00
			-	Archit & Supervision Fee	260,209.00		260,209.00
			-	Auditorium	3,154,980.00		3,154,980.00
			-	Campus Development	2,766,971.00		2,766,971.00
			-	Computer & Accessories	5,845,010.00		5,845,010.00
			-	Development of Forensic Lab	481,638.00		481,638.00
			-	Furniture & Fixtures	5,417,191.00		5,417,191.00
			-	Journals & Periodicals	5,095,136.50		5,095,136.50
			-	Lab equipments	193,642.00		193,642.00

Particulars	RECEIPTS			Particulars	PAYMENTS		
	Plan	Non Plan	Total		Plan	Non Plan	Total
			-	Library Books	2,627,551.00		2,627,551.00
			-	Office Equipment	2,259,095.00		2,259,095.00
			-	Photographs & Equipments	92,380.00		92,380.00
			-	Road & Culvert	360,197.00		360,197.00
			-	Sports Complex	272,462.00		272,462.00
			-	Training Equipment	1,515,024.00		1,515,024.00
			-	AMC of Computers	538,462.00		538,462.00
			-	Annual Research Seminar	116,479.00		116,479.00
			-	Bonus	288,898.00		288,898.00
			-	Wages	810,755.00	150,749.00	961,504.00
			-	Workshop & Seminar	820,098.00		820,098.00
			-	Closing Balance (Bank)		34,644,969.23	34,644,969.23
			-	Closing Balance (Hand)		125,530.00	125,530.00
Total A	**135,150,000.00**	**18,860,257.73**	**154,010,257.73**	**Total**	**109,073,280.50**	**44,936,977.23**	**154,010,257.73**

Research Project

Particulars	RECEIPTS			Particulars	PAYMENTS		
	Plan	Non Plan	Total		Plan	Non Plan	Total
Opening in Bank		219,791.00	219,791.00	Advance for Expenses (Research Project)		501,340.00	501,340.00
Opening in Hand		32,804.00	32,804.00	Camp Equipment (Research Project)		1,249,704.50	1,249,704.50
Misc. Receipt for Research Project		16,796,447.00	16,796,447.00	Office Equipment (Research Project)		646,986.00	646,986.00
				Fellowship & Wages (Research Project)		3,180,716.00	3,180,716.00
				Camp Expenses (Research Project)		166,432.00	166,432.00
				Cont./Misc Expenses		2,481,505.00	2,481,505.00
				POL & Maintenance of Vehicle		890,240.00	890,240.00
				Travel Expenses		692,981.00	692,981.00
				Closing in Hand		17,655.00	17,655.00
				Closing in Bank		7,221,482.50	7,221,482.50
		17,049,042.00	17,049,042.00	TOTAL		17,049,042.00	17,049,042.00

Training Account

Particulars	RECEIPTS			Particulars	PAYMENTS		
	Plan	Non Plan	Total		Plan	Non Plan	Total
Opening in Bank		3,064,098.36	3,064,098.36	Computer and Pheripheral		3,729,250.00	3,729,250.00
				Furniture & Fixture		15,950.00	15,950.00
TDS (Training A/c)		304.00	304.00				
Advance for Training Expenses		367,705.00	367,705.00				
			0.00	Contingent & Misc. Expenses		3,007,750.00	3,007,750.00
Misc. Receipt		194,519.00	194,519.00	Employer Contribution for EPF		8,922.00	8,922.00
Receipt for Workshop/Course		11,788,733.00	11,788,733.00	Honorarium (Training A/c)		53,850.00	53,850.00
				Salary & Allowances		106,395.00	106,395.00
				Stationery Exp.		629,482.00	629,482.00
				Training Allowances		948,155.00	948,155.00
				Travelling Allowances		2,112,222.00	2,112,222.00
				Closing in Bank		4,803,383.36	4,803,383.36
TOTAL C		**15,415,359.36**	**15,415,359.36**	**TOTAL**		**15,415,359.36**	**15,415,359.36**

