WILDLIFE INSTITUTE OF INDIA

An Autonomous Institution of the Ministry of Environment & Forests

ANNUAL REPORT
1988-89

New Forest, Dehradun
December, 1989

AT A GLANCE

Wildlife Institute of India is a young national institute with a mandate to strengthen field conservation in India by providing trained professionals as wildlife scientists and managers and by providing researched scientific information. To this end the Institute conducts regular post graduate and inservice, long and short term courses. The Institute has an elaborate field based wildlife research programme addressing biological, managemental and human dimensions aspects, conforming to the national conservation priorities. Enhancing faculty proficiency and building up infrastructure mark the current institutional development phase and this report reviews the activities of the year 1988-89.

Training Courses conducted were a 9-month Post Graduate Diploma Course (20 trainees) and a 3-month Certificate Course (14 trainees) in wildlife management.

Post Graduate Education highlight has been the satisfactory progress of the maiden M.Sc. wildlife biology course launched in January, 1988 (7 students). The Institute is recognised as a Centre for Post Graduate Studies and Research in wildlife science by the Saurashtra University.

Short term courses in wildlife management, with a larger and quicker turn over, were launched this year to meet the needs of the states for managers capable of introducing at least a minimum level of scientific management in the national parks and sanctuaries. Three such 2-week Capsule Courses were conducted for inservice forest officers from the rank of ACF to CCF (41 participants). A high altitude census techniques workshop conducted in Dachigam National Park had in all 20 participants from wildlife wings of three Himalayan states and from the faculty of two universities.

A special training programme in elephant management was conducted for six officers of Sri Lanka and this covered management of populations and habitats, management in captivity, capture and translocation and damage control. Two Indian officers also received this training.

Research in Wildlife Science is a major activity providing not only scientific information for improving management but also inputting directly into faculty development. In addition to the 14 ongoing research projects, six new studies were launched this year. The study sites are distributed all over the country and encompass ecological,

management and human dimension aspects. The progress of the studies conducted by research fellows under supervision of the Institute faculty has been very encouraging. This programme also helps augment the present rather small pool of competent wildlife scientists.

As a part of **Consultancy Services** a special study was initiated for the Government of India for developing guidelines for management of wildlife in captivity and for preparation of management plans for zoological parks. First stage formulation of syllabi for regular training courses in zooo management has been done. The Institute plans to initiate such courses as a part of this programme in the coming year. Continuing its inputs into the major consultancy on "Planning of Protected Area Network in India" the Institute conducted two regional seminars in south and north-east regions as a follow up of its recommendations for setting up of new protected areas. These were well attended by the wildlife and other senior officers of the concerned states.

Among the publications a major out put was "A Manual on Wildlife Management Techniques for India". This is a book of high utility in population and habitat management in our protected areas. 'A Handbook on Indian Pheasants' was also published. Apart from this a large number of research papers and reports were contributed by the faculty in different symposia and workshops and a number of them were published in national and international journals. The bio-monthly Newsletter of the Institute was given a wider circulation this year.

Faculty development continued to receive support from the FAO-UNDP Project which has placed the services of international experts as well as provided scientific equipment. The main inputs came in the conduct of the M.Sc. Wildlife course and that of the research studies. Three faculty members also received specialised overseas training.

Infrastructural development covered strengthening of Library, Documentation, Laboratory, Herbarium and Computer facilities. Data of all research projects is being processed and analysed with the help of computers. The construction of main buildings in the new campus at Chandrabani, Dehra Dun got underway in August, 1988 as a part of a two and half year programme of new campus development.

The year gone by belonged to the ongoing eventful formative phase of the Institute. Activities in the coming year, 1989-90, promise to be no different. While continuing with the research, post graduate education and inservice training programmes, the long awaited five-year collaborative programme with the U.S. Fish and Wildlife Service gets started. This programme addressing mainly faculty development will focus on transfer of know-how in modern wildlife research methods employing computer based technologies.

INTRODUCTION

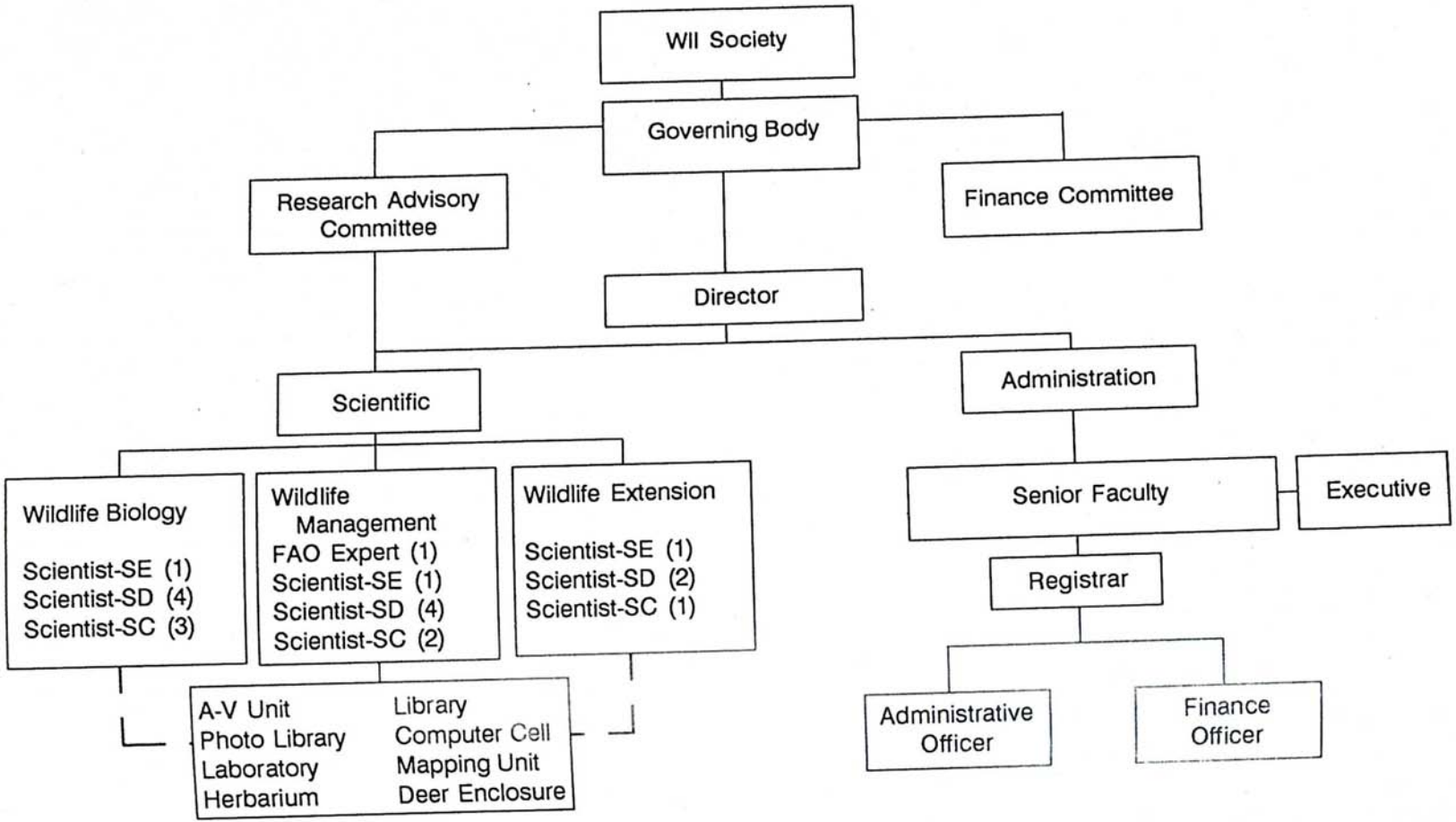
Wildlife conservation has travelled a long way from its past of addressing attention merely to some spectacular wild animals and birds in their choice habitats. It has, in recent times, proved to be the only effective means of preserving natural ecosystems which nurture gene resources and evolutionary processes in nature.

India is indeed privileged in its endowment of biodiversity, situated as it largely is in the tropics in the region of confluence of three major global biogeographical realms viz. the Paleoarctic (Eurasian landmass), the Afrotropical and the Indomalayan. This biogeographical feature is further enriched by a host of attributes of physical environment--great range of altitudes, and latitudes giving rise to a gradient of tropical thermo photo regimes, diverse land forms, varied climatic regimes, a long coastline and tropical islands, just to name a few. Little wonder, therefore, that our rich and diverse array of biological communities is well the envy of entire continents.

The development of a biogeographically representative network of national parks, sanctuaries and biosphere reserves and their appropriate management is the only way we can secure our genetic biomass wealth which represents a futuristic resource and on which economic growth and scientific progress will come to depend increasingly in the coming decades. Wildlife Institute of India's aim is to strengthen such an effort through scientific information and trained manpower.

Given our high population densities, with the forest living people still substantially dependent upon biomass resources, wildlife conservation measures face resistance from local communities. Conservation planning and management must therefore take into account this special situation in a perceptive and responsive manner. Unfortunately this important human dimension of wildlife management has failed to receive due attention hitherto,

WILDLIFE INSTITUTE OF INDIA
Organizational Chart



leading to the present scenario of aggravated interface conflicts.

We must peer closely into the relatively recent chronicle of the ravage of our wilderness. While we cannot unlive this inglorious past, we certainly can identify the aberrations and incongruities in the landuse, the resource utilisation practices and the development strategies which have mainly been responsible for this debacle. Proper scientific and socio-economic investigation of the resource dependencies and of the resource productivity parameters is a pre-requisite to the planning and implementing of mitigatory measures, the goal being ecologically sustainable and economically advantageous development of the inhabitated surrounds of protected areas. This underscores the need of visualising protected areas in the context of their regional setting with both ecological and human aspects adequately cared for through a zonation approach and zonally appropriate development-management strategies.

The Wildlife Institute of India is alive to the aforementioned realities of the field and to the need for a holistic and integrated approach to wildlife conservation planning and management so that it compatibly becomes a part of the overall national development effort. This concern is reflected in the various training courses conducted by the Institute as well as in its education and research programmes. The development of skills among wildlife professionals, which will enable them to meet the emerging challenges in the field, is the principal mandate of the Institute and its various activities are geared toward this end.

The report reviews the progress of the Institute in 1988-89 during its present developmental phase marked by concerted academic and institution building activities.

THE OBJECTIVES

The major objectives of the Institute are :

1. Training managers and biologists for protected area management and wildlife research;

2. Training education and extension specialists for protected areas to gain public support for wildlife conservation;

3. Providing orientation courses for those involved in land-use management;

4. Conducting and coordinating applied wildlife research and evolving relevant techniques suited to Indian conditions;

5. Creating a database for building up a wildlife information system employing modern analytical techniques and computer equipment; and

6. Providing advisory and consultancy services to Central and State governments, universities, research institutions, and other official and non-official agencies.

INSTITUTIONAL STRUCTURE

WII is organized into three scientific faculty divisions, viz. Wildlife Biology, Wildlife Management, and Wildlife Extension. An organizational chart showing how the various divisions and wings of the Institute relate to one another is given on page 5. Each of the faculties is headed by a Scientist-SE, and the administration division by a senior faculty coordinator who has a ì.pn6 post of a Registrar to assist him. Out of a sanctioned strength of 28 faculty posts in the scientists category 22 are currently in position, including the Director. There are in addition 25 Research Fellows. Of the remaining 22 technical level posts, 13 have been filled up. In the administrative category 31 out of 38 positions have been filled, and against 42 maintenance level posts 38 incumbents have been recruited.

THE ACTIVITIES

The primary aim of the Institute is to develop a cadre of trained wildlife managers, and a pool of scientific personnel including researchers and wildlife biologists. Its attempt is to provide training and research inputs for better management of wildlife and wild habitats in the country, in a manner that our efforts at the conservation of our natural heritage are compatible with the present-day field realities. It is hoped that the personnel and researchers trained by the Institute will fulfill the requirements of the state forest departments, academic and research institutions including universities, and various other agencies; a few of them may also be absorbed by the Institute itself. Towards these objectives, WII carries out training,r teaching, research, and consultancy.

The following sections present a round up of the Institute's activities during 1988-89 under three broad groups:

1. Academic
2. Organizational
3. Developmental

Training Programmes

One of the primary responsibilities of the Institute is to train in-service personnel of the state forest departments and wildlife wings, in the field of wildlife management. For this purpose the Institute conducts a number of short-term and long-term courses. There are two regular longer term training programmes in wildlife management: a Post-graduate Diploma Course in Wildlife Management for the officers at the level of director/officer in-charge of a protected area, and a Certificate Course in Wildlife Management for the officers at the level of Range Forest Officer.

The **Post-graduate Diploma Course in Wildlife Management**, of 9- months'duration, imparts training in management planning, strategies, and techniques that are most appropriate to today's ìconservation situations and needs. The trainee officers are put through a programme involving both the theoretical and the practical aspects of management of wildlife and protected areas. The programme includes visits to representative wildlife areas in different parts of the country to get a first-hand experience of management problems and remedial measures. Special emphasis is laid on preparing them to handle the buffer zones of our protected areas, where wildlife-people and habitat-people interface conflicts today pose the greatest challenge to conservation. The legal aspects of protected-area management, including the enforcement of wildlife and forest laws, constitute another important area of instruction. A major part of the course is devoted to training these officers in the preparation of management plans for protected areas. This includes a 6-week field exercise in management planning, in an appropriate national park or sanctuary. At the end of this exercise each trainee has to independently devise and write up a management plan for the area.

The 3-month Certificate Course in Wildlife Management trains personnel at the field executive level, i.e. Range Forest Officer. The course structure is quite similar to that of the Diploma Course but the emphasis here is more on the practical aspects of wildlife management than on theory. The course thus aims at preparing the Range Officers so that they may be able to properly implement management plans as well as perform for the practical tasks that they encounter in their everyday duties in the field. This course, too, has a sizable component of field tours and exercises.

