

# A feasibility study for the establishment of a national wildlife health centre in Sri Lanka

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## Summary

Sri Lanka is a tropical nation within a zoogeographic zone that is at high risk for infectious disease emergence. In 2010, a study was conducted on the feasibility of enhancing capacity in Sri Lanka to manage wildlife diseases through the establishment of a national wildlife health centre. The Canadian Cooperative Wildlife Health Centre was assessed as a potential model for adaptation in Sri Lanka. Interviews and group meetings were conducted with potential key participants from the Sri Lankan Departments of Wildlife Conservation and Animal Production and Health, and the Faculty of Veterinary Medicine and Animal Science of the University of Peradeniya. In addition, site visits were made to potentially participating facilities and the literature on best practices in building scientific capacity was consulted. With strategic enhancements in education and training, additional personnel, improvements in transportation and diagnostic facilities, and central coordination, Sri Lanka appears very well positioned to establish a sustainable wildlife health centre and programme.

## Keywords

Canada – Capacity building – Disease – Feasibility – Management – National wildlife health centre – Sri Lanka – Surveillance – Wildlife – Wildlife health.

## Introduction

Recent experience has shown that the probability of the emergence of important human and animal diseases is highest in geographical areas characterised by large populations of people, domestic animals and wildlife, and by rapidly changing environmental conditions. Densely populated tropical and sub-tropical environments are the areas at highest risk for inter-species transmission of

pathogens and the development of new, often globally distributed, diseases of socio-economic importance. Analysis has also identified pathogens in wild animals as the most important source of emerging infectious diseases (6, 15).

Many of the low- and middle-income tropical countries at greatest risk from emerging diseases, due to ecological and environmental factors, also lack the internal infrastructure

and human resources needed to prevent, detect and manage these diseases. Sri Lanka is a densely populated island nation of about 20 million people, which has a rich assemblage of wild animal species of high ecological, economic and social value, and dense populations of domestic animals, particularly poultry. Sri Lanka is within the zone of high risk for disease emergence. It is in this zone that investment in national capacity for early detection of new or newly important pathogens is predicted to have the greatest global impact.

Canada and Sri Lanka have collaborated since 2005 in a programme to enhance Sri Lanka's capacity in veterinary and public health (5, 9, 10, 11, 14). In 2008, wildlife disease surveillance and management were identified by Sri Lankan officials as complementary capacities also in need of enhancement. The Canadian Cooperative Wildlife Health Centre (CCWHC) is a Collaborating Centre for Wildlife Disease Surveillance and Monitoring, Epidemiology and Management of the World Organisation for Animal Health (OIE). In summer 2010, the CCWHC coordinated a study among the Department of Wildlife Conservation (DWC), Department of Animal Production and Health (DAPH) and the Faculty of Veterinary Medicine and Animal Science at the University of Peradeniya (FVMAS), to assess the feasibility of establishing a national wildlife health centre in Sri Lanka (SLWHC).

The purpose of the study was to gather the thoughts and opinions of potential key participants in an SLWHC, and to gather information about current facilities, government structures and related matters to determine whether or not it would be feasible and of value to Sri Lanka to establish sustainable new capacity to manage wildlife health and disease issues. A second objective was to determine to what extent the CCWHC could be used as a model for establishing an SLWHC.

## Materials and methods

The study was conducted in two phases. First, two of the authors (S. Valeix and L.G.S. Lokugalappatti) visited the Headquarters of the CCWHC in Saskatoon, Canada, from 2 to 21 July 2010 to assess its structure, context and activities. The study then moved to Sri Lanka from 23 July to 25 August 2010, where all authors participated in the feasibility study.

### Phase 1: Canada

Three weeks were dedicated to identifying the core structures, functions, objectives and methods of the CCWHC, and Canada's National Wildlife Disease Strategy (3). This was achieved by reviewing documents, participating in disease surveillance and research activities,

and holding interviews and discussions with local and distant participants in the CCWHC programme (Table I).