Consultancy Project

Particulars	RECEIPTS			Particulars	PAYMENTS		
	Plan	Non Plan	Total		Plan	Non Plan	Total
Opening in Bank		7,722,688.00	7,722,688.00	Camp Equipment (Consult. Project)		539,781.00	539,781.00
Opening in Hand		235.00	235.00	Office Equipment (Consult. Project)		289,189.00	289,189.00
Internal Transfer for EPF/Pension		6,196,226.83	6,196,226.83	Camp Expenses (Consult. Project)		75,304.00	75,304.00
Loan to other A/c		3,000,000.00	3,000,000.00	Fellowship & Wages (Consult. Project)		562,136.00	562,136.00
Misc. Receipt		359,316.00	359,316.00	Contingent & Misc. Expenses		258,914.00	258,914.00
Receipt for Project		2,629,857.00	2,629,857.00	Govt. Cont. to Pension Fund		3,198,285.78	3,198,285.78
				GPF Contribution		2,997,941.05	2,997,941.05
				POL & Maintenance of Vehicle		12,290.00	12,290.00
				Travel Expenses (Consult. Project)		181,871.00	181,871.00
				Closing in Bank		11,792,611.00	11,792,611.00
TOTAL D		**19908322.83**	**19908322.83**	**TOTAL**		**19,908,322.83**	**19,908,322.83**

Pension Fund

Particulars	RECEIPTS			Particulars	PAYMENTS		
	Plan	Non Plan	Total		Plan	Non Plan	Total
Opening in Bank		2186252.78	2186252.78				
				Investment in FDR (Pension fund)		7,300,000.00	7,300,000.00
				Pension/Family Pension		726,586.75	726,586.75
Interest on Saving A/c		51135.00	51135.00				
WII Contribution (Pension A/c)		5991189.00	5991189.00				
				Closing in Bank		201,990.03	201,990.03
TOTAL E		**8228576.78**	**8228576.78**	**TOTAL**		**8,228,576.78**	**8,228,576.78**

GPF Account

Particulars	RECEIPTS			Particulars	PAYMENTS		
	Plan	Non Plan	Total		Plan	Non Plan	Total
To Opening balance (Bank)		826250.26	826250.26	By Advance/Withdrawal		2,598,066.00	2,598,066.00
WII Contribution		3,347,713.00	3,347,713.00	Final Payment		394,126.00	394,126.00
Interest on Bank Deposit		25,465.00	25,465.00	Closing Balance		1,207,236.26	1,207,236.26
Total F		**4199428.26**	**4199428.26**	**Total**		**4,199,428.26**	**4,199,428.26**
Total A+B+C+D+E+F	**135,150,000.00**	**83,660,986.96**	**218,810,986.96**	**Total A+B+C+D+E+F**	**109,073,280.50**	**109,737,706.46**	**218,810,986.96**

(S.S. Lamba)
Finance Officer

(P.R. Sinha)
Director

Financial Statements (Non-Profit Organization)
Wildlife Institute of India, Dehradun
BALANCE SHEET FOR THE YEAR 2004-2005

(Amt. Rs.)

	Schedule	Current Year	Previous Year
CORPUS /CAPITAL FUND AND LIABILITIES			
CORPUS /CAPITAL FUND	1	268862659.99	303617602.67
RESERVE AND SURPLUS	2	0.00	0.00
EARMARKED/ENDOWMENT FUND	3	0.00	0.00
SECURED LOAN AND BORROWINGS	4	0.00	0.00
UNSECURED LOAN AND BORROWINGS	5	673284.00	3611428.00
DEFERRED CREDIT LIABILITIES	6	0.00	0.00
CURRENT LIABILITIES AND PROVISION	7	62495965.08	50771165.00
TOTAL (A)		**332031909.07**	**358000195.67**
ASSETS			
FIXED ASSETS	8	196784472.99	198745720.00
INVESTMENTS- FROM EARMARKED / ENDOWMENT FUNDS	9	0.00	0.00
INVESTMENTS- OTHERS	10	68234284.79	94829284.79
CURENT ASSETS, LOANS, ADVANCES ETC.	11	67013151.28	64425190.88
MISCELLANEOUS EXPENDITURE (to the extent not written off or adjusted)			
TOTAL (B)		**332031909.06**	**358000195.67**

(S.S. Lamba)
Finance Officer

(P.R. Sinha)
Director

Financial Statement (Non-Profit Organization)
Wildlife Institute of India, Dehradun
Schedule forming part of Balance Sheet as on 31st March, 2005

(Amt. Rs.)

