SCIENTIFIC TASK FORCE ON WILDLIFE AND ECOSYSTEM HEALTH

Co–convened by FAO and UNEP-CMS

# Wildlife and Ecosystem Health news

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## Upcoming Events

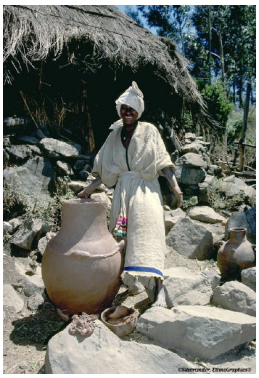
- September 6-7: International Symposium on Emerging Infectious Diseases (Ulaanbaatar, Mongolia)
- October 8-19: Convention on Biological Diversity Conference of the Parties (Hyderabad, India)
- October 13-18: Wildlife Society 19th Annual Conference (Portland, Oregon USA)
- October 15-18: EcoHealth 2012 (Kunming China)
- October 22-23: Emerging Infectious Diseases Symposium (Geelong, Australia)
- January 28-February 3 2013: Prince Mahidol Awards Ceremony/2nd Annual One Health Congress (Bangkok, Thailand)

## Inside this issue:



## Hotspots of poverty, zoonoses and emerging diseases

The International Livestock Research Institute (ILRI) has recently published a study mapping hot spots of extreme poverty and outbreaks in zoonotic diseases like Tuberculosis, Rabies, etc. The report takes into account a large number of variables including livestock numbers, human presence, disease outbreaks and type of livestock production systems used. The study identified 13 zoonotic diseases that were responsible for 2.4 billion human cases and 2.2 million deaths each year. The great majority of these cases occur in Ethiopia, Nigeria, Tanzania and India. Ethiopia, India, and Nigeria were identified as countries with the most poor livestock keepers, highest numbers of malnourished people and carry some of the highest burden of zoonotic diseases. In addition, the study highlighted severe gaps in reporting of zoonoses and animal diseases, and acknowledges that the numbers are likely much lower than actual cases worldwide. ILRI researchers tried to identify ways to improve rural farmers' access to global markets. With the growing world population and an increasing demand for meat and animal by-products, improved market access for rural farmers may provide enough income for them to move out of poverty. Unfortunately, improving access to global markets is difficult and impractical in some developing nations. To combat the growing problems of zoonotic diseases, emerging diseases and the large gaps in food security, global interventions must focus on regions where aid can make the most difference. The entire study is available here: http://www.nature.com/nature/journal/v451/n7181/pdf/



## Effects of wildlife and ecosystems on maintaining human health

Finding ways to educate the general public on the importance of the One Health Initiative and the role that wildlife and ecosystems play in maintaining our health is not always simple. The New York Times article by Jim Robbins does a superb job at highlighting the ecology aspects associated with disease emergence and transmission. Around 60% of emerging diseases in recent years are zoonotic, or spread between animals and humans. Of these, more than 2/3 come from wildlife. This can be attributed to a wide variety of issues, many of which are direct results of human activities. Through intensified farming practices, habitat degradation, human encroachment, and an increasing human population worldwide, we create a situation in which disease transmission between human, wildlife, and livestock is easy. There are many examples of diseases originating in wildlife that can cause drastic effects on human and livestock health including Nipah virus, Hendra virus, and the spread of Lyme disease in the US. The first step in combating these emerging diseases is to understand the factors that influence their emergence and spread. Find the original article here: http://www.nytimes.com/2012/07/15/sunday-review/the-ecology-of-disease.html?_r=2

# FOCUS ON:
# Impacts of Farming Intensification on Wildlife and Ecosystem Health

In a world with over 1 billion people living in a state of chronic hunger, it is imperative that we identify ways to redistribute or sustainably increase food production. Many of these problems can be solved through intensified farming production but may result in environmental degradation, changes in biodiversity, ecosystem services, and increases the likelihood of disease emergence and spread with significant implications to human, livestock, wildlife, and ecosystem health. In a recent meeting in Lyon, France the Task Force supported the production of an FAO poster entitled "Impacts of Farming Intensification on Wildlife and Ecosystem Health." Together with representatives from the Task Force the poster highlighted the difficulties in finding solutions to food security while taking into account potential negative outcomes. See box below for a list of outcomes.

In order to find sustainable ways to increase production globally, farmers should attempt to integrate sustainable agricultural practices into their production plans. Sustainable practice include a variety of methods of preserving local ecosystems and minimizing the impacts that farming intensification can have on both farmed land and surrounding areas. These are further outlined in the box on the right.