**Table I**  
**Interviews conducted with participants in Canada**

Affiliation of interviewee	Position of interviewee
Headquarters of the Canadian Cooperative Wildlife Health Centre (CCWHC)	Executive Director of the CCWHC Director of Head Office of the CCWHC Information Technology Manager of the CCWHC
Western and northern region of CCWHC	Regional Director
Quebec region of CCWHC	Regional Director
Atlantic region of CCWHC	Regional Director
Saskatchewan Ministry of Environment	Wildlife health specialist

### Phase 2: Sri Lanka

The feasibility of establishing an SLWHC was assessed through a series of interviews (Table II) and group meetings with responsible parties in their official

**Table II**  
**Interviews conducted in Sri Lanka**

Affiliation of interviewee	Position of interviewee
Ministry of Economic Development*	Director General, Wildlife, Botanical and Zoological Gardens
	Director General, Department of Wildlife Conservation
	Deputy Director, Department of Wildlife Conservation
	Wildlife field veterinarians (four)
Department of Animal Health and Production	Director General
	Director of the Animal Health Division
	Senior Epidemiologist
	Director of Human Resources
	Director of the Central Veterinary Investigation Centre
	Veterinary Investigation Officer
	Field veterinary officers (two)
Faculty of Veterinary Medicine and Animal Science, University of Peradeniya	Veterinary officers, National Zoological Gardens (three)
	Professor in Veterinary Clinical Studies and former Vice Chancellor of the University of Peradeniya
	Dean
	Professor in Veterinary Parasitology
	Senior Lecturer in Veterinary Pathology
	Senior Lecturer in Veterinary Clinical Studies
	Director of the Centre for Aquatic Animal Disease Diagnosis and Research
Lecturer in Veterinary Physiology	

\*These responsibilities were transferred to the Ministry of Agrarian Services and Wildlife Conservation after this study was completed

capacities, and site visits to facilities. Interviews and site visits were conducted by S. Valeix and L.G.S. Lokugalappatti. At each interview, the concepts of an SLWHC and national wildlife health programme were introduced, and the views and opinions of the interviewee were recorded. A list of topics was used to guide interviews and included:

- the value (high or low) of a national wildlife health programme to Sri Lanka
- agencies, institutions and individuals that could be involved in an SLWHC
- strengths and gaps in the current Sri Lankan wildlife health system
- the value (high or low) of wildlife disease surveillance and management in Sri Lanka
- the possible location, policies and sustainability of an SLWHC.

Discussions were initiated by referring to these topics, but were not restricted to them, and were also guided by the interests and experience of the interviewee.

In both Canada and Sri Lanka, interviews lasted from less than one hour to three hours. Interviews were conducted in person or by telephone. Responses were captured as notes, and a written record of each interview was made within a few days of the interview itself. Interview records were then analysed for major themes by following the general principles of grounded theory (8).

## Results

### Canada: the Canadian Cooperative Wildlife Health Centre

#### National policy

Wildlife disease management in Canada is guided by a National Wildlife Disease Strategy (3). This policy identifies national goals in wildlife disease prevention, early detection, rapid response, scientific management, education and communication, and serves as an important guiding framework for the activities of the CCWHC and of the government agencies responsible for human and animal health.

#### Structure and objectives

The CCWHC is a research and service institute, organised as a partnership among Canada's five veterinary faculties and between these faculties and government and non-governmental organisations. Its purpose is to apply the veterinary medical sciences to wildlife conservation and

management in Canada to reduce the socio-economic and ecological impacts of wild animal diseases. The CCWHC is not a government organisation but is supported financially by government. This structure ensures scientific independence, which is highly valued by government.

### Responsibilities, governance and finance

The CCWHC has two simultaneous responsibilities:

- to serve as a national provider of wildlife health services to support the work of government agencies responsible for public health, domestic animals and wildlife, and
- to serve as an academic wildlife health sciences centre, which carries out wildlife health management responses, research and teaching as part of the academic programmes of the participating veterinary faculties.

Government and non-government agencies and the faculties govern the CCWHC together, through a governance committee. Internal management is achieved through a Headquarters Office and Executive Director, responsible for national and international coordination, and Regional Centres which manage regional activities.

Financial support for the CCWHC is provided collaboratively by federal, provincial and territorial governments. Several non-government organisations also provide funds, and the five veterinary faculties provide salaried faculty time, all physical space, laboratories, and audit, financial and personnel services. The financial partners in the CCWHC thus pool their resources to achieve a single national wildlife health programme that serves the collective needs of all partners. The CCWHC provides an Annual Report to all participants (2).