	Current Year	Previous Year
SCHEDULE 1: CORPUS/ CAPITAL FUND		
Balance as at the beginnig of the year	303617602.67	-5641287.00
Add: Contribution towards Corpus/ Capital fund	38686573.00	313252587.00
Add/(Deduct) : Balance of net income/ (expenditure) transferred from the income & expenditure account	-73441515.68	-3993697.33
TOTAL	**268862659.99**	**303617602.67**
SCHEDULE 4: SECURED LOANS AND BORROWINGS		
(1) Central Government		
(2) State Government (specify)		
(3) Financial Institutions		
(1) Term Loans		
(2) Interest accrued and due		
(4) Banks		
(1) Term Loans- Interest accrued and due		
(2) Others Loans (Specify)- Interest accrued and due		
(5) Other Institutions and Agencies		
(6) Debentures and Bonds		
(7) Others (Specify)		
Internal transfer of Pension Fund for 2003-04	-3198285.78	
Internal transfer of GPF for 2003-04	-2997941.05	
Insternal transfer of EPF/Pension Fund for 2003-04	6196226.83	
TOTAL	**0.00**	**0.00**
SCHEDULE 5 : UNSECURED LOANS AND BORROWINGS		
(1) Central Govt.		
(2) State Govt.(Specify)		
(3) Financial Instittions		
(4) Banks		
(i) Term Loans		
(ii) Others (specify)		
(5) Other Institutions and Agencies		
(6) Debentures and Bonds		
(7) Fixed Deposits		
(8) Others (Specify)		
Security Deposit	635163.00	573307.00
Loans	38121.00	3038121.00
TOTAL	**673284.00**	**3611428.00**

SCHEDULE 7 : CURRENT LIABILITIES AND PROVISION		
(A) CURRENT LIABILITIES		
(1) Acceptances		
(2) Sudnry Creditors		
(1) For Goods		
(2) For Others		
(3) Advances Received		
Study on Acquisition of Private Land Around National Park		
CZA Management Course 2001		
CZA Stud Book Project		
Tropical Rain Forest workshop		
Payment Received for Research Equipment for Siberain		
CZA Value of Exihibit Design		
To Advance Receipt of Printing of Eco-Dev. Project		
Zoo Management Course 2002		
Hostel Caution Money	67500.00	65000.00
Camera Trapping		
Project Cost		
CZA Management Course		
Telemetry Workshop		
(4) Interest accrued but not due on		
(1) Secured Loans/Borrowings		
(2) Unsecured Loans/Borrowings		
(5) Statuary Liabilities		
(1) Overdue		
(2) Others (Specify)		
Pension Fund	41308311.03	32794288.00
GP Fund	20835200.05	17901273.00
(6) Others (Specify)		
EMD Received	274521.00	6510.00
SPF/FPF		
TDS (Consultancy Project)		
EPF, House Licence Fee, Bus Charges & Other recoveries		
TOTAL (A)	**62485532.08**	**50767071.00**
(B) Provisions		
(1) For Taxation		
Income Tax Salary		
TDS	3614.00	3614.00
TDS (Training A/c)	304.00	
(2) Gratuity		
(3) Superannuation/ Pension		
(4) Accumulated Leave Encashment		
(5) Trade Warranties/ Claims		
(6) Others (Specify)		
Income Tax from Pensioners		
Employee Contribution (EPF)	6515.00	
CM Relief Fund		
CGEGIS		-840.00
Cable		1320.00
HDFC		
GPF		
Car/Scooter Adv. (Transferrable)		
Sale Tax/Trade Tax/Prof.Tax/ Com. Tax		
EPF Contribution (Training A/c)		
House Licence Fee (Consultancy A/c)		
EPF Subscription		
Pension Contribution (According to New Scheme)		
TOTAL (B)	**10433.00**	**4094.00**
TOTAL (A+ B)	**62495965.08**	**50771165.00**