## Facets of Sustainable Farming

1. Biodiversity and Ecosystem Services: Using integrated pest management or incorporating natural areas into farmed land areas to preserve the local ecosystem.
2. Conservation-Minded Agricultural Practices: Utilizing multipurpose crops and performing crop rotation to prevent agricultural runoff and support livestock feed.
3. Integrated Pest Management: Alternatives to pesticides, or maintaining a separation between livestock and wildlife whenever possible to prevent transmission of pathogens or vectors (eg ticks) between species.
4. Integrated Plant Nutrient Management: Monitor the health of soil and water and implement mitigation measures such as treatment wetland systems for dealing with waste.
5. Integrated Weed Management: Crop rotation, maintain livestock in coordination with plant cropping to reduce use of herbicides and aid in weed management.
6. Soil Retention, Quality and Integrity: Maintain adequate nutrients in the soil, ie diversifying the farm or reducing grazing density.

Another method used to achieving sustainability is through diversification. In a study of swine production in the US, the outputs and cost effectiveness of two well-managed intensified production systems of swine were researched. The work showed that the diversified swine production system that incorporated grain production allowed for decreased input costs through dual-purpose tractors, utilization of swine manure for fertilization of the crops, and improved price assurance for both operations when compared with the specialized swine production system in Iowa.

Through diversification of livestock farming, producers are able to mitigate environmental risks through decreased fertilizer costs with utilization of manure, shared machinery costs with dual purpose machinery, and more stable grain prices. In the example of a diversified swine production farm, corn produced on the farm was used to feed growing pigs, therefore protecting the corn production from fluctuating market prices. In diversified production systems, rotation of crops and livestock is relatively simple, but allows the land to recover valuable nutrients that may have been lost.

To address the growing issues of food security in a dramatically increasing global population, we must work together with professionals from a variety of backgrounds to identify sustainable ways to increase production of both crops and animals. There is no simple solution to these complex issues, but a multifaceted One Health approach is certainly indicated.

For more information on the Impacts of Farming Intensification on Wildlife and Ecosystem Health from the conference in July 2012, please see the following links:

http://wildlifeandecosystemhealth.org/farming-intensification-and-wildlife-and-ecosystem-health/

http://www.fao.org/Ag/AGAInfo/home/en/news_archive/2012_Impacts_of_farming_intensification_on_wildlife.html

## Farming Intensification

### Positive Outcomes:

- Decreased cost of animal products
- Increased availability of animals and animal products (increased outputs)
- Increased trade through the region and between rural and urban areas
- Improved food security

### Negative outcomes:

- Decreased genetic diversity of livestock produced
- Selection pressure for pathogen strains adapted to survive in modified agricultural environments and changes in pathogenicity
- Increased pathogen transmission due to higher densities of livestock and increased contacts among livestock, humans, and wildlife
- Immune compromised livestock populations and increased susceptibility to pathogens
- Habitat loss and environmental degradation due to farming development, expansion, and point source run-off and diffuse pollution
- Changes in biodiversity within agro-ecological systems

## Climate change and the spread of Dengue

Climate change worldwide has a variety of impacts on the environment, plants, and animals. These changes can alter disease dynamics as hosts ranges, life cycles, or habitats are altered. In some cases, this modifies disease ecology since the life cycle of some vectors, like the mosquito, changes due to alterations in temperature and seasonality. In a study published in July 2012, researchers explored potential changes that may occur associated with climate change on populations of the Asian tiger mosquito (Aedes albopictus), the vector for Dengue.

Dengue is a viral disease that causes flu-like illness and can occasionally cause severe symptoms and death . Currently the disease is endemic in many Asian and African countries, although it is also spreading across other continents. The disease has no prevention and no cure, although access to supportive care can drastically reduce case fatality rates. Researchers in this study hypothesized that warming temperatures would increase both the population size and the life span of the Asian tiger mosquito, bringing about an increased range and risk of Dengue spread. Surprisingly, the model used showed that the projected warming actually decreased mosquito life span, therefore decreasing the potential dengue season. This research highlights how difficult it is to predict changes in disease ecology that may result from climate change.

