Report on visit and training at London, Jersey and Chester Zoo 2004

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From 25 May to 25 June I was priviledged to undergo a unique, tailored, training experience in United Kingdom. This training was arranged by Zoo Outreach Organisation and CBSG, South Asia to assist me in various works I have been doing in collaboration with them in the School of Forestry, University of Kerala. Part of the training was informal and experiential, such as a tour around the "BUGS" (*Biodiversity Underpinning Global Survival*) – Web of Life facility or invertebrate house (affectionately known as the "bug house" by locals at London Zoo. I was joined by Dr. B.A. Daniel, Scientist, Zoo Outreach Organisation in London and in Jersey. Our visit was sponsored by the Durrell Wildlife Preservation Trust, which provided Daniel with a scholarship for the Facilitator Training, Walt Disney World, the Zoo Outreach Organisation and the Chester Zoo jointly sponsored our various travel, tuition and stay in UK.

On our first morning, 26 May, we spent the day with Dr. Paul Pearce-Kelly, Curator, in the invertebrate exhibit. Paul Pearce-Kelly is the same invertebrate expert who visited India in 1995 and conducted Invertebrate Conservation Training Short Courses in five zoos and aquaria in five states in India. He arranged for the stay at the London Zoo Guest House and appointments later at the Museum. He explained to us the keeping and husbandry of different types of invertebrates including spiders, scorpions, snails, beetles, cockroaches, millipedes etc. We had a chance to see and understand the types of enclosures, the habitat enrichments, the food of the various invertebrates, the ideal temperatures at the enclosures, the observations to be recorded for the animals etc. We also learned the technique of rearing crickets, locusts and grasshoppers, which act as food for many of the invertebrates as well as some of the lower vertebrates. This can be done primarily with the help of some leafy vegetables and egg trays. We had a detailed look at the BUGS enclosures and I also took many pictures (3000 plus altogether).

Afternoon we went for a brief tour of the London zoo, having a closer look at the enclosures of Lion, Red Panda, Leopard, Tiger, Red Fox, Bearded Pig, Bactrian Camel, Llama, Wallaby, Flamingo, Pelicans and other waterfowl, Parrots, Toucan, Tawny Frogmouth, Shama, Cardinal etc.

The following day we went to the British Museum of Natural History. In the forenoon we met and had a discussion with Dr. Fred Naggs of the Land Snail section, then went around the museum. In the afternoon met Dr David Jones of Soil Invertebrate division.

On Friday, 27 May, we left for Jersey at 9 AM from the zoo, and reached there by 2.15 PM where we spent the rest of the day meeting our co-participants in the much anticipated Facilitator-Training Course hosted by Jersey and taught by experts from the Conservation Breeding Specialist Group, CBSG.

The facilitator-training course helps someone working in the field of Conservation of biological diversity and interested in improving the skills for getting the best conservation plans developed and implemented. The best place to undergo such a course is at the International Training Centre, Durrell Wildlife Conservation Trust, Jersey, British Channel Islands. The facilitator-training course at ITC, Jersey actually combines state-of-the-art science with state-of-the-art management/leadership skills.

Undertaking the facilitator-training course would also help me assist with the PHVA / CAMP workshops being organized by the Zoo Outreach Organisation / CBSG South Asia, in a better way.

On Saturday, we visited the Jersey Zoo situated at the Durrell Wildlife Preservation Trust. We took several pictures of various enclosures, which include, Spectacled Bear, Small-clawed Otter, Tropical aviary, reptile house, Rodrigues fruit bat, Gorilla, Orangutan, Gibbons, different species of tamarins, lemurs, flamingoes, maned wolf, Celebes Macaque, native bird tank, Giant Jumping rat, Crowned Crane, Echo Parakeet etc. In the evening we were taken to the zoo lecture hall from the hotel where we had an icebreaker that included "getting acquainted" games.

Sunday, the first day of the course, an Introductory lecture by Frances Westley, training leader. The course covered a variety of skills in interpersonal relationships and conflict management as well as problem solving and scientific concepts for conservation, population biology, Vortex modelling, Population Habitat Viability Assessment (PHVA) process, etc.