SCHEDULE 8 : FIXED ASSETS

Pariculars	Gross Block					DEPRECIATION			NET BLOCK	
	Cost as at the beginning of the year	Addition during the year		Deduction during the year	Cost as at the end of the year	As at the beginning of the year	For the year	At the end of the year	As at the current year-end	As at the Previous year-end
		Upto 30-Sep	After 30-Sep							
LAND BLOCK: 0%										
Avenue Plantations	3438280.15	0.00	0.00	0.00	3438280.15	0.00	0.00	0.00	3438280.15	3438280.15
Land	6607214.58	0.00	0.00	0.00	6607214.58	0.00	0.00	0.00	6607214.58	6607214.58
Trees	2432709.00	0.00	0.00	0.00	2432709.00	0.00	0.00	0.00	2432709.00	2432709.00
TOTAL	**12478203.73**	**0.00**	**0.00**	**0.00**	**12478203.73**	**0.00**	**0.00**	**0.00**	**12478203.73**	**12478203.73**
BUILDINGS BLOCK: 10%										
Architectural & Supervision Fee	6999802.06	260209.00	0.00	0.00	7260011.06	777755.79	726001.11	726001.11	6534009.96	6999802.07
Auditorium	7716668.40	3154980.00	0.00	0.00	10871648.40	857407.60	1087164.84	1087164.84	9784483.56	7716668.40
Boundary Fencing	662527.74	0.00	0.00	0.00	662527.74	73614.19	66252.77	66252.77	596274.96	662527.74
Boundary Wall	1171422.53	0.00	0.00	0.00	1171422.53	130158.06	117142.25	117142.25	1054280.28	1171422.53
Building Complex	110370084.03	0.00	0.00	0.00	110370084.03	12263342.67	11037008.40	11037008.40	99333075.63	110370084.03
Campus Development	6378892.21	2766971.00	0.00	0.00	9145863.21	708765.80	914586.32	914586.32	8231276.89	6378892.21
Materials and Supplies	3139879.46	0.00	0.00	0.00	3139879.46	348875.50	313987.95	313987.95	2825891.51	3139879.46
Tennis Court	429990.30	0.00	0.00	0.00	429990.30	47776.70	42999.03	42999.03	386991.27	429990.30
Sports Complex	0.00	272462.00	0.00	0.00	272462.00	0.00	27246.20	27246.20	245215.80	0.00
BLOCK: 20%										
Road & Culvert	1103431.20	360197.00	0.00	0.00	1463628.20	275857.80	292725.64	292725.64	1170902.56	1103431.20
Staff Quarters	2032332.80	0.00	0.00	0.00	2032332.80	508083.20	406466.56	406466.56	1625866.24	2032332.80
TOTAL	140005030.73	6814819.00	0.00	0.00	146819849.73	15991637.30	15031581.07	15031581.07	131788268.66	140005030.74
PLANT MACHINERY & EQUIPMENT BLOCK: 20%										
Vehicle	3633409.43	0.00	0.00	0.00	3633409.44	908352.36	726681.88	726681.89	2906727.55	3633409.44
Vehicle (Project)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Development of Forensic Laboratory	0.00	481638.00	0.00	0.00	481638.00	0.00	96327.60	96327.60	385310.40	0.00
Training Equipments	1526856.00	0.00	0.00	0.00	1526856.00	381714.00	305371.20	305371.20	1221484.80	1526856.00
Vehicle (Research Project)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BLOCK: 25%										
AC Plant	3021017.63	1874226.00	0.00	0.00	4895243.63	1007005.88	1223810.91	1223810.91	3671432.72	3021017.63
Camp Equipment (project)	1336817.07	0.00	0.00	0.00	1336817.07	445605.69	334204.27	334204.27	1002612.80	1336817.07
DG Set	1108308.38	0.00	0.00	0.00	1108308.38	369436.13	277077.09	277077.09	831231.28	1108308.38
EPABX	577125.00	0.00	0.00	0.00	577125.00	192375.00	144281.25	144281.25	432843.75	577125.00
Lab Equipment	322029.60	193642.00	0.00	0.00	515671.60	107343.20	128917.90	128917.90	386753.70	322029.60
Office Equipment	8117832.32	2259095.00	0.00	0.00	10376927.32	2705944.11	2594231.83	2594231.83	7782695.49	8117832.32