Find the entire study here: http://iopscience.iop.org/1748-9326/7/3/034003/pdf/1748-9326_7_3_034003.pdf

## Listening to the sounds of the night: Bat Walks

New technology to enable an army of citizen scientists to take part in learning about bats and help the public identify bats present at night through the high frequency sounds they emit. These sounds are otherwise inaudible to humans, but are used by the bats to help them locate small prey like bugs. Unfortunately, bats tend to get a bad reputation as a disease source or associated with vampires and Halloween. In order to try and shift some of that thinking and educate the public on the many positive roles bats play in ecosystem maintenance, Professor Kate Jones of University College London is arranging a series of "bat walks" in which the new technology will allow participants to listen in on the world of bats and learn about the species present. Professor Jones hopes that these activities will help improve the public view of bats and in the future the technology can be developed into a mobile application available to the public.

Find more information on Professor Jones' work here: http://www.bbc.co.uk/news/science-environment-18769019

# Production and Conservation in Partnership

The research platform "Production and Conservation in Partnership" recently held a five day training in Zimbabwe entitled "Vegetation Mapping by Remote Sensing" with the objective of training students on the techniques required to create vegetation maps. The research platform "Production and Conservation in Partnership" was created in 2007, and includes researchers from the University of Zimbabwe, the National University of Science and Technology (Bulawayo, Zimbabwe), the French Institute for Agricultural Research for Development (Cirad) and the French National Centre for Scientific Research (CNRS).

The overall objective of the RP-PCP is to contribute to sustainable development, biodiversity conservation and improved rural livelihoods in Southern Africa, through strengthening national research capacities, multidisciplinary approaches and institutional partnerships with a focus on protected areas and neighbouring production. The RP-PCP seeks to promote applied research on "wild-domestic interfaces" in order to address issues related to the coexistence of Man and Nature, by mitigating development and conservation activities.

The multidisciplinary group is organized in four broad thematic areas: Animal Health and Environment (AHE), Functional Ecology (Eco), Conservation and Agriculture (C&A) and Natural Resources Governance and Institutions (NRGI). The platform has selected 3 priority areas of activities the GLTFCA, the KAZA-TFCA and the mid-Zambezi valley/Lower Zambezi-Mana Pools TFCA.

The group continues to be highly successful, with more than 30 post-graduate students supported (MSc, Mphil, and PhD levels), greater than 30 research articles, 14 book chapters and preparing numerous presentations for various international conferences and regional workshops.

Find more information about the partnership and the support and trainings they provide here:

http://www.rp-pcp.org/

Story submitted by Alexandre Caron


Photo by RP– PCP

# Newsworthy items in Wildlife and Ecosystem Health

- The IUCN Species Survival Commission website has been redesigned! Now both Wildlife Health Specialist Group members and non-members can log on and stay up to date on current issues and events. The new site can be found at : http://iucn-whsg.org

- A new book has been published, supported by the by the research platform "Production and Conservation in Partnership" (see above) entitled "Transfrontier Conservation Areas: People living on the edge." This book highlights the difficulties associated with creating a sustainable TFCA, and especially looks at the impacts that its creation can have on local people. The book is available on Amazon. (Andersson, Jens. *Transfrontier Conservation Areas: People Living on the Edge*. N.p.: Rou-

## European strain of *Echinococcus* found in canines in Canada

An alveolar hydatid cyst, the intermediate stage of *Echinococcus multilocularis*, was removed from a pet canine in British Columbia in Canada. This particular region of Canada is generally free of *E. multilocularis*, indicating either the introduction of a new strain of *Echinococcus*, or a range expansion of a strain present 600 miles from the identified location. Molecular epidemiologic techniques on the tissue identified the cestode as a European strain, presumably the result of a recent introduction from Europe via translocation of dog(s) or an earlier translocation through the red fox. Subsequent investigations of wildlife definitive hosts from central British Columbia revealed that this strain is established in red fox and coyote in this region, suggesting that this parasite has emerged in a newly endemic region of North America (K. Gesy, E. Jenkins, H. Schwantje, unpubl. data). This has significance for both public and veterinary health, as *E. multilocularis* is the cause of alveolar hydatid disease in people and other aberrant intermediate hosts, and is emerging world wide as a result of a anthropogenic translocation and changes in climate, landscape, and wildlife-human interfaces. Find the whole report here: http://wwwnc.cdc.gov/eid/article/18/6/11-1420_article.htm