### Programme components

The central activity of the CCWHC is wildlife disease surveillance. This includes a primary programme of general disease surveillance for all pathogens in all species of wild vertebrates (fish, amphibians, reptiles, mammals and birds), based on the autopsy of animals that have been found dead, and, in addition, surveillance programmes targeted at specific pathogens in specific hosts. This disease surveillance programme integrates field personnel from many different government and non-government groups and veterinary diagnostic laboratories, as well as information technologists, data analysts and communications personnel, into a single programme. Other key activities include information services, education and research, each of which also depends on the disease surveillance programme. The key factors essential to the CCWHC programme and wildlife health centre are listed in Box 1.

**Box 1****Key features of the Canadian Cooperative Wildlife Health Centre****Structural features**

- A university-based partnership with government departments
- Governed and financed collaboratively by the Government, universities and others
- Operates under the authority of its governmental partners; has no independent legal authority

**Functional features**

- Scientific independence
- Wildlife disease surveillance is the central activity

**Enabling features**

- Operates within a national policy on wildlife disease management
- Collaborating Centre of the World Organisation for Animal Health (OIE)

**Sri Lanka: feasibility of a wildlife health centre and national programme**

Several recurrent themes were identified in the interviews conducted in Sri Lanka.

**Value of a Sri Lankan wildlife health centre and programme**

According to interviewees, outbreaks of disease occur every year in wildlife but most are not investigated or identified. Several diseases of importance to people, livestock and trade occur in Sri Lankan wildlife, such as rabies, bovine tuberculosis, Newcastle disease, brucellosis, foot and mouth disease, fowl cholera, leptospirosis and haemorrhagic septicaemia, but their prevalence in many susceptible wild animal species is not known. To manage these diseases, the role of wildlife as reservoirs must be understood. Tourism, particularly eco-tourism, is very important to the Sri Lankan economy. Eco-tourism is supported by healthy wild animal populations, safe food and high standards of public health and public safety, and is jeopardised when any of these is not maintained (16). A wildlife health programme is required to support this sector of the economy.

**Current capacity and gaps in wildlife health management**

Veterinary personnel in Sri Lanka are well trained at the BVSc level but generally do not have specialist training. There are 11 positions for wildlife veterinarians within the DWC, of which seven are currently staffed. These staff members are deployed at field stations distributed around the country. The Department of Animal Production and Health maintains 18 Veterinary Investigation Centres

(VICs) across the country, each with some capacity for dissection, specimen collection and some preliminary diagnostic assessments. The Central Veterinary Investigation Centre and the Veterinary Research Institute (CVIC/VRI) of DAPH are centrally located together at Peradeniya, and have personnel and equipment for a wide range of laboratory diagnostic tests for animal pathogens (16). The Faculty of Veterinary Medicine and Animal Science maintains autopsy and some additional diagnostic facilities, and has teaching and research programmes in animal and zoonotic diseases, including diseases of wild and aquatic animals. It is in close proximity to the CVIC/VRI.

Interviewees identified a number of gaps in current wildlife health management capacity. The number of wildlife veterinarians is insufficient to handle a broad mandate in wildlife health management and these veterinarians are mostly occupied with human–elephant conflicts (12). Their work is demanding and recruitment of new veterinarians to wildlife positions is difficult. Transportation of people to field locations and of specimens to laboratories is a major difficulty and limitation for both DWC and DAPH animal health programmes (16). There is little integration among DWC, DAPH and FVMAS activities and no organised programme of general wildlife disease surveillance.

**Needs assessment***Staffing levels*

Interviewees identified both an increase in the number of veterinary and technical personnel and further training as key requirements for establishing a wildlife health programme. Specific training in wildlife-related matters is required for all personnel who participate in the detection of diseases in wild animals, diagnosis and information management. Specialty training is needed in key areas, such as anatomical pathology. Employment conditions will have to be made attractive to achieve sustainable recruitment and retention of personnel.

*Tools and facilities*

Performing autopsies on animals that have been found dead is a central activity of general wildlife disease surveillance, and adequate autopsy facilities are thus required. Interviewees and site visits identified a need for modest improvements in autopsy and specimen-handling facilities at VICs and FVMAS, including personal protective equipment and storage facilities. Wildlife health management personnel at DWC, and in field veterinary offices and VICs, also require better access to electronic communication through mobile telephone and Internet connections, to coordinate programmes and ensure the best use of resources, as demonstrated by Robertson *et al.* (11). Attention must be given to transportation requirements to ensure that timely disease investigations

are undertaken and that diagnostic specimens arrive quickly and in good condition at the laboratories; this need was also highlighted for livestock health programmes (16). Information technology to manage disease surveillance data and make it available to all users requires development.