Particulars	Gross Block					DEPRECIATION			NET BLOCK	
	Cost as at the beginning of the year	Addition during the year		Deduction during the year	Cost as at the end of the year	As at the beginning of the year	For the year	At the end of the year	As at the current year-end	As at the Previous year-end
		Upto 30-Sep	After 30-Sep							
Training Equipment	17853273.89	1515024.00	0.00	0.00	19368297.89	5951091.30	4842074.47	4842074.47	14526223.41	17853273.89
Office Equipment (Project)	65280.00	0.00	0.00	0.00	65280.00	21760.00	16320.00	16320.00	48960.00	65280.00
Camp Equipment (Conslt. Project)	0.00	539781.00	0.00	0.00	539781.00	0.00	134945.25	134945.25	404835.75	0.00
Office Equipment (Research Project)	5349.75	646986.00	0.00	0.00	652335.75	1783.25	163083.94	163083.94	489251.81	5349.75
Camp Equipment (Research Project)	0.00	1249704.50	0.00	0.00	1249704.50	0.00	312426.13	312426.13	937278.38	0.00
TOTAL	**37567299.07**	**8760096.50**	**0.00**	**0.00**	**46327395.58**	**12092410.92**	**11299753.72**	**11299753.73**	**35027641.84**	**37567299.08**
VEHICLES										
BLOCK : 20%										
Vehicle (Conslt. Project)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
FURNITURE, FIXTURES										
BLOCK : 15%										
Furinitures & Fixtures	8540380.47	5417191.00	0.00	0.00	13957571.47	1507125.97	2093635.72	2093635.72	11863935.75	8540380.47
Furniture & Fixture	0.00	15950.00	0.00	0.00	15950.00	0.00	2392.50	2392.50	13557.50	0.00
TOTAL	**8540380.47**	**5433141.00**	**0.00**	**0.00**	**13973521.47**	**1507125.97**	**2096028.22**	**2096028.22**	**11877493.25**	**8540380.47**
OFFICE EQUIPMENT										
BLOCK : 20%										
Office Equipment (Training A/c)	18480.00	0.00	0.00	0.00	18480.00	4620.00	3696.00	3696.00	14784.00	18480.00
BLOCK 25%										
Office Equipment (Conslt. Project)	0.00	289189.00	0.00	0.00	289189.00	0.00	72297.25	72297.25	216891.75	0.00
TOTAL	**18480.00**	**289189.00**	**0.00**	**0.00**	**307669.00**	**4620.00**	**75993.25**	**75993.25**	**231675.75**	**18480.00**
COMPUTER/PERIPHERALS										
BLOCK : 20%										
Computer and Periphrals	13138.40	3729250.00	0.00	0.00	3742388.40	3284.60	748477.68	748477.68	2993910.72	13138.40
BLOCK : 60%										
Computer & Accessories	123187.60	5845010.00	0.00	0.00	5968197.60	184781.40	3580918.56	3580918.56	2387279.04	123187.60
TOTAL	**136326.00**	**9574260.00**	**0.00**	**0.00**	**9710586.00**	**188066.00**	**4329396.24**	**4329396.24**	**5381189.76**	**136326.00**
LIBRARY BOOKS										
BLOCK : 100%										
Eductional Films	0.00	0.00	0.00	0.00	0.00	1080432.35	0.00	0.00	0.00	0.00
Journals & Periodicals	0.00	5119675.50	0.00	24539.00	5095136.50	28685593.00	5095136.50	5095136.50	0.00	0.00
Library Books	0.00	2677975.00	0.00	50424.00	2627551.00	14081685.28	2627551.00	2627551.00	0.00	0.00
Photographs and Equipment	0.00	92380.00	0.00	0.00	92380.00	2232745.20	92380.00	92380.00	0.00	0.00
Library Books (Training A/c)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL	**0.00**	**7890030.50**	**0.00**	**74963.00**	**7815067.50**	**46080455.83**	**7815067.50**	**7815067.50**	**0.00**	**0.00**
GRAND TOTAL	**198745720.00**	**38761536.00**	**0.00**	**74963.00**	**237432293.00**	**75864316.00**	**40647820.00**	**40647820.00**	**196784472.99**	**198745720.00**

