PROCEEDINGS OF HANDS ON TRAINING WORKSHOP ON CONSERVATION BREEDING OF PHEASANTS IN DARJEELING (WEST BENGAL)

6th November - 9th November 2008

Organised By :

CENTRAL ZOO AUTHORITY

(A Statutory body under the Ministry of Environment & Forest, Govt. of India)

In collaboration with

PADMAJA NAIDU HIMALAYAN ZOOLOGICAL PARK

Darjeeling, West Bengal, India

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PROCEEDING OF WORKSHOP ON PHEASANT BREEDING AND CONSERVATION DARJEELING (WEST BENGAL)

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Govt. of India - New Delhi

&

PADMAJA NAIDU HIMALAYAN ZOOLOGICAL PARK

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Training Workshop on Conservation
Breeding of Pheasants


India


Training Workshop on Conservation
Breeding of Pheasants
DARJEELING


Training Workshop on Conservation
Breeding of Pheasants

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Training session V(8th Nov 2008)

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3. Preparation of Conservation Breeding Management Plan by Dr. Naim Akhtar, Scientific Officer, CZA.
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2. Status of Grey Peacock Pheasant in Alipore Zoological Garden by Dr. S. K.Choudhary Director Alipore Zoo, Kolkata.
3. Breeding and Management of Red Jungle Fowl in selected Zoos by Dr, Rahul Kaul, Director of Conservation, Wildlife Trust of India.

Training session VII (9th Nov 2008)

1. Status of Grey Jungle Fowl Breeding in Tirupati Zoo by S. Krishnaiah, Director S.V. Zoo Park Tirupati, AP.
2. Status of Hume's Pheasant in Aizawl Zoo, by Shri Liankina Lailung, Director DCF (Wildlife), Aizawl, Mizoram.
3. Problems in Pheasant Breeding by Raj Bahadur Singh, Dy. Director Pt. Govind Ballabh Pant High Altitude Zoo, Nainital.

Schedule for Hands on training workshop on Conservation Breeding of Pheasants in Darjeeling (West Bengal)
6th November-9th November 2008

Day/ Time	Subject	Resource Person
Day one 6.11.2008 (Thrusday)		
8:30-9:00 hrs	Registration	
9:00-9:10 hrs	Welcome address	Shri A.K. Jha IFS
9:10-9:20 hrs	Inaugural speech	Shri P.K. Roy, IFS Adl. PCCF, West Bengal
9:20-9:50 hrs	Keynote address & presentation on conservation breeding of pheasants	Dr. B. R. Sharma, Member Secretary CZA
9:00-10:00 hrs	Vote of Thanks	CF Hill Circle
10:00-10:30 hrs	High Tea	
10:30-11:00 hrs	Pheasant of the worlds :Status and distribution	Dr. K Sivkumar WII
11:00-12:00 hrs	What is conservation Breeding Design and enrichment of pheasant aviary prerequisite of pheasant breedig	Dr John Corder
12:00-13:00 hrs	Brief on Anatomy and physiology of Pheasant	Dr. K. Sivakumar WII & John Corder
13:00-13:45 hrs	Lunch	
13:45-14:15 hrs	Incubation and egg development	Dr. L. N. Acharjyo & John Corder
14:15-14:30 hrs	Tea	
14:30-16:30 hrs	Capturing of pheasants, health check up and measurement of metamorpic character (visit to zoo)	Dr. Deepak Sharma, Dr. John Corder and Alam Singh
19:30 onwards	Official Dinner	
Day Two 7.11.2008 (Friday)		
9:00-9:30 hrs	Rare pheasants in Beijing Zoo	Mrs. Zang Jing & John Corder
9:30-10:00 hrs	Feeding,Nutrition and supplements for Pheasants in Captivity	Dr. L.N. Acharjyo Bhubaneswar & John Corder
10:00-11:00 hrs	Disease & Hygiene including deworming procedures and applying medication & pest control	Dr. L.N. Acharjyo /Veterinarian Darjeeling zoo & John Corder
11:00:11:30 hrs	Tea	
11:30-12:30 hrs	Blood pheasants in Beijing zoo-from the field to a breeding programme Incubation and Rearing of chicks (Broodies,Incubation and Rearing equipments)	Mrs. Zhang Jing and Dr. John Corder
12:30-13:00 hrs	Predator of pheasants and rodent control	Dr. L. N. Acharjiya & Dr. John Corder
13:00-13:45 hrs	Lunch	
13:45-16:30 hrs	Incubation in pheasants (Field visits to zoo) (Tea will be served inside the zoo premises)	
18:00-18:30 hrs	Film show on pheasants (upkeep husbandry etc)	Dr. John Corder
18:30-20:00 hrs	Species level meeting of coordination and participating zoos	Facilitated by CZA Staff
20:00 onward	Dinner	

Day/ Time	Subject	Resource Person
Day Three 8.11.2008 (Saturday)		
4:00-7:30 hrs	Visit to Tiger hill and Senchal WLS	Mr. A.K. Jha, Mr. S. Syangden, Shri J. B. Chhetri
9.00:10:00 hrs	Breeding Behaviour pheasants	Dr. Rahul Kaul
10:00-10:30 hrs	Importance of pheasant calls-Cheer Pheasants	Dr. John Corder
10:30-11:00 hrs	Preparation of conservation breeding management plan	Dr. Naim Akhtar
11:00-11:30 hrs	Tea	
11:30-12:00 hrs	Initiative of Darjeeling zoo on conservation breeding of endangered species	Shri A.K. Jha IFS
12:00-12:20 hrs	Status of Western Tragopan breeding in Sarahan Pheasantry/Video	Alam Singh
12:20-13:00 hrs	Status of pheasants in Padmaja Naidu Himalayan Zoological park; Darjeeling, India	Mr. Shiromani Syangdan
13:00-13:45 hrs	Lunch	
13:45-14:00 hrs	Status of Cheer pheasant breeding in Chail WLS	Satpal Dhimal
14:00-14:15 hrs	Status of Grey peacock pheasant breeding in Alipore zoological garden	Dr. S. Choudhary, Alipore Zoo
14:15-14:45 hrs	Breeding & Managemant of Red Jungle fowl in selected zoos	Dr. Raul Kaul, WTI
14:45-16:45 hrs	Visit to Red Panda and Snow Leopard conservation breeding centre in the PNHZP. (Tea will be served inside the zoo premises)	Dr. Deepak Sharma, PNHZP
18:00-18:30 hrs	Film show on PNHZ Park	
18:30-20:00 hrs	Species level meeting of coordinating and participating zoos	Facilitated by CZA staff
20:00 onwards	Dinner	
Day Four 9.11.2008 (Sunday)		
9:00-9:20 hrs	Status of Grey Jungle fowl breeding in Tirupati zoo	S. Krishnaiah Director of Tirupati Zoo
9:20-9:40 hrs	Status of Blyth Tragopan in Nagaland Zoological park, Rangapahar	Director of vetenerian Nagaland Zoological Park, Rangapahar
9:40-10:00 hrs	Status of Hume's pheasant in Aizwal zoo	Director Aizwark Zoo
10:00-10:20 hrs	Problem in pheasant breeding	Deputy director Naintal Zoo
10:40-12:30 hrs	Protocols for aviary designs for pheasants-pratical session. Reintroduction protocal for pheasants (IUCN guideline) Group discussion & Recommendations	Dr. John Corder & Others.
12:30-13:00hrs	Valedictory functions	
13:00-13:45hrs	Lunch	
13:45-18:30hrs	Visit to Mirik and back for study of Ex-situ pheasant conservation efforts and habitat study	Director PNHZ Park
19:00-20:00hrs	Species level meeting of coordinating and participating zoos	Facilitated by CZA staff
20:00 Onwards	Dinner	

LIST OF PARTICIPANTS

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Welcome address by Shri A. K. Jha, IFS, Director Padmaja Naidu Himalayan Zoological Park, Darjeeling

Namaskar, SUPRABHAT and very Good Morning to every one present here

Today on this sunny morning I have this proud privilege to be with you here in the lap of QUEEN OF HILL STATION DARJEELING. With seeking the blessings of looming Kanchenjunga abode of the Goddess--, to all those who come to Darjeeling, I welcome you here. Darjeeling has been a place of immense natural beauty, and a house of beautiful people. The nature has filled the coffers of Darjeeling the beauty of rivers, forests, lakes, animals and birds. With three T's timber, tourism, and tea-boosting the economy of Darjeeling, there is conflict between population of Darjeeling with its natural assets, which has been converted into opportunity by eco tourism, nature tourism, and village tourism.

Darjeeling district has a forest cover of 38%, and the forest cover extends from 600 feet above sea level near Kalijhora and Riyang to 12000 feet near Sandakfu and phalut. This unique nature of forest has given extremes of biodiversity both flora and fauna to this district. The forest types are Riverian forest, Lower Hill forests(includes Sal forest, wet mixed forests, dry mixed forests),Middle hill forests from 3000' to 5000',Upper Hill forests from 5000' to 8000', Oak hemlock Forests from 8000' to 10000' and Alpine Forests from 10000' to 12000'.For each zone there is unique flora and fauna.

It was with a view to conserve the eastern Himalayan ecosystem, the Birch hill park was developed as Zoological Park. The location is, at an altitude of 7000 feet, eminently suitable for housing and breeding of animals, from foothills to the alpine zone, as this is optimal altitudinal zone for animals. The park is composed of natural woods that originally existed in the area and which correspond to Northern montane /East Himalayan Wet Temperate forests. The park was established on 14th of August 1958, and this year we are celebrating our fifty years. In 1975, the park was renamed when late Smt Indira Gandhi dedicated the erstwhile Himalayan Zoological Park in the memory of Late Smt Padmaja Naidu, ex Governor of West Bengal. The park has since then been known as Padmaja Naidu Himalayan Zoological Park.

Over the years this park has created a niche for itself by actively working for the cause of conservation breeding of endangered Himalayan animals. The park is not very big, it comes in the category of small zoo, but houses animals of importance which are from this region and have one of the oldest record for conservation breeding. The park itself consists of variety of Himalayan fauna and at the beginning of its opening, it supported Himalayan Black Bear, Barking Deer, Civets, small Cats, Hodgson's Flying squirrel, orange bellied Himalayan squirrels etc. Even today one can see Kalij pheasants, jackals, Martens, Civets and variety of birds in the park, roaming freely.

The park started work on the conservation breeding of Snow Leopards from 1983.This was the first instance of an Asian Zoo participating in the snow leopard breeding master plan, which was conceptualized by Mrs Helen Freeman, the then President of International Snow Leopard Trust. The breeding stock was brought from Europe and the project was started in 1986.First births were recorded on 20th may 1989.The PNHZ Park with an existing population of 1 male and 3 females started the conservation breeding project , in Red Pandas in 1990.It also released four female animals in the Project Back to Wild in 2003. Further two male animals are proposed to be released in wild.

The park has been identified by the CZA as coordinating Zoo for Snow Leopards, Red Panda, Tibetan wolves, Himalayan Salamanders, and Styr Tragopan; and participating zoo for Grey Peacock Pheasant, Blood Pheasant, Himalayan Monal, Blue Sheep and Himalayan Tahr. The zoo has been reasonably successful in breeding of pheasants. The space crunch has been a major problem for herbivore and pheasant breeding and hence the Governing Body of the PNHZ Park Society decided to develop the Dow Hill deer park, as a satellite Zoo for PNHZ Park. The work is going to start soon.

With this background I welcome you again in this serene captivating Queen of Hill Station Darjeeling and wish you a very comfortable stay. Thanks.

Address by Shri. P.K. Roy IFS
Addl. PCCF, West Bengal, India

Good morning everyone, this is a great privilege for me to be here among the people who have been involved in conservation of wildlife.

I thank CZA who has organised the programme at Darjeeling and I am highly privileged to participate in this workshop. I particularly thank CZA for their concern over the fast disappearing pheasant species of our country.

I wish all the success for this seminar where we can share our experience in breeding pheasants and I welcome you all to Darjeeling on behalf of the forest department of W.B

Thank you very much.

Conservation Breeding - India's Initiative

Hands on training workshop on Conservation Breeding of Pheasants at Darjeeling (West Bengal), India

6th to 9th November, 2008

Dr. B.R. Sharma, IFS
Member Secretary,
Central Zoo Authority

India

- 32.8 lakh sq.kms. of land mass i.e. 2.4% of world's total area
- More than 100 crore (2001 census) people and again more than 50 crore cattle.

India's forests and biodiversity

7.75 lakhs sq.kms of forest cover i.e. 23.57% of total land area with

- 350 species of mammals
- 1224 of birds
- 408 of reptiles
- 197 of amphibians
- 2546 of fishes
- 57548 of insects &
- 46284 species of plants

from 8% of world's biodiversity

People

- Love and respect for nature and natural resource is part of out tradition, our culture and our religions.
- What we had and still have is conserved not only because of our Governments, our legislation, our policy, but by the people, as they have that respect for nature and brotherly feeling for fellow living beings.

Forest Policy

- The first regular forest policy statement in India was issued in 1894.
- After independence, a new National Forest Policy was enunciated in 1952.
- And finally replaced by the National Forest Policy of 1988.

Forest Legislation

- Forest legislation in India dates back to 1865, which was later revised in 1878.
- Process continued till the currently application Indian Forest Act of 1927.
- The Forest (Conservation) Act was enacted in 1980 to check diversion of forest land to non-forestry activities.

Wildlife Legislation

- The Wild Life (Protection) Act came into being in 1972 to give proper shape to wildlife conservation in the country.
- The Act has later been amended in 1982, 1986, 1991, 1993 2003 and 2006 to make it more comprehensive.

National Wildlife Action Plans

- The first National Wildlife Action Plan was adopted in 1983.
- Presently, the National Wildlife Action Plan (2002-2016) is in operation and is guiding in deciding the priorities for wildlife conservation.

Constraints to wildlife conservation

Countless obstacles to conservation

- Severe biotic pressure
- Degradation of habitat
- Fragmentation of habitat
- Diversion of forest land for non-forest purpose.
- Illegal occupations/encroachments
- Hunting/poaching and many more.

Needs

- There is an urgent need to conserve India's forests and wildlife.
- The Government of India has always been sensitive to this and has taken several initiatives towards preservation of forests and wildlife from time to time.

In-situ wildlife conservation

606 Protected Areas comprising

- 96 National Parks
- 510 Wildlife Sanctuary

With overlapping of 36 tiger reserves and 28 Elephant Reserves cover and area of 1.6 lakh sq.kms i.e. 4.58 of total geographic area and/or 22.12% of total forest area of the country.

In-situ wildlife conservation

- Yes, all the efforts to protect the wildlife in its wild home are on.
- Stress on eco-system based conservation of wildlife.

Ex-situ wildlife conservation

There are many wild animal species which are critically endangered may be because of

- Very specific/special needs which are not available
- Habitat loss
- Over-harvesting, hunting, poaching etc.

And are in need of outside help.

Ex-situ wildlife conservation

- The Government of India has always acknowledge it.
- The India Board for Wildlife (now Nationl Bpard for Wildlife) in its very first meeting in 1952 made important recommendations in this regard.
- An Expert Committee on management of Zoos was set up by the Government of India in November, 1972 and its recommendation accepted in June, 1973, which still have relevance.

Central Zoo Authority

- The Central Zoo Authority was established by the Government of India in the year 1992 through an amendment in the Wild Life (Protection) Act, 1972.
- Main objectives was to oversee the functioning of Zoos and enforce minimum standards and norms for upkeep and health care of animals in Indian Zoos and to provide them technical and other assistance for improvement.

Central Zoo Authority

- The Central Zoo Authority is a twelve member statutory body heded by a chairman.
- Minister-in-charge, Forests and wildlife Government of India is presently ex-officio Chairman of the Authority.
- Member Secretary, Central Zoo Authority is the Chief Executive Officer of the Authority.

Regulation of Zoo Rulee, 1992

- There are 51 prescribed standards and norms for zoos in India.
- The Rules presceibe, type of husing facilities, health care, hygiene, feeding and overall upkeep of the animals, the minimum number of trained personnel to be posted, visitor facilities and others.

National Zoo Policy, 1998

- To give proper direction and thrust to the management of Zoos in the country, the Natonal Zoo policy was framed and adopted by Government of India in the year 1998.
- The main objective of the Zoos under the National Zoo Policy is to complement and strengthen the national efforts in conservation of rich biodiversity of the country, particularly, the wild fauna.

National Zoo Policy, 1998

This objective can be achieved by zoos through the following protocol.

- Coordinated conservation breeding of critically endangered species in ex-situ conditions.
- Conservation education
- Research for conservation and if resources permit, to act as Receue Centre.

National Wildlife Action Plans

- The National Wildlife Action Plan, 1983 emphasized the role of ex-situ conservation in national conservation efforts.
- The National Wildlife Action Plan (2002-2016) also lays emphasis on the role of Zoos for ex-situ breding of endangered species of wild fauna and their rehabilitation in the wild as per the IUCN guidelines for reintroduction.

- The **Central Zoo Authority** just after its establishment in 1992 formed an Expert Group for preparing a strategy for conservation breeding of endangered species in Indian Zoos.
- Species in need were identified, species co-ordinators made and responsibilities for maintenance of stud books were assigned.
- But because of many factors, not much could have been achieved, except few successes here and there.

Efforts

- May be it was too early and we were not ready for it in 1992.
- Taking note of the past successes and failures, the issue was again taken up for discussions in the Central Zoo Authority in the year 2005.
- We have done lot of soul searching and homework on the issue in last three years.

Initiative-Sub-Committee on Conservation Breeding

- A Five member Sub-Committee on Conservation Breeding was constitued in the Central Zoo Authority to prepare a concept paper for consideration by the Authority.
- The Chief Wild Life Wardens, in-situ wildlife managers were requested to propose the names of the wild animal species to be taken up under the programme.
- The Sub-Committee had four sittings and considered different proposals.

Initiative - meetings with in situ managers

- Many meetings with the Chief wild life Wardens,in-situ managers, zoo directors have been organized at Guwahati, Ooty, Ahmedabad, New Delhi to finalize the details..
- A concept paper has been prepared on ex-situ Conservation Breeding of endangered wild animals in India. 63 species have been identified for planned coordinated conservation breeding under the programme. The Central Zoo Authority has finally approved the draft in July, 2007.

Initiative - Ex- Situ Conservation Breeding

- The Zoos in India have been provided basic veterinary care facilities in the Zoos.
- Health Care Advisory Committees and mechanism for getting sophisticated diagnostic facilities and services from the local veterinary institutes / hospitals have also been requested at the zoo level.
- A National Referral Centre has been established at Indian Veterinary Research Institute, Bareilly (UP) for providing super-speciality services and diagnostic facilities to the Zoos.

Initiatives- LaCONES

- A Laboratory for conservation of Endangered Species (LaCONES) forbiotechnological intervantions has been established at Hyderabad for doing genetic fingerprinting of the founder populations and others. The Laboratory is also working as frozen Zoo and is experimenting on assisted reproduction (AR) in wild animals including cloning.

Initiative - National Studbook Cell

- All the founders under the breeding programme are being marked for identification by tagging, ringing or microchipping. The Wildlife Institute of India, Dehradun andCentral Zoo Authority ae assisting the zoos in preparing the Animal History Cards and National studbook/herdbooks of the identifiedspecies under the programme.
- We have already come out with first compilation of annual profiles and National studbooks of some of the identified species as up to 31st March, 2008

Initiatives- Joining of ZIMS

- All the major Zoos (57Nos.) and related organizations (4Nos.) in India are joining ZIMS / ISIS from 1st January,2009.
- These initiatives are to modify and equip the Zoos to take up this great responsibility.

Objective

It is felt that the Indian Zoos have to have at least 100 property bred and physically, genetically and behaviourally healthy indivaduals of all the identified wild animal species in captivity to

- Have proper captive stock for display
- As insurance cover in case population of the species collapses in the wild.
- Trail releases of the spill over stock in the wild for developing expertise.

Objective

- And to bring in holistic development of Zoos in India to become centre, even nucleus which can compliment the national efforts in conservation of wildlife.
- And to infuse more technical and scientific culture in operation of zoos.
- And to change the general perception of zoos from being mere picnic spots to extension of wildife conservation activities.

Ex-situ Conservation Breeding

- The conservation breeding programme in India is a joint venture of in situ and ex-situ wildlife managers . It is a need based activity
- The Chief Wild Life Wardens and Protected Area Managers have to identify the species which need immediate intervention in the form of ex-situconservation breeding for the areas under their control.

Ex-situ Conservation Breeding

- Wildlife wings of the States/ Union Territories have to conduct time to time census of the targetted wild animals species and its related species in their areas to assess the status of the wild animals species, as well as to analyze the condition of its habitat.
- The in-situ wildlife managers need to identify the Protected Areas having / had wild population of the proposed species/ re-introduction site.
- The in-sity managers also have to take corrective measures to address the cause of decline of the wild population of the targetted species in the natural habitat.

Ex-situ Conservation Breeding

- Analyzing suitability of the wild habitat for the targetted species, its present condition, assessing the causes of earlier decling, inputs required for improvement of the habitat and its protection form major components of the programme.

Ex-situ Conservation Breeding

- It is felt that critically endangered wild animal species with few hundreds/thousands (of say 2500) left in te wild need to be taken up for ex-situ conservation breeding in the Zoos on immediate basis.
- Species with localized distribution should get preference in the scheme of things.

Ex-situ Conservation Breeding

- The existing Zoos are the right places for the exsitu conservation breeding programme as there is huge infrastructure and trained manpower available over there to deal with the issue.
- One major zoo just next to the natural habitat of the identified species and having expertise and infrastructure has been identified as conordinating zoo for each species.
- Two-four Zoos in the habitat range of the targetted species will take part in the breeding programme as participating Zoos.

Ex-situ Conservation Breeding

- Conservation reeding facilities in the form of off-display conservation breeding centres (if the appropriate land is available in the Zoo compound) or in the form of satellite facilities are being created in co-ordinating Zoos.
- The other Zoos in the country in addition to the coordinating and participating Zoos may continue to display the species in the naturalistic enclosures, if available.

Ex-situ Conservation Breeding

- The possibility of identifying at least 25 founders is being assessed from the existing captive stock in Indian Zoos. Efforts are being made to acquire suitable founders from Rescue Centres, foreign Zoos and even from wild.
- The target will be to have at least 250 physically genetically and behaviourally healthy and identifiable individuals with animal histary sheets of each targetted species in captivity in the world of which at least 100 must be in India.

Ex-situ Conservation Breeding

- The Central Zoo Authority will provide all possible technical, financial and other assistance to the zoos under the programme.
- The creation of appropriate animal housing facilities in the form of off-display conservation breeding centres/ satellite facilities along with the project office will be financed by the Central Zoo Authority on 100% basis.

Ex-situ Conservation Breeding

- The Central Zoo Authority is also providing funds as Small-Grants Fellowship for engaging technical manpower for preparation of captive breeding management plans for the targeted species.
- The Central Zoo Authority is also considering providing maintenance expenditure on off-display Conservation Breeding Centres in the coordinating Zoos.

In-Situ Ex-situ linkage

- 90% zoos in India are controlled by the Chief Wild Life Wardens of States/UTs
- The Chief Wild Life Wardens in the States/UTs are also the controlling authorities of all the in-situ wildlife conservation areas.

That makes the coordination between in-situ and ex-situ activities much easier.

Species Recovery Plan

- The Government of India has lately realized that the wild animal species which are losing ground faster than general decline in the wild, may be because of lose of specific habitats, special needs, or over exploitation and have become critically endangered need special attention. More species specific approach than general ecosystem based management approach needed for these species.
- There are some such ongoing projects like Project Tiger. Project Elephant etc. In India to deal with such issues.

Species Recovery Plan

- In the XI Five Year Plan (2007-2012) the Government of India has come up with a special scheme known as Species Recovery Plan (SRP) tp deal with these wild animal species.
- Special efforts will be made for their recovery in the wild
- Ex-soti conservation breeding in captive conditions and their later release / reintroduction in the wild is a major component of the scheme.

Species Recovery Plan

- For Asiatic Lion Snow leopard, Bustards, Vultures, Hangul, Dolphins are already in progress.
- More species may have to be taken up under the scheme in future.

International Co-operation

- National/international organizations, institutions, NGOs, related bodies and more importantly the Zoo dealing with and interested and invested in the wild animal species of Indian sub-continent and requested to contribute and be art of the programme.

International Co-operation

- Conservation Breeding Specialist Group of SSC/ IUCN with its regional offices has been reguested to cooperate in this very ambitious project.
- Though we have not yet formally sent our request, the World Association of Zoos and Aquariums has also been requested to allow and support the activity as part of Global Species Management Plan (GSMP) for conservation breeding.

International Co-operation

- Hopefully all the identified individuals of all the identified species will be part of National and international studbooks
- We are also in process of going for WAZA Branding of programme on species to species basis

This Workshop

- Organizing this hands on training workshop on conservation breeding of identified pheasants is part of the programme.
- 13 different species of pheasants of Indian origin have been identified under the programme.

Species are :-

S.No.	Species	Coordinating Zoo	Participating Zoo
1.	Himalayan Monal	Manali	Darjeeling Gangtok
2.	Blood Pheasant	Gangtok	Darjeeling
3.	Cheer Pheasant	Chail	Almora
4.	Hume's Pheasant	Aizawal	-
5.	Grey Peacock Pheasant	Guwahati	Kolkata, Darjeeling
6.	Sclater's Monal	Arunachal Pradesh	-

Species are :-

S.No.	Species	Coordinating Zoo	Participating
7.	Tibetan eared Pheasant	Arunachal Pradesh	-
8.	Temminck Tragopan	do	-
9.	Blyth's Tragopan	Kohima	-
10.	Western Tragopan	Sarahan	-
11.	Styr Tragopan	Darjeeling	Gangtok
12.	Grey jungle fowl	Tirupati	-
13.	Red jungle fowl	Morni (Haryana)	Chail, New Delhi, Aizawal

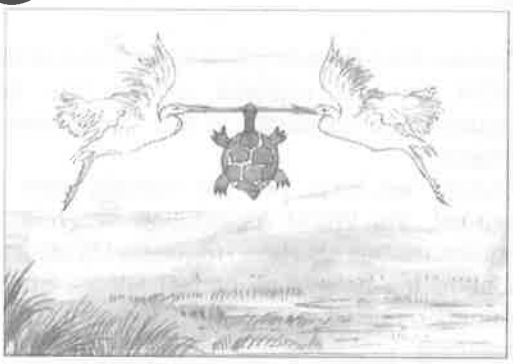
The WorkShop

- So we will be discussing about the housing husbandry breeding healthcare, record keeping studbooks and other details of the above species in next four day over here

The Workshop

THIS IS A VERY AMBITIOUS, FULLY FUNDED, NATIONAL PROGRAMME.

WE NEED TO CO-OPERATE TO MAKE THIS SUCCESSFUL.



Together we can

PHEASANTS OF INDIA- STATUS AND DISTRIBUTION

Dr. K.Shivkumar,WII

Dr. Shivkumar provided information on the status and variety of pheasants found in the Indian sub-continent. He also gave recommendations for the conservation of these pheasants.

