SLU

7th International Workshop

Global Challenges University Alliance

WHY WILDLIFE?

– Global Opportunities & Challenges

April 26-29 2015, Uppsala, Sweden

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- UNIVERSITY OF NATURAL RESOURCES AND LIFE SCIENCES (BOKU), AUSTRIA
- UNIVERSITY OF SAO PAOLO, BRAZIL
- UNIVERSITY OF BOLOGNA, ITALY
- UNIVERSITY PUTRA MALAYSIA (UPM), MALAYSIA
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- SOKOINE UNIVERSITY OF AGRICULTURE, TANZANIA
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- UNIVERSITY OF CALIFORNIA, DAVIS (UC DAVIS), USA

Hosted by: SLU, Swedish University of Agricultural Sciences

7th International Global Challenges University Alliance Workshop
Why Wildlife?
– Global Opportunities & Challenges

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WHY WILDLIFE?

– Global Opportunities & Challenges

7th International Global Challenges University Alliance Workshop
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Content

The Global Challenges University Alliance (CGUA)

By 2050 the world's population will exceed nine billion, requiring agricultural, forest and fisheries systems to produce food, animal feed, fibres, energy and materials for another two billion people. The crucial issue is how to achieve this with very little new land to use, without causing unsustainable ecological consequences and during an on-going climate change. Meeting these global challenges can only be done through obtaining greater scientific knowledge about the fundamental conditions for life – translating knowledge into relevant action – and through dedicated international co-operation. The Swedish University of Agricultural Sciences (SLU) has recently initiated a project to form a Global Challenges University Alliance, and is planning to involve 25 of the world's top "bio-economy" universities at all continents. The partner universities should be strong in agricultural sciences (including food, veterinary, landscape architecture and forest sciences), environmental sciences and/or the life sciences.

The Alliance build-up will take place through thematic Global Challenges University Workshops, each with 4-10 participating universities, and by organising corresponding thematic Global Challenges Summer Schools for MSc/PhD students. Both the research and education components will train the young "bioeconomy" leaders of the future and provide them with an active global network very early in their careers.

The first GCUA workshop on Biofuels and Biorefineries was held in September 26-28, 2012 at SLU, Uppsala. Additionally five workshops have been arranged in Uppsala during 2013 and 2014, entitled "The Future of Food – Security, Quality and Safety", "Environmental monitoring and detection of invasive species – current challenges", "Green and sustainable cities – the role of landscape architecture", "The Future of forests – to manage forests for people" and "Aquaculture – Providing Food for the Future", respectively.

During 2013 the first GCUA Summer School, Biofuels and Biorefineries, was given in Uppsala with students from seven universities. The course included both lectures and fieldtrips and was highly appreciated by the students. They were provided with a new international network as well as a good introduction to the global perspective on biofuels and the important challenges connected to this topic.

In September 2014 the second GCUA Summer School, Future of Food, was given in Uppsala with 39 students from 13 different universities and during 2015, three more GCUA Summer Schools are underway; "Aquaculture – local solutions to a global challenge" June 26 – Juli 1, "Green and Sustainable Cities" August 8 – 22 and "The future of forests – Managing forests for people" August

24 – September 4.

In 2011-2014, more than 200 researchers and students have participated in GCUA activities. The following Universities have participated in one or more activities within the GCUA initiative:

University of Melbourne (Australia)
University of Queensland (Australia)
University of Natural Resources and Life Sciences, BOKU (Austria)
University of Sao Paolo (Brazil)
University of Guelph (Canada)
University of British Colombia (Canada)
China Agricultural University (China)
Bogor Agricultural University (ndonesia)
University of Bologna (Italy)
University of Tokyo (Japan)
University Putra Malaysia (Malaysia)
Universidad Nacional Autonoma de Mexico (Mexico)
Wageningen University (Netherlands)
Lincoln University (New Zealand)
The National University of Agriculture (Nicaragua)
St Petersburg State Forest Technical University (Russia)
University of Pretoria (South Africa)
Sokoine University of Agriculture (Tanzania)
Chulalongkorn University (Thailand)
Makerere University (Uganda)
Cornell University (USA)
University of California Davis (USA)
Swedish University of Agricultural Sciences, SLU (Sweden)

This seventh workshop Why Wildlife? – Global Opportunities & Challenges will be held at SLU, Uppsala, April 26-29, 2015. Participating universities includes University of Melbourne (Australia), BOKU University (Austria), University of Sao Paolo (Brazil), University of Bologna (Italy), University Putra Malaysia (Malaysia), Wageningen University (Netherlands), Lincoln University (New Zealand), University of Porto (Portugal), University of Pretoria (South Africa), Sokoine University of Agriculture (Tanzania), Makerere University (Uganda), UC Davis (USA) and SLU (Sweden).

