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Final Report

Wildlife Health Component

Wildlife Institute of India – US Fish and Wildlife Service Collaborative Project

The Development of Indian Wildlife Health Cooperative (IWHC)

(1995 – 2002)

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Introduction

India has over 579 Protected Areas (89 National Parks and 490 Wildlife Sanctuaries) containing a wide diversity of plants and animals. Most of these protected areas are between 100 to 500 km^2 in size. Sixty-five percent of the protected areas are inhabited and 90 million livestock are dependent on forest resources. These domestic animals receive little or no veterinary care, due to the poor financial condition of their rural owners, and are affected by numerous infectious diseases. The ability to sustain viable populations of free-living wild animals and recovery of endangered species are in part dependent on successful health monitoring, disease prevention and control programmes. In India considerable progress has been made in the control of diseases of domestic livestock, but there has not been any systematic study of wildlife diseases or the disease interactions between wild and domestic species. Veterinary institutions provide little formal training and education in wildlife health, and therefore local veterinarians can offer little assistance. Monitoring disease prevalence, and understanding disease interactions, will help in controlling losses in both wild and domestic stock. While more direct wildlife health research is a must, field biologists and managers need to consider adding wildlife health monitoring and surveillance as routine components of their work. Attention is also being drawn to the relationships between wildlife and human health, both as concern for diseases that may be transmitted between people and animals, as well as the potential for wildlife serving as sentinels for human health risks. This project was conceived and implemented to heighten the awareness of wildlife health needs in India, and promote a sustainable infrastructure for the future.

Institutional Background

The Wildlife Institute of India (WII; http://www.wii.gov.in/) was established in 1982 within the Government of India, Ministry of Environment and Forests in response to the country's need for a scientific foundation to it's wildlife conservation efforts. The Institute offers training courses in wildlife management for foresters, and conducts research projects to help formulate priorities and guidelines for wildlife conservation. This is done from it's campus in Chandrabani near Dehra Dun, Uttaranchal, and at field sites throughout the country.

The National Wildlife Health Center (NWHC; http://www.nwhc.usgs.gov/), located in Madison, Wisconsin, is a science center of the Biological Resources Discipline of the United States Geological Survey. It's mission is to provide information, technical assistance, and research on national and international wildlife health issues. To fulfill the NWHC mission, the Center monitors disease and assesses the impact of disease on wildlife populations; defines ecological relationships leading to the occurrence of disease; transfers technology for disease prevention and control; and provides guidance, training and on-site assistance for reducing wildlife losses when outbreaks occur.

Project Background

The Wildlife Health Component (WH) of the WII – US Fish and Wildlife Service (FWS) Project began as one of the several other components of the first phase of a collaborative programme to provide technical and financial assistance to the Institute leading to the strenghting of both the technical skills of it's faculty and established curriculum. This program was developed by the Environment & Ecology Sub-group of the Indo-US Sub-Commission on Science and Technology, and financed through the US-India Fund. This Phase ran from 1989 through 1994. A second phase focusing on the application of competence acquired in Phase I was scheduled for 1995 through 2000, with extensions granted to complete projects through 2002.

Phase I

Drs. Milton Friend and Joshua Dein from NWHC, and Dr. P.K. Malik of WII, provided the initial planning for Phase I of the WH component in May, 1989. Beginning in July 1989 with the arrival of NWHC pathologist Dr. Louis Sileo, activities involving research methods, disease investigation and pathology procedures were conducted with Dr. Malik though September 1989. Dr. Dein returned at that time to continue with efforts on veterinary and laboratory procedures and immobilization techniques. A "Workshop on Wildlife Health Monitoring and Disease Survey" was convened at WII in September 1989 by Drs. Malik, Sileo and Dein, along with Dr. Julie Langenberg, from the International Crane Foundation. Twenty-four participants, including research and veterinary officers from state wildlife organizations and academic institutions, were in attendance.