Phil Miller, Programme Officer, CBSG introduced the Population Habitat Viability Assessment (PHVA) and explained much about the Conservation Breeding Specialist Group, including its mission, regional networks, (CBSG) workshop process and Conservation Assessment and Management Plan (CAMP). Population Genetics and Population Biology. Primary threats to Wildlife. This was very useful for me as in situ representative of CBSG South Asia. Later there was a video on PHVA and a presentation on the the benefits and challenges of a multi-stakeholder collaboration.

After lunch Phil gave a lecture on population biology and an introduction to Vortex. We discussed process design including, PHVA logic model, and knowledge based facilitation. Later more on PHVA was presented including an introduction to principles of population biology, genetic variation to conservation, loss of genetic variation, genetic bottleneck, inbreeding mechanics, inbreeding depression, genetic drift mechanics, loss of genetic variation for small population, wildlife population biology system, extinction vortex, small population extinction vortex, vortex 9.42 version. Vortex is a stochastic Simulation model of the extinction process.

On 31 May, Monday we covered team building, thinking tools, a desert survival situation as a decision making model, skills and rationale, more interpersonal relations, effective decision, quality thinking and acceptance. Frances Westley is an expert in these skills and explained aspects of communication, effective listening, supporting and

differing very effectively. She stressed that a well functioning Team is like an orchestra.

On Tuesday we had an introduction to the Namibian Lion PHVA as a case study by Frances. We were divided into four groups that might occur at a PHVA, a scientists group, a managers group, a land owner group and a conservationist group. I was with the Conservationists group. Our Working Groups had a brain storming session and during the course of the discussion we defined our anticipated needs :

-- to develop a strategic plan to meet the needs of the local people and species with an agreement between and owner, local community and wildlife manager"
-- developing communication between local and landowners, researchers, ministry, local community, NGO's
-- to develop practical solutions that can be sustainable

In the afternoon Frances described the CBSG Tool Kit which included process structuring tools, techniques for problem restatement: Ask "why" – the rule 7 – ask why seven times. As Working group discussions continued we discussed why there was lack of local involvement and why there was lack of space for lions.

Later Phil explained the steps in using Vortex for PHVA in modeling the "ideal PHVA workshop" speaking of baseline model, Alele effect, Statistics.

On Wednesday Frances continued with the tool kit, including convergent thinking for rationale analysis. She explained a matrix and various flow diagrams which help in analysis. All this time the Working group discussions continued.

Frances also taught "Active Listening" which is more than merely hearing. We used techniques to deal with door closers, and participated in a listening clinic. Another technique to enhance our skills was a working group discussion exercise on the "most influential person in your life", an interview technique. In her basket of "thinking tools" Frances explained how to expand and stretch the GOAL statement.

We continued discussing the case study of Nambian lions which included capacity building among the locals to carry out management, education & research on the animals, reduction of conflict between human and animals and the maintenance of genetically diverse population of lions.

On Thursday there were presentations by the different groups, e.g. the Land owners, Scientists, Managers and Conservationist by different participants. Frances again imparted thinking tools for unstructured problem solving, alternative strategy, winnowing and clustering and taught a technique for decision making called paired ranking – pros, cons and fixes. Group discussion reviewed a casual flow diagram on the basis of a goal statement. Frances taught conflict resolution by leading a game on negotiating the sale of oranges.

Phil reviewed PHVA and sensibility analysis and decision analysis followed by a demonstration on the use of Vortex until 7 pm.

On 4 June, Friday the different groups gave their presentations. I presented for my group, the Conservationists. Following this, we discussed policy, boundary issues, population increase, habitat fragmentation, disease in the PHVA.

In the afternoon Phil introduced the "uncertainty" concept, reproduction rate, disease frequency, fences, carrying capacity, litter size, trophy hunting as applied to use in PHVA.

On Saturday morning the group discussions continued followed by final group presentations. This was followed by certificate distribution and a closing dinner.

On Sunday morning I had time to go to Jersey zoo and spend the morning there before my flight to Manchester and Chester Zoo.

The main purpose of me going to Chester was to learn the techniques of small mammal conservation breeding and reintroduction. The same would again, help me to assist ZOO / CBSG, S Asia with the training programmes on the Small mammal conservation breeding and reintroductions. Moreover, it would also help us to start the conservation breeding and reintroduction work on threatened small mammals of the region.