PROGRAM

26 April

18.00 Welcome Reception & Registration, Uppsala Castle

27 April

Moderator: *Carl-Gustaf Thulin*

9.00 Welcome and introduction to GCUA
Johan Schnürer, pro Vice-Chancellor of external collaboration, SLU, Sweden

9.20 Speed dating!

10.00 Coffee

11.00 Organizers: Workshop procedures and details of engagement!

10.45 Workshop I: Identifying Key Issues for Position Paper

11.45 Reporting Back

12.00 Lunch

Moderator: *Åsa Fahlman*

13.00 Introduction: Theme Health & Welfare

13.15 Veterinary anesthesia: an essential tool for wildlife support.
Adriano Bonfim Carregaro, University of São Paulo, Brazil

13.30 Bad teeth and lumpy bones – a cautionary tale of wildlife co-existing with industry.
Jasmin Hufschmid, The University of Melbourne, Australia

13.45 Etiology and lesions associated with a novel skin disease affecting Giraffe in Ruaha National Park, Tanzania.
Donald.G Mpanduji, Sokoine University of Agriculture, Tanzania

14.00 Short break

Moderator: *Joris Cromsigt*

14.15 Introduction: Theme Wildlife & Management

14.30 Designing functional linkages between conservation areas for wildlife in Africa.
Robert AR Guldemond, University of Pretoria, South Africa

14.45 Impacts of logging on tropical forest birds: Implications in forest management system.
Mohamed Zakaria Hussin, University Putra, Malaysia

15.00 Wildlife management studies at the Agriculture and Veterinary School Bologna University (Italy).
Dino Scaravelli, University of Bologna, Italy

15.15 Coffee

Moderator: *Hans Peter Hansen*

16.00 Introduction: Theme Social Sciences

16.15 Environmental racism and struggles for recognition of people in the Amazon forest.
Alessandro de Oliveira dos Santos, University of São Paulo, Brazil

16.30 Why Owls? Using Nocturnal Birds to Improve Nature Conservation in

Malaysia.
Chong Leong Puan, University Putra, Malaysia

16.45 Technology advances for vertebrate pest eradication.
James Ross, Lincoln University, New Zealand

17.00 Short break

Moderator: *Carl-Gustaf Thulin*

17.15 The role of Barn owl (*Tyto alba javanica*) in preserving wildlife in plantation ecosystem.
Hafidzi Bin Mohd Noor, University Putra, Malaysia

17.30 Determination of the patho-physiological consequences of capture-induced hyperthermia in wildlife.
Richard Burroughs, University Of Pretoria, South Africa

17.45 Green Technologies and Intellectual Property Rights.
Cristina Godoy Bernardo de Oliveira, University of São Paulo, Brazil

18.00 Dinner

28 April

8.30 Departure Äleby from Hotel Svava

10.00 Arrival/Coffee

10.30 Welcome address: Presentation of Äleby Estate.
Jacob Högfeldt, Owner & Manager, Äleby Estate

10.50 Invited speaker:
Solveig Larsson, Jägarnas Riksförbund

11.10 Invited speaker:
Allan Carlsson, WWF

11.30 Discussion – Wildlife Farming & Management

12.00 Lunch at Äleby

Moderator: *Carl-Gustaf Thulin*

13.00 Conservation through sustainable use of wildlife: lessons learned from Austria.
Klaus Hackländer, University of Natural Resources and Life Sciences, Vienna, Austria

13.15 Reversing the trend of wildlife poaching in Tanzania.
Jafari R Kideghesho, Sokoine University of Agriculture, Tanzania