SCHEDULE :10 INVESTMENT - OTHERS		
(1) In the Govt. Securities		
(2) Other approved Securities		
(3) Shares		
(4) Debentures and Bonds		
(5) Subsidaries and Joint Ventures		
(6) Others (Specify)		
Investment in FDR (Pension Fund)	41106321.00	33806321.00
FDR (GPF)	19627963.79	19627963.79
Account No. 1 FDR		33450000.00
Training FDR	7500000.00	7500000.00
ICICI		445000.00
TOTAL	**68234284.79**	**94829284.79**
SCHEDULE :11 CURRENT ASSETS, LOANS, ADVANCES ETC.		
(A) CURRENT ASSETS		
(1) Inventories		
Closing Stock of Steel & Cement	131274.90	131274.90
Advance for Research Projects		
Grant-in-Aid accrued but not received		35700000.00
(2) Sundry Debtors		
(1) Debts outstanding for a period exceeding six months		
(2) Others (Specify)		
(3) Cash balances in hand (including cheques/drafts and imprest)		
Grant-in-Aid A/c	125530.00	340710.00
Research Project A/c	17655.00	32804.00
Training A/c		
Consultancy A/c		235.00
Pension Fund A/c		
GPF A/c		
(4) Bank Balances		
(1) With Scheduled Banks		
Grant-in-Aid A/c	34644969.23	4955510.58
Research Project A/c	7221482.50	219791.00
Training A/c	4803383.36	3064098.36
Consultancy A/c	11792611.00	7722688.00
Pension Fund A/c	201990.03	2186252.78
GPF A/c	1207236.26	826250.26
(2) With Non-Scheduled Banks		
(5) Post Office-Savings Accounts		
TOTAL (A)	**60146132.28**	**55179614.88**

(B) LOANS, ADVANCES AND OTHER ASSETS		
(1) Loans		
(1) Staff		
Loan & Advances to Staff	2684198.00	2435590.00
Advance for expenses to Staff	2159949.00	1680626.00
Advance for expenses (Project)		240123.00
Advances for expenses (Conslt. Project)		
HBA		
Advance for Computer		
Festival Advance		
Conveyance (Scooter, Motorcycle, Car etc.)		
Advance for expenses (Research Projects)	635300.00	133960.00
(2) Other entities engaged in activities /objectives similar to		
(3) Others (Specify)		
Loan to Envis Project		
Loan to Other A/c		3000000.00
(2) Advances and other amounts recoverable in cash or in kind or		
(1) On Capital Accounts		
(2) Prepayments		
(3) Others (Specify)		
Advance for Training Expenses	983597.00	1351302.00
(3) Income Accrued		
(1) On Investments from Earmarked / Endowment Funds		
(2) On Invesments -Others		
(3) On Loans and Advances		
(4) Others (Specify)		
Training Cost Accrued But not Received	403975.00	403975.00
(4) Claims Receivable		
TOTAL (B)	**6867019.00**	**9245576.00**
TOTAL (A+B)	**67013151.28**	**64425190.88**

(S.S. Lamba)
Finance Officer

(P.R. Sinha)
Director

Financial Statement (Non-Profit Organization)
Wildlife Institute of India, Dehradun
INCOME & EXPENDITURE ACCOUNT FOR THE YEAR ENDED 31st MARCH 2005

(Amt. Rs.)

	Schedule	Current Year	Previous Year
INCOME			
Income form Salaries/Service	12	0.00	0.00
Grants/Subsidies	13	37313427.00	113604469.00
Fees/Subscriptions	14	12038092.00	13924362.64
Income from Investments (Income on Invest. From earmarked/endow. Funds t/f to Funds	15	0.00	0.00
Income from Royalty, Publication etc.	16	578017.00	1386358.20
Interest Earned	17	1970048.15	3337785.78
Other Income	18	20166907.00	13517669.05
Increase/(decrease) in stock of Finished Goods and works-in-progress	19	0.00	0.00
TOTAL (A)		**72066491.15**	**145770644.67**
EXPENDITURE			
Establishment Expenses	20	52526299.00	38210997.00
Other Administrative Expenses	21	46137661.00	35689029.00
Expenditure on Grants, Subsidies etc.	22	6196226.83	0.00
Interest	23	0.00	0.00
Depreciation (Net Total at the year end- corresponding to Schedule-8)		40647820.00	75864316.00
TOTAL (B)		**145508006.83**	**149764342.00**
Balance being excess of Income over Expenditure (A-B)		73441515.68	-3993697.33
Transfer to Special Reserve (Specify each)			
Transfer to / From General Reserve			
BALANCE BEING SURPLUS (DEFICIT) CARRIED TO CORPUS/CAPITAL FUND		**-73441515.68**	**-3993697.33**