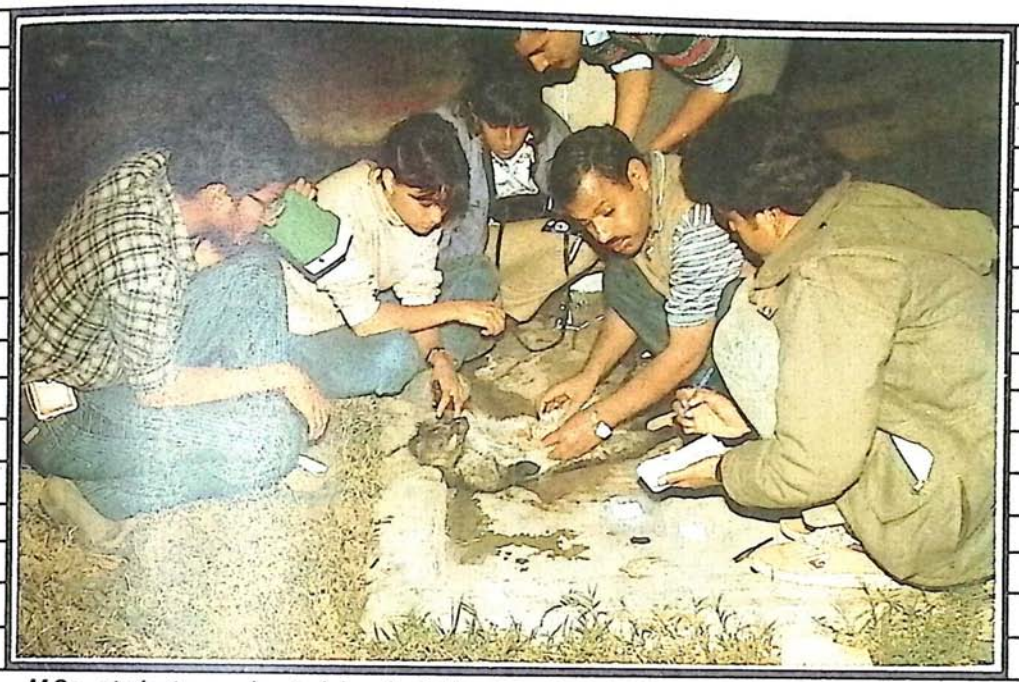
In addition to these two regular training courses, a number of short-term courses and training workshops are conducted to meet specific training needs of the target groups involved. Most of these are of two to three weeks duration. Among these, a Capsule Course in Wildlife Management is organized at Dehradun and in some protected areas for a regional coverage. This course was started out of the realization that the number of protected areas in India is quite large, and the Diploma and the Certificate courses put together cannot turn out trained officers at the desired rate. The Capsule Course thus provides a short-duration, high-turnover option. Open to officers of state forest departments and wildlife wings this course aims at enabling them, in a short time, to introduce a minimum component of scientific management in the administration of protected areas, and providing for wildlife habitat concerns in the course of forestry operations in forests outside the umbrella of the protected-area network of India.

Post Graduate Degree Programme

The Institute started its post-graduate degree programme inr 1987-88 with the introduction of an M.Sc. Course in Wildlife Biology. This programme aims at producing qualified field biologists and ecologists who could pursue a career either in research with the state wildlife wings/forest departments or other research organisations, or in teaching at the universities which are setting up new courses in wildlife biology and ecology. The M.Sc. programme has thus not only met the long-standing demand for a good post-graduate degree course in Wildlife Biology but has also extended WII's academic activities beyond the training of in-service officers.

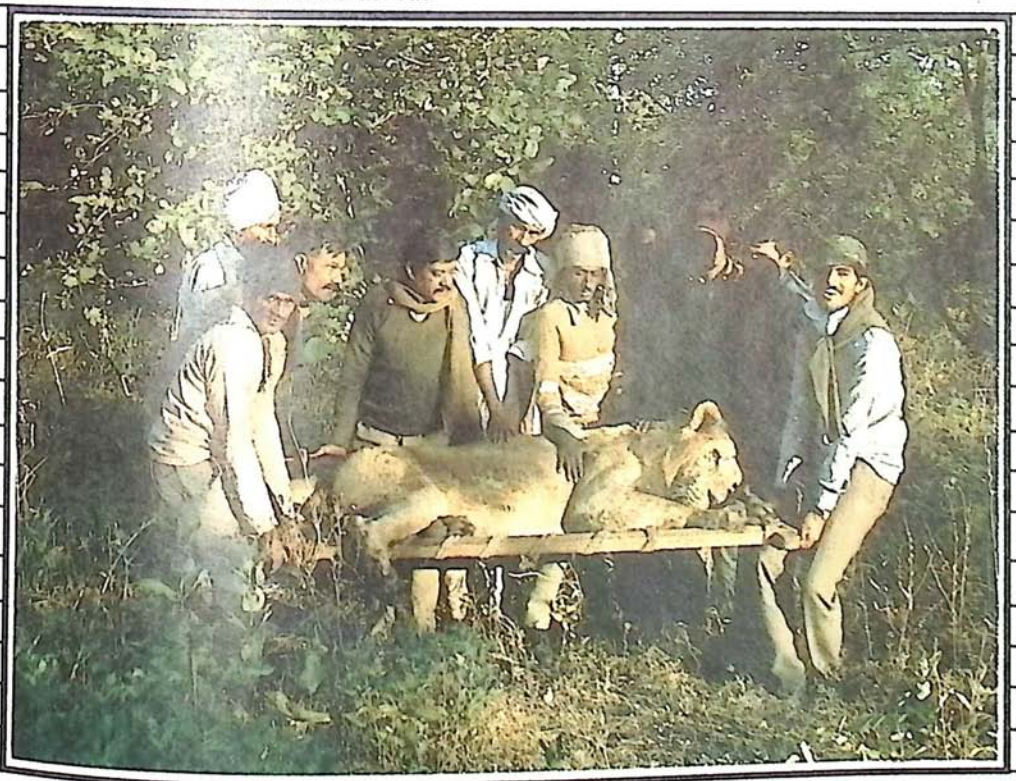
This course is of two years (four semester) duration. It admits direct entrants from Indian and foreign universities who have graduated in one of the specified Life Sciences/ Forestry/Veterinary courses. But it has also provision for taking in-service forestry and wildlife candidates.

Applications for enrolment are screened, choosing those with good 1st class and some evidnece of conservation interest. All those chosen then appear in a national entrance test and the top twenty or so are called to an interview in which the first 6 or 7 candidates are chosen. The Institute provides scholarships for six candidates. In the first course the Bombay Natural History Society provided one, as Salim Ali Memorial Scholarship. IUCN has also offered scholarships for this programme.



M.Sc. students receive training in field research techniques.

The Lion Ecology Project continues to assess the population, predation, and activity patterns of the Asiatic Lions in Gir.



Saurashtra University in Rajkot, Gujarat awards the Master of Science, Wildlife degree and for this purpose the WII is recognised as a Centre for Post Graduate Teaching and Research.

The first course commenced with seven candidates in January, 1988 and the screening process was well underway in March, 1989 for the second course due to start in July, 1989. Interest in the M.Sc. has been exceptional, over 1300 applications having been received for the second course, including several who have M.Sc in other disciplines or have professional training as veterinarians.

The syllabus gives great emphasis to field work, there being some ten weeks of formal field courses besides several weekends and day long trips prior to eight month dissertation. The syllabus is broad based, with considerable attention being given to an understanding of the environment of India. As most candidates come from strong zoological backgrounds, there is a large botanical component as well. The strongest emphasis however is on vertebrate ecology and behaviour and the inter-relationships between animals and their habitats. Considerable time is spent on research methodology including quantitative analysis and computing, chemical capture, census techniques, laboratory nutritional and dietary analyses and remote sensing technologies.

The programme recognizes that the graduates will largely be working in the field of conservation and so there are courses on conservation, human ecology and wildlife and forest management which introduce the students to the reality of the wildlife situation in India and elsewhere. The syllabus introduces the student to independent study through formal term papers, major essays on wildlife science topics which necessitate much library research and data compilation. The degree is examined both by semester examinations and by course work: essays and practical reports. There are field based practical examinations each semester to ensure the students are competent in basic field craft. Finally, the dissertation accounts for one quarter of all marks for the degree.

Regular Courses in 1988-89

M.Sc. Wildlife Biology: The first 2-year M.Sc. course of WII started in January, 1988 is successfully nearing completion. The students have undertaken a series of field tours interspersed with classroom teaching and laboratory work. They have already appeared for the examinations for

three semesters out of four. Their academic performance as adjudged so far through classroom and field work is good and all of them have aptitude for studies in wildlife science. The students are currently engaged in field research for their dissertation which form the last semester of the course.

The Institute has taken the view that the dissertation should both be a research training and an exposure to working independently in the field in realistic wildlife situations. The dissertation topics reflect this decision, viz:

- An investigation of core zone - buffer zone status in Palamau Tiger Reserve.

- Niche separation between three sympatric bovids inJodhpur District.

- Niche separation between three sympatric small carnivores in Keoladeo Ghana National Park.

- Movement patterns and habitat use in black bears in Dachigam National Park.

- Feeding preferences of black bears in Dachigam National Park.

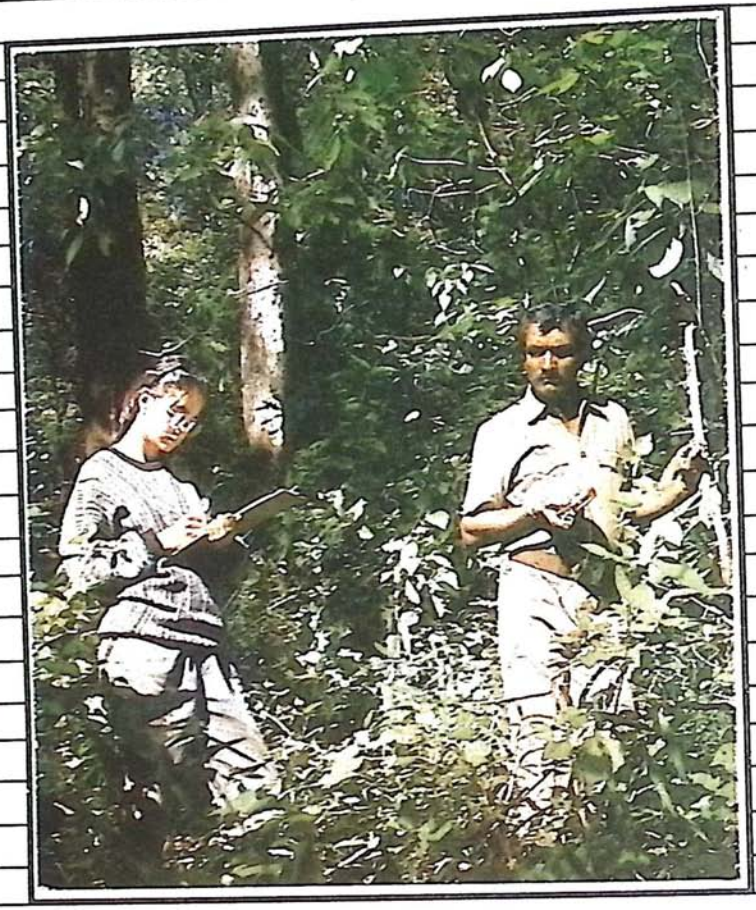
- Altitudinal and vegetation effects on Himalayan avifauna in Dachigam National Park.

- Porcupine and tree debarking in Sariska Tiger Reserve.

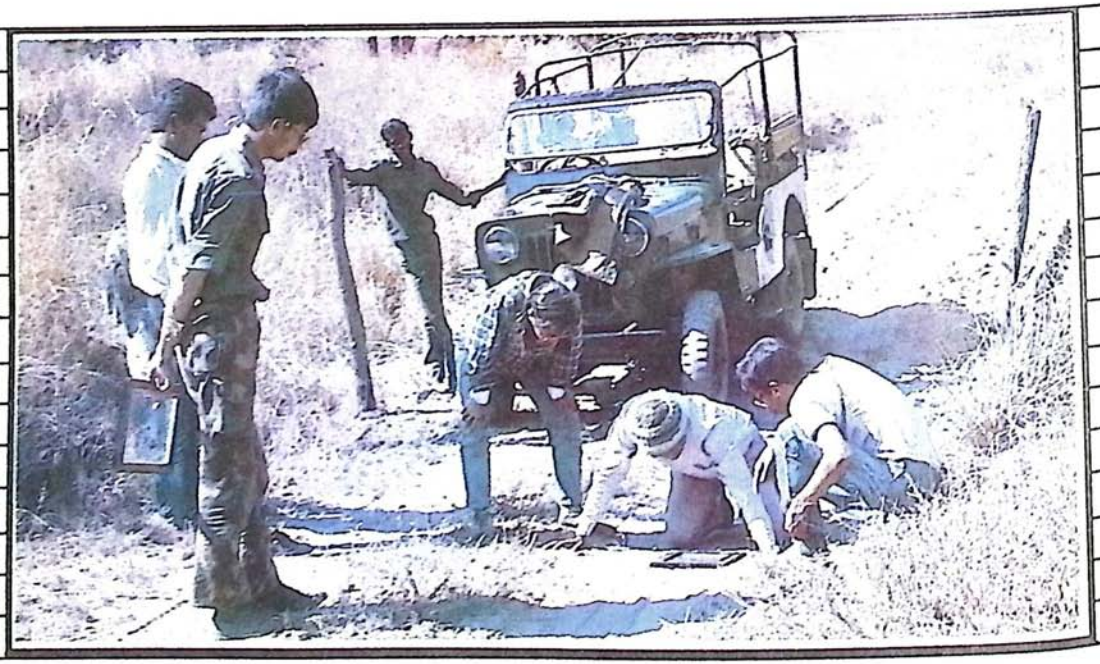
These research projects not only serve as research training for the students but also contribute to the still scarce body of knowledge on India's wildlife. The Institute is planning to recruit several of the M.Sc. graduates into its own continuing research programme.