13.30 Impacts from hunting tourism on the Swedish local moose hunt – tensions and solutions.
Yvonne Gunnarsdotter, SLU, Sweden

13.45 Discussion

14.00 Coffee

Moderator: *Hans Peter Hansen*

14.30 Changes in bushmeat hunting in the Campo Ma'an area of Cameroon after 10 years.
Ignas Heitkönig, Wageningen University, The Netherlands

14.45 Wild boar population of growing concern.
Anne-Marie Dalin, SLU, Sweden

15.00 Status and economic value of livestock-wildlife conflict in West Kilimanjaro, Tanzania.
Shombe N Hassan, Sokoine University of Agriculture, Tanzania

15.30 **Workshop II:** Translating Position Paper Outline into Summer School Objective

16.30 Guided tour (wagon ride)

18.30 **Dinner** at Äleby

20.30 Return bus

22.00 Back in hotel

29 April

Moderator: *Åsa Fahlman*

9.00 **Research presentations:** Health & Welfare

9.00 One Health Institute: Working at the interface of animals, people and the environment – Part 1.
Chris Kreuder-Johnson, University of California Davis, USA

9.15 One Health Institute: Working at the interface of animals, people and the environment - Part 2
Patricia A Conrad, University of California Davis, USA

9.30 Health challenges at wildlife – livestock-human interfaces in Uganda.
Michael Ocaido, Makerere University, Uganda

9.45 Discussion

10.00 Coffee

10.30 **Workshop III:** Reporting Back Idea for Summer School

12.00 Lunch

Moderator: *Joris Cromsigt*

13.00 Threats and opportunities for wildlife: Experiences from Uganda.
Enock Ssekuubwa, Makerere University, Uganda

13.15 Positive and negative effects of wildlife on the spread of infectious zoonotic diseases.
Frank van Langevelde, Wageningen University, The Netherlands

13.30 Game numbers, the predator pit and the occurrence of zoonotic diseases.
Herbert HT Prins, Wageningen University, The Netherlands

13.45 Wild rabbit management issues in Iberia.
Paulo Alves, University of Porto, Portugal

14.00 **Workshop IV:** Elaborating Ideas for Summer School & Position Paper (Special Issue, Funding)

14.45 Summary of Workshop & Closing Remarks

15.00 End of Workshop

Abstracts

The role of Barn owl (*Tyto alba javanica*) in preserving wildlife in plantation ecosystem

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The barn owl (*Tyto alba javanica*) has become an integral feature in oil palm and rice field in Malaysia. Soon it will be common in the plantations in east Malaysia (of Sabah and Sarawak) soon as more owls have been translocated for the purpose of biological control of rats. Since the beginning, chemical rodenticides have been the mainstay in rodent control, which may cause tremendous loss even in the region of 70-80% crop loss. In order to keep crop damage to less than 5% which has been set as the threshold for oil palm production, FGAR (First Generation Anticoagulant Rodenticide) and SGAR (Second Generation) has been consistently applied in plantations across the country. This, especially the more potent SGAR has lead to serious secondary poisoning especially on predators and raptors including the barn owls. Studies have shown that barn owl has been subjected to both lethal and non-lethal effects of secondary poisoning leading to lower fecundity, lower survival rates and unsustainable rat control programme. Assessment on barn owls provide some insight on the survival and fecundity of other wildlife in the oil palm as well the contiguous forest where resident and visiting civit cats and leopard cats may sample rats in the oil palm for prey. Exposure to SGAR would certainly lead to bioaccumulation of rodenticide residues and since they are the top predators it may affect the food pyramid in the natural habitat in the long run. Therefore a more sustainable approach of rat control combining barn owls and anticoagulant rodenticide has to be formulated.