(S.S. Lamba)
Finance Officer

(P.R. Sinha)
Director

Financial Statement (Non-Profit Organization)
Wildlife Institute of India, Dehradun
Schedule forming part of Income & Expenditure as on 31st March, 2005

	(Amt. Rs.)	
	Current Year	**Previous Year**
SCHEDULE :13 GRANTS/SUBSIDIES		
(1) Central Government		
Grant -in- Aid from MoEF	37313427.00	112514493.00
(2) State Governments (s)		
(3) Government Agencies		
(4) Institutions/Welfare Bodies		
(5) International Organisations		
(6) Others (Specify)		
WII Contribution (Pension A/c)		1089976.00
TOTAL	**37313427.00**	**113604469.00**
SCHEDULE :14 FEES/ SUBSCRIPTIONS		
(1) Entrance Fees		
M.Sc.Course Fee		506250.64
(2) Annual Fees/ Subscriptions		
(3) Seminar/ Program Fees		
Seminar/ Workshop Fees		
(4) Consultancy Fees		
Consultancy refund	54840.00	352146.00
(5) Others (Specify)		
Other Receipt (Training)		
Training Cost		
Receipt for Workshop/Courses	11788733.00	10228192.00
Misc. Receipts (Training A/c)	194519.00	2837774.00
Receipt for Training Cost		
TOTAL	**12038092.00**	**13924362.64**
SCHEDULE :16 INCOME FROM ROYALTY, PUBLICATION ETC.		
(1) Income from Royalty		
(2) Income from Publications		
(3) Others (Specify)		
Misc. Receipts	146970.00	727838.20
Instt. Charges (WII Receipts)	77850.00	244599.00
House Licence Fee	224097.00	288910.00
Bus Charges	62511.00	
Lab Testing Charges	129100.00	62500.00
TOTAL	**578017.00**	**1386358.20**

SCHEDULE :17 INTEREST EARNED		
(1) On Term Deposits		
(1) With Scheduled Banks		
Int. on Bank Deposit	1970048.15	220352.00
Interest on FDR		
Interest on Investment		3054858.78
(2) With Non-Scheduled Banks		
(3) With Institutions		
(4) Others (Specify)		
Int. on Investment		
Interest		
(2) On Savings Account		
(1) With Scheduled Banks		
Int. on Savings Account		62575.00
(2) With Non-Scheduled Banks		
(3) Post Office Savings Account		
(4) Others (Specify)		
(3) On Loans		
(1) Employees/Staff		
(2) Others		
(4) Interest on Debtors and Other Receivables		
TOTAL	**1970048.15**	**3337785.78**
SCHEDULE :18 OTHER INCOME		
(1) Profit on Sale/Disposal of Assets		
(1) Owned Assets		
(2) Assets acquired out of grants, or received free of cost		
(2) Export Incentives realized		
(3) Fees for Misc. Services		
(4) Others (Specify)		
Misc. Receipts		5500.00
WII Contribution (GPFA/c)		3299430.00
Misc. Receipts (GPFA/c)		2154383.05
Consultancy Project Receiptn during the year		
EMD Forfeited		10000.00
Research Project		2935936.00
Rent	287003.00	166677.00
WII Products	94284.00	97682.00
Misc. Receipts (Penal Int. on Car Advance)		
Training Receipts Income		
EPF Receipts		
Misc. Receipts (Consultancy A/c)	359316.00	690230.00
Receipt for Project	2629857.00	1682052.00
Saving of Project Cost		
Misc. Receipts for Research Project	16796447.00	2475779.00
Interest on Bank Deposit		
Misc. Receipts for Research Project		
TOTAL	**20166907.00**	**13517669.05**