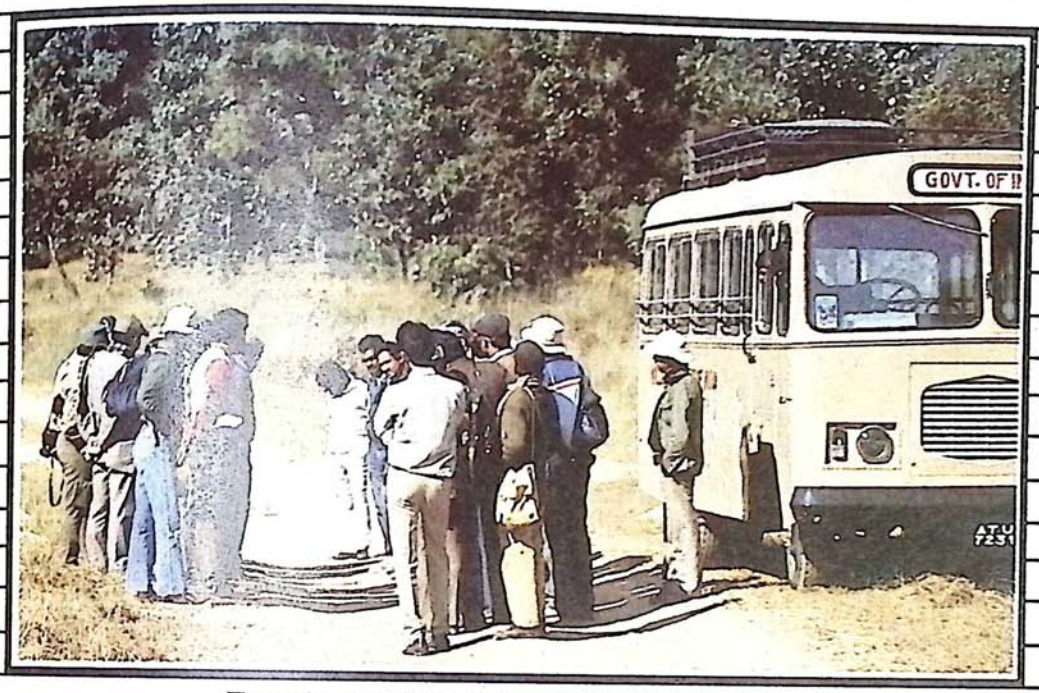
Preparations are now on for the admission of the second batch of students for the M.Sc. course following a national test.

IX Diploma Course in Wildlife Management: The IX Diploma Course which started on 1st August 1987 came to an end on 30th April 1988. 24 officer trainees from 14 states and union territories successfully completed the training.



The first batch of students in the M.Sc. Wildlife Biology Course is now engaged in field research and data collection, in preparation for their dissertations.





Three Capsule Courses have been conducted this year, turning out 41 trainees from the rank of ACF to CCF.

X Diploma Course in Wildlife Management: The X Diploma Course, which started on 1st August 1988, will end on 30th April 1989. Twenty officer trainees from 12 states are attending this course. Of the total training period of 39 weeks, the class utilized 14 weeks in field tours, visiting various protected areas of the country. Classroom teaching, laboratory work, guest lectures, group discussions, class tests, and library work constituted the remaining period.

The first field tour was the one-week Orientation Tour to Chilla Range in the Rajaji National Park where the trainees were acquainted with basic techniques of observing wildlife and their ihabitats, quantifying observations, collecting study materials, and interpreting wildlife signs and evidences.

The Wildlife Field Techniques Tour was conducted at the Kedarnath Musk Deer Sanctuary, the Sariska Tiger Reserve, and the Keoladeo National Park of Bharatpur. Trainees evaluated the musk deer breeding project, discussed the problems of regeneration and visited the High-altitude Plant Preservation Centre at Kedarnath. At Sariska, exercises on wildlife population parameters and census methods for various species were conducted, besides studies on habitat analysis and evaluation, animal behaviour, visitor management, facility and interpretive resource inventory, and park zoning for recreation. At the Keoladeo National Park, trainees were familiarized with the intricacies of wetland ecosystem management and its related conservation problems, with the assistance of Park personnel and the BNHS research team stationed in the Park. The last part of this tour included visits to the National Zoological Park and the National Museum of Natural History, both in New Delhi. Personnel from these institutions, and the accompanying WII faculty, highlighted the role of zoos and musea in the mobilization of public support for conservation, through awareness building.

The object of the Management Tour, conducted in selected wildlife reserves of Rajasthan, Gujarat, West Bengal, and Assam was to facilitate the trainees' understanding of the practices and problems of wildlife management, using a variety of field situations in selected wildlife areas of the country. To put this learning into practice, a Management Planning Tour of 4 weeks duration was conducted at the Satpura National Park, following which each trainee independently prepared a management plan of the study area. These plans will be evaluated for course credits.

Guest Lectures form another important part of this training. Guest speakers with considerable experience in wildlife management and environmental issues were invited both from within and outside the country to share their knowledge and management expertise with the trainees and the faculty. Besides this, the trainees participated in a number of in-house seminars and group discussions on various issues related to wildlife management.

V Certificate course in Wildlife Management: The V Certificate Course in Wildlife Management commenced on 1st May 1988. Fourteen participants (13 Range Forest Officers and one ACF) from Tamil Nadu, Karnataka, Andhra Pradesh, Maharashtra, Madhya Pradesh, Himachal Pradesh, Assam, Meghalaya, Andaman & Nicobar Islands, and Dadra & Nagar Haveli were admitted to this course.

The 13-week course curriculum was made up of eight weeks of classroom lectures and five weeks of field tours. Classroom work covered various components of the three broad disciplines of wildlife science--Wildlife Biology, Wildlife Management, and Wildlife Extension. Special emphasis was laid on integrating the socio-economic and legal aspects of management of protected ìareas. All teaching inputs were backed up as far as possible, with practical demonstrations, open discussions, audio-visual presentations, and literature reference. Important inputs to teaching were provided by guest lecturers and subject matter experts visiting the Institute.

Two field tours formed an important part of the Certificate Course. First among these, the Techniques Tour, was conducted in the Chilla Range of the Rajaji National Park from 21st May to 1st June, 1988. Training exercises during this tour included interpretation of animal evidences and behaviour; collection, recording, and management of field data; animal capture; animal census; habitat evaluation; and impact assessment. The use and erection of modern wildlife barriers such as power fencing was also demonstrated. Trainees learnt how to apply radio telemetry for improving management strategies; during their fieldwork they had the opportunity to actually radio-track and monitor a radio- collared elephant of the Park.

The class undertook the second tour, the Management Tour, from 8th June to 26th June 1988. As part of this tour the trainees were taken to Kanha, Panna, and Bandhavgarh National Parks, with the object of familiarizing

The rhinos reintroduced into the Dudhwa National Park continue to be monitored in WII's ongoing research project, so as to provide advisory inputs for their better management. The recent alarming decline in the Dudhwa population of the endangered swamp deer led to the launching of another project here, to investigate key population and habitat parameters for this species. Significant findings are constantly being conveyed to the Park management.

them with the management problems of protected areas, and demonstrating how various scientific management strategies can bring about favourable changes in the conservation status of these areas. Special emphasis was laid on exposing the trainees to conflict situations arising in and around protected areas, and the human dimension in wildlife management. The tour also included a visit to the crocodile breeding and rearing centre at Kukrail, Lucknow, where the role of such rearing centres in conserving India's endangered crocodilian species, through active management practices such as 'grow and release', was highlighted. The centre's efforts in breeding and restocking gharials into the wild in the National Chambal Sanctuary, and the subsequent management problems of the free-ranging animals were also pointed out. Besides this, the trainees were acquainted with modern practices of zoo management at the Prince of Wales Zoological Garden at Lucknow. Towards the end of this tour, they visited the Keoladeo Ghana National Park at Bharatpur and studied the management of this wetland ecosystem.

After each tour the trainees were asked to write detailed tour journals, which were evaluated by the faculty. At the end of the course the trainees' performance was assessed through an examination consisting of three theory papers and related practical tests. Course credits from the tour journals were also taken into account for computing the overall results. All 14 trainees qualified for the Certificate in Wildlife Management. The outstanding among them were awarded medals and prizes. The course ended on July 28, 1988.

Short Term Courses in 1988-89

Capsule Course in Wildlife Management: During the reporting period, 3 capsule courses in Wildlife Management for Forest officers were conducted as per the schedule given below:

i) 5-19 September 1988 at the Bandipur National Park, Karnataka for officers of the southern states.

ii) 4-15 January 1989 at the Kanha National Park, Madhya Pradesh for officers from the central and northern states.

iii) 27 February-10 March 1989 at the Kaziranga National Park, Assam for officers from the eastern and northeastern states.

In all a total of 41 officers from the rank of ACF to CCF attended these three courses during 1988-89. The first course had 14 participants from 5 states, the second had 16 from 7 states while the third course had only 11 participants from 5 states.

The participants of each course were asked to evaluate the utility, quality and duration of the course through a questionnaire. The results of these evaluations can be summed up as follows:

a) Utility - High. Courses must be continued.

b) Quality - Very good. Suggestions to bring down component of wildlife biology and to enhance that of management.

c) Duration- By and large 10 to 12 day duration was considered appropriate. However the senior level partcipants were of the view that a separate one week (5 day) course should be organised for officers of the rank of Conservator of Forests and up.

It is proposed to continue the 12 day capsule courses in the coming year for inservice forest officers of ACF and DCF levels but these courses will be based at Dehra Dun itself. In addition, a 5 day senior level capsule course will be conducted for officers of the rank of Conservator and above at a National Park or sanctuary setting, selected on a regional basis in successive years. This course will lay greater emphasis on policy issues and management approaches.

It is also proposed to undertake one course every year on wildlife management as a part of the one week compulsory training programme for IFS officers.

Elephant management training programme: A two-week training programme in elephant management was organised by the Institute for six Sri Lankan and two Indian wildlife officers. The programme was conducted from 16th to 31st January, 1989. The training began with participation in the National Symposium on Ecology, Biology, Management, and Diseases of the Asian Elephant, organised at Trichur by the Kerala Agricultural University. This was followed by a 5-day field training programme at the Mudumalai Wildlife Sanctuary. The participants were addressed by biologists from the Bombay Natural History Society, the Indian Institute of Sciences, the Kerala

Agricultural University, and officers from the forest departments of Tamil Nadu and Kerala. Topics such as elephant research in south India, elephant management in captivity, elephant tranquilisation, electric fencing and elephant translocation were covered. The last phase was a field training programme and a discussion session in Dehradun. The field training included radio-tracking and radio- collaring exercises on elephants of the Rajaji National Park. The rounding up session of discussions covered the problems of Asian and African elephant conservation, and the validity of the training programme in the Sri Lankan context.

Symposia/ Workshops/ Conferences

A faculty member attended the VIIth Annual Meeting of the International Association for Impact Assessment which was held at the Griffith University in Brisbane, Queensland, Australia from July 4-10, 1988. This meeting was attended by over 350 professionals from around the world and the theme of the Conference was "Integrating Impact Assessment into the Planning Process" The role of EIA in assuring sustainable development was highlighted. A paper on "The Social Consequences of Protected Area Development on Resident and Neighbouring Populations" was presented by the participating WII faculty member at the Conference.

The Director, WII, two faculty members and one research fellow participated in the International Asian Otters Symposium which was held at Bangalore, Karnataka from 16-19 October '88. A paper on the "Distribution and status of the smooth otter in National Chambal Sanctuary" was presented by a faculty member and the research fellow. Another faculty member presented a paper on "Breeding of Indian smooth otter (Lutrogale perspicillata) in captivity-- some important regulatory factors" at the Symposium. Based on the deliberations a broad-based conservation action plan was formulated emphasising the need to declare otters as indicators of acquatic habitat health.

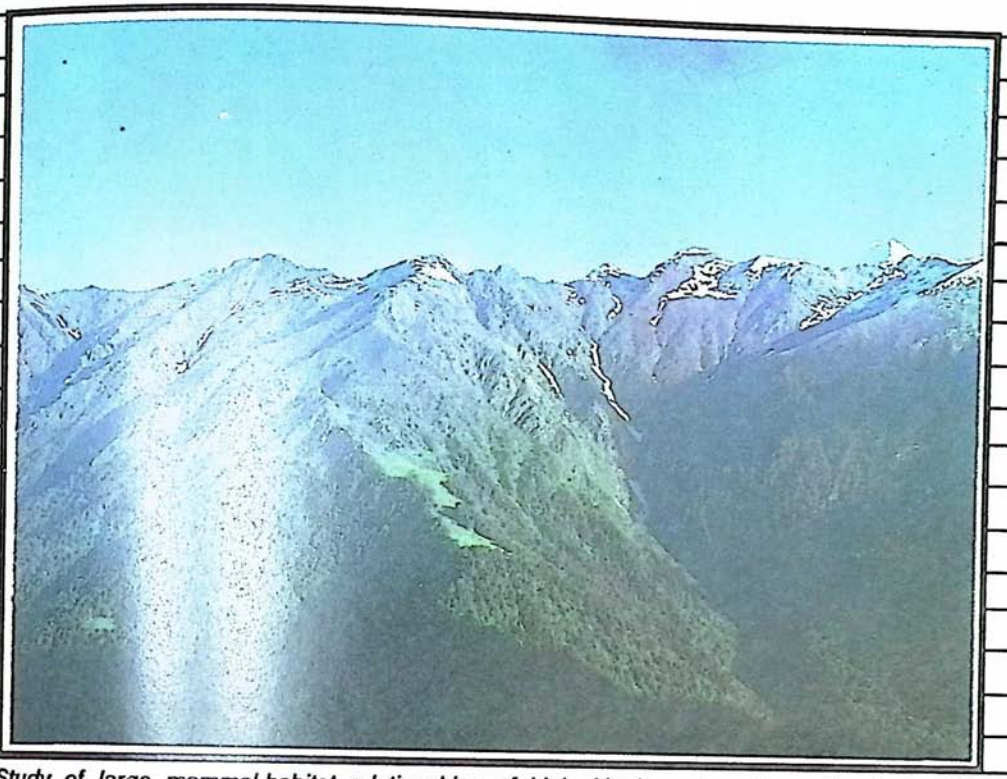
A High Altitude Census Workshop was conducted by the Institute at Dachigam National Park, (Jammu & Kashmir) from 24-29 October 1988. The Workshop was attended by forest and wildlife department officials from the states of Uttar Pradesh, Himachal Pradesh and Jammu & Kashmir. In addition, some faculty and students of Kashmir University, Srinagar and Aligarh Muslim University, Aligarh also took part in the workshop in which icensus methods employed in different high altitude areas for different species were discussed.