Areas of interest: Secondary poisoning, raptors, rodent management

Determination of the patho-physiological consequences of capture-induced hyperthermia in wildlife

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An unacceptable number of animals still die or experience morbidity as a result of capture-related complications. Capture-induced hyperthermia is believed to play a role in the morbidity and mortality of captured animals. The aims of this research were to gain a better understanding of the pathophysiological consequences of capture and capture-induced hyperthermia and to better understand the association between capture-induced hyperthermia and capture myopathy. We aimed to determine whether cooling could reduce the pathophysiological consequences of capture and protect against the development of capture myopathy. Forty blesbok were divided into 3 groups - hyperthermic coupled with cooling, and hyperthermic and not cooled, and a control. The treatment groups were chased for 15 minutes, immobilized by dart using etorphine and azaperone, and a variety of clinical and physiological parameters were measured. These included muscle and rectal temperature, mass, serum biochemistry, blood gas analysis, muscle biopsy and urinanalysis. Serum biochemistry parameters that were measured included lactate, glucose creatinine kinase, Troponin I, GGT, GLDH, AST, bilirubin, creatinine and cortisol. Results showed hypoxia, elevated lactate, acidaemia and cardiac troponin levels as expected. Cooling did not prevent or protect against the pathophysiological metabolic alterations that occurred from chasing the animals.

Areas of interest: Management, capture, anaesthesia

Veterinary anaesthesia: An essential tool for wildlife support

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Farmland encroachment, hydroelectric facility construction, and the increase of urban areas lead to raise the number of wild animal capture. Techniques of immobilization, combining physical and chemical restraints, are necessary in those cases, especially on big and or aggressive animals. Ordinary anaesthesia monitoring, i.e. heart rate, respiratory rate and non-invasive blood pressure, might not assess the real anaesthetic condition of the patients. Beyond those parameters, blood gas analysis and serum lactate are more specific to monitoring the anaesthetic status. We have observed that animals undergoing anaesthesia might show hypoxia, hypercapnia, and anaerobic metabolism, especially those submitted to physical restraint, and 100% of O2 supply, and fluid therapy are mandatory. However, we also have been using deep sedation in some cases to avoid anaesthetic procedures, and also cardiopulmonary depression. Opioids and or sedatives have been used to promote an adequate immobilization, without intense physiological changes in those animals. Besides, the sedation can be reversed by specific antagonists at the end of the procedure, reducing the immobilization time. We point out that the proper use of anaesthetic drugs and techniques are essential for the safe handling of wildlife, minimizing stress and long-term physiological damage in those animals.

Areas of interest: Anaesthesia, analgesia, wildlife

Contrasting challenges and opportunities for the field of wildlife ecology

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Across the world conservation and societal issues that involve large mammalian wildlife are increasing. Ironically, these issues range from strongly expanding to strongly declining wildlife populations. As a result society is asking scientists to answer questions such as; how will populations develop under future global change scenarios, what will this mean for their potential environmental and socio-economic impact? How do we deal with too many or too few wildlife? Which challenges and opportunities does this bring? I will use examples from my own studies in South Africa and Europe to illustrate the contrasting challenges and opportunities that the field of wildlife ecology faces. I will relate to several new ecological concepts and ideas that have been brought forward in the field of wildlife ecology in recent years, including: trophic downgrading, defaunation, rewilding, overabundance, ecological substitutes, and ecological tools. I will also try to illustrate the difficulties in bridging ecological, social and veterinary sciences.

Areas of interest: Trophic ecology, global issues, out-of-the-box thinking

Wild boar population of growing concern

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During the last two decades, the wild boar population has increased remarkable in Sweden. It is today approximated to be around 200 000 free-ranging animals. Supplementary feeding, the reproductive potential and no natural regulating factor, such as disease or predation are most likely reasons for the high increase in number. It is a very popular game to hunt (approximately 90 000 were shot in 2013). However, the high number of wild boars in Sweden creates conflicts between hunters and agricultures due to wild boar damage on standing crops, hence it is also of political concern. The same situation occurs in many European countries. In addition, the wild boar population is a potential danger for spread of various diseases to domestic animals, endangered species and humans. For example, African swine fever spread from Russia to Easter Europe and Baltic countries during the recent years. Also, bovine tuberculosis (bTb) is common among wild boars in many European countries and is considered to be a wildlife reservoir. In an ongoing research project on wild boars in Sweden, we study reproductive parameters (examination of reproductive organs from female wild boars) put in relation to supplementary feeding, genetic variation, disease prevalence, and annual variations.