Hands on training workshop on conservation breeding of pheasants, 6-9 November 2008
central Zoo Authority, Govt. of India

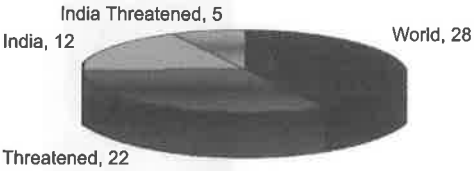
Pheasants of India

Status and distribution

K. Sivakumar
wildlife Institute of India

Pheasents

- Most charismatic and popular bird
- National bird of India
- 50 species of pheasants in the World, about 22 species are threatened
- 17 species of pheasants in India, five are threatened



No.	Commoe Name	Scientific Name	Population	IUCN	WPA
1.	Blood Pheasant	*Ithaginis cruentus*	fairly common	others	Schedule I
2.	Western Tragopan	*Tragopan melamocephalus*	rare	vulnerable	Schedule I
3.	Satyr Tragopan	*Tragopan satyra*	uncommon	near threatened	Schedule I
4.	Blyth's Tragopan	*Tragopan Blythii*	rare	vulnerable	Schedule I
5.	Temminck's Tragopan	*Tragopan lemminckii*	rare	others	Schedule I
6.	Koklass Pheasant	*Pucrasia macrolopha*	fairly common	others	Schedule IV
7.	Himalayan Monal	*Lophophorus mipeianus*	common	others	Schedule I
8.	Sclater's Monal	*Lophophorus sclateri*	rare	vulnerable	Schedule I
9.	Red Junglefowl	*Gallus gallus*	common	others	Schedule IV
10.	Grey Junglefowl	*Golus sonneratit*	common	others	Schedule II
11.	Kalij Pheasamt	*Lophura leucomelanos*	common	others	Schedule I
12.	Tibetan Eared Pheasan	*Crossoptilon harmani*	rare	Near	Schedule I
13.	Cheer Pheasant	*Catreus wallichii*	uncommon	vulnerable	Schedule I
14.	Mrs Hume's Pheasant	*Syrmaticus humiae*	rare	Near	Schedule I
15.	Grey Peacock Pheasant	*Polyplectron hicallcaeatum*	fairly common	others	Schedule I
16.	Indian Peafowl	*Pavo cristatus*	common	others	Schedule I
17.	Green Peafowl	*Pavo muticus*	extinct?	vulnerable	Schedule IV

BLOOD PHEASANT *Ithaginis cruentus* Hardwicke 1821
Vernacular Names : Same, Semo, Soomoong pho (Sikkim-Lepha), Chiku (Arunachal-Mishmi)

- Resident and fairly common. Distributed in the Central and Eastern Himalayas (Sikkim & Arunachal Pradesh), mostly between 3,200-4,700 m (dwn to 1,500 m in winter).
- Inhabits open fir and rhododendron forest and rhododendrpn scrub, birch and juniper scrub. Mostly in dense bamboo dumps and often near snow patches.

Conservation Status
IUCN : others
IWPA : Schedule I
CITES : II

WESTERN TRAGOPAN Tragopan melenocephalus Gray 1829
Vernacular Names Jujurana (Himachall-Kullu, Mandi), Fulgar, Fulgan (Himachali-Chamba), Pyara (Kinnaur), Jyazi (Bushahr) Sonalu, Solalee (Kashmiri), Jewar (Garhwali), Sing monal (Pahari-N.W.Himalaya)

- Resident and rare.
- Distributed in the northwestern and western Himalayas (Jammu & Kashmir, Himachal Pradesh and Uttarakhand).
- Mostly between 2,400-3,600 m (down to 2,999 m in winter).
- Inhabits dense undergrawth and montane bamboo clumps in undisturbed temperate and subalpine oak, coniferous, and mixed forests.

Conservation Status
IUCN : vulnerable
IWPA : Schedule I
CITES : I

SATYR TRAGOPAN Tragopan satyra Linnaeus 1829
Vernacular Names Lungi (Hindi Garhwali, Kumauni), Bop (Bhotia), Tarrhyak (Sikkm- Lepcha)

- Resident and rare.
- Distributed in the western, central and eastern Himalayas (eastern Uttarakhand, northern West Bengal , Sikkim and western Arunachal Pradesh), mostly between 2,400-500m (down to 2,000 m in winter).
- Inhabits dense undergrowth or montane bamboo clumps in temperate and subalpine oak-rhododendron, coniferous or broadleaved forests, scrub in steep billsides, and narrow ravines.

Conservation Status
Iucn : Near threatened
IWPA : Schedule I
CITES : III

BLYTH'S TRAGOPAN Ttragopan blythii Jerodon 1870
Vernacular Names, Son Soral (Assamese-Sadiya), Hur huria (Assamese & Miri), Gnu (Naga-Angami), Aghah (Naga.Sema), Aoho (Naga-Chang)

- **Resident and rare.**
- **Distributed in the eastern Himalaya (Arunachal Pradesh) and hills of northeast India (Assam, Manipur, Mizoram and Nagaland).**
- **Inhabits Moist, evergreen broad-leaved forest with a thick understorey, dense scrub, and in montane bamboo on steep slopes.**

Conservation Status
IUCN : vulnerable
IWPA : Schedule I
CITES : I

TEMMINCK'S TRAGORAN Tragopan temminckii Gray 1831
Vernacular Namos Bop (Tibetan)

- Resident and rare.
- Distributed ineastern Himalaya (Arunachal Pradesh) between 2,100 - 3,600m.
- Inhabits dense Undergrowth in damp, evergreen broad-leaved forest and dense rhododendron and montane bamboo.

Conservation Status
IUCN : other
IWPA : Schedule I
CITES : Not listed

KOKLASS PHEASANT Pucrasia macrolopha Lesson 1829
Vernacular Names Pucrasi (Kumauni), Pucklas (Garhwali, Himachali), Kukrola (Himachali-Chamba), Plash, Khwasksha (Shimlal Pandrabis), Plas Kashmiri)

- Resident and fairly common.
- Distributed in the north western and western Himalayas (Jammu & Kashmir, Himachal Pradesh, Uttarakhand) between 2, 700 and 3,300 m (down to 1,500m in winters).
- Inhabits coniferous , oak and deodar forests with dense undergrowth of bushes and montane bamboo, and favours steep slopes and ravines.

Conservation Status
IUCN : others
IWPA : Schedule IV
CITES : Not Listed

HIMALAYAN MONAL Lophophorus impejanus Latham 1790 Vernacular Names : Munal, Ghar munal, Ratia Kwan, Ratnal, Ratkap Nil(m), Kareri (f), Nilgur (Pahri-N.W.Himalaya) Bnal (m), Bodh (f) (Shimla, Kullu, Pandrabis) Datiya (garhawali, Kumauni), Sunal, Sunamurgh (m), Ham(f) (Kashmiri), Fo dong (Sikkim-Lepcha) Pia Padir (Arunachal-Mishmi)

- Resident and fairly common.
- Distributed in the north western, western, central and eastern Himalayas (Jammu & Kashmir, Himachal Pradesh, Uttarakhand, Sikkim & Arunachal Pradesh) between 2,300-4,,875 m and down to 2,000 m during winters (western Himalaya), and between 2,800-4,575 m and down to 2,500 m during winters (eastern Himalaya).
- Inhanits Temperate and subalpine oak, deodar, coniferous and rhododendron forests with montane bamboo and grassy glades; and alpine scrub and meadows, and sometimes remains above the snowline.

Conservation Status
IUCN : others
IWPA : Schedule I
CITES : I

SCLATER'S MONAL Lophophorus sclateri Jerdon 1870
Vernacular Names: Tratta, Poa padio (Arunachal-Mishmi), Pur di (Arunachal-Chuikatta Mishmi)

- Resident and rare.
- Distributed in the eastern Himalayas (Arunachal Pradesh) between 3,00 and 4,000m.
- Inhabits fir forest with dense rhododendron Undergrowth.

Conservation Status
IUCN : vulnerable
IWPA : Schedule I
CITES : I

KALIJ PHEASANT Lophura leucomelanos latham 1790
Vernacular NamesKala murgha, Kalesi (Hindi) Kaleej, Kukera, Kalesur (m) Kolsa (Pahri-N.W.Himalaya), Kansha, Kalesa (Shimla Solan / Pandrabis), Panti Kulsus (Kinnaur), Kar rhyak (Sikkim-Lepcha), Modura (Assam-Cachar), Darik Dirrik, Durug (Meghalaya-Garo Hills) Inruitip (naga), Waba (Manipuri)

- Resident andlocally common.
- Distributed in the northwestern, western, central and eastern Himalayas (Jammu &Kashmir, Himachal Pradesh, Uttarakhand, Sikkim, Arunachal Pradesh and northern West Bengal) usually < 2, 700m and in the hills of northeast India (Assam, Meghalaya, Manipur, Meghalaya, Mizoram, Nagaland & Tripura).
- Inhabits all types of forest with dense undergrowth and thickly overgrown steep gullies, usually not far from water.

Conservation Status
IUCN : others
IWPA : Schedule I
CITES : not listed

TIBETAN EARED PHEASANT Crossoptillon harmani Elwes 1881
Vernacular Names : (cha- ng)

- In India, very rare and only one confirmed record from Tawang, Arunachal Pradesh.
- InTibet, summers in parchy subalpine birch and rhododendron scrub and subalpine meadows; winters in spruce and pine forests.

Conservation Status
IUCN : near theatened
IWPA : Schedule II
CITES : not listed

CHEER PHEASANT, Catreus wallichil Hardwicke 1827
Vernacular Names. Chir, Chihir (Garhwal Kumauni) Bunchil, Hemil (Pahri-N.W.Himalaya) Chaman(m), Chamani (f) (Himachali-Chamba), Tana(Shimla/Pandrabis), Reear, Rehar (Kashmiri)

- Resident and uncommon.
- Distributed as fragmented populations in the northwesternand western Himalayas (Jammu & Kashmir, Himachal Pradesh, Uttarakhand) between 1,500-3,050 m.
- Inhabits precipitous, often craggy hillsides with scrub and stunted trees and dissected bywooded ravines or with some scrub and grass cover; village grazing lands and recently cleared areas with secondary growth . Strongly favours early successional habitats.

Conservation Status
IUCN : vulnerable
IWPA : Schedule I
CITES : I & II

MRS HUME'S PHEASANT Syrmaticus humlae Hume 1881
Vernacular Names : Loningkol, Noiningkol, (Manipuri)
Nongin (manipuri- Chiru tribe)

- Local resident and rare.
- Recorded from Manipur, Mizoram and Nagaland, at 1,200-3,000 m; only recent records are from Mizoram.
- It inhabits steep rocky slopes with open oak and pine froest and long grass, bracken and bushes.

Conservation Status
IUCN : vulnerable
IWPA : Schedule II
CITES : I

GREY PEACOCK PHEASANT, Polyplectron bicalcaratum Linnaeus 1758
Vernacular Names Munowwar, Deyodahuk, Deoderik (Assamese), Dao Dip Dao dal dip, Mejoor (Assamese- Cachar), Deodurug (meghalaya-Garo) Burruninrui (Naga-Kacha)

- Resident and fairly common in undisturbed forests.
- Distributed in the central and eastern Himalayas (Sikkim, Arunachal Pradesh) and northeast India (Assm. Meghalaya, Manipur, Mizoram, Nagaland, Tripura).
- Inhabits dense undergrowth in tropical moist, broadleaved evergreen and semi-evergreen forest.

Conservation Status
IUCN : others
IWPA : Schedule I
CITES : II

INDIAN PEAFOWL PAVO cristatus Linnaeus 1758
Vernacular Names : Mor, Mayura (Hindi), Mayil (Tamil, Malayalam), Nemali (Telugu), Nevilu (Kannada), Mor (m), Dhel (f) Gujarati) Mor (m) Landor(f) (Marathi), Mayur (Bengali),, Manja (m), Mania (f) (Oriya), Moira (Assamese), Mongyung (Sikkim-Lepcha), Dode (Meghalaya- Garo), Wahong (Manipuri)

- Resident and locally very common.
- Distributed throughout much of India except for the Himalayas and northeast India.
- Inhabits undergrawth in a variety of forests and scrub near streams, also in agricultural lands villages, and in institutional campuses in urban areas. Introduced in Andaman and Nicobar islands and Sikkim.

Conservation Status
IUCN : others
IWPA : Schedule II
CITES : I

GREEN PEAFOWL Pavo muticus Linnaeus 1766
Vernacular Names : Pegu majura (Bengali), Wahong (Manipuri)

- Resident and very rare.
- Recorded from eastern (West Bengal) and northeastern India (Assam, Manipur, Mizoram), but now is very rare and believed to be exterminated from the Indian subcontinent. A recent report has confirmed the presence of Green Peafowl in Chintupui and Lunglei districts, Mizoram.
- It inhabits dense forest near streams or clearings.

Conservation Status
IUCN : vulnerable
IWPA : Schedule IV
CITES : II

Pheasants in Himalayan Protected Areas

- Of the 17 species of pheasantsoccur in India, 16 species are forund in the Himalayan region.
- Grey Junglefowl is the only one not occurs in the Himalaya.
- There are about 99 Protected Areas (which includes five proposed PAs) on Himalayas covering approzimately 41, 597 km^2 (approximately 7.9% of the region) in which the pheasants occur in all but Trans-Himalaya.
- The Central Himalayan Province (2C) has the highest percentage of PA coverage while the province of North-East Hills (9B) has the lowest PA coverage.

Pheasants Species Richness in Protected Areas of Himalayas and surrounding areas.

- Himalayan Monal, Kaleej and Koklass pheassants are seems to be the most common pheasants in the Himàlaya as it is reported from 44 32 and 27 Pas respectively.

- Distribution of Tibetan Eared Pheasant, Sclater's Monal, Green Peafowl, Grey Peacook Pheasant, Blyth's Tragopan and Temminck's Tragopan are either not covered under the present Protected . Area Network or detailed distribution of these species in the Pas are not available.

Recommendations

- It is important to protect the certain habitats of Tibetan Eared Pheasant, Sclater's Monal, Green Peafowl, Grey Peacock Pheasant, Blyth's Tragopan and Temminck's Tragopan by declaring some of their range as PAs of Conservation / Community Reserves or Biodiversity Heritage Sites. In this connection, a survey on these species aimed to identify their population status, distribution pattern and habitat quality need to be taken up immediately.
- Among the Himalayas, Western Himalayas, which is home to several threatened pheasants including the Western Tragopan not adequately covered under the existing Protected Areas Network compared to other two biogeographic provinces of Himalayas, Hence, it is proposed to identify certain important pheasant habitats in the Western Himalayas and declare the same as either Conservation / Community Reserve of Biodiversity Heritage Sites or Protected Areas.
- Ex-situ conservation programme for all threatened as well as near threatened species.
- Grey Junglefowl, endemic to India especially to south & west part of India believed to be declining especially those populations, which occur outside the Protected Areas. It is important to know their present population status and include some of their distribution range in the PA Network of India.

WHAT IS CONSERVATION BREEDING DESIGN AND ENRICHMENT OF PHEASANT AVIARY PREREQUISITE OF PHEASANT BREEDING

Dr. John Corder
Vice President
World Pheasant Association

The presentation provided insight on different aspects of conservation breeding and also some interesting points regarding aviary size, designs and plantations.

Conservation Breeding

Stage 1
Can we keep the birds alive?

- Provide a suitable diet.
- Aviary construction to keeppredators out and birds in,
- Keep them healthy- cleanliness,
- Protect them from each other.

Stage 2
Can we bread the birds?

- Need to understand that different species have different requirements.
- Need to very diet seasonally.

This is Captive Breeding

Stage 3
Do we try to achieve natural characteristics and apply scientific principles to our breeding practices?

- Look at maintaining genetic diversity in out stock and use closed rings for identity?
- Encourage natural behaviour, particiularly parent-rearing?
- Involve ourselves with others where the conservation of species both in situ and exsitu are prioritised?
- Record our findings and share them with others for the benefit of the species?
- Return birds to their countries of origin if required?
- Evaluate with others the beed for re-introductions?
- Join with WPA and research our subject?

This is the beginining of Conservation Breeding

Conservation Breding

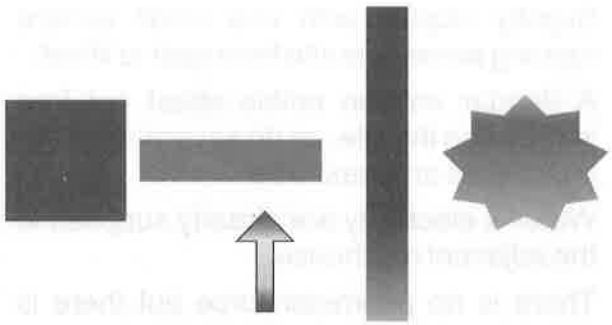
National or International studbooks

"Closed" rings to identify captive born birds and to conform to accepted international requirements

In India currently :
Are any zoos "conservation breeding" pheasant species?

This needs considerable commitment from animal keepers, staff at all levels and CZA

Prison Design



Public viewing access

How big does an aviary need to be?

- **Big enough for a whole family to overwinter without destroying the foliage**
- **How good is the soil quality to sustain and encourage natural plant life?**
- **Is there access to water to keep plants growing during dry seasons?**
- **What species will be kept there and how destructive are they of plant life?**

This is just a brief summary of considerations

GOPALPUR

Aviary design

Rest House

Orchard area

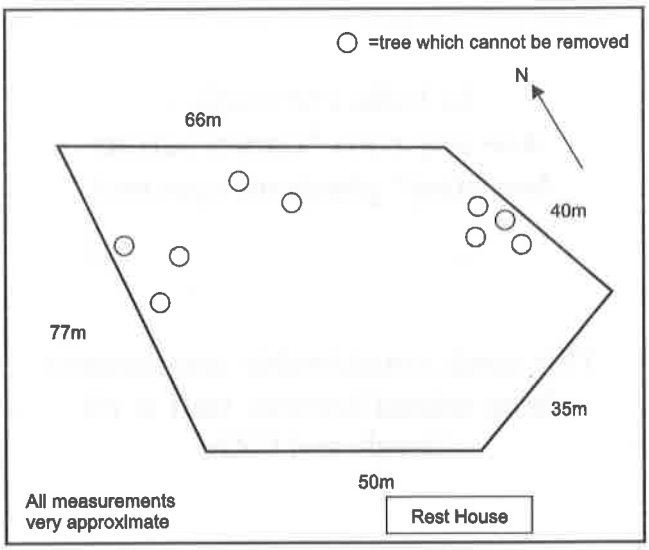
An open site of about one hectare, currently utilised as an apple orchard. It is surrounded on 3 sides by deoddars

Slightly sloping with one small terrace running across the site from east to West.

A deodar and an edible chest out free impinge on the site, as do several deodars on the east and west side.

Water & electricity are already supplied to the adjacent rest house.

There is no perimeter force but there is good access to the nearby road.



Considerations

- No perimeter fence is yet in place.
- There is water and electricity supply to the rest house.
- The summer femperature can reach 32° C
- There will be no public access to concern you The soil quality is good.
- RAviaries will need to be between 250 & 300m^2
- How will you protect the birds from predators?
- Where will the food store be located?
- Where will broody hens be situated?
- What height will the aviiaries be?
- What height will internal trees be allowed to grow?

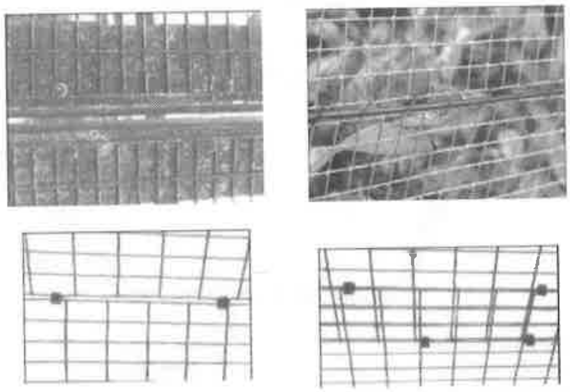
Determining factors

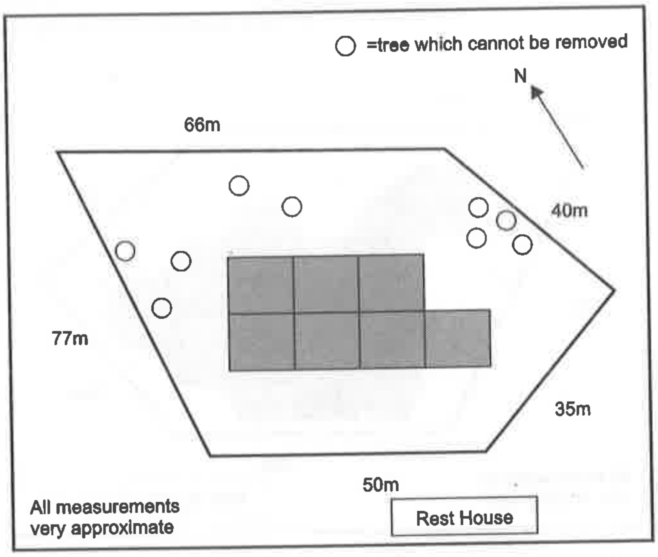
- The soil quality is quite good and will support good plant growth.
- There is easy access to water to keep aviary plants growing.
- Tragopans will usually have a clutch of about 3 or 4 young , so the aviary will need to provide for up to 6 birds through the winter without destroying the foliage.
- Rectangular aviaries do little to assist bens to breed naturally
- Martens visit the site frequently at night.

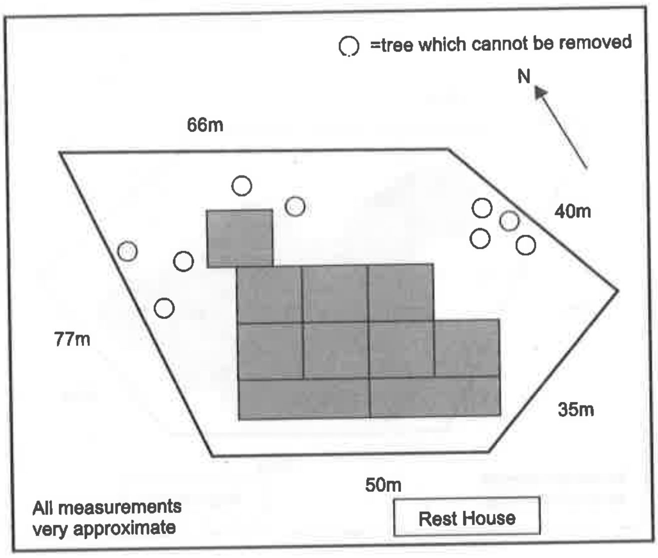
Materials

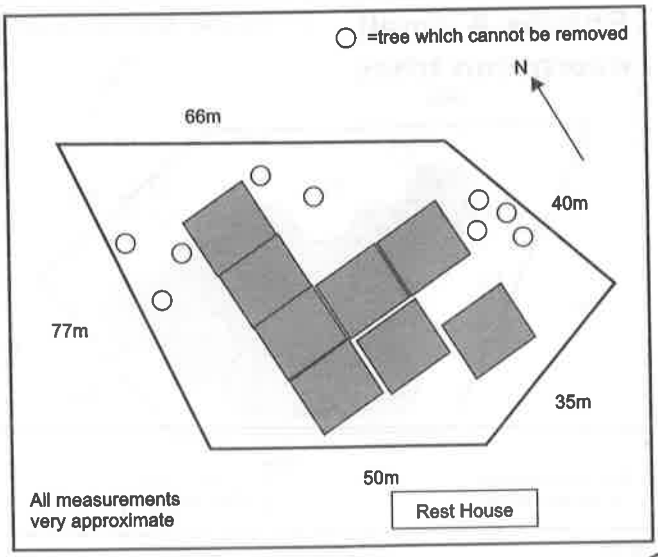
- Foundations - Is there a need to keep our predators or rats/ mice?
- Exterior Walls- Is there a need for an exterior wall -if there are snakes, use a capping stone. Make it a smooth construction so that an electric fence could be used, which will save considerable expense.
- Framework - wood form Forest Corporation - why use metal?
- Half inch square 16 gauge galvanised wire mesh
- Roof - same mesh and framework stong enough to walk on
- Interior walls - less substantial since they only need to keep the birds apart.

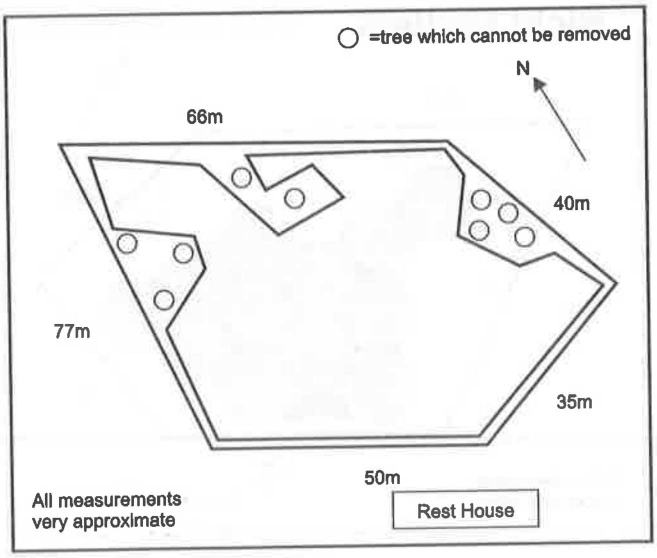
Aviary wire mesh

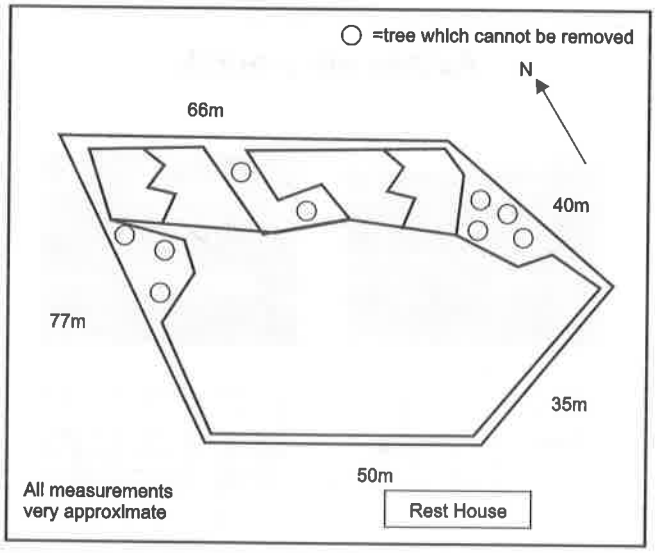


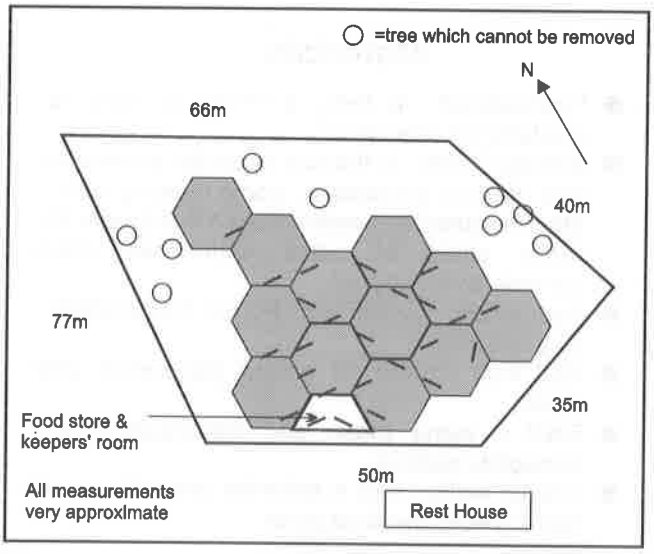









=tree which cannot be removed
N
66m
40m
77m
35m
50m
All measurements very approximate
Rest House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66m
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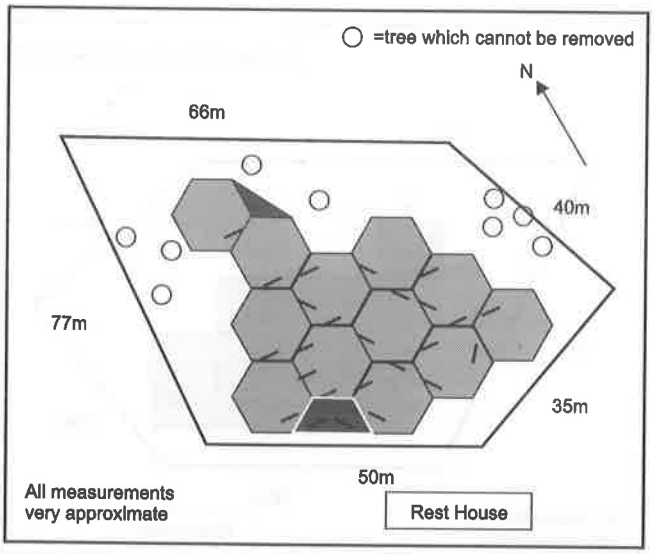
Food store & keepers' room
50m
All measurements very approximate
Rest House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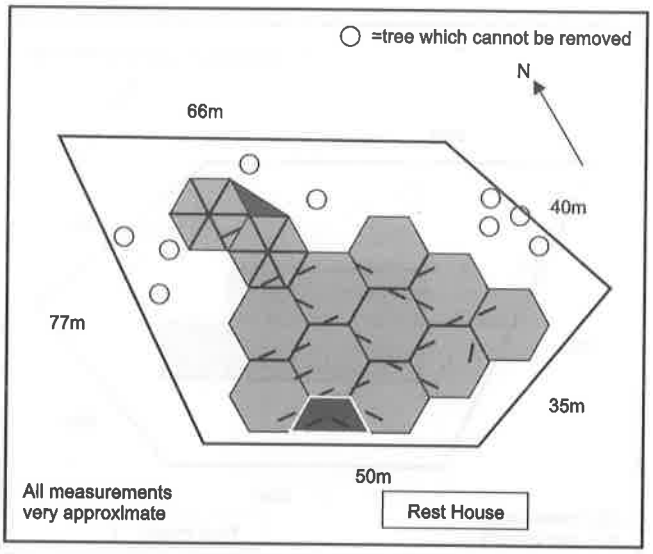
Rest House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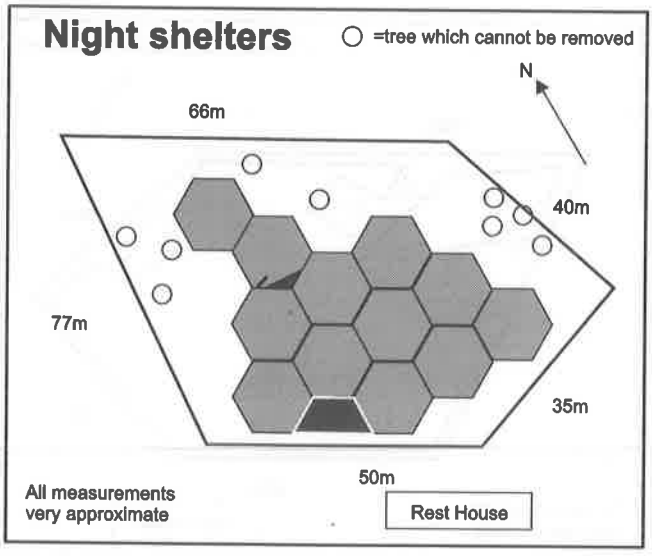
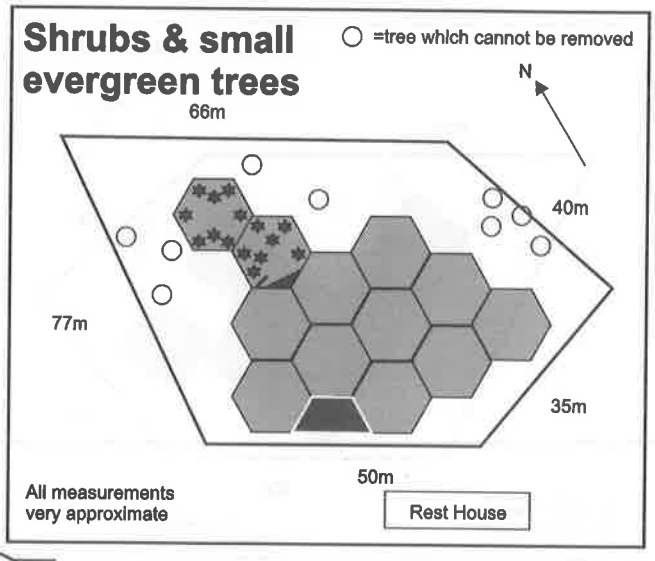
All measurements very approximate
Rest House