On Monday morning, Mike Jordan, Curator of Lower Vertebrates, Chester Zoological and Botanical Gardens, took me around the zoo and introduced me to many staff people in the zoo and a brief tour and an overview of the Chester zoo. The enclosures visited include, Spirit of Jaguar, Sand Lizard, Forest zone, Tropical realm, Babirusa, Dwarf forest buffalo, giraffe, onager, Burmese brow-antlered deer (thamin), blackbuck, Twilight zone (for bats), LTM, waterfowl, elephants etc. In the afternoon we visited Harvest Mouse (*Microtus minutus)* 2002 reintroduction site and set 250 traps. I was lucky to spend time at Chester during this particular period, when the zoo was conducting work on this unique reintroduction project.

Harvest Mouse (*Microtus minutus)* is small mouse (6 to 7g.) that is distributed in the Palearctic and northern part of the Indomalayan region. The species is locally exterminated from UK, owing to various reasons. The Chester Zoo has a major project on the Harvest Mouse reintroduction since the last few years. Currently the same is a collaborative venture between Chester Zoo, Cheshire nature conservation society and Cheshire County.

Two types of traps are used for trapping - the Longworth trap and small plastic trap. The bait used was grains and mealworms. One of the differences, I noticed, in trap setting was that the traps were also provided with some bedding (some grass) for the animals caught. The traps were arranged in six rows (A to G) and each row had 20 to 22 columns, marked using pegs that are serially numbered (eg.A1 to A 22). At each point two traps (one each of Longworth and the plastic) were set. A total of 1.8 ha area

was sampled, using about 250 traps. Finished the trap setting by 5 PM. Back to Zoo. Went around the zoo till 6 PM.

The following day I accompanied Mike on his rounds and then visited the Veterinary section of the Chester zoo. Chester has a very well developed Veterinary section with three doctors, one veterinary nurse and one nutritionist. I was told that Chester is the only zoo in UK having a full time nutritionist. That morning two events were in pending with the Veterinary division. 1. Health examination of an Iguana. The animal was not feeding for quite some time and it was brought to the Vet. Centre. The Iguana was anesthetized, using anesthesia mask. The chemical used for anesthesia is was isoflurine, mixed with oxygen. After anesthetizing blood samples were collected form the animal and x-ray was also taken from different angles. After studying the x-ray films the doctors found that the animal didn't have any problems but decided they would keep the iguana under observation for some more time before sending it back to the enclosure. Meanwhile the blood sample also was studied. The hematological tests were conducted after centrifuging the blood, after which one can measure the percentage of RBC, EBC and blood serum. The blood serum in this case was yellowish in colour, which was an indication that animal may have jaundice. The RBC was about 28%. The above simple test also helps understand whether the animal was starving or the animal was dehydrated. All this took about an hour.

Immediately after that the vets had to do a caesarian of a snake. The eggs had become stuck in the oviduct of the snake and were unable to emerge. The snake was also anesthetized in a similar way. It was then operated in the operation theatre of the vet center. The surgery lasted for about an hour and a half. In the end, the eggs were successfully removed from the oviduct. During the process I become familiar with some equipment such as the pulse oxygenator (which measure the oxygen in the RBC and the pulse rate), anesthesia unit, x-ray unit, refactometer (which measure the blood protein level). The blood protein level of the snake was 8.2%.

Chester has an excellent library and I extensively used it whenever I got time. Later I went to the Harvest Mouse reintroduction site for actual setting of the traps. The setting exercise was completed by 18.00.

Next morning we went to the field for checking the traps. The capture success was quite high, > 70% of the traps caught animals. Six species of small mammals were caught, they are, Common Shrew (*Sorex araneus),* Water Shrew (*Neomys fodiens),* Wood Mouse (*Apodemus sylvaticus),* Bank Vole *(Clethrionomys glareolus),* Field Vole *(Microtus agrestris),* Pygmy Shrew (*Sorex minutus*). Each of the animals was sexed, aged, weighed and marked (fur clipping) after capture and released back. We also examined the reproductive status of the animals. Most of the females were either pregnant or lactating mothers. Mike also explained as to how to identify a breeding male - which will have well developed testes.