### *Coordination*

Sri Lanka should not try to develop a wildlife health management system that is totally new and separate from existing animal health personnel and facilities. A wildlife health management programme can be established through collaboration and coordination among the existing personnel and facilities of DWC, DAPH and FVMAS, with strategic additions of human and financial resources to address major programme gaps. Currently, there is no coordinating body to manage a wildlife health programme among these three key participants or with other potential participants, such as other government Ministries, university faculties and non-government organisations. Such a coordinating function will have to be created and maintained.

Interviewees were both enthusiastic and cautious when considering their own and their organisation's potential participation in a national wildlife health programme and an SLWHC. All could see advantages to Sri Lanka and to their institutions from a strong and efficient network, and many were personally motivated to participate directly in the programme. However, many were also concerned that a new organisation, with some independent authority for aspects of wildlife health, would create more problems than solutions. They felt strongly that an SLWHC should coordinate a programme established under the existing legal authorities and mandates of the participants, but should not have additional, independent authority.

## **Key points associated with the implementation of a wildlife health programme**

### *Sustainability*

Interviewees insisted that the national wildlife health programme, with an SLWHC as its coordinating centre, should be implemented in such a way that a durable programme is created, one that is affordable and sustainable by Sri Lanka alone. While international assistance will be required to build new capacity, the operation of the programme, once established, should not be dependent on external resources. This will require firm internal commitment from the start, and attention to sustainable resources throughout implementation. Interviewees were of the opinion that an SLWHC and wildlife health programme could be sustained.

### *Governance*

Wildlife health and disease management is not the sole responsibility of any one government Ministry or group in

Sri Lanka. Instead, aspects of public responsibility for wildlife diseases and their social, economic and ecological impacts fall under the remits of several Ministries and organisations. Governance of the SLWHC and its programmes should thus be shared by these responsible parties in a manner consistent with their responsibilities.

### *National policy*

While Sri Lanka has a national policy on wildlife management (4), this policy does not directly address wildlife health and disease. Interviewees felt that a national policy specifically on wildlife health and disease management would be essential in developing a national wildlife health management programme. Opinions differed as to whether such a policy should precede the programme's development or occur in parallel with programme development.

### *Scope of programme*

Interviewees felt it would be important to define precisely the scope of a national wildlife health programme, including the range of species to be included. All agreed that the national programme and the SLWHC should conduct disease surveillance, education and research on a wide range of wild animal species and pathogens, and should not focus primarily on any one species or on only a few species.

### *Elephants*

The Asian elephant (*Elephas maximus maximus*) is a species of exceptional importance to Sri Lanka. It is relatively abundant, important to tourism, and of great socio-cultural value. Human–elephant conflicts currently dominate wildlife management programmes in Sri Lanka. In 2009, a typical year, 50 people were killed by elephants and 228 elephants were killed by people (12). Mitigating human–elephant conflicts tends to fully occupy DWC field veterinarians, focusing less attention on other wild animal species and issues. The current dominant position of the elephant in wildlife management and the serious nature of human–elephant conflicts demand that the SLWHC become involved with these issues, perhaps through research, risk assessments and surveillance of elephant health issues. However, the SLWHC programme, particularly disease surveillance, should be structured to include the full range of wild vertebrates and to avoid a single-species focus.

## **Discussion**

From a review of the available literature on best practices in building capacity in medical research in low- and middle-income countries, Bates *et al.* (1) identified three themes found within successful programmes:

- a stepwise approach, so that capacity is built over time and not all at once, with sequential involvement of stakeholders
- strengthening of existing capacity through incorporation and enhancement of components that are already in place
- the forming of partnerships among those groups that are most involved, so that responsibilities, obligations, ownership and leadership for the new capacity and associated programmes and activities are accepted and managed within the country.