Night shelters
=tree which cannot be removed
N
66m
40m
77m
35m
50m
All measurements very approximate
Rest House


Shrubs & small evergreen trees
=tree which cannot be removed
N
66m
40m
77m
35m
50m
All measurements very approximate
Rest House

Some principles

- Think like a female pheasant.
- As few exterior doors as possible to limit possible escapes and predator entry.
- Height - 2m is adequate for birds and keepers.
- Doorways placed where they will not limit nesting opportunities.
- Avoid overhanging frees.
- Design roof so that it is easily cleared of debris or snow
- Have food store and keeper facilities with in the site so that they have easy access.
- Have the night shelter close to the door to limit keeper's wear & tear on aviary foloage.
- Electricity & water on site improved many oppertunities as well as plant growth.

Don's forget.....

- Broody hen facilities away from aviary complex to avoid corssinfuction
- Incubation facilities if you intend to use them - in the shade with north facing windows to minimise temperatire fluctuation
- Any intended resesrch facility
- Don't build an architectural folly that looks good to humans, but a site which appeals to the resident birds. Beware of architects!!!
- Evaluate an electric fence

BRIEF ON ANATOMY AND PHYSIOLOGY OF PHEASANTS

Dr. K. Sivakumar
Scientist, WII &
Dr. John Corder
Vice President,
WPA

The presentation provided a brief account on anatomy and physiology of pheasants.

Hands on training workshop on conservation breeding of pheasants 6-9 November 2008
Central Zoo Authority

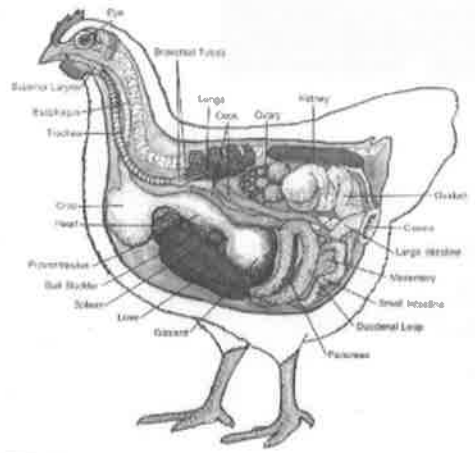
Anatomy and physiology of pheasants

K Sivakumar
Wildlife Institute of India

Requirements of a Pheasant

HIBITAL	PARTNERS	FOOD
Breeding		Breeding
Non-Breeding		Non-Breading
Nesting		Nesting/
Young		Incubation
Display		Chicks
Protection		Immature
Roost		Adults
Feeding		Molting
Mating		
Quality & Quantity	Quality & Quantity	Quality & Quantity

Anatomy of a bird



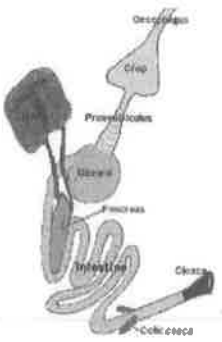
Physiology

Important physiological parameters

- Homoeothermic/Warm blooded animal.
- No skin glands except oil gland on the tails
- Matabolism rate is high, digestion is rapid, selective in their diet, hever stores the undigested food (reduced rectum)
- Dense, Inelastic and complicated lungs.
- Large sized powerful and efficient heart, large amount of haemoglobin in the blood.
- Metanephric Kidneys are added with henle's loops which are effcient in water absorption.
- Ovary and oviduct of one side to redduce the body weight.
- In temperate climates thyroid gland activity is increased during the colder periods of the year when an increase of metabolic rate, brought about by increased titers of thyroid hormones, is needed to counteract the increased heat loss.
- Histological examination of the theyroid glands during preeding period showed them to be quite active in appearance indicating that the thyroid gland is activated during the reproductive period and , probably, plays an important role in normal gonadal function in iew of the role of the thyroid hormone in reproduction of birds.

Nutrition & Digestion

- The avian diet varies as much as in mammals, leading to classification of individuals as carnivores insectivores, seed eaters, frugivores, ominivores and the like.
- The Pregastric System : Birds have no teeth and their jaws are covered by a beak. Birds fo not really masticate and mechnical disruption of food is accomplished by the beak and gizzard.
- The easophagus is large in diameter, all pheasants have a crop.
- Have a g;amdi;ar [rpvemtroci;is. and muscular stomach or gizzard.



Diet of pheasants

- Omnivore
- Chicks (first 3 weeks) largely survive on insects.
- Plant foods gradually start dominating in the diet of pheasants after three weeks of growth.
- Diet of the pheasants in wild may vary at any given place by seasons.
- Diet of a pheasant may vary place to place through its range depend upon habitat and season.
- In captivity, about 100 items of food eaten by the pheasants. But in wild, it must be on higher numbers.

Diet

- In wild, pheasant always prefer the better habitat with good food resources including water
- Foods contain with more fat and carbohydrates are preferred just before the breeding season
- Foods with more protein fat and calcium preferred by the brood.

Diet

- In winter most of the pheasants eat mostly seeds grains, roots, and berries.
- While in the summer they take advantage of insects fresh green shoots spiders, earthworms, and snails.
- Breeding hens and young chicks eat a greater proportion of animal matter than the rest of the population.
- While laying eggs, females eat large quantities of high calcium snail shells/insects.

Reproduction

- Unique mating systems
- Highly evolved display and copulatory behaviour.
- Birds reproduce by sexual reproduction males having paired testes lying in the body cavity and females having only a functional left ovary and oviduct.
- Sperm passes out of the testis into a duct (the vas deferens) which expands near the cloaca into a storage organ. During copulation, the cloace is everted and semen is deposited In the female's cloase.
- The females lay sets of eggs known as clutches, isn discrete groups in clearly defined nests. This may range from just a scrape in the ground to highly elaborate constructions .
- Numbers of eggs laid in a clutch may vary considerably, both between species and within species. Shape varies too - slthough related groups of birds tend to have similar egg forms - while colour may be uniform or a ground- colour overlaid with streaks spots, blotches or patterns of one or more colours.
- Following laying there is a period of incubation.

No.	Common Name	Food	Clutch size	Breeding	Sub- species
1.	Blood Pheasant	Moss, fern, lichens, pine, shoots	4-12,29days (ip)	April-June	Nepal, Sikkim Tibetan and Mishm blood pheasant
2.	Western Tragopan	Oak leaves, bamboo shoots roots, seeds acorns, barries, and insects.	2-6captivity	April-June	
3.	Satye Tragopan	Leaf and fern, (diplazium polypodium etc)	2-4 eggs	April-June	
4.	Blyth's ragopan	Oak leaves, oamboo shoots roots, seeds acorns, berries and insects		Aprio-June	T.b.blythi, T.b. molesworthi
5.	Temminck's Tragopan	Oak leaves, bamboo shoots, roots, seeds acorns, berries and insects		April-June	

INCUBATION AND EGG DEVELOPMENT

Dr. L.N. Acharjiyo Retd. Veterinarian,
Bhubaneshwar, Orissa &
Dr. John Corder, Vice President,
WPA

The presentation provided elaborate information on incubation and development of eggs. It also provided insight on setting of eggs in incubation, record keeping of eggs and some simple troubleshooting methods for problems in chicks.

Incubation & Egg Development

Dr. L. N. Acharjya & Dr. John. Corder

BREEDING AND INCUBATION

- The breeding season of most of the identified pheasants are from April to June pheasants are from April to June.
- The clutch size varies from 2-14.
- They lay only one clutch of eggs in a season, unless the clutch is predated, and incubate them and the hen broods the hatched out chicks.
- They start incubating usually after the full clutch of eggs are laid.
- Many pheasant species will be in full colour in 9 - 10 months and they are ready to breed in the first or second year.

- Incubation refers to the process of applying heat to an egg so that the embryo in the egg will develop into a chick.
- Incubation of eggs can be a accomplished by broody pheasants broody domestic hen or artificial incubators.
- The incubation period reported for Indian pheasants varies from 19 to 30 days depending upon the species.
- The pheasant eggs may be incubated in incubators having thermoregulatory & humidity regulatory devices.
- The ideal temperature for setting the eggs is 37 5°C (99,0°F).
- 50%relative humidity inside the incubator is required. The newly hatched chicks usually live on their yolk for about 24 hours and are self feeding.

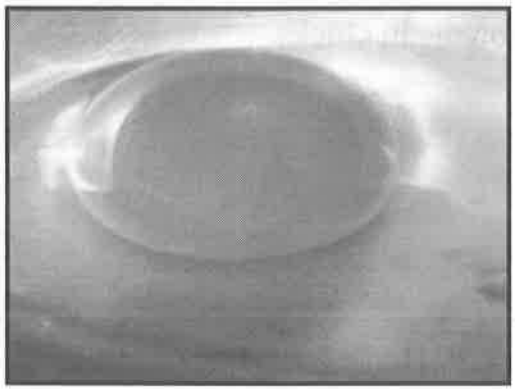
Embryonic development of a chicken's egg day be day

Photos courtesy of

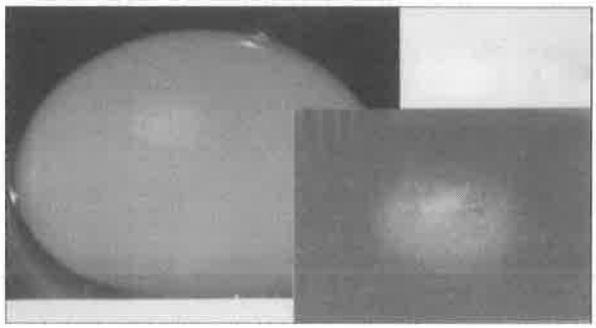
CEVA SANTE ANIMALE S.A

France

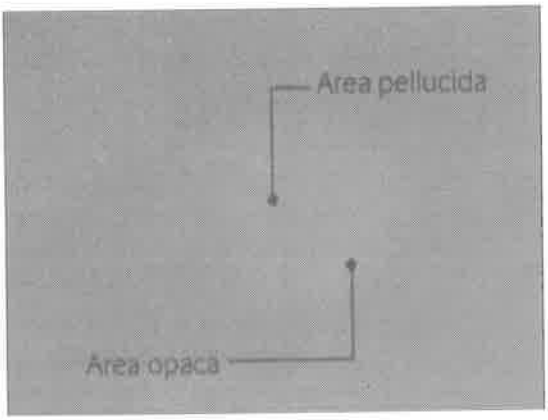
Unfertilised



Fertilised egg



Day 1



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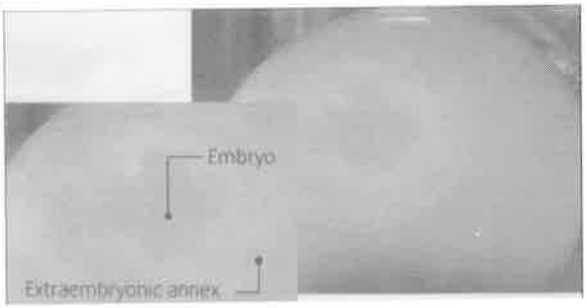

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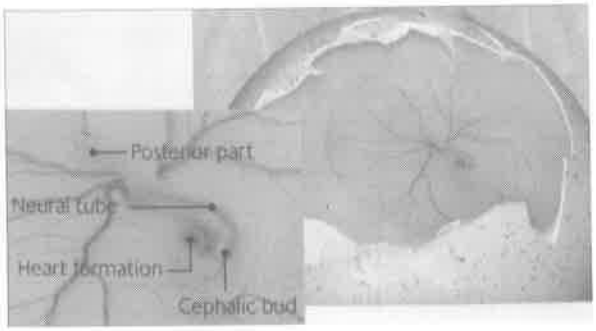

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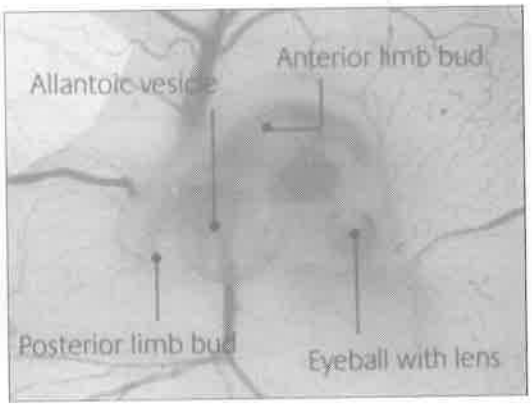

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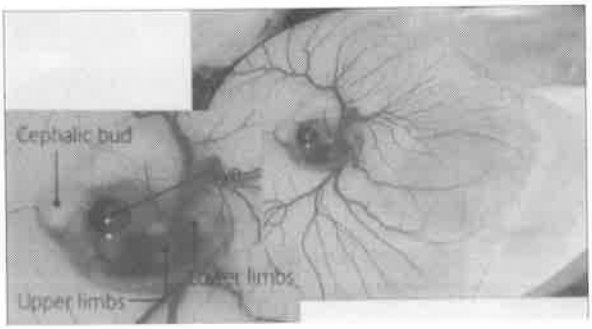

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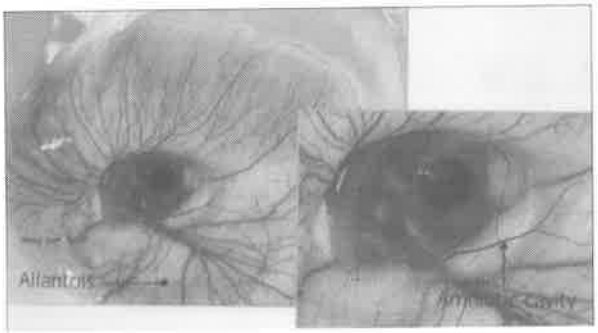

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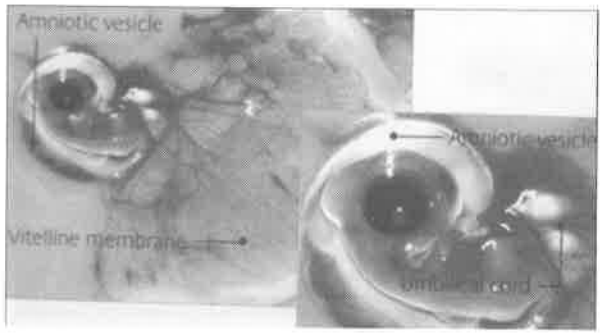

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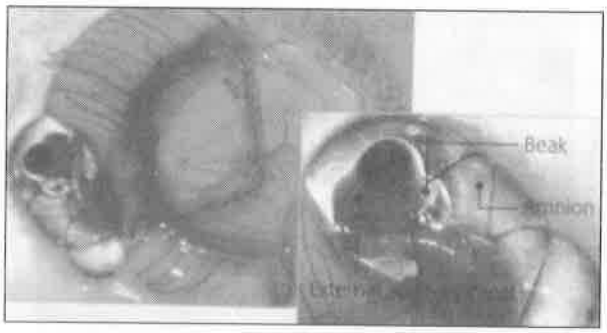
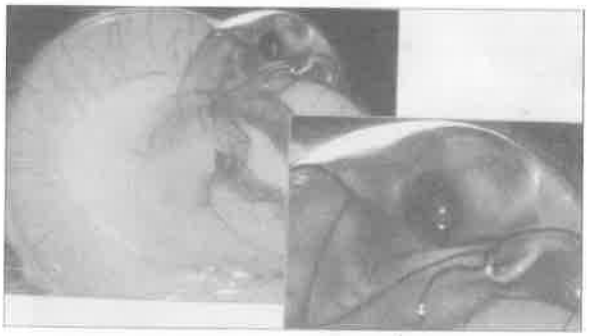


Day 9



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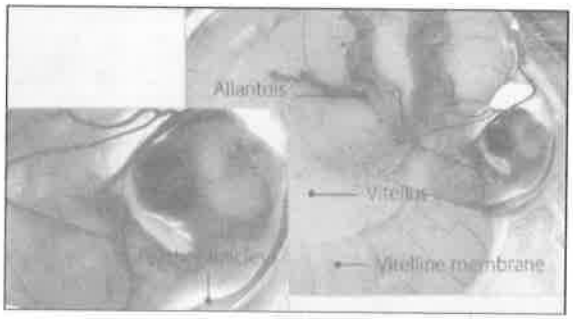

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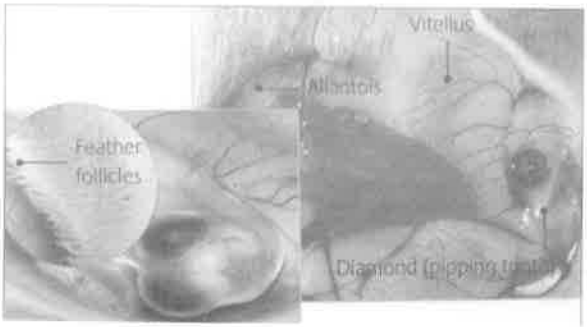

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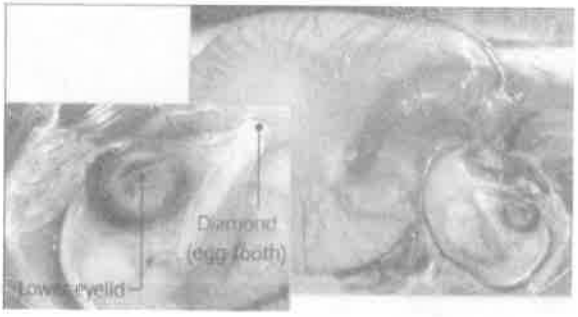
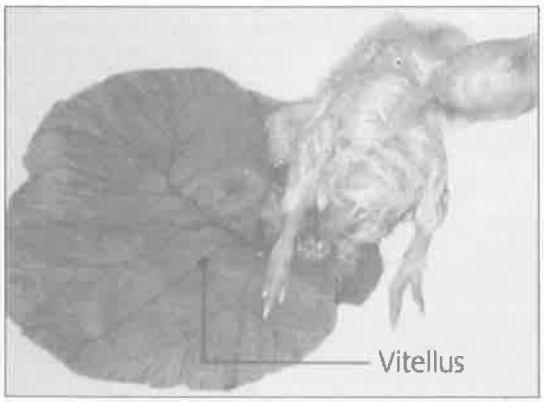


Day 13

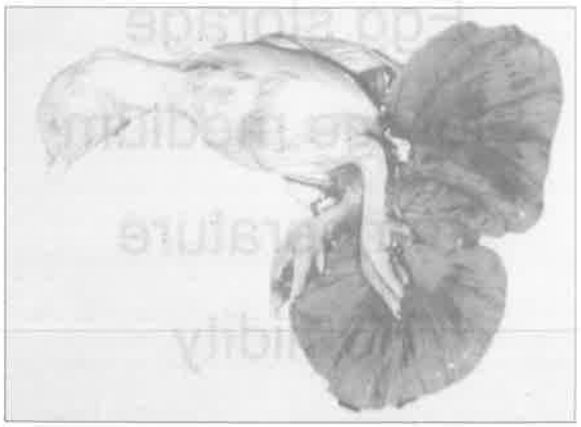
Day 14

Day 15 & 16



Day 17

Day 18



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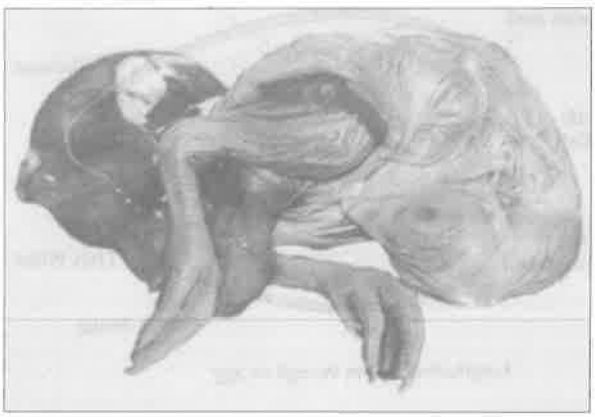
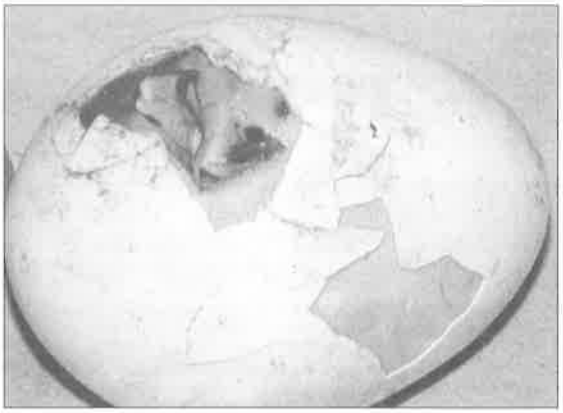


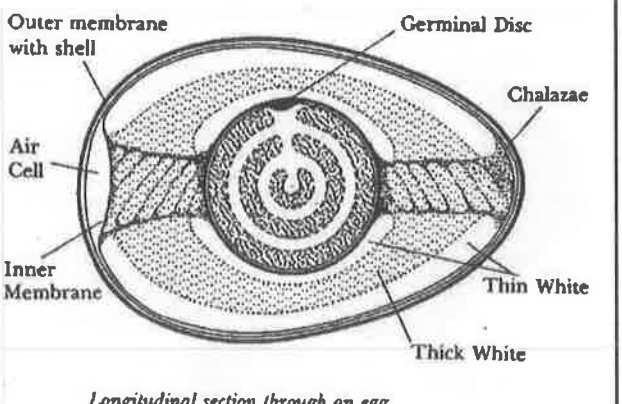
Day 20

Day 21



Hatched

Embryology



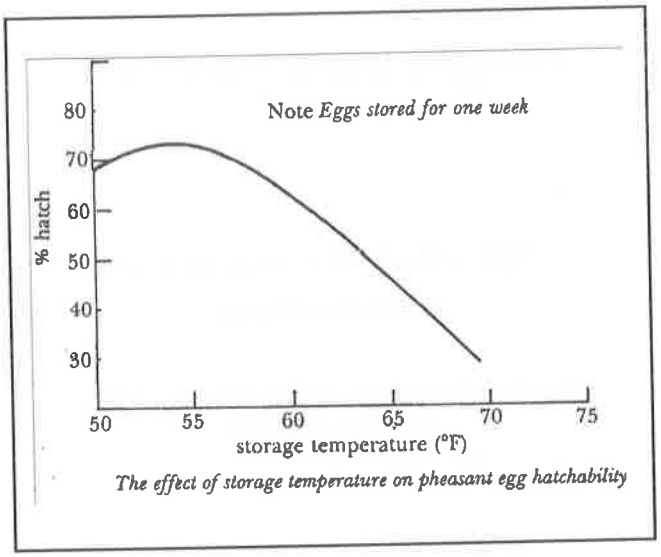
Longitudinal section through an egg

Egg storage

Storage medium

Temperature

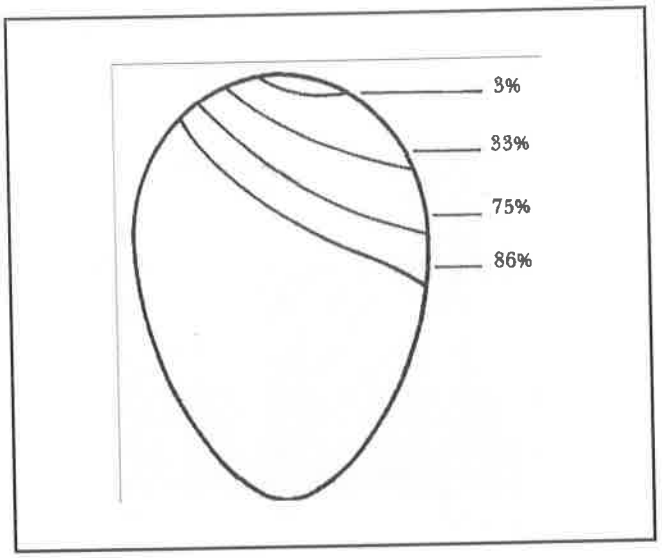
Humidity

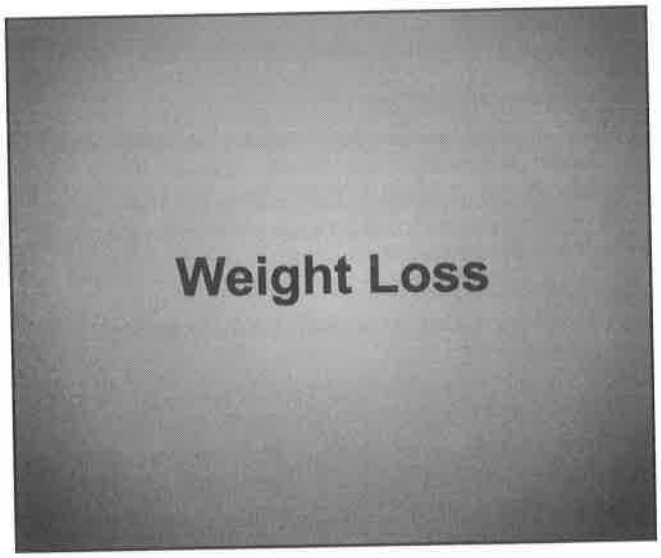


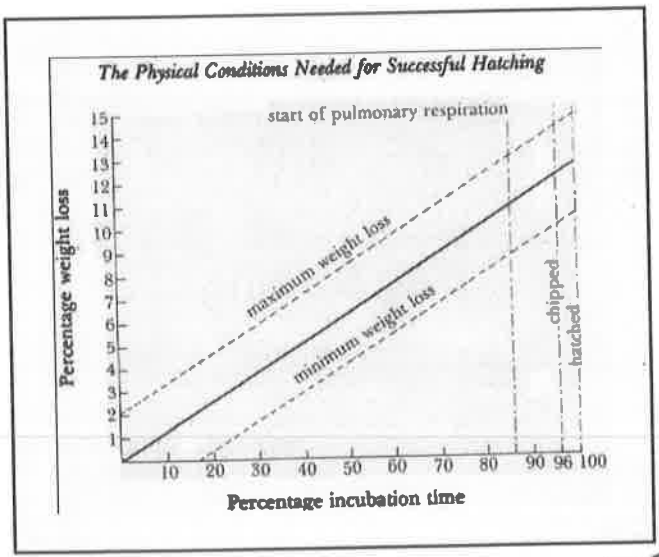
The effect of storage temperature on pheasant egg hatchability

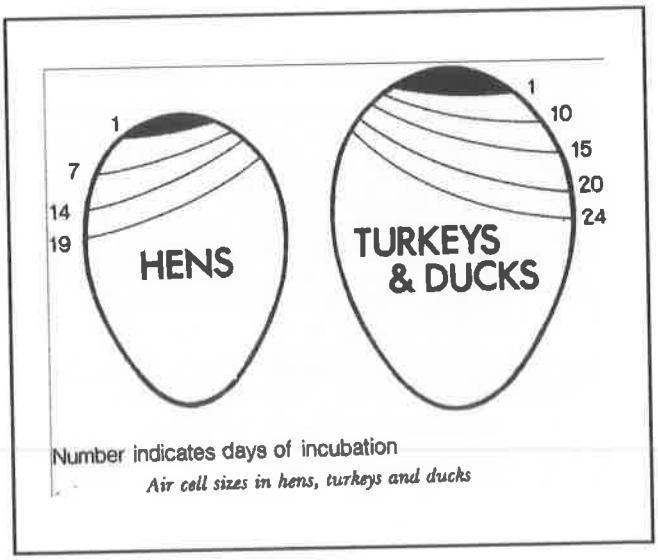
Development of Air Cell

$$\% \text{ incubation age} = \frac{\text{time in incubator}}{\text{incubation time for species}} \times 100$$









Air cell sizes in hens, turkeys and ducks

Using Weight Loss Techniques

Weight Loss Formula

Length x Breadth x Breadth x 0.51
= Volume of egg

(The 0.51 is a correwction factor to take account of the oval shape of the egg)

Weight Loss Calculation

How to calculate weight loss

When using Weight loss as a way of inproving hatchability there are certain guidelines.