From September to December 1989, Drs. Malik and Dein gained background information on needs and available resources from visits to government institutions, protected areas and veterinary colleges. They also drew on recommendations offered by Dr. Albert Franzman who was a WII consultation from FAO from 1982 to 1984. From these efforts, they developed a planning document which would guide the activities for the remainder of Phase I, which is

attached as **Annexure 1**. This document offers further details on the process and analysis by which the recommendations below were achieved:

1. Improve the wildlife health curriculum included in WII's various courses.
2. Develop animal capture and restraint as an independent course.
3. Support WII Faculty and research projects, particularly those which require animal capture and handling, sample collection, post-mortem examination, and surgical implantation of radio-transmitters.
4. Assist state governments through provision of training and consultancies.
5. Conduct research projects on wildlife health, either independently by the Institute or as collaborative projects with veterinary colleges.

Phase I Results

The following are achievements of this phase:

- Conduct of two workshops for Wildlife Managers, Veterinarians and Biologists
    - Wildlife Health Monitoring and Disease Surveys
    - Wildlife Immobilization and Restraint
- Improvement in the Wildlife Health Curriculum included in WII's Courses
- Developed Wildlife Restraint and Immobilization as an independent course
- Development of instructional materials on Wildlife Health and Wildlife Immobilization
- Standardization of experiments on chemical restraint drug/doses in wild ungulates
- Surgical implantation of radio-transmitters in river otters
- Development of a Planning Document for Wildlife Health Programme in India
- Initiation of a systematic study on diseases of wild ungulates
- Procurement of basic Laboratory Investigation and Wildlife Immobilization equipment

Phase II

Six major activities were conducted during Phase II:

Development of the Indian Wildlife Health Cooperative

- Training of veterinary college faculty
- Development of resources at 5 veterinary schools
- Completion of ungulate disease serosurvey project
- Retrospective survey of diseases in Indian wildlife
- Support to ecological projects of WII
- Provide veterinary medical services to state wildlife agencies for disease investigation, diagnosis, control and prevention of wildlife diseases in major protected areas

Development of the Indian Wildlife Health Cooperative

Throughout Phase I, it became increasingly apparent that WII did not have the manpower or facilities to provide immobilization and disease investigation services for the entire country. This was anticipated in the Phase I planning document, and the vision to establish wildlife health capabilities in Indian veterinary colleges was proposed to meet this need. There are 31 veterinary colleges in India, all with associated diagnostic laboratories, and many in proximity to large wildlife areas. This concept remained reasonable, in light of the additional experiences and knowledge gained through Phase I, therefore, it was decided that Phase II would attempt to implement this scheme. The success of the similar Canadian Cooperative Wildlife Health Centre model (http://wildlife.usask.ca/) also encouraged us to pursue this course. The proposed name for this new entity would be the Indian Wildlife Health Cooperative (IWHC), honouring India's history of cooperative ventures, and signifying that this would not be the realm of one Institution, but dependent on the collaborative efforts of many.

The formal objectives as stated in the Phase II proposal were:

1. To advance the capabilities of veterinary colleges to provide diagnosis and investigation of disease outbreaks, information exchange, education and consultation to wildlife managers and veterinarians.

2. To enhance the capabilities, of faculty members from five veterinary colleges and enabling them to teach a course in Wildlife health at the undergraduate level, and supervise graduate student programs.

3. To increase coordination of wildlife health programs in India through the establishment of an Indian Wildlife Health Cooperative (IWHC).

4. To strengthen WII's capability in serological diagnosis of wildlife diseases, isolation, of infectious bacterial and viral agents, determine the impact of diseases on wildlife losses in Sariska National Park.

5. Development of a field guide on wildlife diseases.

Five veterinary colleges were selected, located in close proximity to major protected areas, many containing highly endangered wildlife. Communication was made with administrators of these colleges inviting them to participate in this programme. Drs. Malik and Dein then made personal visits to each location, and made presentations on the proposed IWHC structure to the faculty. Comments and suggestions from the faculty were solicited, and incorporated into the project design. We requested each Dean to recommend one faculty member meeting the following criteria:

- A permanent faculty member of the college to act as coordinator for all activities on wildlife health in the region
- Not more than 35 years of age
- Preferably from the pathology, medicine, or surgery disciplines
- Interest in wildlife and desire to engage in field activities

Based on the Dean's recommendations, prospective candidates were interviewed to identify those who possessed qualities felt to contribute most to the development of the project:

- Communication skills
- Ability to work with colleagues
- Previous work with wildlife,

and an invitation to join the IWHC was offered.