Later at the zoo I visited the Twilight zone, which is an exceptionally good nocturnal enclosure where two species of fruit bats are kept. The enclosure dimension is, height = 8m, length = 30m, and width = 20m, has a total area of 2800 m^3. Apart form the two species of fruit bats the twilight zone also has cat fish, a mice and cockroaches.
The bats kept in Twilight zone are, Rodrigues Fruit bat (*Pteropus rodrigues)* and Seba's Fruit bat (*Carollia perspicillata)*. The former is found in the rain forests of Rodrigues Is., west of Madagascar, and is endemic to the region. It is a Critically Endangered species, only 150 animals survive in the wild. There are about 60 Rodrigues Fruit bat in the Twilight zone of Chester Zoo.
The Seba's fruit bats on the other hand is found in South America. It's a cave dwelling fruit bat, 200+ animals are kept in the Twilight zone of Chester Zoo. This species live about 7 yrs. In the wild, they have a litter size of one, breed twice a year. Male maintain territory, one male keeping about 18 females. There can also be all male roosts.

The day is reversed in the Twilight zone in such a way that the dim light is provided in the enclosure, so that for the bats the day time appears like night, while during the night white light is kept on in the Twilight zone. This reversal of the day and night make the bats active when the visitors are in the zoo and the bats go to roost / sleep during night. The routine activity in the Twilight zone include, cleaning the food bowls, which are hung in to the branches of the trees / shrubs inside the enclosure. They are then replaced with fresh food items, fruits. Different fruits are given including apple, orange, banana, melon, pear etc, which are chopped into small pieces and kept in small plastic trays, which hung from the branches. Apart from this grape bunches and banana are also kept in different positions in the enclosure. As a matter of environmental enrichment, the fruits are randomly kept in the enclosure so that bats need to search and find out the fruits. For the Seba's fruit bat an artificial cage is made in the Twilight zone, which is being used by the Seba's fruit bats. Seba's fruit bats is a small sized fruit bat, smaller than even the *Cynopterus sphinx*, while the Rodrigues Fruit bat is about the size of the *Pteropus giganteus.* All the Rodrigues Fruit bats are colour banded on the claw in the forelimb, and also micro chipped. Information on the date of birth, sex, and health status are maintained in the data base.

At the Twilight zone it was James Andrewes who explained to me the various activities including the design of the enclosure. James also demonstrated the feeding, capture, health examination, weighing, marking and releasing the bats back to the Twilight zone. James is the same person who came to our Field Techniques Training Workshop for Rodents and Insectivores, held at my university in 2003.

After going around different enclosures and spending time in the library we visited the trapping site again and worked until 6:00 pm.

Thursday our routine continued at the trapping site where we checked traps, handling, marking etc till mid-morning. Mike demonstrated the dry preservation technique. In the afternoon I could spend the time with the animal record keeping section. Calvin, the registrar explained to me about various aspects of record keeping in the zoos. He explained about ISIS - International Species Information System, ARKS – Animal Record Keeping Systems and SPARKS – Single Population Analysis and record keeping system.

Chester zoo is planning to bring all the above said three record keeping systems under one newly developing system, the Zoological Information Management System or ZIMS by 2005. Stud books are maintained at three levels. a. International stud book, b. European stud book and c. UK stud book. It is based on the stud book information that the breeding strategy of the zoo animals is to be decided. 16.00 to 18.30 field trapping site.

On Friday field trapping site work continued. We got two dead Shrews (one common and pygmy) from the traps. Finished the trap checking by 9.30 and removed all the traps for returning them to the zoo. We conducted skinning of the shrew in the veterinary section. While Mike was working with the Pygmy Shrew, I did the skinning of the Common Shrew. Before skinning we recorded the date and place of collection, weight, HBL, TL, EL and sex of the animal. In the case of males also measured the testes, the measurement of which would tell about the reproductive condition of the animal.

In the afternoon I returned to the veterinary section where I observed the micro-chipping of the Harvest Mouse which is to be reintroduced into a new area. The actual reintroduction was planned on 19th, a week later. The micro chipping can be done only after the general health check ups is done by the vets. The animal is taken out of the cage and is anaesthetized. The weight of the animals is recorded. The average weight of the Harvest Mouse is 6 to 7 g. If the animal is below 4g. and if it is above 8g, it will not be used for the reintroduction and hence would not be micro chipped. The mouse also underwent a general checking of the teeth, tail and claws. For example, if the tail was not intact, the animal would have been 'rejected'. Harvest Mouse is a species that has a long prehensile tail, and the mouse being a semi-arboreal one the intact tail determine the chances of survival of the animal. The 'healthy' mouse alone would be micro-chipped, using a special micro-chipping gun. The chip is injected subcutaneously behind the neck of the animal. The same can be read using a reader. The micro chipping was competed by 16.00.