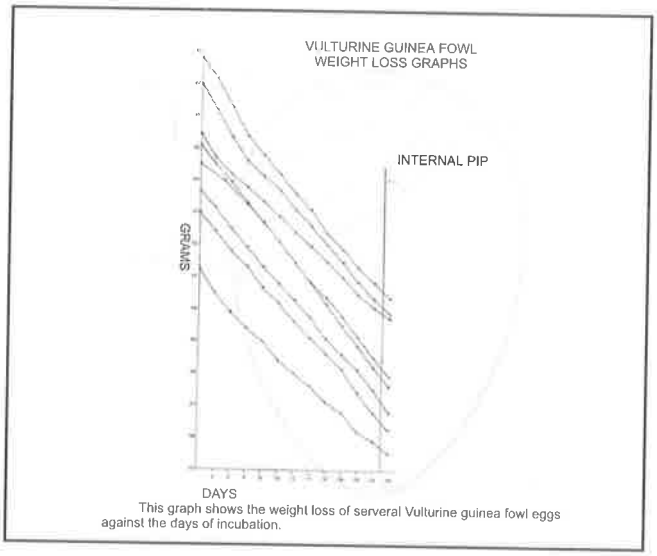
a) The egg must be freshly laid. The time for the loss to be monitored starts from the time of setting the egg until the internel pip, that is when the chick breaks into the air-sac and starts to breathe.

b) To calculate the weight loss.

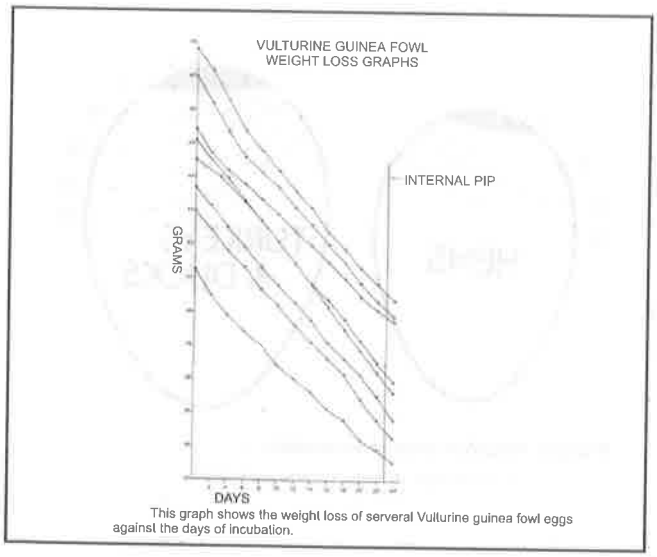
i) The egg is weight on an accurate set of scales, reading to 100th of a gram (0.01g)

ii) Take the volume of the egg and take 85% from the total, which will give the total weight loss during incubation up to internal pip.

iii) Divide the result of ii), by the number of days from setting the egg to internal pip. This will give you the average loss per day though out the incubation.

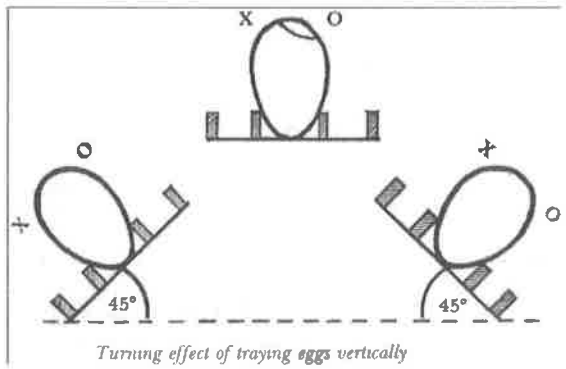


This graph shows the weight loss of serveral Vulturine guinea fowl eggs against the days of incubation.

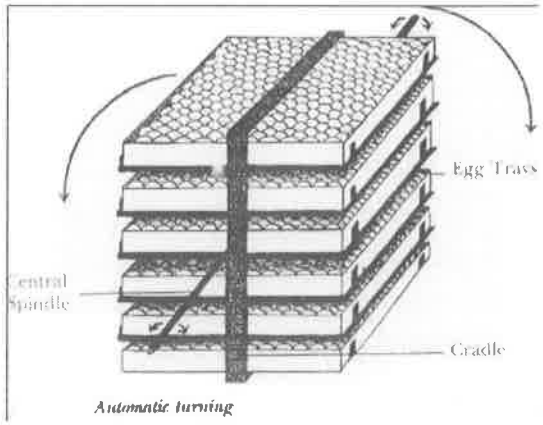


This graph shows the weight loss of serveral Vulturine guinea fowl eggs against the days of incubation.

Egg turning



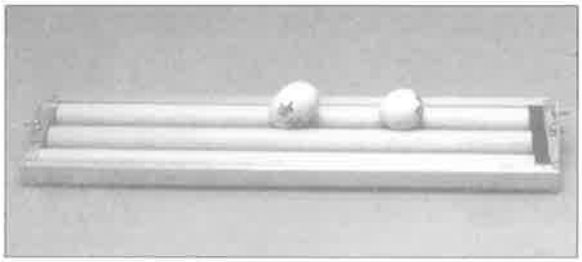
Turning effect of traying eggs vertically



Automatic turning

Vertical Turning

Horizontal Egg Turning

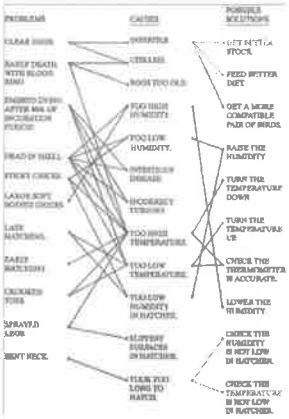


Horizontal Egg Turning

AB Starlife Moving Carpet Incubator

Egg Records

Trouble shooting



RARE PHEASANTS IN BEIJING ZOO

Dr. John Corder,
Vice President, WPA

The presentation provided information on the different species of pheasants found at Beijing zoo and also gave practical knowledge on raising of pheasants in zoos.

Breeding Rare Pheasants in Beijing Zoo

Survey

There were 28 species of galliformes in 1978 in Beijing Zoo according to records
The are 26 species 349 individiual galliformes in January2008 in Bejing Zoo.

Great Curassow
(Crax rubra)

Great Argus
Argisianus argus

Harman's eared pheasant

Brown-eared pheasant

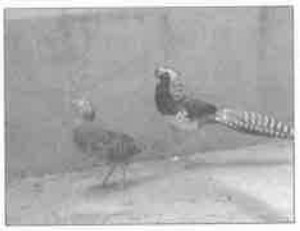
White-eared pheasant

blue-eared-pheasant

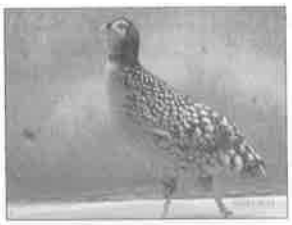
Elliot's pheasant

Reeves pheasant

Golden pheasant



Lady Amherst's pheasant



Cabot's Tragopan
[Tragopan caboti]

Temminck's Tragopan
[Tragopan temminckii]

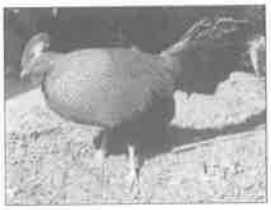
Chinese Monal
(Lophophorus lhuysii)

Himalayan Monal
[Lophophorus Impajanus]

Himalayan Snowcock
(Tetraogallus himalayensis)

Blood Pheasant
(Ithaginis cruentus)

Sri Lanka
Jungle fowl



Palawan Peasock Pheasant

Grey Pecock Pheasant

Sclater's Monal
With Zhang Jing

26Species 349 individual galliformes in Beijing Zoo in January 2008	
Great Currassow *Cryoc rubra*	4
Wild Turkey *Meleagris gallopavo*	6
Himalayan Snowcock *Tetraogallus himalayensis*	4
Chukar Partridge *Alectoris chukar*	26
Japanese QUail *Coturnix japonica*	6
Blood Pheasant *Ithaginis cruentus*	3
Temminck's *Tragopan tiagopan temminckii*	10
Cabot's Tragapan *Tragopan caboti*	6
Chinese Monal *Lpohophorus lhuysii*	8
Red Junglefowl *Gallus gallus*	3
Silver Pheasant *Lophura nycthemera*	12
Swinhoe's Pheasant *Lophura swinkoii*	37
White Eared Pheasant *Crossoptilon crossoptilon*	11

Tibetan Eared Pheasant Crossoptilon Harnuni	31
Blue Eared Pheasant Crossoptilan Auritum	24
Brown Eared Pheasant Crossoptilon mantchuricum	14
Elliat's Pheasant Syrmaticus ellioti	12
Reeves's Pheasant Syrmaticus reevesii	13
Ring- necked Pheasant Phasianus colchicus	23
Golden Peasant Chrysolophus pictus	42
Lady Amherst's Pheasant Chrysolophus amherstiae	11
Great Argus Argusianus argus	1
Blue Peafowl Pavocristatus	6
Green Peafowl Pavomuticus	8
Helmeted Guineafowl Numida Meleagris	26
Vulturine Guineafwol Acryllium Vulturinum	2

Breeding Surroundings

Exhibit Area

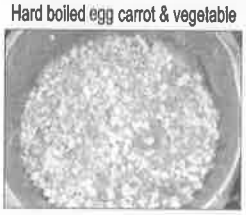
Breeding Surroundings

Breeding Area
Off exhibit

Feeding

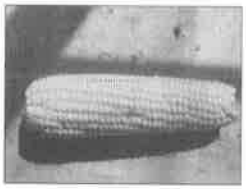
Vegetable

Hard boiled egg carrot & vegetable



Clover

Sweetcorn



Feeding

Crickets

Home-Made Pelets

Minced meat & Vegetables

Locusts

Mealworms

Breeding

- Breed many species and numbers
- Main methods are artificial
- Some endengered species using broody hens

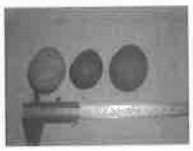
Breeding
Survey of pheasants in recent yeas

	species	number
2006	18	195
2007	17	188
2008	19	474 (until September)

Artificial incubation

Eggs of Great Bustard and Tibetan Eared Pheasant

Egg of Chinese Monal



Artificial incubation

Artificial incubation

Incubator for Pheasant and waterfowl.

incubator for endangered species

Artificial incubation

Egg hatching

Note boxes to keep different species apart

Artificial incubation

Cranes

Hand Rearing Chicks

- Main kinds of Pheasant chicks hand reared since 1965
- Many survived easy to manage
- Stops problem of mites and lice in the feathers of the hens killing chicks
- Economic for feeding

Raising Chicks

Raising Chicks

Raising Chicks

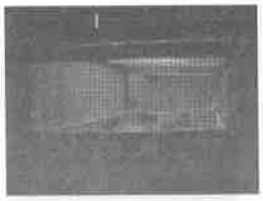
Raising Chicks

Using broodies for rare species

Raising Chicks

Specialist keepers

Raising Chicks



Rearing pens

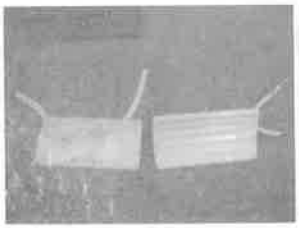
Raising Chicks

Rearing pens

Raising Chicks

Heater

Light



Used in rearing pens

Raising Chicks

Thermostats for keeping the temperature level

Raising Chicks

Timers to control lightings

Raising Chicks

Chick pens

Raising Chicks

Chick pens

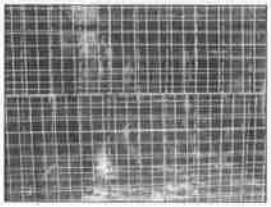
Raising Chicks

Fans for fresh air

Air conditioning when temperature gets too high

Raising Chicks

Protecting young chicks from predators by using small mesh wire; 2 cm×2cm & 2cm×4cm



Raising Chicks

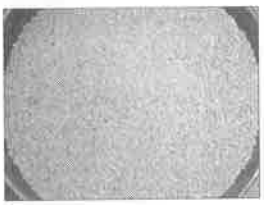
Food for chicks

- Chick crumbs
- insects : mealworms, beetles & crickets.
- vegetables : ❑ after 1 month)❑ clover & grapes

Raising Chicks

Food we use

Home made pellets



Commercial chicken pellets

Raising Chicks

Insects

Raising Chicks

Food for chicks

Sprouting barley

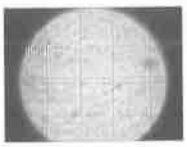
clover & grass

Applying Artificial Insemination Techniques (AI).

Only with cranes and not for pheasants, we use AI to get fertile eggs from difficult species.

- Incompatible pairs who cannot live together:
- come into breeding condition at different times,
- preventing in-breeding by using unrelea birds
- sperm can be frozen and stored and then used anywhere in the world

Applying Artificial Insemination Techniques (AI) with cranes



A.I. storing equipment

Rare pheasant breeding

Tibetan Eared Pheasant
[Crossoptilon harmani]

- Project stated in 1999
- Eggs were found at 4340m
- 16 eggs were collected
- 7 young chicks were collected.

Tibetan eared pheasant

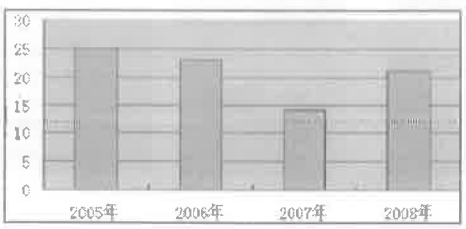
Rere Pheasant breeding
Tibetan Eared Pheasant
[Crossoptilon harmani]

distribution

Tibetan Eared Pheasant
[Crossoptilon harmani]

Tibetan Eared Pheasant
[Crossoptilon harmani]

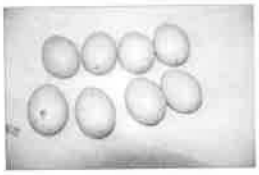
- We how have 31 adults
- We breed 20-30 every year
- We send many to other zoos all over China every year



Tibetan Eared Pheasant
[Crossoptilon harmani]

Tibetan Eared Pheasant
[Crossoptilon harmani]

Incubation

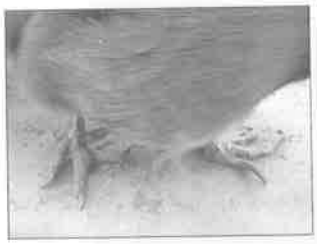


Tibetan Eared Pheasant
[Crossoptilon harmani]

Tibetan Eared Pheasant
[Crossoptilon harmani]

Difigurement in early years of breeding project caused by vitamin deficiency

Tibetan Eared Pheasant
[Crossoptilon harmani]



Disfigurement

Normal

Tibetan Eared Pheasant
[Crossoptilon harmani]

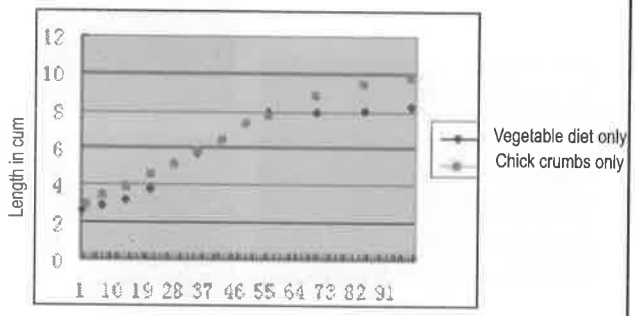
Disfigurement

Tibetan Eared Pheasant
[Crossoptilon harmani]

Treatment of deformity caused by Vitamin B difficiency

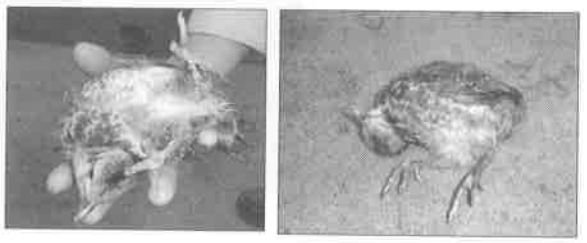
Tibetan Eared Pheasant
[Crossoptilon harmani]

Deformity due to Vitamin B difficiency



Tibetan Eared Pheasant
[Crossoptilon harmani]

A neurological symptom of deformity due to lack of vitamin B



Tibetan Eared Pheasant
[Crossoptilon harmani]

A Neurological symptom of deformity due to lack of Vitamin B

Tibetan Eared Pheasant
[Crossoptilon harmani]

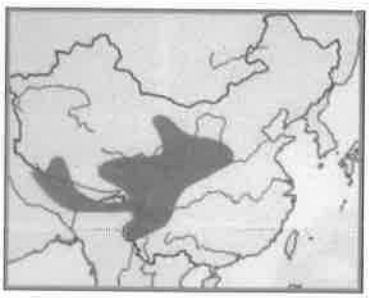
The young of this species seem prone to becterial infecition. At post mortem E coli has been found in the large intestine. Live disease and thickened pericardium has also been noted.

Rare pheasant breeding

Blood Pheasant

[Ithaginis Cruentus]

Distribution



Blood Pheasant
[Ithaginis cruentus]

- In 2007 & 2008 we collected eggs in Shanxi Province
- We collected 26 eggs at height of between 2540 & 2630 m
- In June 2008 we had 9 birds still living

Blood Pheasant
[Ithaginis cruentus]


Habitat


Blood Pheasant
[Ithaginis cruentus]


8eggs under 2 broody hens

Blood Pheasant
[Ithaginis cruentus]


5eggs put incubator

Blood Pheasant
[Ithaginis cruentus]

Egg incubation

2008 number	Eggs of eggs	Incubation hatched	Weight days	Average loss (%)	weight loss (%)
Under broody	8	7	25	12.8 - 19.2	16.4
In incubator	5	5	26	12.3-18.4	15.0

Blood Pheasant
[Ithaginis cruentus]

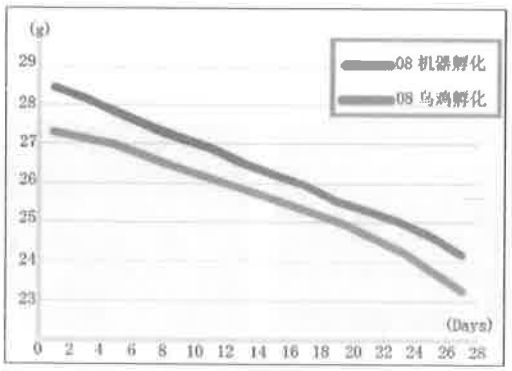
2008	Temperature	Humidityt	Eggs cooling time
Under broody	38.77°C-34.81°C		Eggs cool while hen feeds 10-15 mine twice a day
In incubator	37.5°C	44%-46%	From day 10 of incubation, eggs cooled for 5 mins 3 times a day

Egg incubation

Blood Pheasant
[Ithaginis cruentus]


Measuring egg weight loss

Blood Pheasant
[Ithaginis cruentus]

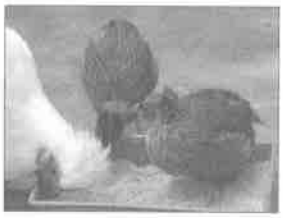


2008 Egg weight loss chart

Blood Pheasant
[Ithaginis cruentus]

2007-6 chicks
hatched & 3 survived

Blood Pheasant
[Ithaginis cruentus]



2008 using broodies

Blood Pheasant
[Ithaginis cruentus]

2008 using broodies

Blood Pheasant
[Ithaginis cruentus]

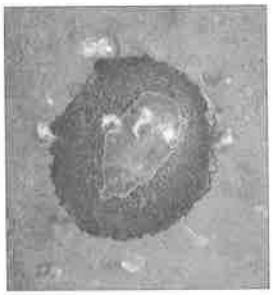
2008 using broodies

Blood Pheasant
[Ithaginis cruentus]

2 day old healthy chick

chick beigntreated for eye infection

Blood Pheasant
[Ithaginis cruentus]



Abnormal faeces from chicks that later died of bacterjal infection

Normal faeces

Blood Pheasant
[Ithaginis cruentus]

Preparing a broody

- Use an experienced bird that is not nervous or she will sit too lightly nad chicks may die under her.
- With an experienced broody we will already know how many chicks she can look after
- Inorder to know health of each chick, itis important to measure it regularly

Blood Pheasant
[Ithaginis cruentus]

Measuring

Blood Pheasant
[Ithaginis cruentus]

Measuring

Rare pheasant breeding

Chinese Monal

[Lophohorus lhuysii]

Distribution

Chinese Monal
[Lophpohorus lhuysii]

1955	Received first bird
1972	First eggs laid
1976	First chicks hatched
1985 & 1989	Chicks survived several weeks
1990	First successful breeding

Chinese Monal
[Lophpohorus lhuysii]

	number of birds bred
1990	1
1999	1
2000	3
2002	4
2005	1
2006	2

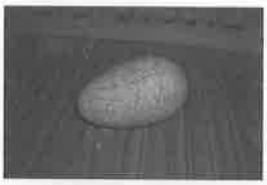
Chinese Monal
[Lophpohorus lhuysii]

Breeding problems

- ✓ With such rare birds. It is difficult to have both members of a pair healthy at same time
- ✓ Many eggs infertile
- ✓ Wet & hot summers in Beijing can cause many illnesses which the birds would not meet in their natural environment

Chinese Monal
[Lophpohorus lhuysii]

Infertile egg



Under-size first egg

Chinese Monal
[Lophpohorus lhuysii]

Chinese Monal
[Lophpohorus lhuysii]

Eye infection in wet summer

Chinese Monal
[Lophpohorus lhuysii]

Eye infection in wet summer

Chinese Monal
[Lophpohorus lhuysii]

Training

- Making the Monal less nervous
- Bird will allow examination without the need for catching with net

Chinese Monal
[Lophpohorus lhuysii]

Chiness monal
{Lophpohorus ihuysii]

Training

Training

Managing rare pheasants

To build a database of each are species we use the Sparks computer programme and fit each bird with a numbered leg ring

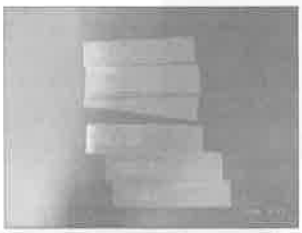
Managing rare pheasants

Sparks computer database

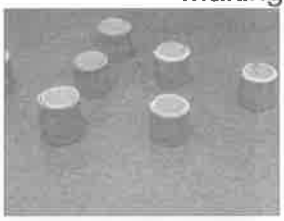
Managing rare pheasants

Making leg rings

Making leg rings



Making leg rings



Fitting

Fitting Leg rings

Thank you

DISEASE AND HYGIENE, INCLUDING DEWORMING PROCEDURES AND APPLYING MEDICATION AND PEST CONTROL



Dr. L. N. Acharjiyo, Bhubaneswar
Dr. John Corder, Vice President, WPA
Dr. Deepak Sharma, Veterinary Surgeon
PNHZ Park, Darjeeling

The Presentation provides insight on the disease, hygiene and healthcare of pheasants.

Disease & Hygiene, induding de-worming procedeoures & applying medication & pest control

Dr. L. N. Achariyo, Dr. Deepak Sharma & Dr. John Corder

SANITATION AND HYGIENE

DISINFECTION :

PEST AND VICTOR CONTROL :

HEALTHCARE :

* QUARANTINE :

ISOLATION :

VACCINATION :

DISEASES OF PHEASANTS

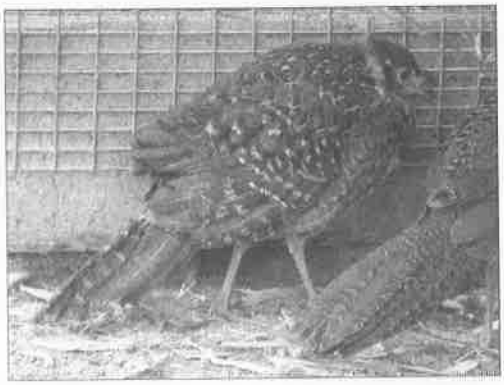
* Bacterial Diseases
* Viral diseases -
* Fungal Diseases -
* Protozoan Discases -
* Helminthic Diseases-
* Nutritional Deficiency Diseases

Few people realise that a pheasant can go with food and drink for up to 28 days. So medicine in water is easily rejected. Also, all birds receive a dose that only one bird needs. Hand feeding avoids this.

Administering worming medication

It is a good idea to find a particular treat which each pheasant likes and will take from your hand. We find that currants are greatly enjoyed by almost all of our birds and always administer our worming powder on this way. Currants have three additional advantages. An exact amount of a medicine can be injected into them. Drugs can be given to individual birds without needing to treat all the occupants of the aviary.
A sick bird does not become stressed further by needing to be caught up for the administration of its medicine.