Story submitted by Emily Jenkins

## Ramsar Convention embraces One Health and provides valuable guidance

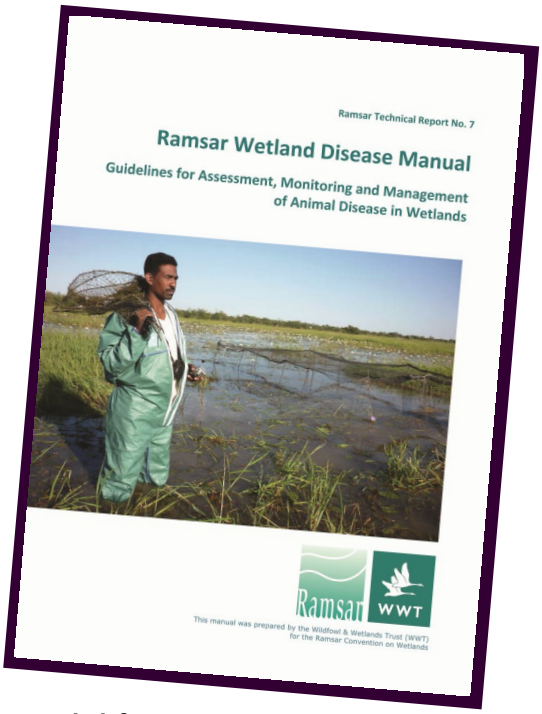
The Ramsar Conference of Parties (COP) held in Bucharest in July saw the 163 Contracting Parties formerly adopt a progressive Resolution calling for an ecosystem approach to health i.e. properly understanding the interconnectivity of health across the board and appreciating how this requires cross sectoral working and participatory approaches. The Resolution http://www.ramsar.org/pdf/cop11/res/cop11-res12-e.pdf includes three important annexes: key messages from Ramsar's technical report on "Healthy Wetlands Healthy People"; how ecosystem approaches help deliver the Millennium Development Goals; and key messages from the new Ramsar Wetland Disease Manual.

The COP saw the formal launch of the Ramsar Wetland Disease Manual, produced by the Wildfowl & Wetlands Trust for Ramsar's Scientific and Technical Review Panel. Written for wetland managers, the Manual was borne from a recognition that these key stakeholders play a vital role in the prevention and control of disease problems in these habitats, yet may not appreciate their importance in promoting health nor have access to appropriate guidance.

The Manual (authored, edited and crafted by 31 personnel from 16 organisations including the FAO and the Scientific Task Force on Wildlife and Ecosystem Health) represents a practical resource of value to policy makers as well as wetland managers. It provides an **overview**; an **introduction; principles** of disease management; specific and generic **practices** for preventing and controlling diseases in wetlands; user-friendly **factsheets** of a wide range of priority animal diseases of wetlands; **case studies;** and **further contacts** and resources. Although focussed on wetlands, many of the principles and practices are appropriate for other habitats.

You can read the Manual at *http://www.wwt.org.uk/ramsardiseasemanual* and *http://www.ramsar.org/pdf/lib/rtr7-disease.pdf*

Story submitted by Ruth Cromie




**Can you help?**

To maximise the utility and accessibility of the Manual the authors are looking to:

- **Increase availability** (production of further copies and a website) and promote to wetland managers internationally in the workplace and via training programmes.
- **Translate** (initially into French and Spanish).
- **Update and improve over time:** by adding new factsheets and case studies, as well as updating the general text as and when necessary.

If you can assist please contact: ruth.cromie@wwt.org.uk

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# Disease Outbreaks in Wildlife Reported to the OIE (June-July 2012)

1. **African Swine Fever**: Russian Federation. Four wild boar (*Sus scrofa*) tested positive for African Swine Fever by PCR in early July in the Russian Federation. Positive wild boar were located in hunting grounds in Likhoslavl`sky raion and the rural town of Vednoye, both located in the Tverskaya Oblast.
   http://web.oie.int/wahis/public.php?page=single_report&pop=1&reportid=12113

2. **H5N1 HPAI**: Hong Kong. A house crow (*Corvus splendens*) and a pet Oriental Magpie Robin (Copsychus saularis) tested positive by virus isolation in late June for H5N1 Highly Pathogenic Avian Influenza in Hong Kong.
   http://web.oie.int/wahis/public.php?page=single_report&pop=1&reportid=12096

3. **H5N1 HPAI:** Hong Kong. A scaly-breasted munia (*Lonchura punctulata*) was found at Yuen Long in Hong Kong June 18. The bird tested positive for H5N1 by PCR and Immunohistochemistry
   http://web.oie.int/wahis/public.php?page=single_report&pop=1&reportid=12063


Map by EMPRES-i
http://empres-i.fao.org/eipws3g/

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