On Sunday I visited the Knowsley Safari Park, Liverpool. It's a very big safari park, where in they have several African and Asian large mammals and large flightless birds, such as Sambar deer, Spotted Deer, Blackbuck, African Elephants, Lion, Tiger, Wild Beast, Blue bull, Baboons, African antelopes (different species), etc. etc, all are kept in separate very big open enclosures. There also a sea lion and dolphin show and a small terrarium. There are quite a few free ranging Peafowls at Knowsley.

On Monday I worked at the Twilight zone, helping with chopping food for the bats, which included melon, capsicum, tomato, apple, grapes, pear and banana. All these are chopped and mixed with zoo mineral mixture. Twenty-four kg of fruits are given in a single day to the bats. We then caught two juvenile Rodrigues fruit bats, which are about three months old. They were caught to be sexed, weighed and micro chipped and fixed with the color tag. The bats were caught using a long and big sized 'butterfly net'. After micro-chipping and color tagging the bat was released back to the enclosure.

Then we set the food in different places in the enclosure. The bright white lights were then gradually turned down to emulate the 'twilight' coming on. The change-over of the light is a gradual process and the same is automatically controlled. So also the temperature of the twilight zone is regulated to simulate the tropical weather. The temperature was maintained between 25 to 28° C. There is a big pool inside the twilight zone, where in large cat fishes are kept. There is also an artificial stream created within the twilight zone.

In the afternoon at the Veterinary centre, Mike explained and demonstrated the preservation techniques of bird's eggs. There were eggs of two species, Tufted Duck (3 eggs) and Red-crested Pochard (eight eggs). The eggs were weighed and measured (length and breadth). Then a small hole is made in the egg using a drill. Now using 'L' shaped needle and syringe the egg contents are slowly and steadily removed from the egg. Once most of the content is gone, water is taken in the syringe, inject into the egg and blown again and again until the egg is completely devoid of contents (the same can be verified by the weight of the egg). The eggs are then numbered and stored.

The following day I went around with Kevin, the head of the herpetofaua and lower vertebrates. A male Komodo Dragon (the largest lizard in the world), was not moving nor was feeding by itself for about three years. The veterinary examination could not find out the precise reason. Now for the last two months the Dragon has been undergoing physiotherapy under the supervision of a trained physiotherapist. The same was rewarding, as the animal started showing symptoms of movement and was trying to feed by it self. The physiotherapist held the animal with both hands and massaged various parts of its body particularly near the arm joint and hip region, causing the animal to walk. She repeated the same for an hour.

We all then went to 'Islands in danger' the Komodo dragon enclosure where I saw another healthy male Komodo dragon and three females in a very lively enclosure.

Later I had a discussion with the Zoo nutritionist – Andrea Fidgett. She is the only full time nutritionist in any of the UK zoo. She explained about *Zootrition* (Ver. 2.0) the dietary and nutrition management software, which is a software of Wildlife Conservation Society. The software costs about $400. The zootrition is a comprehensive database that provides zoo and wildlife managers with a powerful tool to compare the nutritional contents of the specific food item and calculate the overall nutritional composition of the diet. They can identify the potential nutritional deficiency and toxicity.

The next day I spent time in the Asian Elephant Conservation Centre with Mike Jones and team. There is an indoor and outdoor exhibit for the elephants. In the indoor exhibit the temperature is regulated. There are five different pens, for holding the elephants, two for rogue bulls which are separated by concrete walls from the open pens where six elephants and one baby (three month old) elephant, which are kept together. Totally there are nine elephants at Chester. They appear like the North East Indian elephants, with short legs and bulky body. The six elephants kept in the

bigger pen are moved into a small pen in the corner, to facilitate the cleaning of the floor of the bigger pen. Once it is cleaned up the elephants are then taken to the bigger pen, then chained, for general health examination and washing. This is the only time when the elephants are chained, may be for an hour at the most. Each of the elephant is then washed using a hose, through which high pressure-warm water is blown to the elephants. This washing of the animals using warm water is said to be very effective against ecto-parasites. They use about 20 to 30 command words to control the elephants.