Two regional Seminars on the Biogeographic Project were held, one on 19th October 1988 at Bangalore in which senior forest department officials of Karnataka, Kerala, Tamil Nadu and Andhra Pradesh participated in addition to several NGOs. The second such seminar was held in conjunction with the capsule course conducted by the Institute at Kaziranga national Park from 27 February - 10 March 1989. This seminar was attended by officers from Tripura, West Bengal, Arunachal Pradesh, Assam and Sikkim. At these seminars the rationale behind the suggested protected area network in the states and their importance was explained by the Director and Dr.W.A.Rodgers, FAO Expert, who are the authors of the Biogeographic Report. The participants interacted and suggested additions/deletions of areas in the PA network for their respective states. More regional seminars are being planned for each zone.

A faculty member presented a paper on "Bamboo (*Dendrocalamus strictus*) Resources of outer Himalayas and Shiwaliks of Western Uttar Pradesh: A conservation plea for habitat restoration" at the International Bamboo workshop held in Cochin from 14-18 November 1988. This workshop was organised by the Kerala Forest Research Institute and sponsored by the International Development Research Centre, Canada. There were over 100 participants from all over the world. The recommendation of the workshop included provision of greater emphasis on conservation and ecological aspects of Bamboo forest management.

The Director, WII attended the National Conference on the Environment organised by the Ministry of Environment & Forests and held at the Forest Research Institute, Dehra Dun from 15-17 December 1988. The objective of the Conference was to discuss India's achievements in the environment sector in the last 40 years and to identify the strengths and weaknesses of existing policies, and to make recommendations regarding future policy options. The Director participated in the resolutions committee on Forests and Wildlife.

Two faculty members attended the National Symposium on Natural Resources and their Conservation organised by the Division of Post-graduate Studies in Wildlife Biology, A.V.C.College, Mayiladuthurai, Tamil Nadu from 15-17 February 1989. There were over 140 participants from all over India in this national symposium in which the WII faculty participants presented papers on "Habitat Utilization



Study of large mammal-habitat relationships of high-altitude regions forms the basis of the Kedarnath Ecology Project.

A recently initiated project is attempting to assess the degree of genetic contamination in the Asiatic Wild Buffalo of Assam, which is threatening this species.

of some wintering shore birds in Point Calimere Sanctuary, Tamil Nadu" and "Human Impact on Nilgiri Langur Habitat in Mundanthurai Plateau, Tamil Nadu". The second paper was presented jointly by a faculty member and a research fellow.

The WII organised the **Annual Research Fellows** Seminar from 27-28 September 1988 at Dehra Dun. This seminar is presented by the Institute's Research Fellows based on their respective research projects. 9 research fellows presented the work done by them during the year.

Faculty members of WII also participated in the following Confereneces/Workshops/Seminars during the year under report:

i) International Conference on The Future of Tropical Rain forest organised by Oxford Forestry Institute, U.K. from 27-28 June 1988.

ii) British Ecological Society Jubilee Symposium on Towards a More Exact Ecology at Oxford University, U.K. from 13-15 September 1988.

iii) Conference on Resource Sensing from Space held as part of the Festival of France in India at New Delhi in February 1989.

iv) The Third International Rangelands Conference held at Vigyan Bhavan, New Delhi during November 1988.

v) Symposium on Developmental Physiology and Applied Zoology, organised by the Department of Zoology, M.S.University, Baroda from 16-18 August 1988.

vi) All India Zoo Veterinarians' Seminar organised by the Forest Department, Government of Punjab from 2-3 December 1988 at Chandigarh.

RESEARCH

One of the primary objectives of the Institute is to conduct research in selected priority areas pertaining to conservation of India's living natural resources. The Institute is also being increasingly looked upon as an important centre contributing to the development of wildlife science in India and the region. The Institute attempts to meet this objective through its several research projects, and to some extent also by interacting with various

universities and other research organizations, both in India and abroad. WII's research projects are seen as an important means of developing the professional capabilities of its faculty, by keeping the researchers abreast of current field situations, management needs, and research trends. This should help to ensure that the faculty's own inputs and teaching methodologies are constantly updated and upgraded.

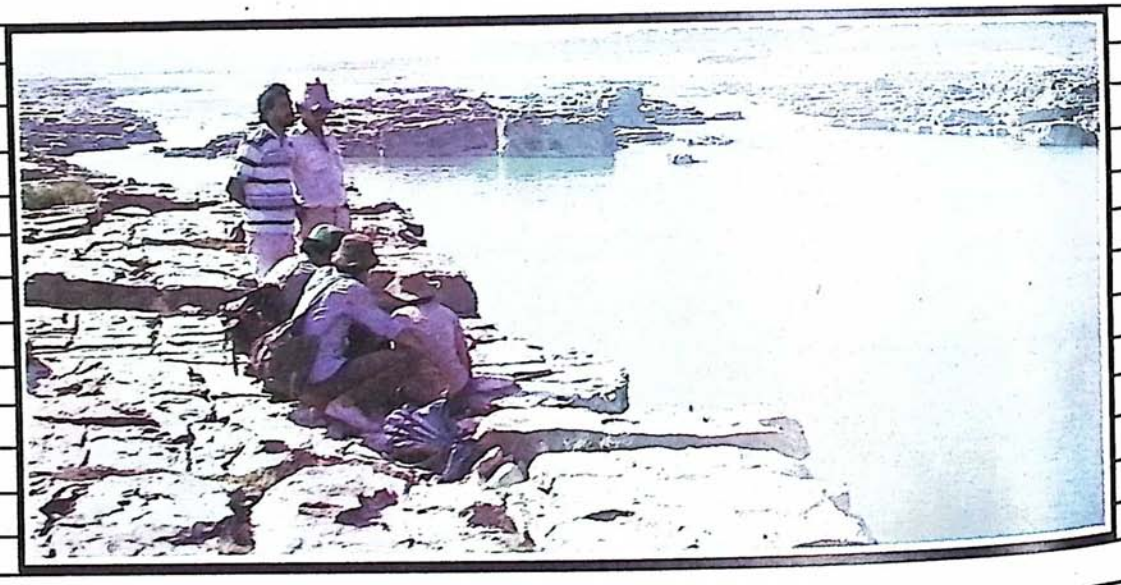
To aid the Institute in setting its research priorities, and to coordinate the procedures of screening and evaluation, a Research Advisory Committee has been established. It has eminent conservationists and academicians as its members. The thrust of the Institute's research effort is on the applied aspects and its prioritization takes into consideration the various ecological, biological, and socio-economic problems encountered in the field. Research projects are conceived and devised in such a manner that their findings are of direct help to conservation.

A brief resume of progress under each of these projects is as follows:

The Ecological Studies of Snow Leopard and its Associated Prey Species in Hemis High Altitude National Park: This is an important study in the fragile, mountainous cold desert ecosystem, which challenges human faculties of both physical endurance and understanding of scientific and socio-economic parameters. During 1988-89, the researcher gathered data on many aspects of Snow leopard ecology. He has characterized snow leopard habitat use, movements, and marking frequency based on observations over 80 km of fresh tracks. Scats of snow leopard have been collected extensively and scat locations have been marked on the map. In addition, a number of blue sheep kills have been identified as victims of either snow leopard or wolf. Data has also been collected on the habitat use by blue sheep, shapu and argali. Designing, developing and monitoring snares and traps for catching snow leopard was a major accomplishment during the year. A snow leopard was radio collared for collecting location data. After two months, however, the animal lost its collar which was recovered later on a scree slope. Information on the vegetation types and habitat/rock features has been collected which has helped in preparing a proper habitat map of the study area.

Field work will be continued by the research scholar upto March 1990. During this period data on the snow leopard's

The National Chambal Sanctuary is the setting for two current projects of WII. One is an ecological study of the sanctuary's freshwater turtles, while the other is investigating the ecology of aquatic mammals, including dolphin and otter.



habitat use and all other relevant aspects will be collected.

Genetical and Ecological Studies on Asiatic Wild Buffaloes in Assam: A three year study on wild buffaloes (Bubalus bubalis Linn.) was initiated in January, 1989. The problem of conserving this species is two pronged:

(i) Population in the North-East India is facing genetic swamping due to contamination from inbreeding with domestic buffaloes, and

(ii) The species is critically endangered because of protection problems and habitat ravage.

A research proposal was drawn-up having the following two aims:

(a) To identify different categories of genetic contamination (probably, pure wild, low contamination, heavy contamina- tion and domestic), based on morphological, behavioural and genetic aspects including electrophoretic studies of blood enzymes, proteins and nucleic acids.

(b) To carry out ecological studies for recommending necessary prescriptions for its management. Attempts for understand- ing mechanics of genetic contamination with domestic buffaloes will also be made.

The researcher and the supervising faculty visited Manas T.R., Kaziranga N.P. and other protected areas in Assam for reconnaissance. A report on the reconnaissance visit has been prepared. Further project work is in progress.

Investigation of Biogeographic Patterns of Relevance to Planning of Long Term Wildlife Conservation Strategies: The project concentrates on two areas: Meghalaya and U.P.Himalaya's with a view to developing viable conservation strategies for the extensive endemic and rare flora in these regions. The study for plant conservation planning in both the areas was completed and the report prepared, which is now being edited.

Monitoring of Rhinoceros Introduced in Dudhwa National Park: The initial task of broad monitoring mainly relating to home ranging patterns having been achieved, a report on broad monitoring that was prepared. All habitat and behaviour related quantifying factors are currently

being studied. In addition advisory inputs are being provided regularly for better management of rhinos. One rhino female gave birth to a calf during February 1989. Both the mother and the calf are being intensively monitored in a separate power fence enclosure especially erected, since calf predation by tiger can be a threat to its survival. All the rhinos are in excellent health.

The Management and Ecology of Swamp Deer (Cervus duvauceli duvauceli) in Dudhwa Tiger Reserve: Midway in the year, a status survey of the swamp deer in Dudwa Tiger Reserve indicated an alarming decline of the species, heretofore the largest single population of this sub-species of the swamp deer in India. A management oriented project was launched in January 1989 which focuses on the key population and habitat parameters. Important findings of management significance requiring immediate attention are being conveyed to the park manager from time to time. The field study phase would cover two years.

An Investigation of the Habitat Ecology of Kedarnath Wildlife Sanctuary: The major objectives of this high altitude alpine habitat study project are: to study the large mammal-habitat relationships in the sanctuary, to develop appropriate methodologies of estimating animal abundance, to collect suitable baseline data, and to make a comparative assessment with the nearby Govind Pashu Vihar Sanctuary.

The field programme for this project began with a reconnaissance trip by the researcher in January 1989. This was followed up by logistics planning and appraisal of methodologies. Regular field work began in March 1989. A firm basis for an intensive study was established along with collection of very useful information during this initial period. Data on plant community structure ìalong an altitudinal gradient of 1700 - 3400 m. were obtained. Along this gradient, large mammal community distribution, abundance, and habitat use are being investigated. In addition, five more transects were established in different parts of the sanctuary encompassing different habitat types to establish habitat/mammal relationships. The wild mammals sought to be included in this study are sambar, barking deer, goral and Himalayan thar.

Food Habitats and Ranging Behaviour of threatened Nilgiri Langur (Presbytis johnii) in Mundanthurai, Tamil Nadu, India: The main objective of this study is to correlate the food habits and ranging behaviour of a group of Nilgiri

langur with restricted habitat so that general habitat problems of circumscribed groups of endangered primate can be identified.

The study areas (two) were quadrat mapped, at a scale of 25m x 25m and tree species were tagged and monitored to collect information on phenology. Scan method and location plotting were used to collect information on the feeding behaviour and ranging pattern of the langur groups.

Field work was completed in June 1988 and data on the following aspects has been entered in the computer: phenology, range quality assessment, rate of habitat destruction from human activity, behaviour and ranging patterns, demography. Data analysis and literature referencing is currently in progress. The final report is expected to be completed by end of 1989.

Ecology of the Endangered Grizzled Giant Squirrel (Ratufa macroura), Tamil Nadu: The main objectives of this project are to find the present range and estimate the population of this endemic species in Tamil Nadu; Conduct quantitive vegetation and phenology studies in Alagarkoil valley; Collect information on food habits, activity and movement pattern of the selected squirrels; and Identify and quantify the characteristics of the nest trees and make necessary recommendations to improve the squirrel population in and around the study area and in other potential areas.

Home range of selected study animals was quadrat (15m x 15m) mapped and the squirrels were followed intermittently for atleast 20-25 days (100-125 hrs) each month to get information on social organization. Phenological information has been collected on varying number of trees (1-10) belonging to 54 tree species. Information on their activity patterns and feeding behaviour was also collected. An intensive survey was carried out in South India (Karnataka, Kerala and Tamil Nadu) which revealed 6 more areas where the grizzled giant squirrel is found to be present. Analysis of data and report writing is in progress and the report will be completed by end of 1989.