Signs of illness

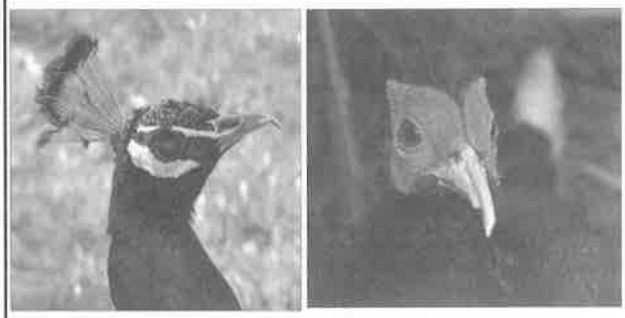


This youngmale Swinhoes chick Shown the typical early sings of being unwell hunehed should use

Signs of illness

The Swinhoe's chick on the left has retreated into acorner it had been raised quite happily with two grey peacock pheasant chicks, which had suddenly united to drive it away from the food. This bullying needs to be recognised quicly, or the chick will give up and die.

Deformed and overgrown beaks



Deformed and overgrown beaks

Occasionally pheasants seem to grow deformed beaks. There are a variety of possible reason for this some of which are mentioned below Whatever, the reason, the keeper will need to decide whether this neeeds treating. If the bird can feed adequately, then probably no threatment is necessary but regular monitoring must still take place to ensure there has been no change.

The beaks of birds grow continuously, some much more rapidly than others. Digging pheasants such as Cheer and Monals, can overgrow top mandible of their backs usually when they have been kept in aviaries where they cannot undertake the digging which keeps their beeak neatly in shape . Because these species usually turn their aviary into something resembling a ploughed field, keepers often use a sand base within their enclosure . Sand that comes from the seaside is much harder than river sand and is much better at abrading the bird's beak when it digs . For those that have access to several sorts of sand . We find that used by builders for mixing with cement is the best- known by builders as "sharp" sand. If sharp sand is unevailable, a bird can often wear down an overgrown beak b proving something for it to peck hard Peanuts in their shells can work well, once the bird recognises that good food is inside . A hard eating apple can also work in a similar manner.

Deformed and overgrown beaks

If the beak is actually deformed not just overgrown, then the problem probably lies elsewhere . If this deformity happens to an adult bird which had previously shown a normal beak then the problem caused by either injury or by diet. A bird that flies into a solid object often damages the cere where the nostrils are located. This usually causes little long term problem- just some bleeding which stops quickly and then heals. However if the damage is more serious, particularly with birds that have been frightened at night then more permanent damage occurs and this seems to result in the beak growing in an abnormal manner . It is also believed that dietary deficiencies can cause similar effects and this is based on studies of wild black-capped chickadees in the USA which have shown nutritional deficiencies of Vitamin D3, calcum or an imbalanced ratio of calcium & phosphorus if the pheasant is receiving a good balance diet, and other birds on the same diet are not showing similar problems then it is more likely that injury is the cause. Certainly a close examination of diet would be a worth while step.

There have also been suggestions that in-breeding might result in beak deformity. Often, we are not aware of the degree to which in-breeding has developed in the ancestors of of the birds we keep, particularly those that have been in captivity for many years. However, it is good practice never to pair related birds and also not to provide brother sister pairs to new owners.

Deformed and overgrown beaks

Whatever the cause, a serious beak deformity will probably need treating for the rest of the bird's life if the bird is losing the ability to feed itself . SOmetimes it is difficult to know how well a bird is coping with a deformed beak. So very close obsevation is required. Obviously if the bird is used to its keeper, this will cause little stress, and many birds will actually become used to feeding right in front of their keeper.

Firstly, it will help the bird considerably if it gets used to regular handling, as this will reduce its stress levels. If you are uncertain about dealing with this yourself, then regular veterinary treatment will be required.

However, it is not a difficult procedure fro a confident keeper (but not for the bird). Before undertaking any pruning or filling of the beak, it is vital to stress that a bird's tongue has a very vigorous blood supply and any cut on the tongue can result in the bird bleeding to death. Therefore, the beaks should be held open when treatment is being undertaken so that the tongue can be seen at all times. Sometimes filing is all that is necessary, but if cutting is required, this is best done with nail clippers that have been designed to cut pet claws without them splitting. If a sharp knife needs to be used for final pruning, always cut in the direction away from the bird's head

Bruising

Sometimes white feathers on a bird, similar to those on the back of this monal's head. Often this is diagnosed as a dietary deficincy. However, white feathers can also appear as a result of bruising, particularly if this happens during the moult. This monal was known to yhave flown in panic and hit head on an interior beam within the aviary. THe white feathering disappeared during the next moulot.

Gynandry

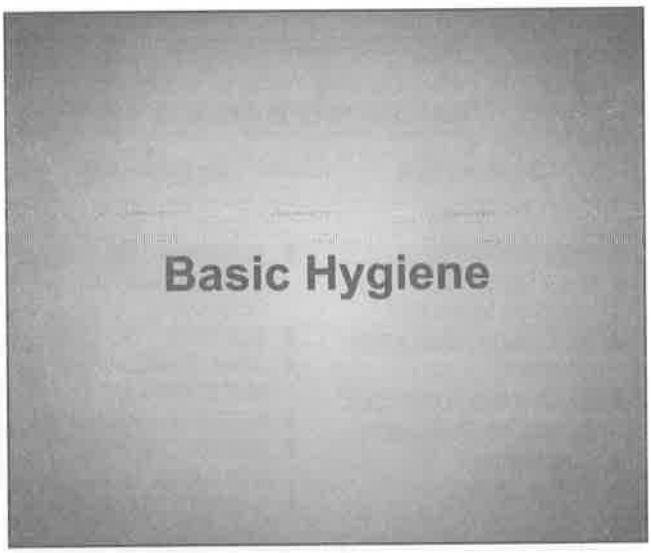
When a female pheasant moults into male plumage

Gynandry in Tragopans

Gynandry in a female golden pheasant

Preventing the transmission of disease

Foot dip to decrease the possibility of transfer of infection



The presentation provedes the Veterinary management "Pheasants in Captivity"

VETERINARY MANAGEMENT : "PHEASANTS IN CAPTIVITY"

PRESENTATION BY :
DR. DEEPAK SHARMA, VETERINARY OFFICER
DARJEELING ZOO

PADMAJA NAIDU HIMALAYAN ZOOLOGICAL PARK, DARJEELING.

- Established in the year 1958, it is a high altitude zoo in the whole of South East Asia.
- Plays a major role in ex-situ conservation breeding of targeted mammals & pheasants for their ultimate release in their wild hebitats.
- The zoo since its inception is maintaining endangered pheasants like Satyr tragopan but from year 1989 captive breeding was a success. (V.Rishi, Zoo's Print, Aug'91)
- Other objectives includes Conservation, Education and Research.

YOU ARE HERE

PHEASANTS-AN INTRODUCTION

Pheasants are group of large birds in the order Galliformes & Family Phasianidae, there are 50 species, 49 from Asia itself. 17in India.

- All Pheasants are more or less shy & timid
- Pheasants are characterized by strong secual dimorphism. - Males are highly ornate with bright colours and adornments such as wattles and long tail.
- Males are usually larger than the females and have longer tails.
- Males play no part in rearing the young with most species.

COLLECTION OF PHEASANTS
DARJEELING ZOO

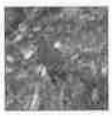
EXOTIC PHEASANTS :

- Lophophura nycthemera (Silver Pheasant)
- Symaticus reecesi (Reeves Pheasant)
- Chrysolophus Pictus (Golden Pheasant)
- Chrysolophus amherstiae (Lady Amherst Pheasant)

INDIIGENOUS PHEASANTS :

- Lophophorus inpeyanus (Himalayan Monal)
- Gallus gallus (Red Jungle Fowl)
- Lophura leucomelanos (Kalij Pheasant)
- Polypectron bicalcartum (Grey Peacock Pheasant)

ZOO VETERINARY SECTION



MANAGEMENT OF PHEASANTS

HUSBANDRY

- AVIARY/HOUSING
- DAILY FEED.
- SANITARY MEASURES.
- BREEDING & POPULATION CONTROL.
- MANAGEMENT OF CHICKS & RESCUED PHEASANTS.
- QUARANTINE.
- PEST CONTROL.

HEALTH CARE

- SCREENING FOR ILLNESS (ROUTINE CHECK UPS)
- RESTRAIN
- DISEASE AND DISEASE INVESTIGATION
- NECROPSY EXAMINATION
- DISEASE CONTROL MEASURES
- CARING & NURSING FOR TREATMENT

Aviary / Housing

- Ideal aviary-catering to needs of individual species e. g. kalij needs large spave, plenty of cover to escape and hide
- Adequate size-providing perception of security & comfort, 4 by 6 meters with an additional 4 sq. m shelter is ideal for all pheasants.

In the zoo : 1) Control of external disturbances.
2) Sumulation of natural conditions inside the enclosure.
3) Provision of materials of satisfy breeding urge of the species.
4) Management of species from extreme weatheis.

Daily Feed of Pheasants

Diet in Darjeeling zoo :

- Lettuce-50gm
- Crushed maize-50gm
- Onion-10gm
- Green vegetables-50gm
- Mousambi 30 gm
- garlllc-0.5gm
- Apple-30 gm.
- Marble chips-10 gm.
- Mutton heart-20gm
- Whea6t-50gm.
- Sattu (Gram)-10gm.
- Egg-11/2pc.

Nutritional suppiement daily with FUR-X (Vt.D.E. & cod liver oil & calcium carbonate powder
Ad libidum clean and potable water is provided.

-Pheasants are omnivorous in wild.
-Occasionally earthworm meal provided.
- Protein intake increased in breeding season.
-Night bulbs fitted In cages to attract Insects.
- Left over grains are collected and scattered in mud boxes to meet their dietary supplement.
-Feed is prepared daile free of mould and contamination. Feed and water proveded in suitable containers to reduce the risk of disease.

Sanitary Measures

- Sanitation and hygiene of the premises Is a reliable indicator of proper health management.
- Removal of excrerta, residual water, all left over food items are, disposed off in a manner congenial to the general cleanliness of the zoo.
- All feeding trays and utensils daily washed with 1% sodium hypochlorite solution.
- Use of disingectants for spraying both inside and outside of the eages using khrosolin- TH solution.
- The surrounding of the cages is regularly spread with chlorinaged lime (beaching Powder)
- Foot baths using potassium permanganate at the entrance of each cage.
- Removal and tilling of the ground Is done and lime spread to control infections.
- Electrical fly repellang equipment are used during the hot season
- Dead pheasants are incinerated after P M to prevent the spread of infection.
- Keepers wear clean gumboots, clothes, gloves whenever entering pheasantries.

BREEDING AND POPULATION CONTROL

- Most pheasant species are polygamous.
- Pheasants are secretive nesters & build their nests on the ground.
- As far as possible, natural breeding & incubation is to be entertained.

* Population control
- Rearing more than carrying capacity,
- Constraint of space, feed, necessary facilities is there.
- Gift exchange with other zoos, rescue centers etc.
-Crowded cages more risks of diseases and of the birds fighting and killing each other.

MANAGEMENT OF CHICKS AND RESCUED ONES

- LAYING EGGS
- EGG COLLECTION AND STORAGE
- NATURAL/ARTIFICIAL INCUBATION
- HATCHING OF CHICKS
- SHIFT TO BROODY HOUSE
- SHIFT TO THE CHICK HOUSE
- TRANSFER TO MAIN CAGE.

RESCUED PHEASANTS :

- KNOWING THE SPECIES
- CONDITION OF THE SPECIES
- NECESSARY FIRST AID
- INPATIENT (IFREQUIRED)
- RELEASED/INTRODUCED IN CAPTIVITY
- OBSERVATIONS

QUARANTINE

-To minimize introduction of diseases into eatablished colonies.
- Allows the pheasants to recover from transportation stress, adapt to new encironment and become physiologically stable.
- Newly acquired pheasants sre quarantined for suitable period for treatment and observation.
- The pheasants are then released into permanent housing early in the day to adjust to the new environment by nightfall.

PEST CONTROL

* REASONS FOR PEST CONTROL

- Major source of contamination for parasites/micro organisms. e. g. feral rodents, birds, domestic cats/dogs or other pests can transmit parasites, ecto- parasites.
- Pests are also primary intermediate host.
- Pests serve as potential sources of pathogens.

HOW WE GO ABOUT

* Well maintained perimeter fencing and floor of cages.
* Regular monitoring of cages for feral animal activity.
* Live trapping provides one method for removing pest.
* Rodent pests are of greatest concern.
- Daily thorough supervision of the cages.
- Leftover, spilled feed and grains collected.
- Use of safe rodenticides if necessary.

SCREENING FOR ILLNESS

"PREVENTION IS BETTER THAN CURE"

- CASE DETECTION
- CONTROL OF DISEASE
- RESEARCH PURPOSE

RESTRAIN OF PHEASANTS

- Stressful for pheasants- minimal required handling.
- Special care and knowledge is necessary in holding or restraining pheasants.
- BY HAND OR BY NET CAPTURE.
- SHOULD NEVER BE RESTRAINED BY FEATHERS ALONE TO PREVENT SHOCK MOULT.

Disease & Disease Investigation

* Ill Health or stress are observed in pheasants in variety of ways.
* Careful observation needed-suppress some signs.

Symptoms of ill-health.

- Changes in appearance of droppings.
- Changes in food & water consumption.
- Changes in attitude or behaviour.
- Changes in appearance or posture.
- Changes in weight, Drooping of wings.
- Enlargements or swellings.
- Discharge from nostrils, eyes or nostrils.

Other signs, Excess loss of feathers, lameness or sores on feet, overgrown beak or nails, stains or scabs sround eyes or nostrils, gasping, etc.

CARING AND NURSING OF TREATMENT

- Well managed clean and hygienic pheasant eages/enclosures.
- Proper ventilation in treatment rooms.
- When necessary clean, dry and proper bedding material should be provided.
- In colder areas heaters, blowers should be provided.
- Nourishing and palatable diet should be given.

NECROPSY OR PM EXAMINATION

* POST MORTEM-Systemic Exposure and scientific examination of Tissues and Organs of a Dead Body.
* WHY P. M. NECESSARY?

- To Determine cause of death
- To Know extent of illness.
- To Know nature of illness.
- To access efficacy of line of treatment before death

* Proper Disposal of Carcasses should be done after post mortem.

DISEASE CONTRO MEASURES

* Four Principles to Control Disease

- Recognition of Causes.
- Prevention of that cause from upsetting the pheasant
- Early recognition of the disease
- Adoption of immediate treatment

* Rigid Isolation-for Rapidly Spreading Disease.

Use of widest Scientific Knowledge about Pheasants and their care.

THANK YOU.....

WILD INVESTIGATION OF BLOOD PHEASANT

Dr. John Corder, V. P. WPA

The presentation provedes information on wild investigation of blood pheasants- from the field to a breeding programme. It also gives useful information on incubation and rearing of chicks (Broodies, incubation and rearing equipments)

Wild Investigation of Blood Pheasant

Blood Pheasants bred at Beijing Zoo 2008

Wild Investigation of Blood Pheasant

Why we would have carry on wild investigation?

Important bases of the Conservation Breeding

- Providing foods
- Design aviary and surroundings

Wild Investigation of Blood Pheasant

Preparation before wild investigation :

- Research actuality on conservation breeding of Blood Pheasant
- Problem of the Blood Pheasant breeding in Beijing Zoo.

Wild Investigation of Blood Pheasant

Practical research on conservation breeding and wild investigation of Blood Pheasant

- Food in the wild
- Home Range and Habitat Characteristics in Summer
- Egg-laying time and laying Intervals of Blood Pheasant in the wild
- Movement and Brooding Behaviour of Blood Pheasant in Brooding Period in the wild

Problems needing to be settled in breeding in Beijing Zoo

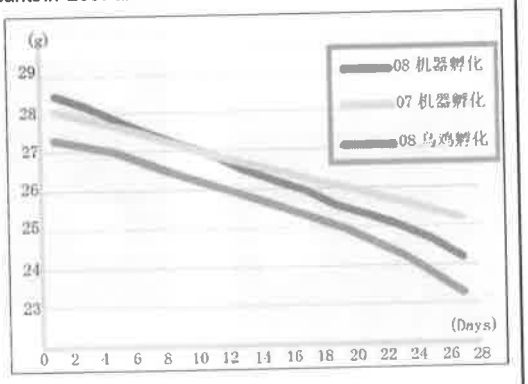
- Incubation percentage in 2007-60%
- Survival percentage in 2007-50%

Wild Investigation of Blood Pheasant

Companson graph egg welght loss during Incuban of Blood Pheasants in 2007 and 2008

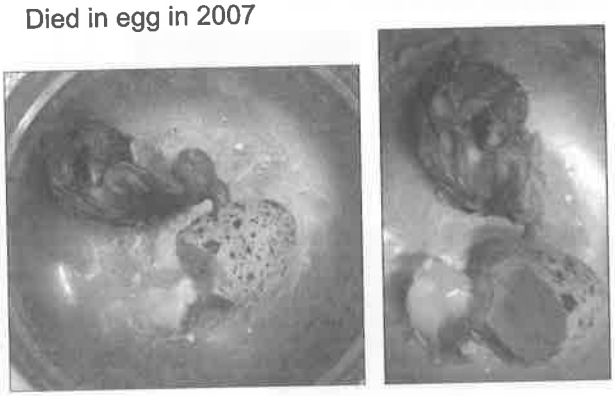
10 eggs
6 chicks
hatched in
2007

13 eggs
12 chicks
hatched in
2008



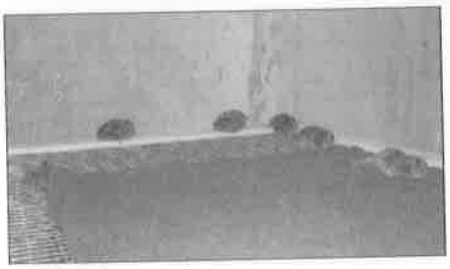
Wild Investigation of Blood Pheasant

Died in egg in 2007



Wild Investigation of Blood Pheasant

Blood Pheasant chicks in 2007



Wild Investigation of Blood Pheasant

Establish the plan of wild Investigation in 2008

- Search for the nest, collect the eggs
- Data in brooding perlod in the wild - Weight loss
- Habitat investigation

Wild Investigation of Blood Pheasant

Preparation before investigation

- Set up the cooperative relationship in advance
- Personnel
- Important instruments of collection and measuring weight loss eggs
- Tools using in the wild

Wild Investigation of Blood Pheasant

Preparation before investigation

- Personnel

Wild Investigation of Blood Pheasant

Preparation before investigation

- guide

Wild Investigation of Blood Pheasant

Preparation before investigation

- Important instruments

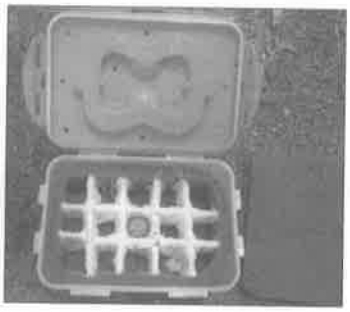
Pocket hygrothermograph and artificial eggs

Wild Investigation of Blood Pheasant

Preparation before investigation

- Imporant instruments

Box for carrying eggs



A. B. 12volt dc Portable Brooder

Specially designed for use transporting Chicks & Eggs needing to be brooded during this time. Also can be used as a standby unit during mains supply failure.

The A.B.12v DC Portable Brooder has been developed to provide a well insulated cabinet to conserve electrical energy from a vehicle or battery supply. yet allowing the chicks to travel in comfort at a brooding temperature. Being a Moving-air Brooderm tha air circulated by a Small fan in the top of the inner brooding area, the air is drawn over the heater, and down the sides of the brooder coming up through the mesh tray, on which the tubs containing the chicks are placed. This gives an even air flow throughout the brooding area.

The Brooder operates form 12v DC supply. via a special lead with a cigar lighter plug fitting. or a similar lead which has crocodile clips for use on a battery. The string type heater is closely regulated by the latest solid-state proportional thermostat housed in a control box on top of the cabinet. A full range of temperatures can be obtatined via the screwdriver adjustment on the front of the control box (20.0C-37.0C) (Note ; maintaining high brooding temperatures are subject to an ambient of 10C/50F or more)

The cabinet is constructed of tough PU plastic with high insulation qualities. A strong aluminum carrying handle is fitted across the top of the cabinet, together with two double glazed holes to provide light and to view the chicks. A double glazed transparent drop down door is fitted to provede easy access and light to the occupants, secured with a magnetic catch at the top. The inner case has sides of aluminum, removable mesh floor, and perspex roof with a mesh protected fan. A draw tray is fitted to the bottom to catch seed etc. or a small water dish to provide humidity should it be required. Ventilation holes are proveded at the rear of the cabinet.

Brooding area = 275mm wide, 240mm deep, 205mm high, A special 7. amps Mains 230/240v AC/ 12 Volt Dc Step-down transformer available as an optional extra.

Power consumption : 43 watt @ 12 colts, 3.75 amps

Dimensions : Unpacked W 350mm D 290mm H 370mm Weight Neff 3.4kgs

Packed : W 360mm D 320mm H 390mm Weight Gross 4.5 kgs.

AB Newlife Portable Incubator

The A.B. Newlife 75 Portable incubator is a specialist unit aimed at people needing to transport eggs during incubation. The cabinet is make from impact resistant plastic and lined with thermally efficient insulation materials to reduce the drain on batteries or the car electrical system. The air flow within the machine is such theat a constant temperature can be maintained throughout the egg holding chamber. The eggs are held in trays built to the requirements of each order, for instance the kakapo eggs being transported in New Zealand. Like the brooder, this unit operates from a 12 volt DC supply and is supplied with leads to connect it to a battery or cigar lighter. The incubator has as standard two thermostats to give an alarm and overheat cut out warning.

Wild investigation of Blood Pheasant

Preparation before investigation

- Tools and instruments in the wild

Video camera and camera

Wild Investigation of Blood Pheasant

Preparation before investigation

- Tools and instruments in the wild

Computer

Instrument for weighing and measuring

Wild Investigation of Blood Pheasant

Preparation before investigation

- Tools and instruments in the wild

hygrothermograph

GPS

Wild Investigation of Blood Pheasant

Preparation before investigation

Tools and instruments in the wild

Wild Investigation of Blood Pheasant

Blood Pheasant in the wild

Wild Investigation of Blood Pheasant

Food of Blood Pheasant

moss

Dandelion

Wild Investigation of Blood Pheasant

Animals

Mole

Goral

Wild Investigation of Blood Pheasant

Animals

Mouse

Panda

Wild Investigation of Blood Pheasant

Animals

Qinling Lenok [Brachymystax lenok tsinlingensis li]

Stream Salamander

Wild Investigation of Blood Pheasant

Animals

Crested Ibis

Eurasian Hoppoe

White capped Redstart

Wild Investigation of Blood Pheasant

Animals

Golden Pheasant

Wild Investigation of Blood Pheasant

Plants

Fairy Primrose

Azales

Wild Investigation of Blood Pheasant

Faeces of carnivore

Wild Investigation of Blood Pheasant

Faeces of vegetarian




Wild Investigation of Blood Pheasant

Faeces of anmals

Faeces of Temminck Tragopan

Faces of Blood Pheasant


Wild Investigation of Blood Pheasant

Searching for a nest of Blood Pheasant

Nest of 2007

Nest of 2003

Wild Investigation of Blood Pheasant

Finding the nest of blood pheasants

Nest D

Nest B

Wild Investigation of Blood Pheasant

Finding the nest of blook pheasants

Nest E

Nest C

Wild Investigation of Blood Pheasant

Finding the nest of blood pheasants

Sand Bath Near the nest

Nest F

Wild Investigation of Blood Pheasant

Nest

Nest of Koklass Pheasant

Nest of Temmincle Tragopan

Wild Investigation of Blood Pheasant

Eggs

Eggs of Koklass Pheassant

Eggs of Temminck Tragopan

Wild Investigation of Blood Pheasant

Measure and record data of nest and eggs

Measure humidity and temperature in the nest

Wild Investigation of Blood Pheasant

Measuring and recording the data of nest and eggs

Wild Investigation of Blood Pheasant

Eggs collection

Wild Investigation of Blood Pheasant

Eggs collection

Wild Investigation of Blood Pheasant

Measure and record date of nest and eggs

Measure humidity and temperature in brooding period in the wild

Wild Investigation of Blood Pheasant

Eggs storage

Wild Investigation of Blood Pheasant

Eggs transportation

Wild Investigation of Blood Pheasant

Eggs Checking

Wild Investigation of Blood Pheasant

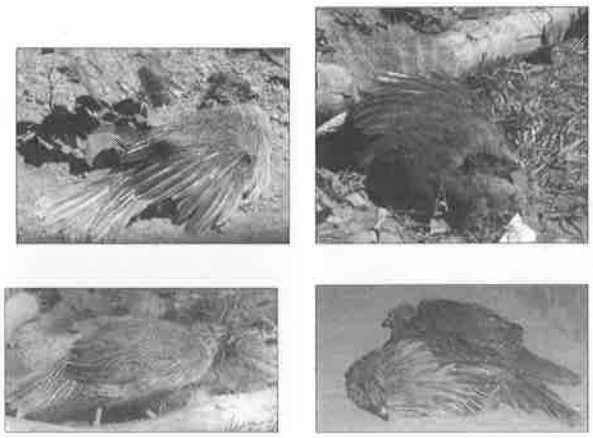
Substituting the Blood Pheasant eggs

Wild Investigation of Blood Pheasant

Results

- We found 6 nests and collected 13 fertile eggs of Blood Pheasant
- Haven's goined the date of brooding period in the wild
- 12 chicks have been hatched out in our Zoo

Wild Investigation of Blood Pheasant



Thank You

PREDATOR OF PHEASANTS AND RODENT CONTROL

Dr. L. N Acharjyo, Bhubaneshwar
Dr. John Corder, V, P, WPA

The Presentation Provided information on different predators of pheasants and ther effective control measures.

Predators of Pheasants and rodent control

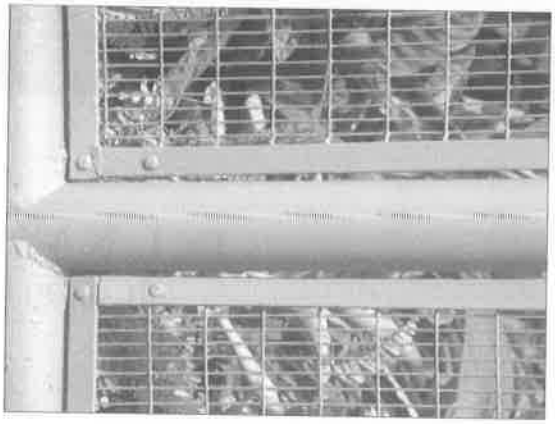
Dr. L.N. Achariyo &
Dr. John Corder

PREDATOR PROBLEMS :

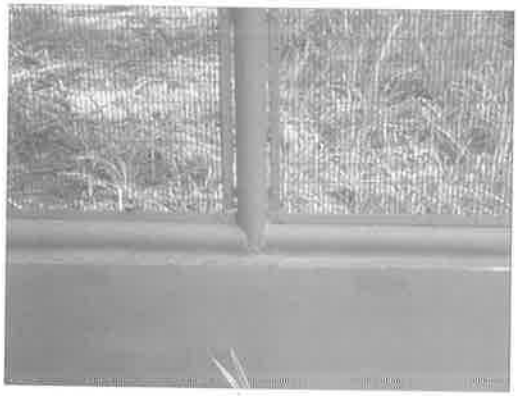
- Many deaths or injuries of animals and birds specially small mammals and birds have been reported from Indian zoos due to predator attacks viz. snake civet cat, mongoose, jungle cat, rat, fox, jackal, feral animals like stray dogs and cats and free living macaques, langurs squirrel, crows etc.
- Further, they eat away the food of the enclosure inmates and deprive them from their ful quota of diet.
- The pheasants and their chicks are vulnerable for such problems.
- Suitable predator control measures including the use of rodenticides for elimination of rodents will prevent or curtail such problems.