The animals are controlled in a very different way than what we see with the captive elephants in Thrissur, India. They carry a fiberglass rod with a rubber handle, but I have never seen the keeper beating the elephants even once. Instead they were giving 'rewards' to the elephants in the form of apples, banana and bread, whenever the animals obeyed their commands. The food item given is also of interest. They feed the elephants primarily with greens and fresh grass. I was also told that the indigestion problem, which is a regular phenomenon in the captive elephants in Kerala, was unknown to them. After the bath and the heath check the elephants are moved to the outdoor exhibit. There is a big pool there, which is being regularly used by the elephants for wallowing. The feed of the elephant, primarily green grasses, fruits and vegetables, are given in a peculiar way. The boundary wall of the outdoor exhibit has many holes arranged randomly, and the feed are kept in different holes randomly and in varying timings. All this necessitates the animals to search and find the food and keep them engaged. Another important aspect of the elephant enclosure of Chester is the behavioral enrichment. The elephants are able to lead a social life, with many elephants of different age classes and gender.

I watched the fixing of the radio-collar of the harvest Mouse at the Veterinary Centre. The radio-collar was fixed after anaesthetizing the animals. These were the Harvest Mice that was to be reintroduced the next weekend. Ten percent of the total animals released are radio-collared for future monitoring of the reintroduction success. The radio-collar weighs about 0.6g, which is approximately 10% of the body weight of the Mouse.

Thursday, 17 June, I spent early morning in the Tropical bird house where I watched the hand rearing of four nestlings of Peckin Robin, an endangered species of Chinese passerine. The nestlings were fed with mealworms and minced meat, and were fed using plastic forceps. The nestlings were kept in a controlled chamber, the temperature of which was 25 to 26^0 C and he humidity of 60 to 70%. I also watched the egg candling. The eggs of the breeding birds are removed from the nest, and are kept in the artificial incubator, while the birds are provided with wooden dummy eggs. This is to retain the brooding instinct of the parent birds. As soon as the egg is about to hatch, which is understood by the egg candling, the 'true' eggs are brought back to the nest. The eggs are removed from the birds eggs mainly because of the fact that the egg predation is a major problem in the zoo, moreover, the eggs are also being accidentally trampled by the parents.

Before candling the eggs are weighed, measured and candled. Based on the percentage of vein coverage, which could be understood from the candling the development of the embryo could be recognized.

Lather in the morning we went to the 2004 Harvest Mouse release field, which is about 30 minutes ride from the Chester zoo. The programme is being coordinated by the Cheshire council and Chester Zoo. The actual re-introduction is a very systematic process. The field is arranged with pegs at every 10 m interval, in different rows. Near each of these pegs are set a small wire mesh cage. The cage is provided with water and food, some grains and fruits, which could support the Mouse for about three days. The Mouse is then slowly released into the wire mesh cage. The animas are released in such a way that, the males and the females were released alternatively at every 10 m interval. There were quite a few volunteers who also participated in the release programme. The release activity was also covered by the BBC. This release is referred to as 'soft release' as the animals are released into the wire-mesh cage.

That night I heard a lecture by Mrs. Barbara Young, Chief Executive, and Environmental agency, Chester on 'Biodiversity Conservation"

Friday I moved around the different enclosures in the zoo. At each of the enclosures one can spent days together and still can learn something new every time. I spent time in the 'free fly area' and the herpetological collection of the Tropical realm.

On Saturday was the 'hard release' day at the Harvest Mouse release site. The mice in this case were let free to the site. Though the animals were let free into the wild, the same was also done systematically, as each of the cage was taken to the pegs already fixed at 10 m intervals, and the animals were released. Along with this the wire-mesh cage are raised open, slightly to let the soft release animals go out if they wish so. The wire mesh cage is retained at the site, so that the animals could use it as shelter place, if they want.

Sunday evening we set about 10 large Shermen traps around the zoo and Manor with an intention of catching Grey Squirrels (*Sciurus carolinensis*) and Rabbit (*Oryctolagus cuniculus*). Next morning we checked the traps, and found that one of the Sherman trap had two Wood Mice, one male and another heavily pregnant female. We handled them , took measurements and released them. Then we went to the eastern part of the zoo, near the zebra enclosure, where there was some 'wilderness' area and lot of activity of Grey Squirrel and set about 20 traps there.

Later I visited the aquarium, which is as fabulous as any other enclosure of the zoo. There are also at least 20 species of fishes that are extinct in the wild (EW), that are being successfully bred in captivity. One of the unique animals that I could see there was the Axotyle – the incomplete metamorphosis form of tiger salamander.