Movements and Habitat Utilization of Elephants in North-Western Uttar Pradesh: The objectives of this study are to : Determine the year round movement pattern of elephants; Assess effects of forest management practices on elephant movement habitat use patterns; and Evaluate key habitat factors which influence the pattern of

habitat occupance by elephants.

Study methods & techniques include: individual identification of elephants, drug immobilization, radio-collaring and tracking of elephants, observation of elephants, and vegetation studies.

Three elephants were radio-collared during the year. Unfortunately, a tusker darted on 27th Jan. 1989 died and as a result the permission to radio-collar additional animals was suspended. A detailed post mortem revealed that the animal had a cardiac deficiency which caused the death. There was no flaw in the darting operation which was conducted with meticulous care and precision. It is neccesary to revive the permission in the best interest of this important study, now in its important midway phase. Of the four collared elephants only the bulls, as they could be tracked for a year, have given us some data. Interestingly a makhna collared near Dholkand in the west frequently crossed the Ganges to the eastern part of the Rajaji National Park. In addition 55 elephants have been individually identified. Seventeen transects totalling 110 km have been laid in the park to quantify food tree availability, utilization and regeneration.

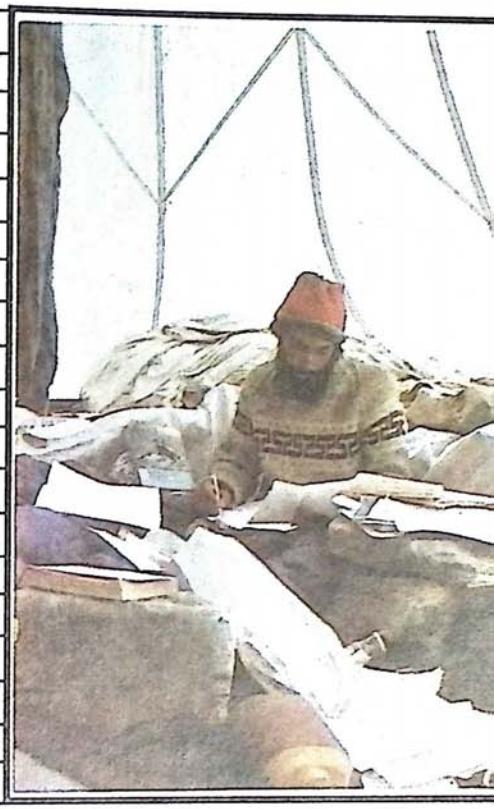
We know very little about the movement pattern and habitat utilization of bulls on the East bank of the Ganges. It is therefore proposed to radio collar three bulls, two on the east bank and one on the west bank, and a cow on the east bank. Two cows whose collars have ceased functioning will be recollared.

Ecological Factors Pertinent to Improved Management of the Asiatic Lion in India: The objectives of the study are to: Assess the size and age/sex composition of the Gir lion population; Study the current rate of reproduction and any factors preventing a higher rate from being achieved; Identify the mortality factors; Observe current feeding patterns; and Determine ungulate density in different areas in Gir.

Techniques used include, drug immobilization of lions, radio- collaring, radio-tracking, collection of scats, kills, and censusing ungulates.

Three lions (one male & two females) were radio-collared during the year. One male radio-collared in the previous year had to be recollared as the transmitter stopped functioning. At present there are four animals with working

The field camp of the Snow Leopard Project, in the Hemis High Altitude National Park.



Marmots are among the several species found in the study area.

A snow leopard radio-collared for location monitoring.

collars. So far, approximately 450 kills and 5000 scats have been collected. Winter and Summer ungulate road censuses have been completed. Other useful information on leopard kills, leopard and hyena sightings were also collected.

Biology, Ecology and Conservation of Phayre's Leaf Monkey (Presbytis phayrei) in Tripura: This study aims to collect data on the species' distribution in Tripura, habitat components, ıpopulation structure, feeding habits, ranging patterns, and behaviour of selected groups, and conservation problems.

Methods of study are to include survey, habitat mapping of the selected study area, location plotting to estimate home range and scan sampling of behaviour, vegetation mapping, and phenological studies. The study being done by an IFS officer of the State was initiated only in march 1989 and in consultation with his supervisor, he has finalised the study methods.

Mugger Crocodiles Monitoring Project in Andhra Pradesh: This project, initiated in 1987, to monitor the reintroduced mugger crocodiles in different sanctuaries of Andhra Pradesh, is now in its last phase. Data on habitat preference by different size- class crocodiles, reproductive and nesting success, movement, dispersal and survival of hatchlings, and food and feeding habits of reintroduced mugger by faecal sample analysis have been gathered. Additional information on diurnal basking patterns of different age class muggers in captivity was collected during the year to be used in future field surveys. The project is expected to continue during the next year.

Turtle Ecology Project in National Chambal Sanctuary (NCS): The field work of this project was completed in December, 1988. Occurrence of six species of fresh water turtles in the NCS, their relative abundance and habitat preferences have been recorded. During the year over 300 turtle hatchlings were reared by this research project for growth studies. These hatchlings were reintroduced into the wild during the year. The final report of this project is expected to be ready by end of 1989.

Ecological Relationship of Aquatic Mammals in National Chambal Sanctuary: Status, abundance and distribution of both otter and dolphin in the NCS was ascertained during the period. Attempts to trap otters for implanting of radio-transmitters is in progress. Preferred

habitat, holting sites and other basic requirements of otter and dolphin in the sanctuary were mapped to ascertain the levels of competition of these with the aquatic fauna.

Ecological Studies to Evaluate Crop Damage by Nilgai and Blackbuck in Haryana and Formulate Mitigation Strategies: The main objectives of the project are: (i) To develop a scientific understanding of the crop damage problem caused by nilgai and blackbuck in certain affected areas of Haryana. This entails studying the crop damage patterns and the population parameters including socio and reproductive biology of the two species as well as the economics of crop damage; (ii) To formulate mitigation strategies by conducting experimental trials on the use of wildlife barriers for the wild populations and fertility control techniques on both the wild and captive populations.

The project work was started in February, 1989. The research fellow has started work in Haryana broadly surveying different districts in order to assess the status of the problem and the irelative abundance of nilgai and blackbuck. The areas with intense problem of crop damage due to these animals are also being identified for detailed studies. Information on the population parameters group size and structure and nature of crops and their proneness to damage is being collected presently. Diurnal activities of nilgai and blackbuck populations especially in relation to crop raiding activity are also being recorded.

Study of Inter-relationships Between Village Ecosystems and Elephant Corridor - Habitat in the Forests linking Rajaji and Corbett National Parks with a view to Devising Compatible Management Strategies: The objectives of this study are: to understand how human pressures operate and impact upon forest ecosystem linking the two National Parks, to investigate the dependency of local people on the natural resources of the area - degree and extent, to design viable alternatives for people so as to mitigate pressure on the corridor forest, and to investigate large mammal utilization of the corridor with special reference to elephant and the status of vegetation. The study was initiated in January 1989.

Assessment of human pressure on corridor forest is being done on a block by block basis by evaluating statements of local forest staff and also by sampling.

Measurement of the degree of dependency of local people on the forest resources of the corridor forest is being done.

Measurement of elephant and other mammal occurrence and use of corridor is being made in four transects across (north-south) and one transect along (east-west) of the corridor forest.

CONSULTANCY SERVICES

Tiger Control in Dudhwa Rhino Reintroduction Area

During June 1988, a consultancy for assuring safety of rhino calves from tigers within the rhino-introduction area was taken up as per the decision of the Rhino Sub-Committee. Three weeks in June '88 were devoted to the consultancy. However, because of very tall grasses in the area no tiger could be captured which was initially intended. Experience none the less laid down detailed plans for a tiger translocation operation including logistics and technical preparation which can be used for such an operation anywhere. It also provided information on tiger activity in rhino area not investigated before and laid down details of monitoring which would help in assessment and control of threat in future. The time at Dudhwa was also used for a detailed assessment of the stauts of the endangered swamp deer leading to the formulation of a full-fledged research project on the management of the species, currently under investigation.

EIA of Bodhghat Hydel Project: A short-term study was undertaken on the directive of the Governing Body to assess the impact of the proposed Bodhghat Hydel Project in Bastar district of Madhya Pradesh. The main objective is to assess the adverse impact on wildlife values, in particular the wild buffalo. The likely impact on the Indravati National Park situated downstream, as a result of regulated flows in the river in the post-completion phase of the project is an additional aspect of the study. Field work involving a faculty member and three research fellows has been initiated and is expected to go up to June, 1989. The report will be finalised thereafter.

Power Fencing: Technical guidance and advice for use, installation, construction, and maintenance of "power fence" has been provided to different states. This includes advice and help to Dudhwa National Park in construction of 6-strand fence at Salukapur. Training on construction of "power fence" for controlling the movements of nilgai was also given to the farmers of Jeewan Nagar, Sirsa district, Haryana. Besides demonstration of this method of animal damage control forms part of the field training programmes in all WII's management training courses.

Assistance to BNHS in Bharatpur: To the research staff of the BNHS project in Keoladeo National Park, Bharatpur, technical assistance was provided in standardizing methodologies for collection and analysis of data concerning phenology of terrestrial plants, standing biomass of herb layer in terrestrial localities of the Park, and habitat preference of ungulates. The BNHS staff also visited WII for guidance on the use of remote sensing techniques in habitat evaluation.

Assistance to other institutions in wildlife management and wildlife biology teaching: WII faculty provided substantial inputs in teaching of 'Advanced Wildlife Management Course' to IFS probationers at the Indira Gandhi National Forest Academy, Dehra Dun. Field training visits to the Rajaji National Park for probationers were also arranged to explain habitat evaluation, wildlife signs and tracks, management problems and habitat management. Inputs also covered safeguarding of wildlife values in managed forests. Likewise a couple of WII faculty members were deputed to Aligarh Muslim University for short periods for teaching wildlife biology, particularly research techniques, to their M.Sc. Wildlife students.

Students of the following other institutions visited WII and the faculty provided appropriate teaching inputs in wildlife biology/management curricula.

G.B. Pant University of Agriculture & Technology Hill Campus, Ranichauri (Tehri Garhwal)	B.Sc. Forestry
Forest Rangers College, Balaghat (M.P.)	Ranger Trainees (1986-88 batch)
State Forest Service College, Burnihat (Assam)	S.F.S. Trainees (1987-89 batch)
Aligarh Muslim University, Aligarh	M.Sc. Wildlife

Training foreign students: The Department of National Parks and Wildlife Conservation (DNPWC), Nepal, deputed one official on a study tour programme to the Institute from 16.2.89 to 24.2.89 in connection with the establishment of a monitoring system and database of natural resources in Nepal. While at WII, the official studied the evolving wildlife database of the Institute and learned the methods of field data collection, analysis, and interpretation. Field visits to the Sariska Tiger Reserve and the Rajaji National Park

were organized to demonstrate the techniques of monitoring wildlife habitats and various methods of vegetation analysis. This official also attended a two-day workshop on Computer Applications and Systems Approach, organized by the Institute. The use of computers in the analysis of complex ecological data, development of Habitat Suitability Index (HSI) models, and mapping of habitats were also demonstrated to him. The trainee felt the need of establishing closer links between the DNPWC and WII so that information and experience gained on database systems could be readily shared.

Study on the management of wildlife in captivity including captive breeding, rehabilitation of threatened and endangered species, and the design and management of zoos: This consultancy study of the Institute started in November 1988, with a targeted schedule of three years. The objectives of this project are: to prepare a report on the status of zoos in the country with regard to their resources, constraints, and requirements including the facilities available for the management of their animals, and to evolve a set of standards and guidelines for improving the existing conditions; to evaluate the facilities available for health care, disease control, and treatment of wild animals in captivity, and propose a model facility for zoos; to develop and conduct two special training programmes each for professional and technical levels of staff in handling, upkeep, treatment, and breeding of wild animals in captivity, and in the management, administration, and interpretation of zoos; to develop guidelines for the preparation of management plans for zoos, and if required, offer consultancy services for the preparation of management plans and design of zoos; to evolve development concepts for new and expanding zoos; to suggest a framework for the creation of a centre/unit under the Central Government, that could function as an agency for collecting, maintaining, and analysing information relating to the different zoos in the country; for coordinating, monitoring, and training in this field; for coordinating acquisition, exchange, and breeding loans of animals from within and outside the country; for procurement of equipment, drugs, and vaccines for zoos; and to further the implementation of objectives relating to captive breeding programmes and rehabilitation of endangered and threatened species as outlined in the National Wildlife Action Plan.

The project started on 15th November, 1988. The first few weeks were utilized for collecting existing information/data

on Indian zoos and various reports prepared in the past on improving their management. The second stage involved collection of information related to zoos from the states and union territories. For this, individual requests with a questionnaire were sent to the Chief Wildlife Wardens of all the states and union territories, soliciting information on zoos, deer parks, safari parks, and snake parks in their respective regions. This was followed up by visits of the investigator to several states to collect information from personal observation.

An 'All India Zoo Veterinarians' Seminar organised by the Forest Department, Govt. of Punjab, at the M.C. Zoological Park, Chandigarh, on 2nd & 3rd December, 1988 was attended. This also provided an opportunity to exchange views with zoo veterinarians and collect data regarding veterinary facilities, constraints, disease control, staff, and equipment.

For the collection of data from individual zoos in the country, a comprehensive questionnaire reporting format was devised backed by a concept paper explaining the background, need, objectives, methodology, work schedule, and other important facets of the project. This paper along with the reporting format has been sent to all the known zoos in the country.