The Dean's and Vice-Chancellor of each university were requested to sign an Memorandum of Understanding (MoU) which itemized the roles and responsibilities for each participant. From this exercise, the IWHC was formulated. Contact details for each Centre are included as **Annexure 2**.

The IWHC administrative structure consists of one Wildlife Health Coordinator (WHC) at each college, reporting to the Dean, and a Central Coordinator at the WII. The WHC responsibilities are:

- Teaching wildlife health course
    - Meet the requirements of the Veterinary Council of India for education in zoo and wildlife management
    - Practical training for veterinary students
- Coordinate research programs, emergency response and consultation with wildlife agencies
    - Veterinary aspects of ecological studies
    - Mortality investigation and disease control
    - Systematic wildlife disease studies
- Education for frontline staff and wildlife managers
    - Visual health assessment and monitoring
    - Collection of biological samples for investigations
- Coordinate with WII and other IWHC Centres
    - Keep all Centres informed of activities in their regions
    - Contribute to country wide databases
- Coordinate with other faculty members interested in wildlife health
    - Solicit assistance from those with more specialised training
    - Help generate opportunities for those with interests in field and laboratory investigations
- Host seminar for State Chief Wildlife Wardens and protected areas in the region
- Potentially help other veterinary colleges in their region to develop wildlife health programmes

In order for the WHC's to understand the needs and requirements of wildlife managers, it was felt they must have a thorough grounding in wildlife management theory and application. Veterinary training does not include any coursework in ecology or natural history, and traditionally, veterinary science has been limited to applications on domestic species. To be able to transfer their training to wildlife work, and teach the required courses in their colleges, the WHC's needed to expand their education in this area. Therefore, each WHC was enrolled in the WII Diploma Course in Wildlife Management which over a nine-month period, provided this training, as well as the opportunity to live and work with other trainees

from the protected area network. Through this association, the WHC's would gain a better understanding of the serious wildlife issues in the country, and the problems facing PA managers (e.g. human-domestic-wildlife interface, wildlife distress and rehabilitation, mortality investigations). This training occurred in two groups, one in 1994-95, and one in 1996-97.

Few opportunities for practical training and experience in the broad aspects of zoo and wildlife medicine existed in India. Critical areas of required training would be:

- field investigations of wildlife diseases,
- animal restraint, handling and immobilization,
- treatment and care of captive animals
- management of research and investigation teams,
- regulatory requirements and processes,
- procedures to assure proper animal care during research and management activities
- mechanisms for communication and interaction with international colleagues

To address the needs mentioned above, an intensive period of training was planned for all the WHC's in the United States, so they could observe and learn first-hand from experienced practitioners in the field. The US portion of these tours were funded by the US Fish and Wildlife Service, Office of International Affairs, and would include visits to zoo's and wildlife centers, attendance at professional meetings, and field work. As with the WII Diploma Course, the US training occurred in two groups, one in 1995 and one in 1997.

To facilitate the efficient and timely functioning of the IWHC Centres, it was felt that specific infrastructure resources must be provided. With this equipment, the WHC's would be able to travel to sites where their services are needed, perform investigations, assist managers with immobilizations, document their efforts, communicate with colleagues, and provide training to veterinary students. Each college would provide the facilities to maintain the equipment and house the program.

After completion of training, and with resources in place, the IWHC Centres were able to begin providing services to their colleges and the State wildlife agencies. Centre by Centre reports of activities and Plates of photographs are in **Annexure 3.**

Ungulate serosurvey project

One of the major concerns in developing a wildlife health program in India was the lack of information regarding the real prevalence of diseases in populations. While there were numerous volumes and reports of disease outbreaks in zoos and natural areas, there were none based on an empirical sampling scheme. Another obvious concern was the movement of infectious diseases between domestic and wild animal. To address each of these issues, a large scale survey of antibodies to common ungulate diseases present in wild animals inside, and domestic animals inside and outside, was conducted in Sariska National Park. The study and the park were chosen using the following considerations:

- Evidence of close wildlife-domestic animal interactions
    - Presence of villages with large livestock populations inside and outside of the park
- Human development projects ongoing in close proximity to the park
- Historical evidence of wildlife mortality within the park
- Easy access to animals congregating at waterholes and in open areas
- Availability of communication and transportation
- High ungulate density
- Cooperation of State Wildlife Agency and Park Director.