Predators

- Foxes
- Rats
- Weasels / Stoats / mink
- Ows & birds of prey
- Mice
- Snakes
- Insects - wood eating
- Other local species

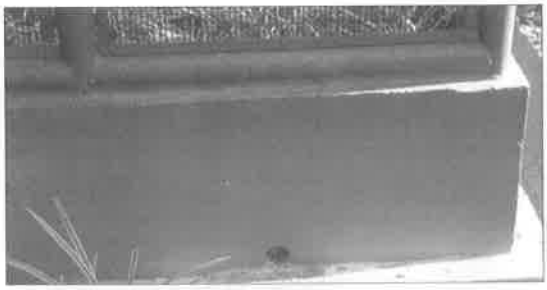


Anti-predator construction 1

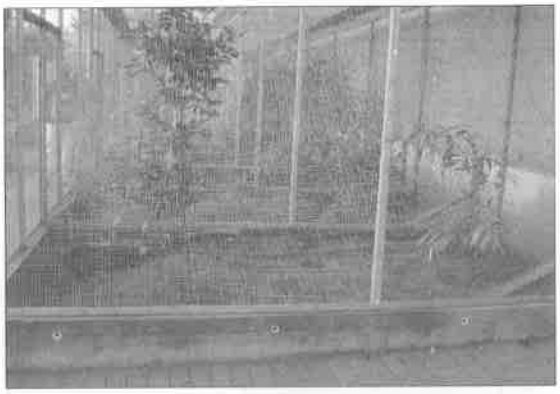


Anti-predator construction 2

Anti-predator construction 3

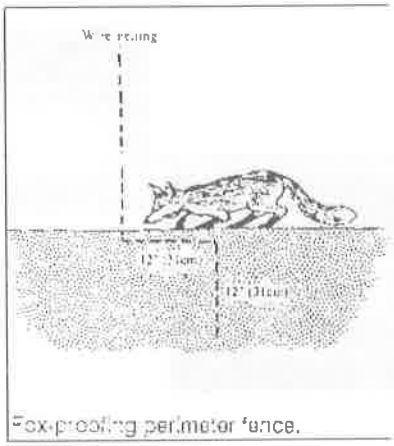


Anti-predator construction 4



Anti-predator construction in an area prone to flooding

For-proofing a perimeter fence



Fox-proofing perimeter fence.

Electric fences

Know your enemy

Emergency measures

Mice

Mice- humane traps

Mice

Rats

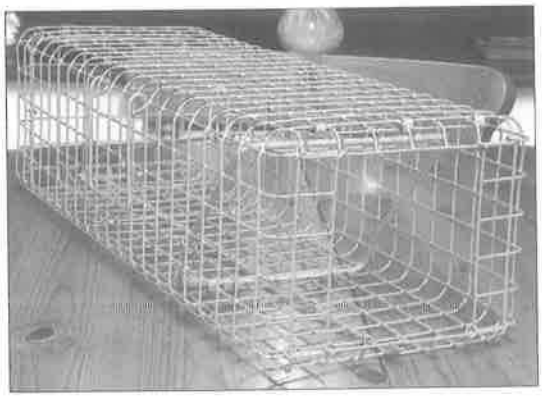
Rats at Blossom Pheasantry in HP

Squirrels

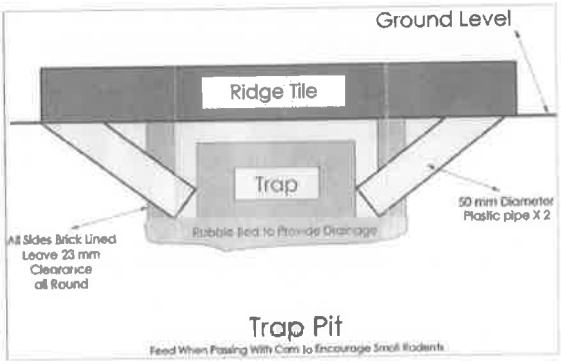
Stoats & Weasels

Mink (martens are very similar)

Mink Traps



Mink Traps



BREEDING BEHAVIOUR IN PHEASANTS

Dr. Rahul Kaul
Director of Conservation,
Wildlife Trust of India

Dr. Rahul Kaul provided an elaborate information on breeding behaviour of pheasants in his presentation.

Breeding Behaviour in Pheasants

Rahul Kaul

What is Behaviour?

- Actions or reactions of an organism (bird) usually in relation to the environment
  - In animals behaviours are controlled by the endocrine and the nervous system
  - Organisms with complex nervous systems have a greater capacity to learn
  - Behaviours can be
    - Innate (instinct)
    - Learned (imprinting, imitation)

Breeding behaviour

Behaviours shown during the events that take place during the process of breeding

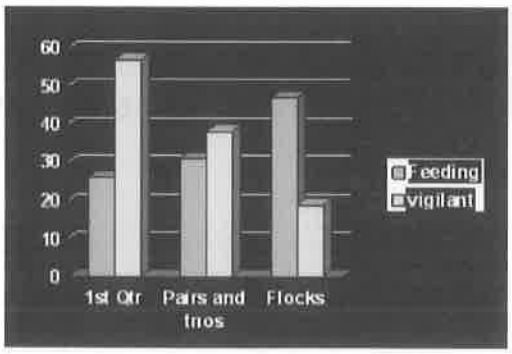
Breeding may be divided into

- Pre-breeding (mate selection, territory defence)
- Nesting (nest building, egg laying, incubation)
- Rearing (chick survival)

Social organisation (Himalayan pheasants)

- Over-wintering groups
  - Winters (bottlenecks) characterised by:
    - Hersh climate, low ambient temperatures and high energy requirements
    - Depleted resources
    - Less escape cover, more vulnerable to predation
    - Low sex hormone levels
      - Less aggressive males

Activity Patterns



Change in season

Spring:

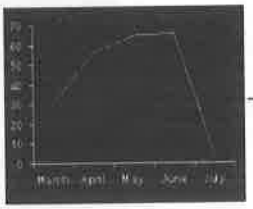
- Ambient temperature increases
- Days become longer (longer photo-periods)
- New food appears
- Hormonal changes in birds
- Pre-breeding begins

Pre-breedings

- Territory formation and its defense
  - Triggers
    - Photoperiods (proximate) foods (ultimate) etc.
- TManifestations of aggression
  - Calling
  - Displays
  - Fighting

Calling

- Advertisement calls
  - Also used for territory defence
- Aggression calls
  - Warn intruders



–Calling

Aggressive Displays

- Flights showing plumage to their full effect
- Frontal displays to establish dominance
- Fights

Pre-breeding

- Mate selection
  - Displays
    - Frontal displays
    - Lateral displays
    - Wing whirring (wing flapping)
  - lekking

Other social behaviours

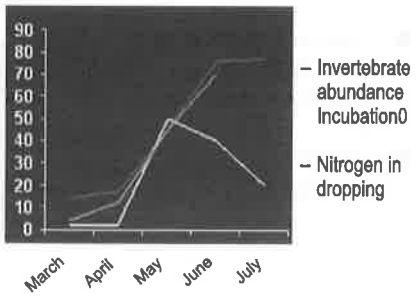
- Mate guarding
- Displays
- Tidbitting
- Mating

Nesting

- The nest
  - Location, materials
- Egg laying
  - Clutch
- Incubation
  - Females only. What do males do??

Timing

Hatching of the chicks coincides with peak food abundance

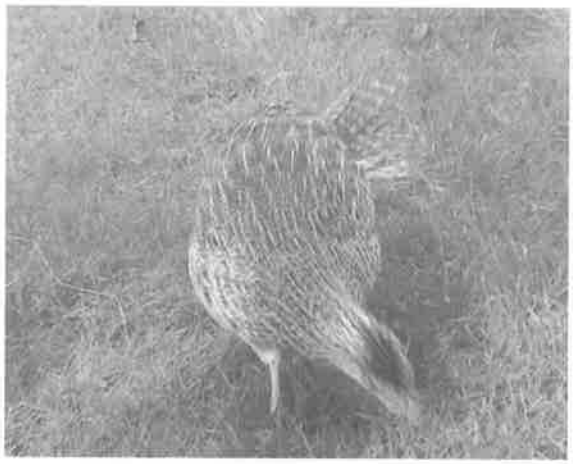


Growing up

- Rearing
  - Precocial
    - Selection
  - Predator avoidance
    - Birds of prey
    - Ground predators
      - Broken wing displays
  - Aggression wanes and flocks form at the onset of winter

THE IMPORTANCE OF PHEASANT CALLS

ESPECIALLY CHEER PHEASANTS



Calling provoked by monal warning call

Behaviour of Cheer Pheasants

- One of the few pheasant species where both parents play a major part in the raising of young. With two caring parents, loss of chicks is far less likely to occur
- Capable of breeding in the Spring following their birth
- Hen lays on alternate days until she has between 6 & 10 eggs and sits for about 26 days
- Hen then sits for a further day on hatchlings When she can be heard calling softly to her to her hatching brood

Behaviour of Cheer Pheasants (2)

- A parent-rearing hen will seldom return to her nest once she has hatched her young
- The more experienced the female, the more likely it is that she will select a spot which is certain to remain warm and dry
- Problems for inexperienced hens at Khariun Pheasantry in Himachal Pradesh
- With any pheasant hen, once she has experienced parent-rearing, the range of calls she uses will increase very significantly
- We have found we are far more likely to discover a hen than a cock of any pheasant species in the wild because she usually has many more calls than the cock and she uses them much more frequently.

Cheer pheasant calls

- Calls seem to fall into several categories
- Initially the most important relate to food, security, family inter-action and dangers
- Breeding at one year old for the first time, they appear to use about 6 different calls (unless they have been parent-reared, when they already use may more)
- One chicks are hatched new calls can be noticed immediately most of these calls appear instinctively provided the birds have the correct experiences in the right environment

Cheer pheasant calls (2)

- Provided they are successful, by the time that a pair of Cheer has raised its first family, the variety of calls has risen from about 6 to around 20.
- There are quite a number of calls concerning food; one just indicates that food is present, a second is much stronger and a third demands abolute attendance by every chick.
- Gradually, the instinctive reaction to different avian predators produces different

Cheer pheasant calls (3)

- At 3 years of age, adult parents-rearing Cheer in our aviaries seem to have at least three different avian predator calls, for sparrow hawk, kestrel and buzzard
- Each of these calls elicits a different reaction in the chicks and adult birds
- One 10 year old pair had an immense range of anti-predator calls, even including one for an over-flying

Cheer pheasant "starburst" call

Cheer Pheasant
chicks
in wild
at Chail

catreus wallichii

Video by Sat Pal Dhiman

Cheer pheasant calls (4)

- By the time that Cheer have raised about five broods, the number of calls and observable behaviours has risen immensely
- As a consequence, the quality of chicks being produced is infinitely greater
- With one pair of Cheer that produced and raised 96 young form 96 eggs over the course of 10 years, we felt we could recognise and interpert more than 90 different calls and behaviours.

Cheer hen feeding call

Cheer male "chuntering" while feeding on grass

Cheer family feeding 3 days old

Cheer family feeding noisily at 6 weeks

Note parental "sentry duty'

Cheer family feeding noisily at 11 weeks

Chick pecking order dispute intervention procedure by

Cheer poults fighting & Parental intervention

Dust bathing communication

Juvenile male practising sentry duty

Temmineck's tragopan feeding calls

Temminck's - warning call

Palawan male territorial
and breeding call

Palawan pair -
beginning antiphonal calling

Monal hen teaching 14 days old chicks
to dig for food
- warning call about danger from male

Satyr her's worried call

Tragopan
male's
"annoyance"
call

*The "annoyance"
call of Mountain
peacock pheasant*

Maonal warning call

Monal hen reacting to hedgehog

Monal hen - "I'm OK" call. Most frequently heard call when there is no danger.

Monal hen "whining"

Malayasian peacock pheasant Nocturnal call of mature male

PREPARATION OF CONSERVATION BREEDING MANAGEMENT PLAN

Dr. Naim Akhtar
Scientific Officer,
Central Zoo Authority, India

The presentation gave a description of the Conservation Breeding Management Plan as Prepared by CZA.

PREPARATION OF CONSERVATION BREEDING MANAGEMENT PLAN

Dr. Naim Akhter
Scientific Officer
Central Zoo Authority, New Delhi

CONTENTS OF CONSERVATION BREEDING PROGRAMME

1. INTRODUCTION

1.1 Taxonomy of Species

- Common Name
- Scientific Name
- It may include evolutionary history of the species, subspecies and races

1.2 Conservation Status
It will highlight the status of the species at National level (Wildlife Protection Act, 1972), IUCN level (e.g. Extinct, Threatened, Not threatened, Lest concerned etc), and CITES status (Appendix I, II or other)

1.3 Captive Management Coordinator (for Identified specise)
Details of the Coordinationg zoo and participating zoos

1.4 Timeframe of the plan
Tentative period to achieve the sustainable conservation breeding of the species.

2. IDENTIFICATION METHOD

2.1 Individual Identification

- Animal may be marked through leg band, ear tags or radio transponder.
- Marking of individuals must be done by authorized individuals in accordance with the conditions of the relevant authority to hold.
- It is recommended that all the individual of identified species covered under planned conservation breeding should be marked appropriately for identification.

2.2 Sexing Methods

- No problem where you have prominent sexual dimorphism.
- But in case where sexual dimorphism is not clear it can be done using differnt colour leg band & car tags.

3. NATURAL HISTORY

Particularly where natural history relates to captive management :

- Adult wild weights and measurements
- Distribution and habitats
- Habits, social structure
- Feeding behaviour
- Breeding behaviour & Reproduction (including natural gestation/incubation regimes, age of sexual maturity, courtship, egg dimensions, growth rates)
- Protected species' role in ecosystem
- Threats in the wild

4. CAPTIVE HUSBANDRY

4.1 Housing and Environment Standards

- Size of enclosure
- Materials for housing
- Shelter/screening
- Water
- Furnishings, including suitable vegetation
- Humidity/ temperature/ thermoregulation
- Cleaning

4.2 Health Care Standards

- Environmental hygiene
- Known health problems
- Preventative procedures
- Treatments
- Veterinary procedures
- Tranquilizing of animals and drugs standardization
- Procedure if animals die
- Quarantine procedures

4.3 Behavioural Notes

- Common captive behavioural needs
- Behaviural enrichment activities
- Mixed/intra species compatibilities
- Handling/physical restrain of animals
- Techniques for Capturing of animals

4.4 Feeding Standard

- Diets and supplements
- Presenta tion of food
- Seasonal/breeding changes in feeding requirements
- feeding schedule/interval
- feeding locations
- Water
- diet ingredients
- nutrient content of diet (s)-summarize informafion and provide table(s) of ranges
- quantities, types and sizes of ingredients
- behaviour related to feeding (competition, rumination, search, etc) and possible means of mitigating problems, enhancing normal acrivities
- stimulation of natural feeding behavio

4.5 Breeding Requirements

- General behavioural notes
- Nesting/breeding requirements
- Requirements of young
- Methods of hatching / rearing / manipulation
- Merhods of controlling breeding

4.6 Rearing young

- Parturition/ delivery facilities
- Incubation facilities (In case of birds) and hygiene
- Incubation Parameters (e.g. temperature, humidity, substrates)
- Diets - method fed, frequency fed, feeding temperature
- Records and monitoring
- Behavioural consideration (e.g. weaning, imprinting,socialiation)

4.7 Transport Requirements

- Animals should be transported following CZA guidelines.

5. RECORD KEEPING

5.1 Individual records

- Transponder, ear tag, band number and sex
- hatch/birth date, parentage and origin
- weights, health problems and treatments
- movement of young ones, movements between closures, holdings with other animals/birds
- breeding attempts and chicks/young reared
- important behavioural notes
- National studbooks-Coordinating zoo.
- International studbooks-International Studbook keeper/Coordinating zoo.
- Advisories of exchange of animals/birds.

5.2 End of breeding season reports

- summary of animals mating.
- summary of aviary holdings, movements of animals/birds.
- pairings.
- breeding (number and size of clutches/liter, dates, nembers hatched/ born, fledged/survived)
- behavioural notes.
- summary of health problems, treatments, pathology or disease testing results
- recommendations

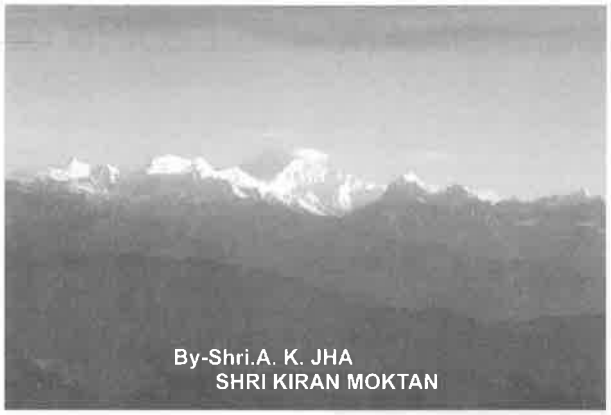
Thanks !!

INITIATIVE OF DARJEELING ZOO ON CONSERVATION BREEDING OF ENDANGERED SPECIES

Sri A.K. Jha, IFS
Director of, PNHZ Park, Darjeeling

The presentation provided and overview of the initiative and constant efforts of Darjeeling Zoo for conservation Breeding of endangered species.

GOOD MORNING



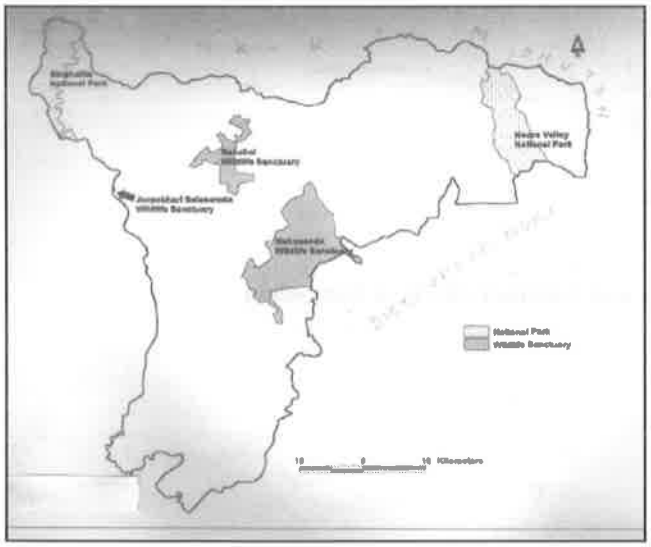
West Bengal -Snow to Ocean

Forest Cover of West Bengal

Forest Cover
11, 879 Sq. km (13.38%)
RESERVE FOREST=7054 Sq. Km

NATIONAL PARK 5
WILDLIFE SANCTUARY 15
TIGER RESERVE-2
ELEPHANT RESERVE 2
BILSPHERE RESERVE-1
WORLD HERIT AGE AGESITE 1

Darjeeling



PNHZ Park

- Eatablis hed on Aug 14th 1958
- A Specialized zoo for Himalayan Species
- Pioneer work in the field of Conservation Breeding of snow Leopards, Red Panda, and Tibetan Wolves
- Only zoo to release captive bred Red panda in wild, in South east Asia
- Area-67, 55 acres
- Altitude-7000 Ft.(2150 Mts) spprox (above msl.)
- Location - Birch Hill (Jawahar Parbat)
- Temperature- 20C to 26C highest and 10C to 50C lowest.
- Being manged by a society under Govermment of West Bengal.

Objects of the zoo

Primary objective of management ----

- Ex situ conservation and captive breeding of animal species.
- Educating, motivating, and initiating awarness campaign among the local people as well as visitors on the importance of conservation awareness, wide life education, interpretation programme with help from society and individuals.
- Initiating applied research on animal biology, behaviour and health care.
- Provide facility for health care of wild animals.

LAYOUT PLAN

- To finalize the Collection Plan of the Zoo, it was decided to survey and have an idea of what we had in nature or still have, how much and where, to know which animal species required help through ex-situ conservation.
- The Zoological Park coordinated first ever complete wild animal census in Darjeeling Hills for the same.
- Based on earlier reports and this census findings only 30 species have been finalised for display and planned breeding in the Zoological Park.
- Our Techinical Assistants are still working in field of our adopted Protected areas Networks in Darjeeling Hills to understand the status of these species in the wild

	Total Forest area	SNP	NVP	SWS	DARJ	KGN	KALM	DGHC	TOTAL
.	In Sq Km →	78.60	88.00	38.80	176.60	66.72	67.00	69.53	585.25
	SPECES- V								
1.	Yellow Throated Martin	132	226	148	41	108	63	93	811
2.	Flying Squirrel	0	334	15	0	12	0	105	466
3.	Red Panda	78	0	0	0	0	0	0	78
4.	Himalayan Black Bear	3	18	20	24	0	0	0	65
5.	Common Langur	0	0	0	0	209	0	220	429
6.	Rhesus Monkey	55	1324	321	3221	2736	780	3807	12344
7.	Gaur	0	81	0	0	0	0	0	81
8.	Himalayan Tahr	13	32	14	12	0	0	0	77
9.	Serow	94	89	0	0	0	0	0	191
10.	Goral	60	73	0	0	293	251	416	
11.	Sambhar Deer	0	286	0	0	0	0	0	286
12.	Barking Deer	125	590	234	145	262	57	660	2073
13.	Hog Deer	0	0	0	0	0	0	40	40
14.	Wild Bear	19	615	395	386	446	110	182	2153
15	Peacock	0	38	0	99	0	0	480	617
16	Boold Phesant	285	0	0	0	0	0	0	285
17.	Saty Tragopant	60	129	0	86	140	0	0	415
18.	SatyPeacock Pheasant	0	0	0	31	0	18	0	49
19.	Kated Pheasant	0	328	306	1029	768	584	1958	4924
20	Red Jungle Fow	0	442	0	143	98	49	477	1309
21	Hill partidos	31	99	0	147	0	228	441	906
22.	Grey Red Hornbill	0	320	0	35	49	0	107	511

Collection plan of Darjeeling Zoo

Sl.No.	Name of the Species MAMMALS
1.	Siberian Tiger/Indian Tiger (Panthera tigris)
2.	Snow Leopard (Panthera uncia)
3.	Leopard (Panthers Pardus)
4.	Clouded Leopard (neofelis Nebulosa)
5.	Golden Cat (Felis Temminoki)
6.	Marbles Cat (Felis marmorata)
7.	Leopard Cat (Felis bengalensis)
8.	Tibetan Wolf (Felis Bengalensis)
9.	Binturong (Arctictis Binturong)
10.	Himalayan Palm Civet (Pamuga larvata)
11.	Large Indian Civet (Viverra zibetha)
12.	Himalayan Black Bear (Selenarctos thibetanus)
13.	Red Panda (Ailurus fulgens)
14.	Yak (Bos Grunnieng)
15.	Takin (Budorcas taxicolor)
16.	Himalayan Tehr (Hemitragus jemlahicus)
17.	Serow (Pseudois Nayaur)
18.	Goral (nemorhaedus goral)
19.	Goral (Nemorhaedus goral)
20.	Barking Deer (Muntiacus muntiak)
21.	Musk Deer Mosohuss moschiferus)
22.	Wild Boar (Sus scrofa)
1.	Himalayan Blood Pheasant (Ithaginis cruentus)
2.	Monal Pheasant (Lophophorus Impeyanus)
3.	Saty Tragopan (Tragopan satyra)
4.	Grey Peacock Pheasant (Polypleatron bioaloaratum)
5.	Kalij Pheasant (Lophura leucomelana)
6.	Red Jungle Fowl (Gallus gallus murghi)
7.	Rutous throated Hill Patridge (Arborophila rutogularious)
	Himalayan Newt

FLAGSHIP SPECIES




RED PANDA

A planned conservation Breeding Project as a part of Global Captive Breeding Master Plan was initiated in early nineties in the zoological Park in response to the International consevation efforts through initition of the project and improvement/modification of existing housing facilities which was already there.

RED PANDA

- Zoological Park had three females (Amita Chanda and Diwa) all of wild origin in stock at the beginning of the Project in (990 Hence one male Oscar d.o.b. June 29, 1992) was brought from Rotterdam zoo of April 1993 to augment the existing populations of 4 Red Pandas in the Zoological Park.
- The first Successful planned breeding of Red Panda occurred on 20.00 1994 when two cubs Ekta and 'Friend were born of Basant' and 'Amita'

RED PANDA


- 'Hari' (Male d.o.b. June 30, 1993, Rotte radam), Gora (male, d.o.b.- June (25, 1993, Koin) and Indira (female, d.o.b. - June 26, 1993, Madrid) arrived in Darjeeling on Novevember 10, 1994 to induce new blood and to continue the palnned breeding programme again 'Omin' (Original name Isambo (Male, d.o.b. July 17, 1994, Rotterdam and 'Vicky' (Female, d.o.b. June 26.1994 Antuerp, were further added into the already existing stock of the zoological Park on December 15, 1996

RED PANDA

- Padmaja Naidu Himalayan Zoological Park in 2003 had a stable and genetically healthy population of 21 Red Pandas in captivity. The pain at Gangtok (Sikkim) Zoo (a subsidiary breeding center established in the region) had also started breeding.
- The Zoological Park then was in a position of realizing the ultimate objective of the project of releasing Zoo bred Red pandas in the wild in the Singhalila National park to begin with.
- Guideines stipulated by the IUCN for re- introduction /re-stocking of captivity born wild animals was follwed in totatity for the programme. All Necessary clearances from Govt. of India and Govt. of West Bengal were obtained for the purpose.
- Pre-release Monitoring of the Red panda population and habitat in the Gairibans area of the Singhalila National Park was organized during November/December, 2002. Another survey is proposed in 2007-08 to assess the impact of release.
- DNA based analys in was conducte in collaboration with Centre for Cellular and Molecular Biology Hyderabad for Taxonomic Status analysis and Genetic Variability studies.

RED PANDA

- An Intemediary release facility (50 sq m) for sort release of the aninals was created near Gairibans Beat Office (around 8500 feet) of South Sinhlila Range in the Singhalila National Park. The construction cost was fully funded by the Central Zoo Authority Govt. of India
- Both the animals were shifted to the intermediary release facility at Gairibans for acclimatization and kept there for 3-4 months. Though they were in the wild, they were still under the supervision and observation of some of the zoo staffs posted there. When the animals were thought to have acclimatized well to the environment, they were finally released into the wild.
- Radio collars of appropriate size and weight were fitted on the animals for their post-release monitoring for at least 12 months (or till batteries of the collars were functional)

RED PANDA

- Out of the two female Red pandas (Mini and Sweetie) released in 2003, Sweerie gave birth to a cub in July 2004 in a hollow of an Oak tree in Gairibans (Singhalila National Park, Darjeeling

Red Panda

Sl. No	Name	Int Stud Book No	Sex	D.O.B.	Sire	Dam	Transponder No.
1.	Gora	9305	Male	25.06.1993	8665	8824	00-00611-1658
2.	Shaan	9404	Male	17.07.1994	0356	1130	981-0981-02056029
3.	Lalit	9650	Male	08.06.1996	9305	94101	981-0981-02055470
4.	Amic	9879	Female	17.06.1998	9305	9411	00-0612-5AC9
5.	Sagar	00121	Male	26.06.2000	9404	95127	00-0061-1058
6.	Pokhraj	01128	Male	18.06.2001	9305	94101	00-061-FD19
7.	Shalya	01127	Male	8.06.20011	9305	94101	00.0611.3083
8.	Sid dhartha	01130	Male	28.06.2001	9305	94101	00-0611-5cc8
9.	Sheetuel	0356	Female	02.07.2003	9404	95127	981-0981-02055661
10.	Johe	Applied for	Male	Est.-24.06-04	wild	wild	981.0981-02058449
11.	Sahadev	0358	Male	2207.2003	01127	9766	00-0618-02BF
12.	Nakul	0358	Male	22.07.2003	01127	97166	00-0618-02BD
13.	Shainec		Male	05.06.2006	01127	9879	981-0981-0256336
14.	2 cubs	Applied for	U	05072008	John	0356	

SNOW LEOPARD

A Pair of unrelated Snow leopards was flown to Darjeeling from Zurich Zoo via London and New Delhi on 21st March 1986.