In the afternoon I went to the 2002 Harvest Mouse field with Mike and set 22 Longworth traps. This time the traps were

set in a different way, using tape to a cane pole of 3 ft. high. The intention was to catch the Harvest Mouse, which is semi-arboreal.

In the evening we checked the traps near the Manor. One of the Sherman trap had a Grey Squirrel. Mike demonstrated the restraint and handling of the animal using a cone. The animal weighed about 725 g including the cone, the cone weighed 150g, so the weight of the animal was 575g. The squirrel was ear clipped, ear pinned and released. It was a young non-perforated female.

Tuesday Mike and I checked the traps set at different places, caught many more squirrels, water voles and wood mouse and got a chance to handle them. Handling of the large squirrel was a completely different experience. The Grey Squirrel is almost the same size as that of the Grizzled Giant Squirrel found in India.

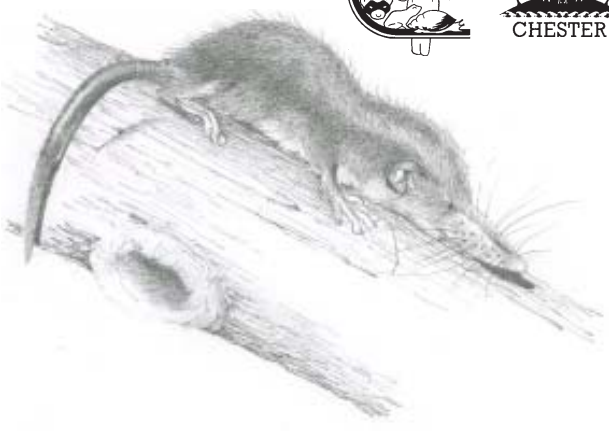
Afternoon I visited the herpetological section where I was told about the different management practices for reptiles and amphibians. The snakes and monitor lizards were fed using dead white rat. The young snakes, chameleons, and iguanas are fed using one-day-old mice babies. The smaller lizards and frogs were fed with crickets, locusts and grasshoppers of varying sizes. They are fed after mixing with the mineral mixtures. The frogs are fed with very small sized tiny little crickets.

I also learned about the husbandry of the Partula snails. The snails are fed in a peculiar way. The food mixture is made into a paste and is applied to a glass sheet, which is kept at an angle in the jar in which the snails are kept and they then feed on them.

In the afternoon when we checked our traps we had caught about five squirrels and gained more confidence in handling the large bodied rodents.

Checking the traps continued the following day. Apart from that today Mike explained to me about the functioning of the radio-telemetry. We did a mock radio-telemetry exercise, by Mike hiding the collar among the bush and letting me made to locate it.

Later in the day I watched more candling of the eggs. The measurements of the eggs are fed to a computer programme called AIMS (Avian Incubation Management System). And went around the enclosure to see the various breeding birds at the free fly zone, including Great Pied Hornbill, Bird of Paradise, Mauritius Kestrel etc. Mauritius Kestrel in the rarest bird of prey of the world, with hardly less than 15 birds left in the wild! Checking traps and handling continued.



Thursday, after checking and removing the traps we took all of them back to the office. I spent the rest of the day at the animal supply division and studied how the mealworms, locusts, crickets and the mice and rats are reared. They are multiplied there to be given as feed to various zoo animals. I was also told that the zoo is able to produce a substantial amount of their grass, shrub and vegetable requirement from the zoo compound itself.

Friday Mike explained about the preparation of the hair sample reference slides of small mammals. He also told about the usefulness of the same as a tool for sampling the small mammals. Later I went to the aquarium,and took several pictures for my collection of thousands of pictures from London, Jersey and Chester.

The five-week trip that I have had was an incredible learning exercise for me. I did learn quite a few new techniques, both sophisticated and simple ones. Most of which has direct and immediate application here at home.

I would like to place on records my deepest sense of gratitude to Ms. Sally Walker and Sanjay Molur of Zoo Outreach Organisation who has been primarily responsible for giving me this unique opportunity. Dr. B.A. Daniel, also of ZOO, who undertook the trip and some of the training with me was an excellent guide around London, and the National Museum of Natural History which I visited for the first time. My travel arrangements made by Ms. Latha Ravikumar, were perfect.

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