Bates *et al.* also identified four key stages in the successful building of sustainable capacity (see also 13):

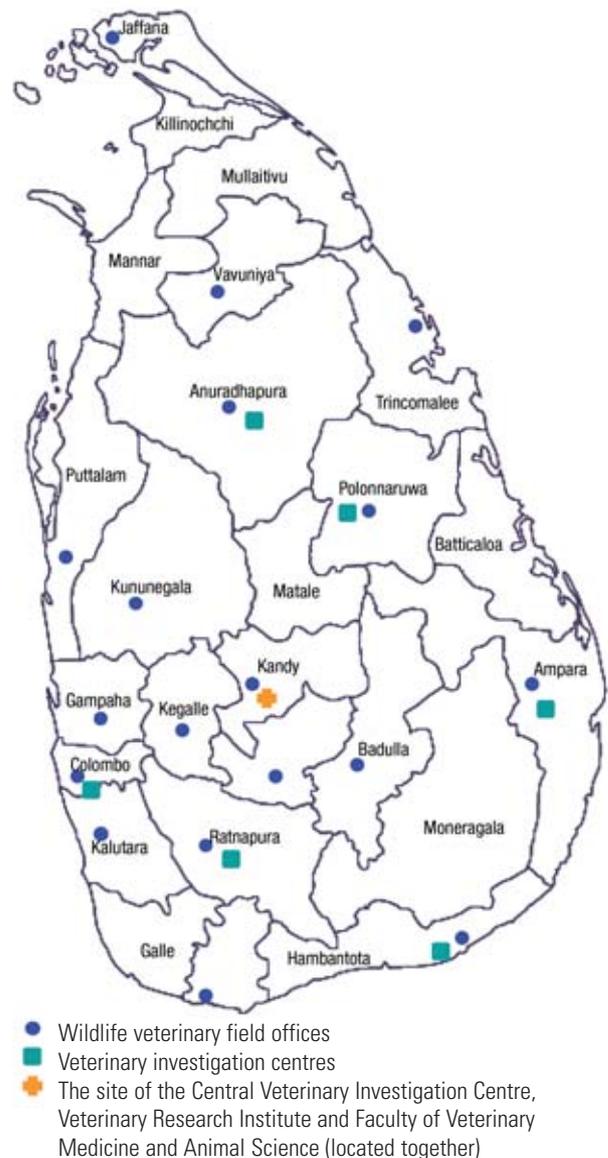
- awareness, during which local decision-makers identify the need, goals and objectives for acquiring new capacity
- implementation, during which initial key capacities are developed and applied, and early objectives are achieved
- expansion, during which the initial programme is scaled up to meet the total of programme objectives
- consolidation, during which the new capacity and associated programmes are fully incorporated into local and national structures and operations.

The present study gathered information relevant to each of the three themes of Bates *et al.* (1), with respect to the proposed SLWHC and programme. Interviewees identified education, training and modest infrastructure improvements as a first step in development, to be followed by a further stepwise phasing-in of disease surveillance and other programmes. They also identified DWC field veterinary offices, VICs, CVIC/VRI and FVMAS as important elements of existing capacity to be enhanced and incorporated into the SLWHC. They pointed to the DWC, DAPH and FVMAS as key partners in developing and sustaining an SLWHC. These bodies share primary responsibility for wild animal health and disease issues, and should therefore collaborate in the governance and financial support of an SLWHC and its programmes. As the SLWHC itself is initiated, the number of organisations participating in its operation would also expand, to include public health bodies, other universities and non-government organisations.

It appears that the ‘awareness’ stage (see above) (1) in building wildlife health capacity has already been partially achieved, aided by the conduct of this study. The relevant government Ministries recognise that a wildlife health management programme is needed and would be of considerable socio-economic and conservation value, and they have expressed willingness to provide sustained support to such a programme. With strategic new investment, it would be possible to organise existing capacity into a collaborative SLWHC. From the analysis of

Lansang and Dennis (7), building such capacity in Sri Lanka, through a formal and long-term twinning relationship between the CCWHC and the SLWHC, would have a high probability of success.

Based on this study, a feasible and potentially workable structure for the SLWHC could be as follows. The SLWHC would be governed collaboratively by DWC, DAPH and FVMAS, with additional participation by public health agencies, other universities and non-government organisations, representing various public interests. These would collectively establish the objectives, priorities and budget of the SLWHC and assist the director of the SLWHC to achieve them. In this way, government Ministries and other stakeholders would pool their resources to achieve a



**Fig. 1**  
**Map of Sri Lanka, showing the locations of potential key network components of a wildlife health centre**

single collaborative wildlife health programme. The SLWHC would operate under the legal authority of its government Ministry partners.