Another pair (Hank and Persia) came to Darjeeling Zoo from US, Zoos on 16.01.1989

SNOW LEOPARD

- Quizil" (Male, d.o.b.-May 23, 1990 Zurich), "Quila" (female, d.o.b.,-May 23, 1990 Zurich) and "Quetta" (female, d.o.b.-May 23, 1990, Zurich) were later added to the coliection of the Zoological Park on January, 28, 1992 to induce new blood and continue the planned breeding programme at Darjeeling.

- Another male "Tyson" d.o.b.-Aug 8, 1995 from Hunbstand. Sweden for sam purpose.
- Two wild/rescued females "Neeta and meeta" from Leh-Ladakh region were brought on May 17.2000.

SNOW LEOPARD

- In the last twenty years there are in total 49 births of Snow Leopards in captivity in the Padmaja Naidu Himalayan Zoological Park, Darjeeling.
- All the record keeping of programme and animals is not only done in Darjeeling Zoo, but is also recorded with the International Stud Book Keeper of the species at Helsinki.

SNOW LEOPARD

- Padmaja Naidu Himalayan Zoological Park in 2003 had 18 Snow Leopards (9 Males and 9 Females), one of the largest captive population, in a single zoo, in the world and a record for the zoo. As on now in Jan. 2008 there are 11 Snow leopards (6 males, 5 females)
- Another step taken was to have at least 4-5 stable captive populations of Snow Leopards at different high altitude zoos in the country, before any release/restocking in the wild canbe contemplated. In 2004, a pair each of snow leopards was from darjeeling .Zoo to Gangtok, Nainital, and Shimla Zoos to Start subsidiary snow leopard breeding centers in these Himalayan Zoos.

Snow Leopard

Sl. No	Name	Int Stud Book No	Sex	D.O.B.	Sire	Dam	Transponder No.
1.	Tyson	1850	Male	88.1995	1723	1285	00-0611-1633
2.	Karan	1897	Male	23.10.1996	1059	1474	981-0981-02057256
3.	Karish	2046	Male	22.31998	1059	1473	981-0981-D2056345
4.	Budh	2401	Male	19.62002	180	1797	0-0510-FA913
5.	Pahhal	2405	Male	87.2002	1850	1899	99-06182E0
6.	Ndth	2228	Famale	Not Know	wild	wild	Appled
7.	Tceta	2398	Female	29.32002	1897	2228	Appled
8.	Rttu	253	Female	11.3.2400	1897	2228	981-0081-02056547
9.	Yasoia	2540	Female	25.52004	1859	1797	00-00F68A3B
10.	Mallia	2541	Female	25.52004	1850	1797	00-00F8-AC18
11.	Kush	1972	Male	31.10.1995	1472	1797	981-0981-02048903

NEW PROJECTS

New Conservation Breeding-

- Tibetan wolf (Darjeeling Zoo As the Coordinator)
- Blue Sheep (Darjeeling Zoo As the Participating Zoo)
- Bhutan grey peacock pheasant (Darjeeling Zoo As the Participating Zoo.
- Himalayan Tahr (Darjeeling Zoo As the Participating Zoo)
- Blood Pheasent (Darjeeling Zoo AS the Partcipating Zoo)
- Satyr Tragopan (Darjeeling Zoo AS the Coordinator)
- Himalayan Monal (Darjeeling Zoo AS the Participating Zoo)
- Himalayan Salamander (Darjeeling Zooa AS the coordinator)

Present Population	Male	Female	Unidentified	TOTAL
Red panda	11	2	2	15
Snow Leopard	6	5	0	11
Tibetan Wolf	8	2	3	13
Monal Pheasant	3	2	0	5
Kalij Pheasant	4	2	0	6
Red Jungle Fowl	1	3	0	4
Grey Peacock Pheasant	3	7	2	12

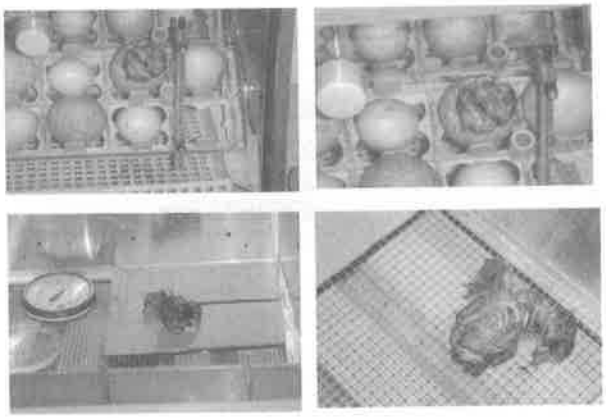
NEW PROJECTS



NEW PROJECTS

Red Panda

Chicks



Record Keeping

- **VETERINARY TREATMENT CARD**
- **ANIMAL HISTORY CARD**
- **STUD BOOK**
- **ANIMAL TREATMENT CARD**
- **ANIMAL DEWORMING CARD**
- **ANIMAL VACCINATION CARD**
- **ANIMAL TRANQUILASATION CARD**
- **ANIMAL OPERATION CARD**
- **ANIMAL FEEDING CARD**
- **Beat (Dally) Report**

Resources -- Visitors, community

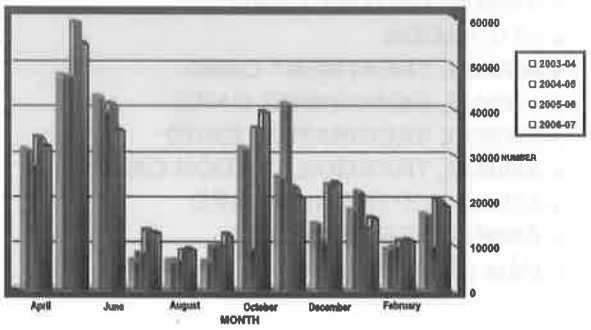
- Huge resources
- Every year 30 million visit Indian zoo, 600 million worlwide (100%of world population may be). Can we increase it?
- Many zoos in tourist circuit--assured touriste. EVen if they spend two hours in general-- how to utilize the for the conservation purpose
- Utilise them for resource generation
- Enthuse the local community to join in Zoo Movement
- Use the visitor for spreading the message of wildlife conservation, empathise them for programme with teachers, senior citizens, GOVERNMENT EMPLOYEES
- They should visit you again and ask others to visit too.
- Facilities -- welcome, toilet, drinking water, shelter, parking space 'F' & B, gift shop First aid, disabled visitor facilities, Information desk, Telephone, camera rolls, Mobile voucher sale, Binocular on hire, tattoos, circulation map.

	2003-04	2004-05	205-06	2006-07	2007-08
April	31378	27721	33971	32093	35329
May	47711	47445	59432	54875	58587
June	43003	39726	41448	35892	45152
July	6645	8203	13428	12893	12087
August	6465	6612	8835	9076	7072
September	6298	9743	9928	12396	
October	31608	9124	35982	39640	
November	25267	41417	22954	20791	
December	14853	10802	23445	23914	
January	17800	21882	13919	16271	
February	9200	9615	11138	11279	
March	16950	9609	20149	18777	
TOTAL	257178	241899	294629	287697	

Esteemed Visitors

Esteemed Visitors

Tourist Flow



Keep in touch

- Web - www.pnhzp
- E mail - pnhzp@yahoo
- Telephone - 0354-2254250-Direct
  2253709-PBX
  2252522-Fax

STATUS OF PHEASANTS IN P ADMAJA NAIDU HIMALAYAN ZOOLOGICALPARK, DARJEELING

Sri Siromani Syangden
Estate Officer, PNHZ Park, Darjeeling

The presentation discussed the status of pheasant in Darjeeling Zoo and also the future endeavors for better management of pheassnts in zoos.

Status of Pheasants at Padmaja Naidu Himalayan zoological Park, Darjeeling, India

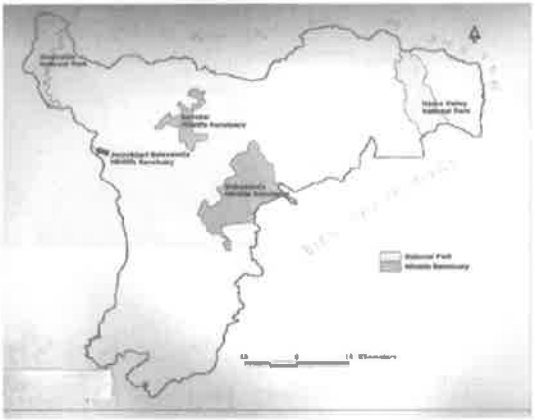
-Padmaja Naidu Himalayan zoological Park.

INTRODUCTION

- Some birds and pheasants were keptat PNHZ Park since its inception for display purpose only.
- From the year 1985, conservation breeding initiatives began. Aviary builtat lebong.
- At that time concept of conservation breeding of pheasants were fairly new to India. Unfortunately the early efforts made by PNHZ park was stalled because of the ongoing agitaion at that time.
- Again the pheasants were set aside as there were Other programs initiated during the Same period.

- Once more in 1999-2000 focus shifted to pheasants many exotic pheasants were acquired for developing expertise.
- Since 2003-2004 we are trying our hand on breeding of indigenous pheasants.
- Although young in this field efforts are on.

Protected areas of Darjeeling



EFFORTS MADE BY PNHZ PARK FOR CONSERVATION BREEDING OF PHEASANTS

1. Marking of Birds:

- Indigenous specise which are housed in the park namely Himalayan Monal, Red Jungle Fowl, Grey, Peacock Pheasant and Kaleej Pheasant are all marked for keeping records and conservation breeding.

Ringing of birds

2. RECORD KEEPING OF PHEASANTS

- MAINTANANCE OF HISTORY SHEET APPROVED BY WPA

PHEASANT HISTORY SHEET

NAME OF THE ZOO	
ADDRESS	
SPECIES	
DATE OF HATCHNG/ HATCHING TYPE	
SEX	
RING NUMBER	
DATE OF RINGING	
SIRE Id*	
DAM Id*	
LOCATION	
REMARKS	

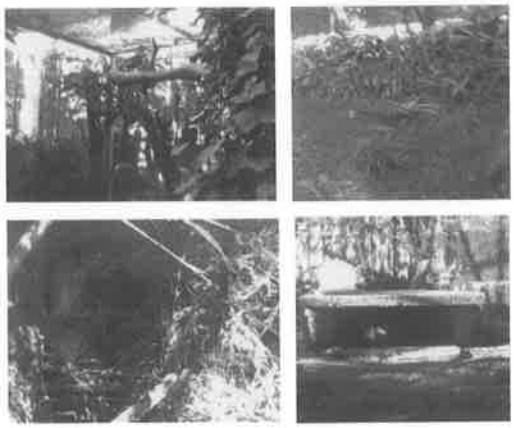
* If identity of male and female parents not known mention source from where obtained.

3. Steps taken to provide more congenial environment for breeding pheasants

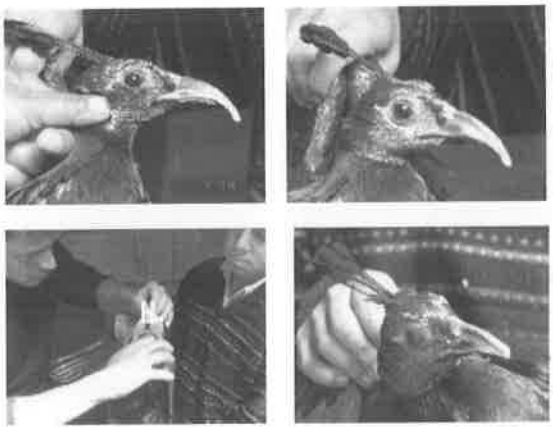
Provision of enrichment items

- Plantation
- Construction of perches
- Providing nesting areas.
- Electricity

3.1 ENCLOSURE ENRICHMENT



4. CARE PROVIDED



MIXED FEED

MARBELECHIPS

- **5. Diet**

crushed maize, lettuce leaves, mutton heart, apple
crushed maize green, vegetable, boiled egg, marble chips, mousambi, garlic, onion, insects and earthworms.

STATUS OF GREY PEACOCK PHEASANT AT PNHZ PARKA

- HISTORY-

Forst stpck of the grey Peacock Pheasant was brought from Alipore Zoo, Calcutta (2:3) on 1st Aug. 2001

- First Successful Breeding 2002 1 male and 1female grey peacock pheasant
- Present Population 3:7:2

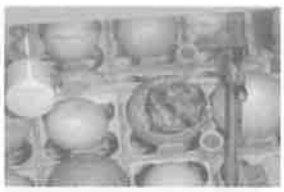
STATUS OF HIMALAYAMN MONAL AT PNHZ PARK

- HISTORY-First stock brought from Himachal Pradesh (1:3) on 23 Dec. 2004
- First Successful Breeding- Year 2005
- Present Population 2 males 3 females

Breeding status of Indigenous Pheasants in the year 2008

Name of the Pheasant	Egg Count	Chicks Hatched	Chicks Survived	No of Birds
Grey peacock pheasant	18	6	2	3:7
Red Jungle fowl	26	1	1	1:3
Himalayan monal Pheasant	06	3 (inc)	0	3:2
Kaleej Pheasant	0	0	0	4:2

HATCHING OF A CHICK



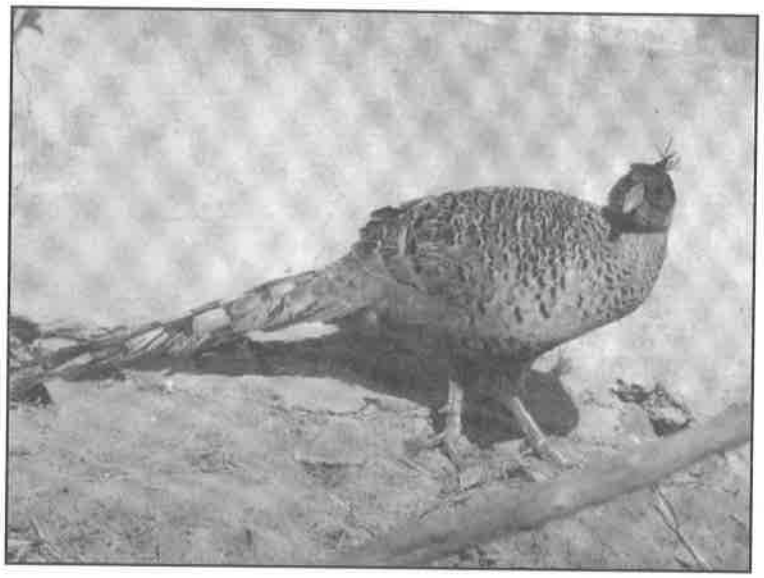
- **Constraint**
  - Aviary design
  - Lack of basic training
  - Wrong perceptions of handling birds
  - Proper record keeping

FUTURE ENDEAVOURS

- Improvement in the design of the present aviaries in a more practical & naturalistic way, suitable for the breeding of pheasants.
- The CZA has assigned our zoo as the co-ordinating zoo for the breeding of *Satyr Tragopan*. Off display site for the bird has to be identified and approved by the CZA.
- Scientific and technical assistance will be gathered from all concerned parties for the management of the pheasants will help in the conservation breeding program.
- Setting up of Satellite facility for breeding of pheasants at kurseong Deer Park
- Trained and qualified staf at the basic level.

The begging

Strategy for cheer Pheasant Release programme in Himachal Pradesh



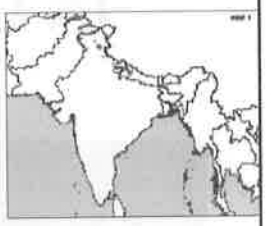
STATUS OF CHEER PHEASANT BREEDING IN CHAIL WLS

Shri Sat Pal Dhimal
R.F.O. wild life
Himachal Pradesh

The presentation highlighted the previous release strategy of Cheer pheasant into the wild, drawbacks and future release plan of the pheasant.

Overview

- Restricted range species endemic to Western Himalayas (Map-1)
- Fragmented populations- in patches of successional grasslands
- Due to various limiting factors and being in small isolated populations, this species is more vulnerable to extinction



Overview

- Identified by CZA for Coordinated Conservation Breeding Programme in India amongst other 58 endangered species
- Therefore a target species for a conservation breeding programme in Himachal Pradesh
- Chail Pheasantry identified as a Coordinating Zoo for this species in India

Release Strategy

- Conservation Breeding Programme : Why to breed birds?
- Objective statemcnt : produce robust stocks to release back into the wild to build up wild population within it's natural distribution range if desirable
- But release is highly complex, challenging and expensive.
- **Out of 145 documented reintroduction projects only 16 (11%) were successful which contributed to establishing a self-sustaining wild population (Beck et al. 1992)**

Release Strategy

- Since the time of this research, the Reintroduction Specialist Group has been formed by IUCN and there heve been a number of significant improvements.
- WPA has been successful in reintroducing several pheasant species, such as Green peafowl and Mountain Peacock pheasant in Malaysia.
- There are still few successes and many failures when IUCN Guidelines have not been followed.

Release Strategy

- Pre-requisites
  - Feasibility study & background research
  - Previous re-introductions-research has already been conducted
- Cheer became extinct locally in Margalla Hills NP in Pakistan in mid 1970's
- WPA started release in 1978 and project was run for more than 10 years.
- Hundreds of Cheer Eggs were flown out of Europe every year and incubated in Pakistan by Broodies/Incubators.
- Cheer Poults were released when they were between six and 14 weeks old

Release Strategy

- Previous re-introductions
  - Project failure : Mistakes committed which is a learning experience for future
  - Majoriry of Chicks predated (Birds did not even learn where to roost to escape the predators)
  - Release in Unsuitable habitat-Scrubby habitat

Release Strategy

- Previous re-introductions
  - Disease-*Histomoniasis*
  - No proper monitoring like radio tracking to know the fate of released birds
  - Viable wild population could not be established-only few parent reared bird from very experienced parents could survive until the following breeding season.

Release Strategy

- **Release site**
  - Should be within the species former natural habitat and distribution range.
  - Occurs in small and isolated sub-populations in upper Ravi, Beas, Sutlej & Yamuna catchments
  - Population abundance estimation-not less than 1000 pairs (Gaston et at., 1981a

Release Strategy

- **Release site**
  - 2005 Survey indicates presence of the species in at least 10 PAs. Possibilities of occurrence in Non-PAs. (Estimated number 1664individuals. Reliability ????)
  - Majathal WLS reported to have highest population density 24 pairs per sq. km. in 1980s followed by Chail WLS-But 2007 survey in selected areas in Majathal indicates sharp decline (4-5 pairs per sq.km.)
  - Majathal WIS can be a candidate site to to test and establish release protocols by way of experimental release
  - Needs evaluation-suitable habitat, carrying capacity, identification and elimination of causes of decline.

Release Strategy

- Majathal survey-Wild Cheer responding to playback calls

Release Strategy

- Majathal survey

Release Strategy

- Communities involvement-Majathal
- Socio-economic survey done-Poor HHs
- 14 SHGs formed -working closely with ACF

Education project of 33 lakhs for poor girl students principally approved by Ambuja cements.

Release Strategy

- Availability ofsuitable release stock
- Total captive stock 50 (Males: 25, Females : 17, Youngs :8)
- Only 3 unrelated wild rescued founder pairs which are invaluable and their 8 youngs.
- Remaining population-no pedigree & inbred. Valueless for this Conservation Breeding Programme.

Release Strategy

- **Availability of suitable release stock**
- Policy laid down by Donor/regulatory agency CZA well supported scientifically
- Maintain 90% genetical variability over a period of 100 years
- Terget : Should have 25wild founders and maintain 100 physically, genetically and behaviourally healthy individuals
- IUCN stipulates clearly that release should not be carried out as means of disposing of surplus stocks-release stocks have to be soundly managed both demographically and genetically.

Release Strategy

- **Monitoring Programme**
- Design pre-and post -monitoring programme
- Construct multidisciplinary team (Department, donor agencies, organisations like WII, WPA) with access to expert technical advice
- Post monitoring required for all individuals by direct method-e.g. radio telemetry to konw the fate of released individuals
- Involvement of local communities and developing conservation education programme

Future Ahead.....

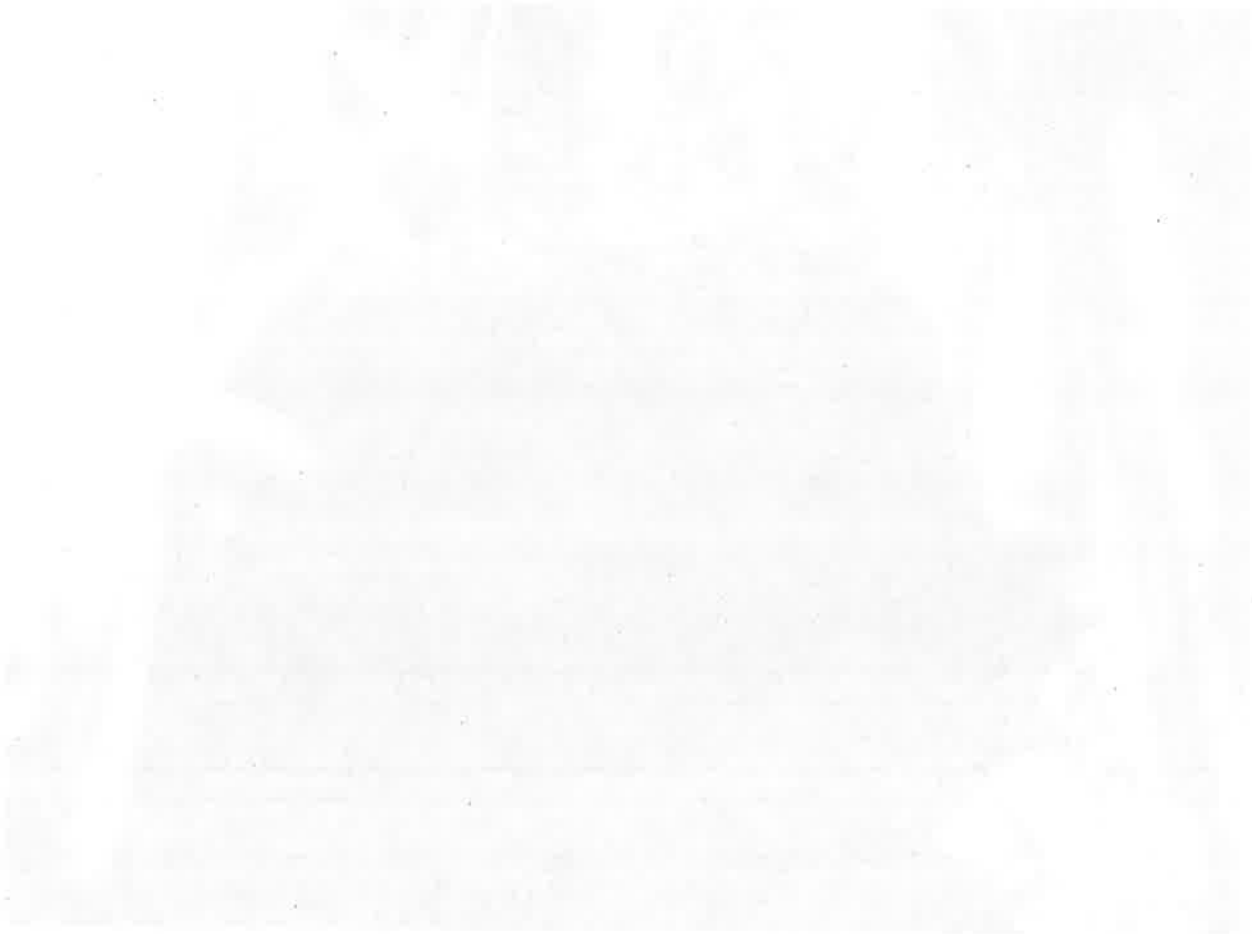
- Do we have surplus Suitable release stock ? No
- Do we know where is the suitable habitat for release ? No
- Do we know that even if birds are released successfully that the local people will not eat them ? No
- Need of long term approach and multidisciplinary team
- Urgent need to build up genetically healthy founder stock to produce release stock
- Identify the need for release supported by thorough field research

Future Ahead.....

- Reintroduction only if desirable and appropriate- Follow IUCN Reintroduction Guidelines

  Consider Majathal WLS a site to test and esteblish release protocols by doing Experimental release througha Multidisciplinary team to lead this Conservation Breeding Programme

Thank You

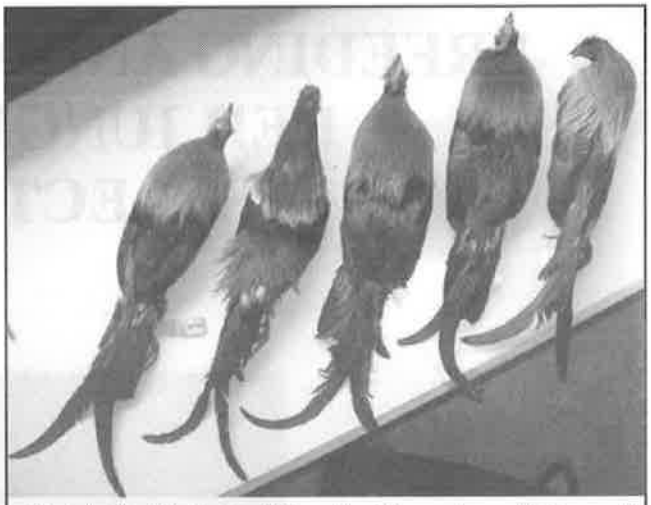


BREEDING AND MANAGEMENT OF RED JUNGLE FOWL IN SELECTED ZOOS

Dr. Raul Kaul, WTI
Director, conservation, WTI

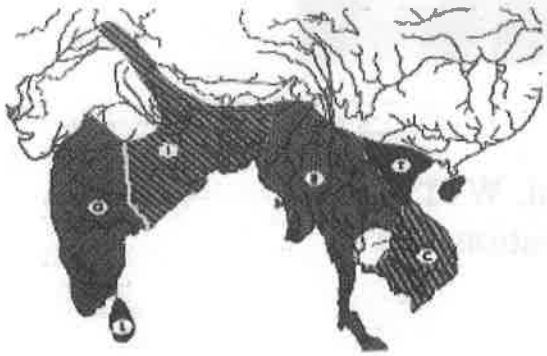
The presentation gave on overview of Breeding and Management of Red Jungle Fowl in selected Indian Zoos.

Breeding and Management of Red jungle fowl in selected Indian Zoos



1 G.g. jabouillei, 2 G.g. bankiva, 3. G.g. gallus, 4. G.g. spadiceus and 5. G.g. murghi

Historical Distribution of Junglefowls



So what is the problem?

- The populations of domestic fowl living close to RJF habitats have possibilities of breeding with them to cause an introgression of domestic genes into the wild population.
- This could imply that some of the populations in the country may have hybridised
- Hybridisation has already happened in SE Asian populations.

So what do we do?

- Identify populations in the country that are 'pure'
- Devise ways how these may be protected against hybridisation
- Implementation

How?

- Physical traits shown by pure RJF
  - Leg shape and colour
  - Moulting of hackles
  - Lack of comb in femal
  - Tail carriage
  - Tone of calls
- Genetic studies

Zoo Survey

- In 2002-03, we observed physical traits shown by RJF in some Zoos of india
  - Renuka(HP)
  - Kufri (HP)
  - Bird Park (HP)
  - Chail (HP)
  - National Zoo (Delhi)
  - Lucknow Zoo
  - Kanpur Zoo
  - Vizag Zoo

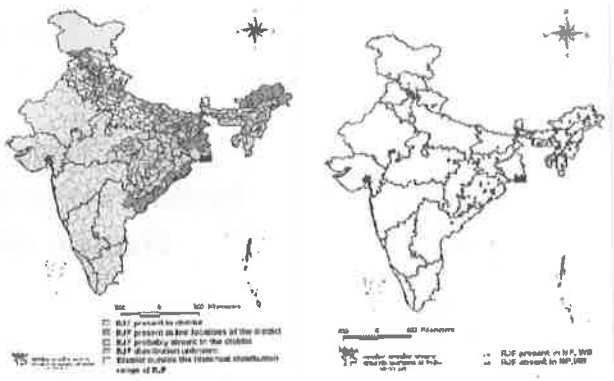
Findings

- All birds observed in the zoos had moulted that year
- None of the females had a comb
- All legs were slender and dark\
- Moulting occurred between July- September.