SCHEDULE : 20 ESTABLISHMENT EXPENSES		
(1) Salaries and Wages		
Fellowship	474066.00	285953.00
Honorarium	47863.00	23200.00
Medical	2016863.00	2036133.00
Salaries & Allowances	23385561.00	21271588.00
Stipend	103800.00	62671.00
Fellowship & Wages (Project)		1545530.00
Travel Exp. (Research Project)		205193.00
Wages	961504.00	892488.00
Salary & Allowances	106395.00	145000.00
Fellowship & Wages (Consl. Project)	562136.00	574050.00
Travel Exp. (Consl. Project)	181871.00	44811.00
Travel Exp. (Research Project)	692981.00	200435.00
Fellowship & Wages (Research Project)	3180716.00	732109.00
Salary & Wages		
(2) Allowances and Bonus		
Bonus	288898.00	249658.00
OTA	478403.00	415012.00
LTC	329285.00	371287.00
Travelling Allowances	2112222.00	1716344.00
Honorarium (Training A/c)	53850.00	12195.00
Training Allowances	948155.00	565520.00
(3) Others (Specify)		
Research Project Expenditure	15894885.00	2000000.00
(4) Contribution to Other Fund (Specify)		
Leave Salary and Pension Contr. To LIC		549193.00
(5) Staff Welfare Expenses		
Uniforms	82068.00	38489.00
Employer Contribution to EPF	8922.00	
(6) Expenses on Employees Retirement and Terminal Benefits		
Final Payment		810213.00
Leave Encashment		
Leave Salary and Pension Contribution	374119.00	
(7) Others (Specify)		
Commuted Value of Pension		328843.00
Misc./Cont.		
Pension/Family Pension		685781.00
Camp Expenses (Project)		136747.00
Advance/ Withdrawal		1645659.00
Camp Expenses (Consl. Project)	75304.00	10952.00
Camp Expenses (Research Project)	166432.00	655943.00
TOTAL	**52526299.00**	**38210997.00**
SCHEDULE : 21 OTHER ADMINISTRATIVE EXPENSES		
AMC of Computers	538462.00	144635.00
Annual Research Seminar	116479.00	183659.00
Auditors Remuneration		
Consultancy Charges		
Consultancy project Exp.		
Cont./Misc. (Conslt. Project)	258914.00	628984.00
Contingencies/Misc. (Project)	240123.00	860725.00
Contingencies/Misc. (Research Project)	2481505.00	326844.00
Contingencies & Misc.Exp.	3007750.00	2521292.00

Conveyance Charges	9073.00	13042.00
Electricity and Water Charges	3845375.00	3519599.00
Entertainment Charges	103825.00	232033.00
EPF Contribution	79142.00	87397.00
Estate Maintenance	918107.00	1744500.00
Estate Security	3392223.00	2365768.00
Exihibition & Museum		
Forest Advance		
Govt. Contribution to Pension Fund		
IUCN Contribution		
Lab Chemicals	551085.00	
Lab Expenses	418676.00	761918.00
Landscaping		
Legal Expenses	639725.00	531835.00
Library Books (Training A/c)		235537.00
Library Expenses	409778.00	42625.00
M.Sc. Course Expenditure		
Newspaper & Magazine	534605.00	500532.00
Operational Expenses	39272.00	45118.00
Pension & EPF Expenses	2220525.00	5823216.00
Pension Contribution	5000000.00	
POL & Maintenance of Vehicle (Project)	1442723.00	1094778.00
POL & Maintenance of Vehicle (Research Project)		567099.00
POL & Maintenance of Vehicle (Conslt. Project)	890240.00	166760.00
POL for Vehicles	12290.00	34437.00
Postage & Telegrams	1032189.00	1228403.00
Printing & Binding	216071.00	190771.00
Publication	449567.00	255711.00
Publicity & Advertisement	380532.00	38373.00
Rent of Buildings	91693.00	126693.00
Repair & Maintenance of Vehicles		
Repair of Computer	821202.00	525878.00
Sale tax (Contractor)		
Sample Testing Charges		
Sharing of cost of Kendriya Vidyalaya	1042320.00	
Sports Goods	140375.00	29399.00
Stationary	1533840.00	1137103.00
Stationary Exp.	629482.00	1196455.00
Telephone & TC	787915.00	1544383.00
Training Account Exp.		
Training Cost Expenditure	9000000.00	5000000.00
Training Receipts		
Travel Exp.	2042480.00	1887940.00
Workshop/Seminar	820098.00	95587.00
TOTAL	**46137661.00**	**35689029.00**
SCHEDULE 22: EXPENDITURE ON GRNAT / SUBSIDIES ETC.		
(1) Grants given to Institutions/Organisations		
(2) Subsidies given to Institutions/Organisations		
Govt. contribution to Pension Fund	3198285.78	
GPF Contribution	2997941.05	
TOTAL	**6196226.83**	**0.00**

(S.S. Lamba)
Finance Officer

(P.R. Sinha)
Director