This project was conducted primarily by Drs. P.K. Malik and Praveen Malik, and required a considerable number of animal immobilizations and laboratory procedures. Specialized laboratory support for diagnostic samples was provided by:

- Indian Veterinary Research Institute, Izatnagar
- College of Veterinary Sciences, HAU, Hissar

A summary of the study and findings are presented as **Annexure 4**.

Summary and Conclusion

Wildlife Health is an emerging discipline in India that closely integrates the fields of wildlife medicine and scientific management of wildlife. This field has remained neglected for a very long time and it is only recently that the Wildlife Institute of India has taken up an initiative to develop perspectives that focus on the complexity of issues related to wildlife health and ecological concerns.

Wildlife Institute of India has a proactive Wildlife Health (WH) program that is a milestone in conservation management. The program is an interdisciplinary effort between health professionals, wildlife managers, ecologists and conservation professionals. It is an important component of educational and applied wildlife research and successfully integrates the disciplines of veterinary medicine and wildlife management. This integration has been possible due to active collaboration between WII, managers of protected areas, state wildlife agencies, state department of animal husbandry, veterinary colleges, as well as with other institutions such as the Indian Veterinary Research Institute (IVRI) and the Indian Council of Agricultural Research (ICAR).

No studies have yet been done to examine the possible inter-relationships of these. The first systematic "Seroepidemiological studies on some infectious and parasitic diseases in wild ungulates and their relationship with livestock", was undertaken by WII in Sariska National Park (1994-96) and the presence of the highly infectious "Blue Tongue" virus in sambar population was conclusively established.

To meet these challenges, Wildlife Institute of India and the National Wildlife Health Center, USA devoted considerable amount of time and efforts to develop regional centers at Anand, Guwahati, Madras, Jabalpur and Hissar Veterinary Medical Institutions with appropriately trained faculty to conduct wildlife health monitoring program. The aim is to enable these regional centres to provide timely consultation and investigation of mortality events in protected areas. The project is called **"Development of an Indian Co-operative Wildlife Health Programme (IWHC)"**. The project is a collaborative effort between WII, USFWS, National Wildlife Health Research Centre (USGS) and five veterinary institutes in India. The approach is appropriate for India because of the availability of Veterinary Colleges with their associated diagnostic laboratories, in proximity to large wildlife areas.

At the conclusion of seven-year duration of the IWHC Project (1995-2002), following objectives and goals were met:

a. Advancement of the capabilities of select Veterinary Colleges to provide diagnosis and investigation of disease outbreaks, control and prevention, information exchange, education and consultation to wildlife managers, biologist and veterinarians.

b. Development of a standard wildlife health curriculum in all Veterinary Colleges.

c. Enhancement of the capabilities of faculty members at five regional centers and enabling them to teach a course in wildlife health at undergraduate level and supervise graduate student programes. They have also developed expertise to conduct training courses and workshops on wildlife health monitoring for wildlife managers and biologists.

d. Increase co-ordination of Wildlife Health Programes in India through the establishment of an Indian Wildlife Health Co-operative (IWHC).

The completion of this project has offered a strong foundation for the incorporation of Wildlife Health Monitoring and Research as components of proactive wildlife management and agriculture in the 21st century.

It is beyond doubt that in the coming years, the interface conflict between humans, livestock and wildlife will increase. It is only to be expected that this will lead to an emergence of new diseases and an increased load of parasites and pathogens. The rising demand of food and animal products to sustain human population has already led to increased use of agricultural chemicals and other chemicals causing pollution to the environment. Developmental projects and activities have brought the protected areas under tremendous pressures. In such circumstances, scientific intervention in the health management of wild flora and fauna for sustaining viable populations, will become most challenging to wildlife managers.

Initiative undertaken by Wildlife Institute of India (WII) to address such issues is a mile stone in conservation management and WII perceives this area as an interdisciplinary effort between health professionals, wildlife managers, ecologists and conservation professionals.