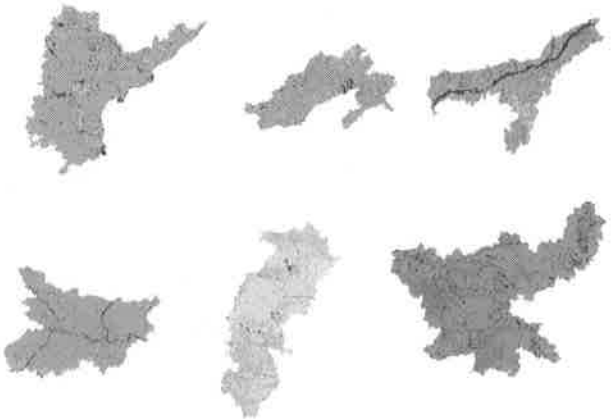
Collaborative project

- Collaborator
  - WII, WTI and MLN College, Yamunanagar and NBAGR, Karnal (?)
- Objectives :
  - To assess the status and distribuion of RJF in India
  - To identify pure RJF populations by moleculer genetic studies
  - To investigate social interactions between wild RJF and domestic chicken
  - To propose conservation action plan

Findings



Distribution

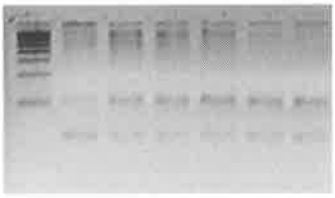


Distribution contd.

- RJF occurs in 21 states of India
- RJF distribution covers 300 Districts in 21 range states. It is now reported to occur in 136 districts in the 21range states. Of the 255 Protected Areas (Pas) that occur within the distribution range in India, 149 PAs (26 NPs and 123WSs) has reported its presence.
- A total of 246 (126 males and 120 females) were characterised of which all males showed traits

Genetic samples

- Seventy RJF samples and 43 domestic chickensamples collected for genetic analysis.
- Samples obtained from nine zoos and more required.
- DNA successfully isolated for further sequencing.



Samples collection from Zoos

Name of the Zoo	State	No of birds	Samples needed
Indira Gandhi	Andhra Pradesh	11	obtained
Nehru Zoo	Andhra Pradesh	2	obtained
Sanjay gandhi	Bihar	7	obtained
National Zoo Park	Delhi	50	needed
Bhiwani Mini Zoo	Haryana	4	needed
Morni	Haryana	47	obtained
Chail	Himachal Pradesh	27	obtained
Dhauladhar	Himachal Pradesh	14	obtained
Himalayan	Himachal Pradesh	11	obtained
Renuka	Himachal Pradesh	7	obtained
Tata Steel	Jharkhand	4	needed
Chammarajendra	Karnataka	15	needed
Mahendra Choudhury	Punjab	17	needed
VOC park & mini Zoo	Tamil Nadu	3	needed
Sephajila	Tripura	7	needed
Kanpur	Uttar Pradesh	40	needed
Lucknow	Uttar Pradesh	9	needed
Govid Balla Pant	Uttarakhand	11	obtained
Padmaja	West Bengal	4	needed

The purpose

To establish conservation breeding facilities in zoos with diverse and 'pure' RJF

STATUS OF GREY JUNGLE FOWL BREEDING IN TIRUPATI ZOO

Shri S. Krishnaiah
Director, Tirupati zoo

The presentation gave a broad overview on habitat, habitat, raising and husbandry of grey jungle fowl. It also gave information on the ongoing conservation breeding project og Grey Jungle fowl at Tirupati zoo under the financial assistance of CZA.

GREY JUNGLE FOWL

■ CLASSIFICATION

Kingdom - Animalia
Phylum - Chordata
Class - Aves
Order - Galiformes
Family - Phasianidae
Genus - Gallus
Species - G.sonneratii (Temminck, 1813)
This bird is named after P.Sonnerat, naturalist, French navel commissary.

GREY JUNGLE FOWL :-

Common Name : Chicken
Other Common Names : Sonnerat's Jungle fowl, Jangli Murghi
Scientific Name : ***Gullus soneratti (Temminek)***

The males have **darkish-grey plumage** with white feather-shafts. The **blackish crown** and neck have white and yellow shaft-**streaks and spots.** The waxy **sickleshaped arching tail** is distinctive. The **female is brownish** overall with white underbody and bold markings on breast.

Food (in natural habitat): seeds, tubers, crop shoots, insects, bamboo and karvi seeds.

Voice : Loud kuk... kuk... kura kuk of the male is distinctive and rather noisy during breeding season

Habit :

The beautiful Grey Jungle fowl has become quite popular in American and European aviculture. Indigenous to Southern and Western India the Grey jungle fowl, also know, as Sonnerat's Jungle fowl, can be found north of Mount Abu to the west, and to the east, they can be found as far as the Godavery River. Their preferred habitat rang is variable, they seem to enjoy many surroundings, from bamboo forests, to clearings near villages, to the densest Indian jungle. It is a fairly successful bird, adapting to live near populated settlements without having suffered any major population loss. The Grey Jungle Fowl is **a cousin to the Red Jungle fowl,** which is in the same line as the modern domestic Chicken.

Description :

The Grey Jungle fowl is a bright, **spectacularly colored** bird . The comb of these birds is slightly dented, and colored a deep red. Their long neck hackles range from dark grey all the way to a deep black, with yellow and white stripes running the length of the neck. Their tail feathers, as well as the feathers near the back, are the same grayish- black color, with similar white stripes. Immature males, typically those less than a year old, will have substantially shorter feathers, and the coloring as won't be vibrant. The color of the Grey Jungle Fowl apparently changes depending on what region they are in, northern examples of this speci tend to be lighter in color, with fewer bright spot while examples form the south are colored very bright and overall tend to be darker birds.

Their beautiful hackle feathers are sought after heavily by fly-tiers (people who make fishing lures) because of their bright, exuberant coloring. The feathers have a lot of interesting features, like horned spangles, that make them especially valuable to anyone making lures. Trout fishers, especially enjoy these feathers since they're so brightly colored and easily attract trout and salmon.

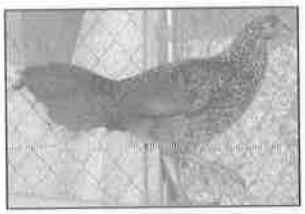
STATUS

Grey Jungle Fowls have been put in the **schedule II Part II** and are now protected birds. But large scale trapping is continuing which is a matter of great concern, most of the birds trapped refuse to eat and die.

PHEASANTRY AT S.V. ZOO

HOUSING

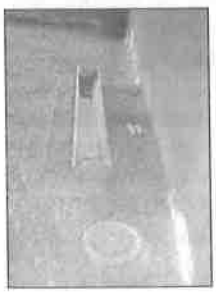
Captive bred Grey Jungle Fowl are easy to care in captivity. They need wind proof shelter with a dry climate inside to keep them comfortable. During summer it is better to dangle Khus khus thatties and sprinkle continuously cool water to keep down the internal temperature



Wild caught Grey jungle Fowl are difficalt to care in captivity for two reasons.

- The first is that it the cage is not high enough they will offen jump and injure their heads.
- Secondly, they will offen stop eating in captivity until they starve to death.

DIET



- Poultry-feed each 120 grams
- The Poultry-feed consist of following combination
  - Wheat 35%
  - Maize 30%
  - Bajra 5%
  - Fish Meal 10%
  - Mineral mixture 3%
  - Paddy 10%
  - Sun flower 7%
- Onion 25 grams
- Vegetable leaves 50 grams
- In addition to that multi-vitamins, Austo-calcium, Vimeral, AV Plex, with B-12 mixed in the water and by feeding the bird(s) twice a day - in the morning and in the evening.

HUSBANDRY

- **Disease and treatment :-**
- 1) De-worming : once in a month
- i) Albandozole - 5 ml / birds with water ii) Fentas puls - 5 ml / birds mixed with water
- 2) Nutrition : Tonic :- every day mixed with water
- a) Arical - 0.50 ml / birds
- b) Ariplex - 0.50 ml / birds
- c) Vimeral - 0.50 ml / birds
- d) Broton - 0.50 ml / birds
- 3) a) Salmonclisis :
- 1) Oxytetracycline - 5 gm. for three (3) days
- 2) Melanex - 0.50 ml I/M every day
- b) Tapeworm Infection: Proziquental:- 1 Tab for 10 birds
- **Prophylactic measures chart :-** Every 6 months change the soil of every cage soil mixed with 1 /10 lime powder. Every 2 months spraying of neem oil every cage. Every 3 months spraying of kohrsolin-in in every cage. Out side of cage spraying of lime powder every month.

BREEDING AND PROPAGATION

In the wild the Grey Jungle Fowl breeds between March and July. The Grey Jungle Fowl reaches sexual maturity at approximately two years of age. Males can be bred to more than one hen. Eggs will incubate for 21 days and then hatch. The average clutch size is between four and six. Grey Jungle fowl are known to become rather noisy.

CURRENT STATUS OF GJF AT S.V. ZOO

At present at S.V. Zoological Park, Tirupati there are 35 Grey Jungle Fowls (16 Male 19 Female).

OFF DISPLAY CONSERVATION BREEDING CENTRE FOR GREY JUNGLE FOWL

S.V. ZOOLOGICAL PARK, TIRUPATI

INTRODUCTION

Grey Jungle Fowl has been identified as one of the targeted species for conservation breeding in Indian Zoos. As per the concept paper communicated by Central Zoo Authority the S.V. Zoological Park, Tirupati, Andhra Pradesh has been identified as a coordinating Zoo for Conservation Breeding of Grey Jungle Fowl vide CZA F, No. 24-37/2007-CZA (M), dt. 04-07.2007. The S.V. Zoological Park, Tirupati having largest population of Grey Jungle Fowl ie. thirty five (35) numbers and it is situated in the animal distribution range. The Forest surrounding Sri Venkateswara Zoological Park, Tirupati is part of its Natural Habitat.

Object of the Project :

The object of the project is to have at least 100 properly and scientifically bread and physically, genetically and behaviorally healthy individuals of Grey Jungle Fowl in captivity. The other objectives are having proper captive stocks to continue display and for reintroduction or release in the wild in case needed.

Proposed Construction of off display breeding centre for Grey Jungle Fowl

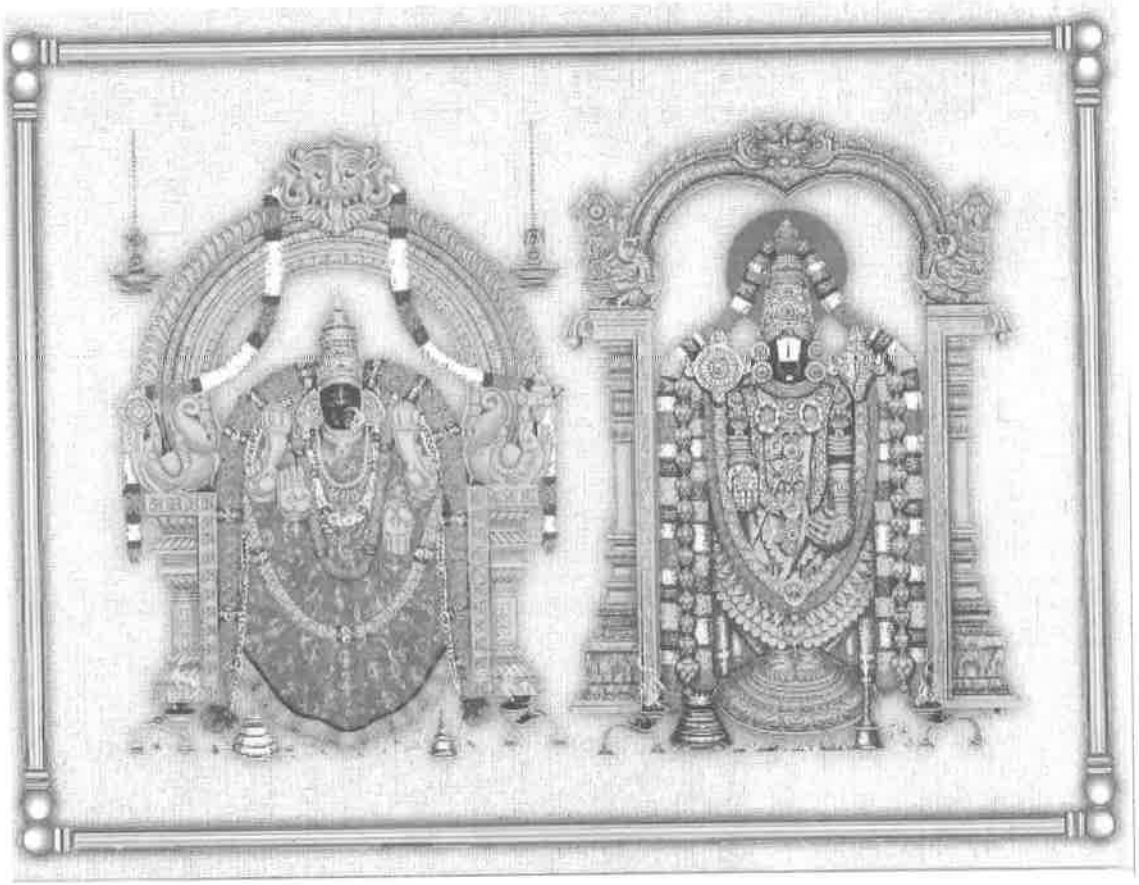
The off display breeding centre for grey jungle fowl is proposed to be constructed with 12 blocks, each with three block cubicles to accommodate 100 birds@3 birds in each cubicle. The width of the block is 6.10 Mts. and length is 13.80 Mts outer to outer, providing 3,10 Mts. height above ground level. The length, width and height of each cubicle is 6.1 mts x 4.60 mts x 3.1 + 2.8/2 mts.

The verticals, horizontals and roof purlins are proposed to be constructed with 40mm dia MS pipe heavy gauge. The chain link of ½" x ½" x 16 gauge will be spread all round the closed aviary. **"Rodent proof flooring"** is provided to each one of these blocks to a thickness of 60 Cms, as follows

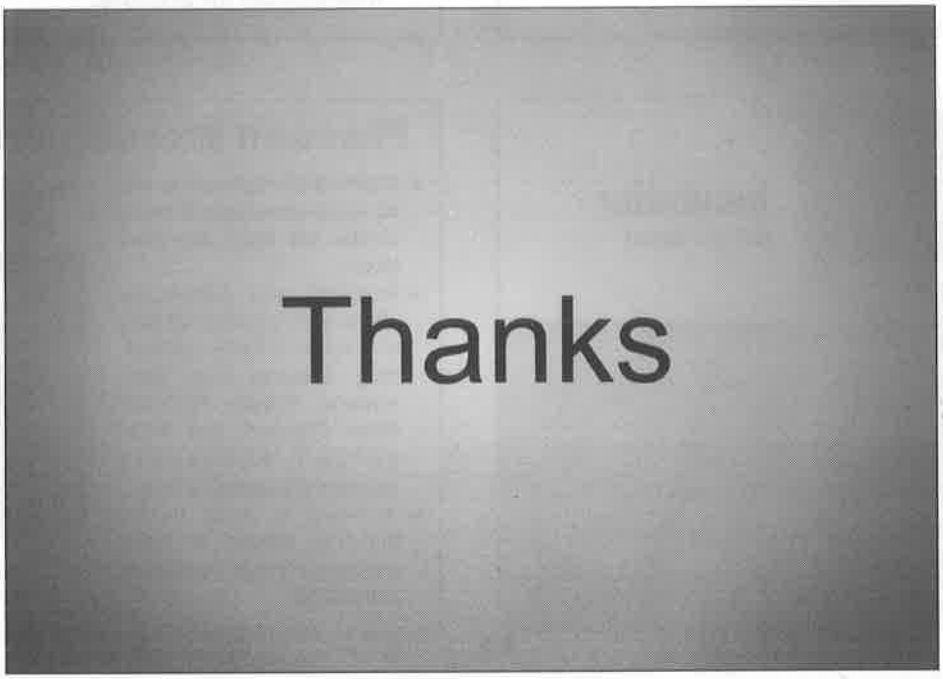
A)	Initial sand filling	= 20 Cms
B)	1:4:8 concrete	= 7 Cms.
C)	Spreading of 3"x3"x8 guage chain link mesh.	
D)	1:2:4 concerete	= 7 Cms.
E)	Spreading of course send	= 30 Cms.
		64 Cms. (60 Cms at the edges)

Effective 60 cms. Thickness will be maintained at the edges, by providing sand mounds inside. For constructing 12 blocks, an amount of Rs. 60.00 lakhs has been proposed, at the rate of Rs. 5.00 lakhs per block

The Central Zoo Authority has considered the proposal and approved for giving financial assistance of Rs. 60.00 lakhs for the above project vide C.Z.A. No. 24-37/2007-CZA(M), dt. 10.03.2008. After receipt of the funds project works will be commenced.



Thank You


Thanks

For better result from 2005 onward the measures adopted

- Fumigation (Formaline+ Potassium per magnate) 2:1 of nursery, incubator, Hatcher etc. is done twice before starting egg laying season.
- Provided invertor of 1400 va capacity & Generator set of 2 kw substitute in case of power failure.
- Provided L.P.G. heater to maintain adequate temperature in hatchery / nursery for newly born chicks for a minimum period of six month of age.
- Wiping of eggs with sprits swab was done before setting of eggs in incubator.
- U.P. agro feed was given to all pheasants & spatromix was also added into feed.

For better results from 2005 onward the measures adopted

- Greens, vitamins, minerals also mixed in feed. Deshi sirka was also given to newly born chicks in water for a period of 3-4 month.
- To reduce vector load and infection bedding changed weekly.
- Deworming of pheasants twice a year (before three month of egg laying)
- Boild meshed eggs with cell were given to pheasants 3-4 month before eggs laying & also to newly born chicks.
- Applied Betadin lotion in newly born chicks navel cord.
- R.D. Vaccination to newly born chicks.
- Light arrangement. (100 watt. bulb provided in their brooder for 24 hours..

Incubator
(21-27 days)

Pheasant Breeding Programme

- Breeding of indigenous as well as exotic pheasants is being carried out since last three years.
- Research and continuous efforts have resulted hatching of 78 chicks of Red jungle fowl, Kalij, Lineated Kalij, Lady Amherst, Golden Pheasant, Silver Pheasant and Silver golden pheasants successfully. Up to this time.
- Hatching is done during breeding season of these pheasants using incubators and hatcher.

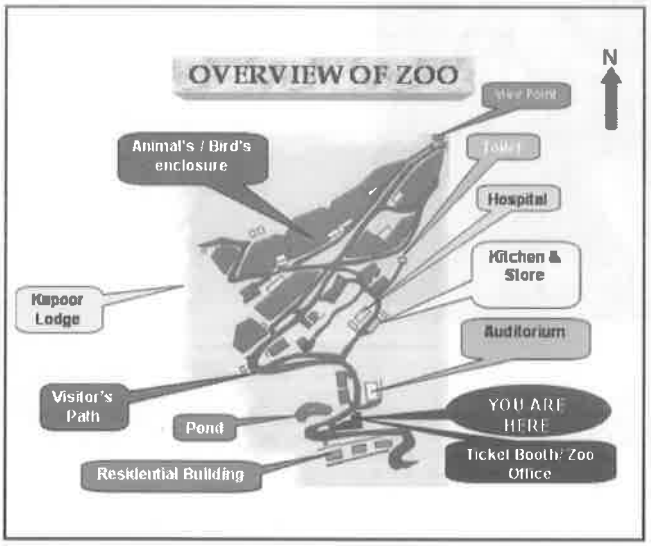
Brooder
(Heat provided to maintain body temperature)

After adopting these measures we got better results

S. No.	Year	No. of Chicks born
1-	2005-06	22
2-	2006-07	18
3-	2007-08	24
4-	2008-09	14

Introduction

- Bharat Ratna Pt. Govind Ballabh Pant High Altitude Zoo Nainital is situated in hills of Sher ka Danda in 4.693 ha. area at about 2 k.m. from Tallital bus station at elevation of 2100 m. above mean sea level.
- Approved for creation of zoo in 1980 acquisition of land and construction of boundary wall in 1984.
- Construction inside the zoo and deployment of staff from 1985 till 1994.
- Order passed for naming the zoo as Bharat Ratna Pt. Govind Ballabh Pant High Altitude Zoo National in 1993.
- Finally Zoo got opened up for visitors from 1st June 1995..



Objectives

- Ex-situ conservation of high altitude Himalayan birds and animals which are endemic and endangered.
- Create awareness about our rich Himalayan fauna amongst general public.
- Education and extension of knowledge for management of animals in captivity.
- Facilitate research and coordinate breeding of endemic and endangered Himalayan fauna.
- Rescue and rehabilitation of injured and endangered species.
- Prevention and cure of major and minor diseases among animals.

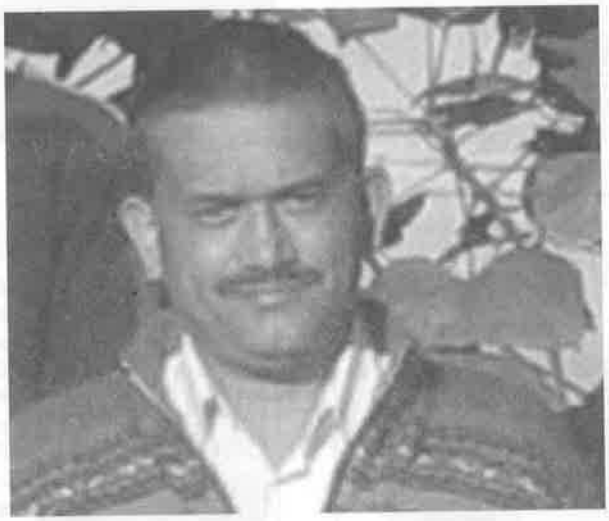
Pheasants breeding programme in National zoo

Pheasants breeding programme started in Nainital zoo in year 2004-05. In the beginning we could not get success but later with the advice and suggestion of specialist pheasant breeder of W.P.A. & Scientist of I.V.R.I. we got better results.

Initially there is a problem of undeveloped chicks & unabsorbed yolk attached to umbilical cord.

Undeveloped chicks

PROBLEMS IN PHEASANT BREEDING



Sri Dy.
Nainital Zoo

The presentation provided some interesting points on general problems on pheasant breeding remedial measures as employed by Nainital Zoo.

Attaining 8 months

Female

Male

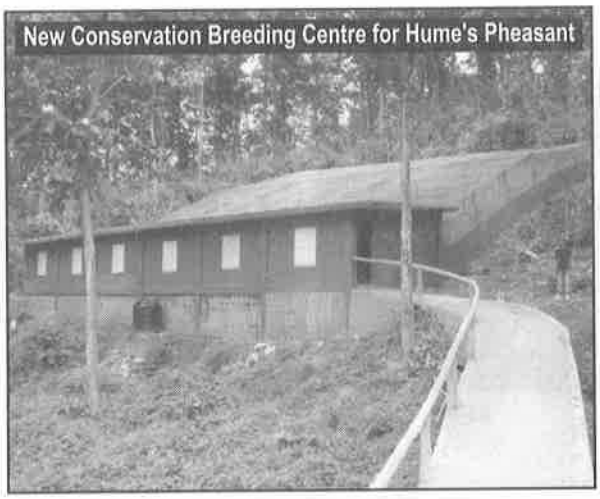
Habitation and Environment

- Being a shy bird freedom from noise is necessary
- Predators and potential predators to keep out
- Poisoning of rats or mice may result in poising birds as well
- The more doors create more opportunities for the bird to escape
- To keep plumage healthy dust bathing area which dries out quickly may prove fruitful.

Fan shaped tail on perturb or frightened

Conservation or Management

- In the absence of natural vegetation perches be provided at high vantage points
- Predators and potential predators - snake, rat, mice and other vermin be kept out or eliminated
- Most importantly manage and maintain according to the needs of the birds. Allow to live peacefully.



FOOD AND WATER

- Adequate quantity of green vegetable, grain and animal proteins required specially during breeding period.
- Termites may be used to supplement food with chick crumbs, grit and greens.
- Availability of fresh water in a shallow container or fountain is vital for the birds.

Food supply - grains

Termite for food supplement

Perennial, fresh & shallow water

STAGES OF GROWTH / DEVELOPMENT

2 week old chick under natural Hiding / camouflage

1 month old chick perching on a twig

Furious mother to save chick

STAGES OF GROWTH / DEVELOPMENT

Curious 1½ month old chick

Natural hiding / camouflage : 1½ month chick

GROWTH / DEVELOPMENT

4 months old chick : plumage

5 months male chick with spur

6 months chick

Male

Female

HUME'S BARTAILED PHEASANT STATE BIRD OF MIZORAM

STATUS, DISTRIBUTION & CHARACTERS

- ***Rare and endangered, high altitude bird.***
- ***Found in S.E Asia, N.E India (Manipur, Mizoram etc), Mayanamar, Malaysia.***
- ***A timid and shy bird, male up to 90 cm and Female 60cm length.***
- ***Bar-tailed in both sexes, male's tail much longer than that of female's.***
- ***Calls - high pitch chirping, buk-buk-buk.***
- ***Crest - Female bird lacks crest.***
- ***Colour - Like other birds male is colourful***
- ***Wings - wings of both sexes are whirring***

THREATS, HABITS & HABITAT etc.

▸ Threats	- Habitat loss, poaching and trapping
▸ Habitat & Habits	- Restricted range in distribution, between 900 to 2000m altitudes - Steep or undulating open forest in hilly areas with grass and bracken. - Deciduous, semi-evergreen and evergreen forest.
u Reproduction	- After mating eggs are laid in early summer. - Incubation period 28 days. - Clutch size varies from 5 to 11 nos. - Attain sexual maturity in 1 year.

ZOO EXPERIENCE & OBSERVATION AIZAWL ZOOLOGICAL PARK

- 2 eggs laid in April 2006 but not hatched.
- 8 eggs laid by 2 hens in April 2007.
- Only 3 eggs hatched in 7 June 2007.
- 10 eggs laid during April-May 2008.
- No hatching probably unfertilized eggs?
- Natural incubation by hen, by surrogate mother and electronic means tried.
- During breeding season enough quantity of green vegetable, animal proteins and grains to be made available.
- Even a newly hatched chick can take care self effectively with mother's help.

Hume eggs

One day old chick

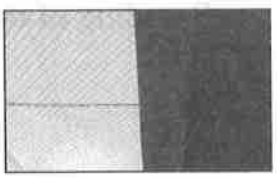
SHELTER - FOUNDATION

- Shelter or enclosure to be natural, spacious and well protected.
- Concrete or brick foundation necessary to keep out burrowing predators.
- Sufficiently thick soil or bare earth covering desire to protect the bird and its feet.
- A floor has to bear dry leaves or hay, weeds, grasses and dead wood.

ROOF AND WALL

- A brick or 1″ hole perimeter net fencing for birds safety.
- Use of chicken wire mesh to prevent chicks from escape.
- Bird needs shelter to protect from strong sunlight and heavy rain.
- Net and slab roofing at low level advisable.

Concrete foundation with 1″ hole fencing



Net & slab roofing

STATUS OF HUME'S PHEASANT IN AIZAWL ZOO

Sri Liankima Lailung, IFS
Director, Aizawl Zoo

The presentation provided information on habit, habitat and distribution on Hume's Bartailed Pheasant and also the efforts of Aizawl zoo on Conservation Breeding of the pheasant.

Training Workshop on Conservation Breeding of Pheasants

6th-9th November 2008

DARJEELING

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