In order to update the available information about the zoos, deer parks, safari parks, and snake parks in the country, several zoos were visited during the months of February and March 1989 to study their layout, enclosure design, animal collection, management, staffing pattern, success in captive breeding, research, educational programmes, veterinary facilities, financial position, administrative problems, constraints, requirements, special features, and future development plans. These visits covered the zoos at Trivandrum, Trichur, Coimbatore, Vandalur (Madras), Visakhapatnam, Bhubaneswar, Gauhati, Shillong, Itanagar, Naharlagun, Imphal, Darjeeling, Calcutta, and Agartala. In addition to discussions with the directors/officers in charge of the respective zoos, there were useful meetings with the Chief Wildlife Wardens of the states and union territories visited.

PUBLICATIONS

The Institute is bringing out an internal bi-monthly Newsletter, which is circulated to a selected number of people, organisations and institutions. One publication, **A Pocketbook of Indian Pheasants**, was brought out during the year. A **Manual on Wildlife Management Techniques**

Crop damage by wild herbivores is a serious conservation problem in India.

WII has launched a project in Haryana to study this problem and suggest remedial measures.

The project is also trying out electrified fencing as a wildlife barrier.

for India was also brought out during the year which is of high utility in population and habitat management to protected area managers. Another publication, The Development of International Principles and Practices of Wildlife Research and Management, which is based on an international workshop held in the Kanha National Park, Madhya Pradesh in January 1982 is currently being edited and should soon be in press. The first drafts of the two volumes of Planning a Protected Area Network in India, which were circulated to a selected number of experts for comments, have undergone major revision and are now being finalised for publication.

Over 48 papers by Institute's the faculty members were published during the year under report. A list of these publications is appended.

ORGANIZATIONAL

The 35 member WII Society, presided over by the Minister for Environment, Forests and Wildlife has a varied membership comprising Forest Ministers of some States, Members of Parliament, Members of the U.P. Legislative Assembly, officials of some concerned Ministries, and non-officials including representatives of NGOs connected with wildlife conservation. No meeting of the Society could be held in the year. The Institute functions under a 14 member Governing Body chaired by the Secretary, Environment, Forests & Wildlife. The Governing Body normally meets once every three months. Some of its functions have been delegated to Sub-Committees in matters such as finance, research and building construction.

Faculty and other recruitments

During the period under review, three appointments at the level of Scientist-SG (one) and Scientist-SD (two) took place by selection of existing incumbents at the respective lower scales. In addition, fresh selections have been made, one each at Scientist-SC and Scientist-SD levels. The new recruits were yet to join. Apart from this, the Institute recruited 13 persons as technical, administrative and support staff.

FAO Inputs

The initial project, designated "The Establishment of Wildlife Institute of India" came to an end in July 1988 after six and a half years valuable contribution to institutional development. The second phase inputs are

being channelled through a smaller project, designated "Assistance to Wildlife Institute of India".

The past project had a large international staff complement, involving three experts, two associate experts, and several consultants. Staff contributed directly in teaching, research and advising work. The project provided technical equipment of all sorts, from vehicles to computers. Many faculty from the Institute benefited from overseas fellowships training.

The new project has more limited goals, and involves two international staff. The principal objective is the completion of the first M.Sc. course in Wildlife Science, started in 1988. Secondary objectives are involvement in the Institute's research programme and to continue the fellowship training activities for new faculty.

This project is scheduled to end in June 1990. Progress is satisfactory on all objectives. Eight faculty members will go on overseas training during the next year, and more equipment is arriving under the assistance programme.

DEVELOPMENTAL

Faculty Training abroad

Under the FAO-UNDP Project, a faculty member was deputed to Australia for a six-week training in management of tropical lgrasslands/rangelands for wildlife and domestic stock. The faculty member visited four states of Australia to study rangelands in both the arid and temperate regions. He visited also the Department of Agriculture/Primary Industry in New South Wales, Queensland; the Western Plains Zoo at Dubbo; the Fowlers Gap Arid Zone Research Station of the University of New South Wales; the Universities of New England and Queensland; five National Parks, one of which is a World Heritage Site; and CSIRO laboratories at Armidale, Brisbane, and Darwin.

Another faculty was deputed to the Colorado State University, Colorado, U.S.A. for a four months course (June-Sept. 1988) with the following objectives:

(i) gain exposure to approaches involved in Enviromental Impact Assessment (EIA) and develop approriate and project specific procedures in EIA.

(ii) generate models of impacts on habitat facilitating the prediction of effects of proposed developing projects and in designing appropriate protection/compensation for wildlife.

(iii) gaining some knowledge of systems analysis and GIS.

The training programme involved participation in field surveys and workshops/short courses and review of research projects, enabling the acquisition of knowledge of the techniques and environmental impact assessment and in selection of alternative sites for developmental projects.

A faculty member responsible for the development of the National Wildlife Database at the Institute was deputed to Oxford University, U.K. for four months to study the techniques for collection and collation of data for the wildlife database. This has been done as a part of a Ph.D programme in developing a computer based wildlife information system which draws from simple field data gathering techniques and creates a database utilising advanced computer analysis technology.

National Wildlife Database

The setting up of a microcomputer-based National Wildlife Database advanced further in its present developmental phase during 1988-89. Field studies for refining the methods of data collection, collation, and interpretation were carried out in three different field situations -- Sariska, Kanha, and Tadoba National Parks. The computer-aided mapping facilities linked with the data-base became fully operational during this year. Maps of study areas, animal distribution and abundance were made for use in research and consultancy projects. The process of appointing investigators engaged on a short-term basis for culling out useful information available with other agencies such as BNHS, ZSI, and BSI has been taken up.

Campus Development

The contract for the main constructions comprising institutional buildings, library, hostel, staff housing, internal roads and water supply was awarded in August, 1988 with a two-year contract period for an amount of Rs.3.11 crores approximately. This includes two main institutional buildings, library building, 96-room hostel, 20 house units for faculty and 32 house units for other staff. Construction management is being looked after by the Consulting Architect, M/s Kothari & Associates of New Delhi, and is being supervised by an Executive Engineer taken on deputation from the CPWD. Because of the award of the

contract during heavy monsoon time the progress in the initial period was somewhat slow. During the year (7 months) about 15 per cent progress has been achieved. However, with all operative hurdles out of the way, it is expected that the construction will be completed more or less on schedule.

The work of boundary wall construction in Block I and fencing work in Block II and III have been completed, except the final closure in Block I, held up because of 'easement of way' problems. This will be completed early next year.

The Library and Documentation Facility

A total of 1820 new books were added to the library this year, bringing the total to 7110. A number of the new titles were gifts for which the Institute is grateful to IUCN -the World Conservation Union, the Bombay Natural History Society, the Food & Agriculture Organisation, and the Fish & Wildlife Service and the Forest Service of the United States. The library now subscribes to 130 titles of journals, including 95 from overseas. Some thirty newsletters from Indian and foreign organisations are received at the library.

The documentation facility is yet to become functional and although the reprint collection is now housed in the library, it has not been brought under operational charge. A new post of Documentation Officer has recently been created and a suitable candidate will be selected shortly. We expect the documentation service to grow rapidly in the months to come.

Laboratory and Equipment

WII has a fairly well equipped research laboratory to support the training and research work being undertaken. The present facilities permit analyses of crude proteins, calorific values, fibre components, and macro-minerals in samples; studies on egg incubation and hatching; haematology; histology; and several physiological investigations. The Institute has also equipment for chemical immobilization, and radiotelemetry. The equipment added this year includes Mettler analytical balances, a Tecator cyclotec grinding mill, and field triple beam balances.

Using the slides of plant material prepared last year, scientists at the Institute investigated the food species of goral (Nemorhaedus goral) by analysing the animal's faecal samples and comparing them with the reference slides.

The continuing drought resulted in large-scale mortality of sambar, chital, and nilgai in the Sariska Tiger Reserve during 1988. Around 150 lower jaws of these animals were collected and brought to the WII laboratory, where these specimens were aged by looking at tooth eruption and wear. The laboratory also received a number of mammal hair samples from various wildlife reserves for identification. Reference slides of hair cuticular patterns were used for comparison, and several species were identified from their hair. In order that trainees and students benefit from the on-going activities of the laboratory, practical exercises based on these were devised and conducted for the Diploma, Certificate, and M.Sc. classes.

Teaching Aids

Training, teaching, and research activities at the Institute are constantly being strengthened by adding relevant audio-visual material and equipment. These teaching aids are maintained by the AV Unit of the Institute. The Unit provides equipment support and maintenance along with technical back up. It maintains a slide collection duly grouped into 44 different heads and a film library. Nearly 1000 slides were added to the slide collection during the reporting period. Twenty-five 16-mm films and three video films were added to the film library during this period. These films cover wildlife conservation, techniques of wildlife management, environmental awareness, and natural history. These together form an important source of visual material for the teaching, extension, and publication work of the Institute.

Herbarium

During 1988-89 plants were collected mainly from the following localities: Nilgiris, Kaziranga National Park, Dachigam National Park, Sariska Tiger Reserve, Narmada Valley (NSP dam area), Bori Sanctuary, Kedarnath Musk Deer Sanctuary, Hemis High Altitude National Park and Rann of Kutch.

Based on the present and earlier collections, checklists of plants of the following areas were added to: Rajaji National Park, Narmada Sagar submergence area, Sariska Tiger Reserve, and Banog area in Mussoorie. In all 1035 herbarium sheets were prepared and added after due processing and mounting.

To enrich the WII Herbarium, an exchange programme has

been initiated with the Herbarium of French Institute, Pondicherry. Under this programme, we have supplied 22 specimens of Himalayan plants to the above organization and in return, have received 30 South Indian tree species of our choice.

The present staff are one Herbarium Assistant and one helper. With the increasing use of WII Herbarium by scientists & research scholars, there is now a felt need of help at a higher technician level.

Deer Enclosure

The Institute has an enclosure to maintain a small holding of animals for its research purposes. There is at present a captive stock of 27 spotted deer and 1 barking deer. These animals are being used for research and demonstrations in chemical immobilization, haematology, and other veterinary aspects.

Computer Facility

Computers are now used in every sphere of the Institute's activities, from simple word processing to complicated data analysis. All the three faculty divisions and the administration and finance sections are equipped with a range of PCs-XTs and ATs, to facilitate accounting, administration, and word processing. Major scientific activities of the Institute, including database management, graphic analysis and mapping, statistical operations, and desktop publication are carried out on these machines. The Institute has in hand a project for the development of the National Wildlife Database, while several faculty members and research fellows maintain their own databases on various aspects.

The computer facility is constantly being upgraded. This year saw the addition of several new XTs and ATs. A major leap forward will be the installation of the newly acquired OASYS, a 386-based multi-user system with six terminals, operating under Unix/Xenix. This will incorporate a specially designed software called the SACIMAGE, for digital analysis of satellite imageries. This is expected to greatly enhance the Institute's vegetation interpretation capabilities. Already, limited interpretation and analysis of geographic and vegetation information is being carried out with the help of an Optical Reflecting Projector for reduction and enlargement of maps, an AutoCAD with a digitizer and a colour plotter, and stereoscopes.

EVALUATION 1988-89

An evaluation of the progress made during the year can best be made with reference to the planned work programme for 1988-89. (Page 46). The following is an evaluation of the progress achieved:

The regular **inservice** courses in wildlife management were conducted as scheduled. Course evaluation showed high utility and optimum quality of impartation of training. Capacity utilisation was, however, suboptimal in both cases--20 for P.G.Diploma and 14 for Certificate, against a capacity of 30 for each. This is because of low nominations or eventual cancellation of nominations by states. As course durations are 9 months and 3 months respectively, candidates with longer service tend to avoid because of family commitments and dislocation in postings. Some states at times express inability due to paucity of funds. If trainees are selected in the first five years of service and Central support in training is provided, capacity utilisation will go up. This is nacessary in order to provide trained personnel for better management of our national parks and sanctuaries.

An important training activity which was commenced during the year is the series of **two-week Capsule Courses in Wildlife Management**. A total of 41 officers were trained in 3 courses which were organised regionally. The participants rated the utility of these courses as very high and suggested a few modifications which have been incorporated into the programme for 1989-90. Shortfall in participation--41 against a targetted 75-- was due to several factors such as the disturbed conditions prevailing in Assam at the time of the Capsule Course organised at Kaziranga N.P., the course in March 1989 coincided with the end of the financial year, and so on. Besides avoiding such locations and timings it is now planned to meet the cost of training of the participants from next year onwards from Central grant-in-aid.

Six new field research projects were initiated as planned, after approval by the Research Advisory Committee (RAC). Some of the ongoing projects due for completion in the current year had to be extended for short periods to enable completion of the enlarged scope of field work and report writing. Extensions were granted with the approval of the RAC.

The consultancy study on zoo management and captive breeding was started as scheduled. Progress has been as per the targetted work programme. A monitoring group has

MAIN WORK PROGRAMME 1988-89

Sl. No.	Activity	Month of commencement	
		1988	1989
	Regular Courses		
1.	2-Year M.Sc. in Wildlife Biology	JAN	
2.	9-month Diploma Course in Wildlife Management	AUG	
3.	3-month Certificate Course in Wildlife Management	MAY	
	Other Activities		
4.	Capsule Course in Wildlife Management	SEP	JAN FEB- MAR
5.	New Field Research Projects	JAN	
6.	Study on Zoo Management and Captive Breeding	NOV	
7.	High Altitude Census Workshop	OCT	
8.	Habitat Evaluation Workshop	NOV	
9.	Workshoppp on Capture and Management of Elephants	JAN	
10.	FAO Phase II Project	JUL	
11.	Overseas Training Fellowships (FAO)	JUN	
12.	Indo-US Project on Faculty Development	MAR	
13.	Main Building Construction	SEP	
14.	Publication of a Manual on Wildlife Management Techniques	JUL	

also been set-up to guide the implementation of the study and to monitor the progress.

All training workshops were conducted as planned. The subjects covered were: high altitude census techniques, management of elephants, and habitat evaluation methods. The symposium on interface conflicts and protected areas could not be held during the year due to the non-availability of guest faculty. However, this has now been scheduled for 27-28 April 1989 at Dehra Dun (since held).