The director and key wildlife health specialists and staff of the SLWHC would be located in headquarters close to FVMAS and the CVIC/VRI. This office would coordinate national wildlife health programmes, with an emphasis on wildlife disease surveillance. The wildlife field veterinarians and other relevant staff of the DWC, of government veterinary offices located close to protected wildlife areas and of the district VIC would take primary roles in disease surveillance, collaborate to obtain wild animal specimens, investigate reports of disease outbreaks, and secure, preserve and forward specimens to the SLWHC head office (Fig. 1). Staff at Headquarters would then carry diagnostic examinations to completion, making use of FVMAS and CVIC/VRI facilities. Headquarters would also coordinate surveillance activities and specimen movements, ensure effective information management and communication, organise and coordinate research and targeted disease surveillance programmes, and contribute to education and training at professional and technical levels.

To conclude, Sri Lanka is highly motivated to develop a national programme in wildlife health management, has an existing infrastructure that can be enhanced

and incorporated into a functional system, and has a willing partner in Canada to assist in developing this programme. All of the features deemed essential to the operation of the CCWHC (Box 1) are potentially available to an SLWHC. The success of this project will rest on continuous evaluation and long-term and stable cooperation among the responsible participating institutions in Sri Lanka.

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## Étude de faisabilité concernant la création d'un centre national dédié à la santé de la faune sauvage au Sri Lanka

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### Résumé

Le Sri Lanka est un pays tropical situé dans une zone zoo-géographique à haut risque d'émergence de maladies infectieuses. Une étude a été conduite en 2010 pour évaluer la faisabilité d'améliorer les capacités du Sri Lanka à gérer les maladies affectant les animaux sauvages grâce à la mise en place d'un centre national dédié à la santé de la faune sauvage. Le Centre canadien coopératif de la santé de la faune (CCWHC) a été choisi pour servir de modèle potentiel, en vue de l'adapter à la situation spécifique du Sri Lanka. Des entretiens et des réunions d'équipe ont été organisés avec les principaux intervenants potentiels au sein des services sri lankais chargés respectivement de la protection de la nature et de la production et de la santé animales, ainsi qu'avec des responsables de la Faculté de médecine vétérinaire et des sciences animales de l'Université de Peradeniya. En outre, des visites ont été organisées dans les établissements participants potentiels, et la littérature traitant des meilleures pratiques

régissant le renforcement des capacités scientifiques a été consultée. Grâce aux améliorations stratégiques apportées aux secteurs de l'enseignement et de la formation, au recrutement de ressources humaines supplémentaires, aux améliorations des infrastructures de transport et de diagnostic, et à l'existence d'une coordination centralisée, le Sri Lanka paraît très bien préparé pour établir un centre et des programmes durables dédiés à la santé de la faune sauvage.

#### **Mots-clés**

Canada – Centre national dédié à la santé de la faune sauvage – Faisabilité – Faune sauvage – Gestion – Maladie – Renforcement des compétences – Santé de la faune sauvage – Sri Lanka.



## **Estudio de viabilidad de la creación de un centro nacional de sanidad de la fauna salvaje en Sri Lanka**

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#### **Resumen**

Sri Lanka es un país tropical, situado en una zona geográfica que presenta un elevado riesgo de aparición de enfermedades infecciosas. Los autores describen un estudio de viabilidad realizado en 2010 con el fin de mejorar la capacidad del país para hacer frente a las enfermedades de los animales salvajes mediante la creación de un centro nacional de sanidad de la fauna salvaje. Como posible modelo que se podría adaptar a Sri Lanka se estudió el del Centro Cooperativo Canadiense para la Sanidad de los Animales Salvajes (*Canadian Cooperative Wildlife Health Centre*). Se mantuvieron entrevistas y se celebraron reuniones en grupo con una serie de importantes posibles participantes de los ministerios de Protección de la Fauna Salvaje y de Producción y Sanidad Animales y de la Facultad de Veterinaria y Ciencias Animales de la Universidad de Peradeniya. Además, se visitaron instalaciones que eventualmente podrían participar en el proyecto y se consultó bibliografía sobre prácticas idóneas de construcción de infraestructuras y medios científicos. Con estratégicos progresos en la enseñanza y la formación, personal adicional, mejoras en el transporte y las instalaciones de diagnóstico y una coordinación centralizada, Sri Lanka parece estar en muy buena posición para establecer un centro dedicado a la sanidad de la fauna salvaje e instituir el correspondiente programa con garantías de continuidad.

#### **Palabras clave**

Canadá – Capacitación – Centro nacional de sanidad de la fauna salvaje – Enfermedad – Fauna salvaje – Gestión – Sanidad de la fauna salvaje – Sri Lanka – Viabilidad – Vigilancia.



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