The two-year FAO phase II, institutional development project commenced from 1st July 1988 after the end of its precursor which was larger and more broad based. The successor project has limited carry on objectives of guiding the M.Sc. course and research studies, continuing overseas faculty training, and acquiring some specialised equipment. The progress and achievements have been good.

The academic activities under the Indo-US Project on faculty development, involving the WII and the US Fish & Wildlife Service could commence in June 1989 as against the planned start in March 1989. This was owing to the delay in contracting scientists and experts in the US. for the various specialised subject areas.

The New campus development activity had an initial delay owing to the backing out of the lowest tenderer of the first call. The lowest tenderer of the second call who quoted even a lower price than the earlier one who backed out. He however, started work in August, 1988. Progress was affected initially because of monsoon at the time of start of work and later by heavy winter showers. All efforts are being made to speed up the progress despite the lack of enthusiasm as part of the contractor because of very low rates.

As for publications, the Field Manual on Wildlife Management Techniques and the Pocket book on Pheasants were published as planned. The publication of the proceedings of an earlier techniques workshop held at the Kanha N.P. was given over to the Oxford University Press for publication.

Infrastructural development of the Institute's library, laboratory, herbarium and computer facilities made desired progress with the acquisition of more materials and

equipment and strengthening of staff so as to keep pace with their increased use by the faculty, trainees, students and researchers of the Institute.

To sum up, the academic progress and achievements have been highly satisfactory and the Institute is well up in meeting its objectives.

PERSPECTIVE FOR 1989-90

The recent years that have gone by and a few that lie ahead belong to the crucial formative phase of the Institute. Expectedly, they are marked by intense institutional development and academic activity. 1989-90 promises to be no different.

The Academic programmes of the Institute while being continued undergo adjustments focussing on their respective objectives. The 3-month Certificate and the 9-month P.G. Diploma courses will be conducted as per schedule commencing respectively in May and August, 1989. The touring schedules and their training components have been modified and adjusted so as to increase conservation and management inputs right from the beginning and to sustain them through the course. The first batch of the 2- year M.Sc. course will pass out in December, 1989 while the second batch will be admitted in July, 1989. Some vacancies in all these regular courses will be advertised for foreign trainees from the South and South-East Asian countries through the Ministry of External Affairs and international conservation organizations such as WWF, IUCN and FAO, who have offered financial assistance to support such training.

Besides these regular courses, the short-term or Capsule courses in Wildlife Management started during 1988-89 will also be continued next year albeit with the following changes. In addition to the 12-day Capsule course which will now be based at Dehra Dun (with field visits to the nearby Rajaji & Corbett National Parks) a 5-day course for senior-level forest officers (Conservators and above) will be conducted. This would lay greater emphasis on policy issues and management approaches. A one-week compulsory course in Wildlife Management for IFS officers is also proposed to be conducted during the coming year. The 5-day Capsule course for senior-level officers is scheduled for November, 1989 at the Ranthambhore National Park, followed by the 12-day course in January, 1990 at Dehra Dun. The One-week compulsory course for IFS officers is also proposed to be held at Dehra Dun in February 1990 subject to nomination of participants by the

Government of India.

Some of the other major activities planned for the coming year include the following:

1. The ongoing as well as the newly initiated research projects will be continued. In all there are at present 19 field research projects in operation and 3 more will be launched in the coming year. The new projects will study the environmental impacts upon the flora and fauna in the project area of Narmada Sagar in Madhya Pradesh, and the rural ecosystem of Masinagudi village in the Mudumalai Sanctuary in Tamil Nadu to ensure compatibility between the village community and the sanctuary. The third project will investigate the alternative habitat for the endangered Manipur sangai in Assam. Highlight of the research activities will be an annual review Seminar in presence of the Research Advisory Committee in September-October 1990.

2. The 3-year Consultancy Study on Zoo Management and Captive Breeding started in 1987-88 will be continued. Activities in the coming year will include continuing survey of zoos, development of a computerized data base on the status of zoos and their management, and development of curricula for training programmes for zoo personnel.

3. Another short-term consultancy study which will be taken up is a rapid EIA of the Bodhghat Project in Madhya Pradesh with particular reference to the wild buffalo population and the nearby Indravati National Park.

4. The year would be marked by the actual launch of the long awaited collaborative faculty development programme between the WII and the US Fish & Wildlife Service. Unlike the FAO/UNDP project which involved long term stay of FAO experts covering a wide spectrum of subjects, the WII-FWS project will entail short term visits of experts in specialised subject areas e.g. Systems Analysis, GIS and Animal Health. The project would gain full momentum during the year with major inputs in five or six subject areas. The project involves in-institute and in-field interaction between visiting US scientists and the identified counterpart Indian faculty. This will be followed by jointly conducted workshops in the respective subject

areas and would also entail top-up training of WII faculty in advanced technology in the USA.

5. Workshops and symposia are planned for 1988-89 to cover subjects such as Elephant Management Issues, Wildlife and People and Wildlife Health. Additionally, faculty training workshops in Geographical Information System (GIS), Systems Modelling and Interpretation and Extension Methods are also planned.

6. Overseas training of faculty would continue in the coming year also under the FAO and the US-FWS projects. Fields of specialization will include High Altitude Ecology, Wildlife in Managed Forests, Wildlife Health, Wildlife Data Base Development, Systems Approach, Animal Damage Control, and Education and Interpretation Techniques. This top-up training, which follows the in-country on-the-job training, is aimed at enhancing the teaching and research capability of the faculty members.

7. The new campus development activity will be stepped up. Landscaping work of Block I would be completed and taken up in Block III. Construction of the main building, library, hostel, guest house and residential facilities as well as water supply and other civil services will achieve at least 50% completion. For rationalisation of campus boundaries, a narrow strip of land between Block I & II will be acquired during the coming year.

8. Proceedings of workshops and symposia organized during the year will be brought out as Institute's publications. In addition, technical reports will cover some major research projects and field manuals for census and management.

9. The library facility and documentation service will continue to be strengthened. The newly sanctioned posts of librarian & documentation officer will be filled up to better guide the development of these facilities.

10. Computer facilities at the Institute will continue to be strengthened. This would include operationalising the 386 based multiuser system with 6 terminals. Some more PC ATs will be added to support database management, statistical analysis, graphic displays, mapping & desk-top publication. Software for Geographical Information System (GIS) and

Simulation Modelling will be added.

11. Phase II of the FAO project for assisting the development of the Institute will be continued through the end of the year. A proposal will be developed for a new FAO project to impart training in the planning of ecodevelopment measures in the surrounds of selected protected areas.

The main work programme for 1989-90 is depicted in the chart on the following page.

MAIN WORK PROGRAMME 1989-90

Sl. No.	Activity	Month of Commencement	
		1989	1990
	Regular Courses:		
1.	2-year M.Sc. in Wildlife Science	JUL	
2.	9-month Diploma Course in WL Management	AUG	
3.	3-month Certificate Course in WL Management	MAY	
	Other Activities:		
4.	Capsule Course in WL Management (12 days)		JAN
5.	Senior Level Capsule Course (5 days)	NOV	
6.	One week Course for IFS Officers (Compulsory Training)		FEB
7.	3 New Field Research Projects	SEP OCT	
8.	Indo-US Project on Faculty Development	MAY	
9.	Workshop on Elephant Management Issues	MAY	
10.	Discussion Forum on People & Wildlife	APR	
11.	Faculty Training Workshop on Systems Analysis	SEP	
12.	Workshop on Wildlife Health & Disease Monitoring	SEP	
13.	Overseas Training Fellowship for Faculty	JUN AUG	JAN APR MAY
14.	Construction of Guest House		JAN
15.	Landscaping of Block I and III		JAN
16.	Publications :		
	i. Manual on Habitat Evaluation Techniques		MAR
	ii. Manual on Chemical & Restraints Techniques		JAN
	iii. Planning a Wildlife Protected Area Network in India - Final Edition		MAR
	iv. Manual on Wildlife Census Techniques		FEB
	v. Guidelines for Preparations of Management Plans of Protected Areas.		MAY
	vi. Manual of Wildlife Techniques for India - 2nd Edition		MAR
	vii. Research Report - Snow Leopard Study		MAR
	viii. Proceedings of the discussion forum on People & Wildlife		FEB

GOVERNING BODY

1. Secretary,
   Ministry of Environment & Forests,
   Paryavaran Bhavan, 'B' Block,
   CGO Complex, Lodi Road,
   NEW DELHI-110 003. — Chairman

2. Inspector General of Forests,
   Ministry of Environment & Forests,
   Paryavaran Bhavan, 'B'Block,
   CGO Complex, Lodi Road,
   NEW DELHI-110 003. — Vice Chairman

3. Shri Duleep Matthai,
   Vice Chairman,
   National Wastelands Development Board,
   Ministry of Environment & Forests,
   CGO Complex, 'B' Block, Lodi Road,
   NEW DELHI-110 003.

4. Shri J.C.Daniel,
   Curator,
   Bombay Natural History Society,
   Hornbill House, Shaheed Bhagat Singh Road,
   BOMBAY-400 023.

5. Prof. R. Misra,
   C/o Dr.P.N.Tiwari,
   D-11/4, IARI, PUSA,
   NEW DELHI.

6. Shri M.A. Partha Sarathy,
   Hamsini,
   1,12th Cross, Rajmahal,
   BANGALORE-560 080.

7. Dr.L.M.Nath,
   Professor,
   All India Institute of Medical Sciences,
   Aurobindo Marg,
   NEW DELHI.

8. Joint Secretary (Wildlife),
   Ministry of Environment & Forests,
   CGO Complex, Paryavaran Bhavan,
   'B' Block, Lodi Road,
   NEW DELHI-110 003.

9. Joint Secretary (Finance),
Ministry of Environment & Forests,
Paryavaran Bhavan, CGO Complex,
'B' Block, Lodi Road,
NEW DELHI-110 003.

10. Director,
Indian Council of Forestry Research & Education,
New Forest,
DEHRA DUN.

11. Joint Secretary (Education),
Ministry of Manpower & Resources,
Shastri Bhavan,
NEW DELHI-110 003.

12. Chief Wildlife Warden, Uttar Pradesh
17 Ranapratap Marg,
LUCKNOW.
(Representative of the Chief Secretary, U.P).

13. Shri S.K.Mukherjee,
Scientist-SG, Faculty Member,
Wildlife Institute of India,
DEHRA DUN.

14. Director,
Wildlife Institute of India,
P.O.New Forest,
DEHRADUN. Member Secretary

RESEARCH ADVISORY COMMITTEE

1. Dr.M.K. Ranjitsinh,
Joint Secretary (Wildlife),
and Director, Wildlife Preservation,
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2. Dr.W.A.Rodgers,
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Wildlife Institute of India,
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3. Shri V.B.Singh,
Ex-Addl.Chief Conservator of Forests (Wildlife),
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4. Shri J.C.Daniel,
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Hornbill House, Shaheed Bhagat Singh Road,
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5. Prof. J.V.Ramana Rao,
Dept. of Zoology, Osmania University,
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6. Director,
Zoological Survey of India,
CALCUTTA.

7. Director,
Indian Institute of Forest Management,
BHOPAL.

8. Director,
Botanical Survey of India,
P-8 Brabourne Road,
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9. Prof. Ishwar Prakash,
Professor of Eminence CAZRI
JODHPUR.

10. Director,
Wildlife Institute of India,
P.O.New Forest,
DEHRA DUN. — Member Secretary

FINANCE COMMITTEE

1. Chairman,
Governing Body. — Chairman

2. Shri M.A.Partha Sarathy
Member,
Governing Body.

3. Joint Secretary (Finance) & F.A.,
Department of Environment, Forests & Wildlife.

4. Joint Sec#c#retary (Wildlife),
Department of Environment, Forests & Wildlife.

5. Director,
Wildlife Institute of India. — Member Secretary

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AUDIT REPORT
&
ACCOUNTS

OFFICE OF THE DIRECTOR OF AUDIT COMMERCE WORKS & MISC.
II, NEW DELHI.

AUDIT CERTIFICATE

I have examined the Receipts & Payments Account/Income and Expenditure Accounts for the year 31st March, 1989 and the Balance Sheet as on 31st March, 1989 of the Wild Life Institute of India, Dehradun. I have obtained all the information and explanation that I have required and subject to the observations in the appended Audit Report, 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 Wild Life Institute according to the best of information and explanations given to me and as shown by the books of the organisation.

(S. Sathyamoorthy)
Director of Audit,
Commerce, Works and Miscellaneous II.

New Delhi
20th Oct. 1989

WILDLIFE INSTITUTE OF INDIA
PERMANENT ASSETS AS ON 31.3.1989

Sl.	Particulars	Opening Stock Rs. Ps.	Addition during the year Rs. Ps.	Total Rs. Ps.
1.	Land	31,87,590.00	1,875.00	31,89,465.00
2	Trees	24,32,709.00		24,32,709.00
3.	Avenue Plantations	1,27,956.65	3,938.00	1,31,894.65
4.	Furniture & Fixtures	4,94,995.97	1,76,992.77	6,71,988.74
5.	Lab.Equipment & Chemicals	7,06,083.27	59,092.85	7,65,176.12
6.	Office Equipment	5,81,492.72	10,785.18	5,92,277.90
7.	AV Aids, Computers & Trg.Equipts.	6,48,143.47	1,46,117.41	7,94,260.88
8.	Camp Equipments	1,76,357.16	70,234.18	2,46,591.34
9.	Photographs & Photographic Equipts.	1,63,181.35	27,868.15	1,91,049.50
10.	Educational Films	4,99,314.75	2,65,614.60	7,64,929.35
11.	Library Books	8,44,285.68	4,01,657.10	12,45,942.78
12.	Journals & Periodicals	2,39,881.48	2,01,585.00	4,41,466.48
13.	Material & Supplies	4,02,489.36	12,02,660.59	16,05,149.95
14.	Vehicles & Trailors	12,36,864.91	1,38,726.00	13,75,590.91
15.	Campus Development	58,658.44	57,751.87	1,16,410.31
16.	Boundary Wall Block-I	11,95,279.59	1,77,708.00	13,72,987.59
17.	Boundary Fencing Block-II & III	4,25,927.62	3,92,007.31	8,17,934.93
18.	Construction of Bldg.Complex	- -	12,90,926.00	12,90,926.00
19.	Architectural Competition	- -	1,50,000.00	1,50,000.00
20.	Architect Fee & Supervision Charges	3,62,873.00	3,19,802.00	6,82,675.00
	Total	1,39,34,084.42	49,45,342.01	1,88,79,426.43

WILDLIFE INSTITUTE OF INDIA BALANCE SHEET AS ON 31ST MARCH,1989

FUNDS & LIABILITIES	Amount (Rs)	Amount (Rs)
Department of Environment & Forests, Govt. of India, New Delhi Grant-in-Aid Account Balance as per last Balance Sheet		
with Indian Bank & Union of India, Hyderabad	17,176.14	
with Union Bank of India, Dehradun (Trainees Account)	62,468.36	
with Indian Bank and Union Bank of India, Dehradun	48,53,740.49	
Cash-in-hand	15,099.82	49,48,484.81
Excess of Income Over Expenditure		1,30,17,279.89
Equipments, Furniture & Fixture, Vehicles, Library Books, etc.		24,47,340.70
Amount transferred to Capital Fund as per last Balance Sheet	58,66,444.72	
Addition during the year	49,43,467.01	1,08,09,911.73
	C/o	3,12,23,017.13

ASSETS			
As per last Balance Sheet			
Land*	31,87,590.00	1,875.00	31,89,465.00
Trees*	24,32,709.00		24.32,709.00
Chandrabani Campus Bldg.Complex		12,90,926.00	12,90,926.00
Architectural Competition	1,50,000.00		1,50,000.00
Architect Fee & Supervision Charges	3,62,873.00	3,19,802.00	6,82,675.00
Avenue Plantations	1,27,956.65	3,938.00	1,31,894.00
Campus Development	58,658.44	57,751.87	1,16,410.31
Boundary Wall Block-I	11,95,279.59	1,77,708.00	13,72,987.59
Boundary Fencing Block-II & III	4,25,927.62	3,92,007.31	8,17,934.93
Equipment, Furniture & Fixtures, Vehicles, Library Books, etc.	59,93,090.12	27,01,333.83	86,94,423.95
Grant-in-Aid accrued not received			1,00,00,000.00
Training Cost accrued but not received	13,450.00	14,900.00	28,350.00
			C/o2,89,07,776.43

Brought Forward		3,12,23,017.13		Brought Forward		2,89,07,776.43
OUTSTANDING LIABILITIES				Closing stock of Steel and Cement		14,12,360.12
Security Deposits	46,172.63)			Advance to conduct Trainees tours, workshops & Seminars		3,38,437.26
	2,06,468.37)	2,52,641.00				
Income Tax	4,000.21)			Loans & Advances to Staff		1,94,115.20
	4,902.02)	8,902.23				
Sundry Credit Balances	26,998.18)			Advance to Staff (for Expenses)		4,74,532.53
	(-) 11,952.00)	15,046.18				
Audit Fee	10,000.00)			To Sundry Debtors	16,17,867.00	16,17,867.00
	10,000.00)	20,000.00				
Earnest Money	750.00)			CASH & BANK BALANCES		
	(-) 50.00)	700.00				
Land	31,87,590.00)					
	1,875.00)	31,89,465.00		with Union Bank of India, Dehradun (Trainees Account)	60,657.67	
Trees	24,32,709.00					
Interest on G.P.F.	1,759.00)					
	3,496.00)	5,255.00				
Interest on C.P.F.	10,731.00)			with Indian Bank & Union Bank of India, Dehradun.	41,62,947.44	
	24,653.00)	35,384.00				
Sale Tax		24,505.04				
		Total - 3,72,07,624.58		Cash-in-hand	38,930.93	42,62,536.04
					Total	3,72,07,624.58

The above Balance Sheet to the best of our belief contains a true accounts of the Funds and Liabilities and Property and Assets of the Institute.

(S.S.Oberai)
Finance Officer

(S.K. Mukherjee)
Senior Administrative Officer & Addl. Director

Director of Audit,
Commerce, Works & Miscellaneous II,
New Delhi.

INCOME & EXPENDITURE ACCOUNT FOR THE YEAR ENDING ON 31ST MARCH,1989

EXPENDITURES	Amount(Rs)	INCOME	Amount(Rs)	Amount(Rs)
To Salaries & Allowances	24,97,803.59	By Grant-in-Aid		
To Honorarium	5,710.00	Department of Environment,		
To Leave Salary & Pension Contribution	69,879.00	Forests & Wildlife, New Delhi	1,33,00,000.00	
To Bonus	75,473.00	Less transferred to Capital		
To Wages	2,40,398.83	Expenditure	49,45.342.01	83,54,657.99
To Fellowship	3,40,255.62	By Grant-in-Aid accrued but		
To Travel Expenses	5,45,550.64	received		1,00,00,000.00
To Newspaper & Magazines	7,061.05			
To Publicity & Advertisement	92,727.40			
To Rent for hired buildings	1,77,535.65	By Training Cost -		
To Electricity & Water Charges	43,450.50	9-months Diploma Course	4,66,500.00)	
To Telephone & Trunk Calls	1,30,785.75	3-months Certificate Course	89,400.00)	
To Postage & Telegrams	57,848.35	2-years M.Sc. Course	12,600.00)	5,68,500.00
To Stationery	1,05,353.44			
To Printing & Binding	2,36,420.00	By Miscellaneous Receipts		30,332.90
To Repairs & Maintenance of Office Equipments	14,956.81			
To Conveyance	11,755.10	By Interest on Mobilisation Advance		51.852.00
To Sports Goods	1,640.00			
To Entertainment	12,185.70	By Workshop & Seminar		8,000.00
To Maintenance of Animals (Deer Park)	37,301.25			
To Stipend to M.Sc. Student	65,700.00	By Earnest Money (Forfeited)		20,000.00
To Food Allowance	18,000.00			
To Legal Expenses	9,119.00	By Interest on Bank Accounts		2,47,631.90
To Provision for Audit Fee	10,000.00			
To Uniform	59,861.50	By Training Cost accrued but		
To Operational Expenses	2,59,849.31	not received		14,900.00
To POL for vehicles	2,36,624.95			
To Repairs & Maintenance of Vehicles	2,23,916.03			
To Vehicle Insurance	4,850.00			
	C/o 55,92,012.47		C/o	1,92,95,874.79

EXPENDITURE	Amount(Rs)	INCOME	Amount(Rs)
Brought Forward	55,92,012.47	Brought Forward	1,92,95,874.79
To Provision for interest on C.P.F.	24,653.00		
To Provision for interest on G.P.F.	3,496.00		
To Insurance (Research Fellows)	8,910.00		
To Training Programmes	5,97,773.43		
To Seminar & Workshop	4,850.00		
To C.P.F. Contribution (WII Shares)	46,900.00		
To Excess of Income Over Expenditure	1,30,17,279.89		
Total	Rs. 1,92,95,874.79	Total	Rs. 1,92,95,874.79

Examined and found correct as per Books of Accounts, Vouchers etc. produced before as and as per information and explanation given to me.

(S.S.Oberai)
Finance Officer

(S.K. Mukherjee)
Senior Administrative Officer & Addl. Director

Dated : 20th Oct. 1989.

Director of Audit
Commerce, Works & Miscellaneous II,
New Delhi.

WILDLIFE INSTITUTE OF INDIA, DEHRADUN RECEIPTS & PAYMENTS ACCOUNT FOR THE YEAR ENDING 31ST MARCH, 1989

RECEIPTS	Amount(Rs)	Amount(Rs)	PAYMENTS	Amount(Rs)
To Opening Balance			By Salaries	24,97,803.59
Cash in hand	15,099.82		By Leave Salary & Pension Contributions	69,879.00
Cash in Bank	49,33,384.99	49,48,484.81	By Bonus	75,473.00
To Grant-in-Aid Deptt.of Env.& Forests, & Wildlife, New Delhi		1,33,00,000.00	By Honorarium	5,710.00
To Training Cost			By Fellowship	3,40,255.62
9-months Diploma Course	4,66,500.00		By Wages	2,40,398.83
3-months Certificate Course	89,400.00		By Travel Expenses	5,45,550.64
2-years M.Sc.Degree Course	12,600.00	5,68,500.00	By Library Books	4,01,657.10
To Workshop & Seminar		8,000.00	By Newspaper & Magazines	7,061.05
To Recoveries from paybills to be remitted to Govt. & other bodies		2,83,037.89	By Journals & Periodicals	2,01,585.00
To refund of unspent advance for Expenses		92,830.98	By Publicity & Advertisement	92,727.40
To Recoveries of Income Tax from Contractor		63,108.50	By Purchase of vehicles	1,38,726.00
To recovery of Security Deposit from Contractors		2,18,267.37	By POL for Vehicles	2,36,624.95
To Earnest Money (Rs. 50,000.00 converted as SD)		700.00	By Repair & Maintenance of Vehicles	2,23,916.03
To Misc.Receipts and Penal recoveries from the contractor		80.00	By Vehicles Insurance	4,850.00
To Interest Received		2,47,631.90	By AV,Computers & Trg.Equipts.	1,46,117.41
To Recovery of Mobilisation Advance		71,719.00	By Lab.Equipts. & Chemicals	59,092.85
To Interest on Mobilisation Advance		51,852.00	By Office Equipments	10,785.18
To Refund of Advance for Expenses (Training)		3,78,500.00	By Camp Equipments	70,234.18
To Recovery of cost of Cement & Steel		5,40,975.00	By Photographs & Photographic Material	27,868.15
To Recovery of Sale Tax from Contractor		39,484.04	By Educational Films	2,65,614.60
To Recovery of Electricity charges from contractor		608.00	By Furniture & Fixtures	1,76,992.77
			By Material & Supplies	12,02,660.59
			By Operational Expenses	2,59,849.31
			By Stationery	1,05,353.44
			By Maintenance of Animals (Deer Park)	37,301.25
			By Rent for hired buildings	1,77,535.65
C/o		2,08,13,779.49		C/F 76,21,623.59

RECEIPTS	Amount(Rs)	Amount(Rs)	PAYMENTS		Amount(Rs)
B/F		- - 2,08,13,779.49	B/F		76,21,623.59
To Miscellaneous Receipts -			By Postage & Telegrams		57,848.35
1) Sale of Tender documents	13,875.00		By Sports Goods		1,640.00
2) Gas refilling charges	492.00		By Uniforms		59,861.50
3) Guest House Charges	975.00		By Telephone & Trunk Calls		1,30,785.75
4) Private use of Vehicle	82.00		By Conveyance Charges		11,755.10
5) Difference of excise duty	218.40		By Electricity & Water Charges		43,450.50
6) Refund of Engineer	2,000.00		By Entertainment		12,185.70
7) Water charges	25.00		By Printing & Binding		2,36,420.00
8) Forfeiture of Earnest Money	20,000.00	37,667.90	By Repairs & Maintenance of Office Equipts.		14,956.81
			By Training Programmes		5,97,773.43
To Miscellaneous revenue of CRC Hyderabad		11,977.00	By Seminars & Workshops		4,850.00
			By G.P.Fund Advance		10,436.00
			By Medical Advance		22,850.00
			By House Building Advance		82,500.00
			By Scooter Advance		81,880.00
			By Cycle Advance		4,400.00
			By Festival Advance		18,920.00
			By Insurance Research Fellows		8,910.00
			By Advance for Expenses		4,74,532.53
			By Remittance of Recoveries		5,86,086.05
			By from Salary bills to Govt.		
			By Deptts/Other bodies		
			By Stipend to M.Sc.Students		65,700.00
			By Food Allowance		18,000.00
			By Legal Expenses		9,119.00
			By Pay Advance		3,794.00
			By CPF Advance	13,296.00	
				2,578.00	15,874.00
			By Advance for Expenses (Training)		3,38,437.26
			By C.P.F.Contributions		46,900.00
		C/o 2,08,63,424.39	C/o		1,05,81,489.57

RECEIPTS	Amount(Rs)	Amount(Rs)	PAYMENTS	Amount(Rs)
Brought Forward		2,08,63,424.39	Brought Forward	1,05,81,489.57
			By Remittance of Income Tax deducted from Salary	46,735.00
			Refund of Earnest Money	750.00
			Compensation for land	1,875.00
			Campus Development	57,751.87
			Construction of Boundary Wall Block-I	1,77,708.00
			Construction of Instt.Bldg.	12,90,926.00
			Remittance of Income Tax deducted from contractor bill	58,206.48
			Construction & Architectural Management	3,19,802.00
			Remittance of Sale Tax deducted from contractor bill	14,979.00
			Release of Security deposits	11,799.00
			Block-II & III	3,92,007.31
			Avenue Plantation	3,938.00
			Mobilisation Advance	15,75,661.00
			Secured Advance	1,13,925.00
			Procurement of Cement & Steel for Bldg.	19,53.335.12
			Cash in hand	38,930.93
			Bank Balances with UBI & Indian Bank	41,62,947.44
			Cash with Union Bank of India (Trainees A/c)	60,657.67
Total		2,08,63,424.39	Total	2,08,63,424.39

Examined and found correct as per Books of Accounts,Vouchers produced before me and as per information and explanations give to me.

Director of Audit
Commerce, Works & Miscellaneous II,
New Delhi.

(S.S.Oberai)
Finance Officer

(S.K.Mukherjee)
Sr.Admn.Officer & Addl. Director.

Dated : 20th Oct. 1989.