Green technologies and intellectual property rights

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The intellectual property rights (IPRs) related to green innovation has demanded new legal rationalities and tools to foster the R&D in many countries due to greenhouse effects. Firstly, it will be studied the role of IPRs to encourage the development of green technologies in the energy field and it will be presented alternatives to IPRs to incentive R&D. Secondly, it will be analyzed the legal issues that have raised in the European Union and in the United States concerning discussions about broad patents, cross patents, low quality patents and biofuels of third generation. Thirdly, it will be verified in a legal perspective the Brazilian pilot program of green patents in relation to the foment of the development of new green technologies.

Areas of interest: Development, intellectual property, green patents

Designing functional linkages between conservation areas for wildlife in Africa

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The future of wildlife in southern Africa may depend on an informed-design and dedicated implementation of a conservation network that consists of viable protected areas, and functional ecological linkages between them. We use an African icon, the savanna elephant (*Loxodonta africana*), to inform us about their distribution across southern Africa, the population numbers locally, and how they use the landscape to avoid conflict with people. Where ecologically appropriate, elephant populations should be linked, and their numbers regulated through density-dependent processes in space and time to abide by the principles set in meta-population dynamics. Moreover, conflict between people and elephants should be mitigated through proper ecological design in land allocation. For such a strategy to be successful, the design of functional and ecological linkages needs to take care of the needs of elephants without interfering with the societal demands and livelihoods of local people. However, the zonation and assignment of land for protection of African wildlife needs to be done with almost an immediate effect before near-future developments in mining and agriculture, driven by global demands, undermines current and future efforts to conserve African savannas and its wildlife constituents.

Areas of interest: Ecology, restoration, conservation

Impacts from hunting tourism on the Swedish local moose hunt – tensions and solutions

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Both the local moose hunting teams and hunting tourism contribute to viable rural areas. The hunting teams help to maintain the sense of community that inhabitants develop over time, and tourism supports the local economy. Both phenomena are necessary for rural areas to be sustainable, but they sometimes work counter to each other. The empirical material comes from a fieldwork in a Swedish parish with declining population, were most of the inhabitants commute to nearby towns. Every year many of those who have moved return with a son or another relative to take part in the moose hunt the first week in October. Some of the landowners let out the moose hunt and/or the roe deer hunt on lease to foreign hunters, preferably from Denmark and Germany. This evokes tensions in the community, handled in different ways. The impacts are both cultural (money and strangers) and social (changed relations, exclusion). One of the local hunting teams has found a solution that seems to be acceptable for all, with a few paying guests who returns every year. This compromise brings less money and fewer strangers to the community and the social relations, characterised by egalitarian ideals, are not as strongly challenged.

Areas of interest: Hunting, nature based tourism, community

Conservation through sustainable use of wildlife: lessons learned from Austria

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According to the IUCN Policy Statement on Sustainable Use of Wild Living Resources (2000) the use of wildlife, if sustainable, is an important conservation tool because the social and economic benefits derived from such use provide incentives for people to conserve them. As hunting is one type of such use Austrians scientists elaborated principles, criteria, and indicators of sustainable hunting for Central Europe (2001). Based on that, the IUCN European Sustainable Use Specialist Group published guidelines of sustainable hunting in Europe (2006), which resulted in the European Charta on Hunting and Biodiversity (2007). Examples from Austria show that use and conservation are indeed no contradictions. Instead, the possibility to use wildlife through hunting motivates hunters to conserve or restore wildlife habitats. Moreover, it encourages hunters to develop sustainable management strategies taking into account ecological, economic and socio-cultural aspects. For example, capercaillie (Tetrao urogallus) are threatened by habitat loss. Moderate hunting quota motivated land owners to move from industrial forestry (with large clear-cuts and monocultures) to semi-natural forestry (with selective tree use and diverse tree communities). In arable land, European hare hunting encourages hunters to improve habitat quality and to hunt common predators, both leading to higher biodiversity in this ecosystem.

Areas of interest: Wildlife biology, wildlife management, sustainable hunting

Status and economic value of livestock-wildlife conflict in West Kilimanjaro, Tanzania

Shombe N Hassan, Joyce E. Kombe, Sayuni B Mariki, Jumanne M Abdallah, Alfan A Rija, Farida S Salehe
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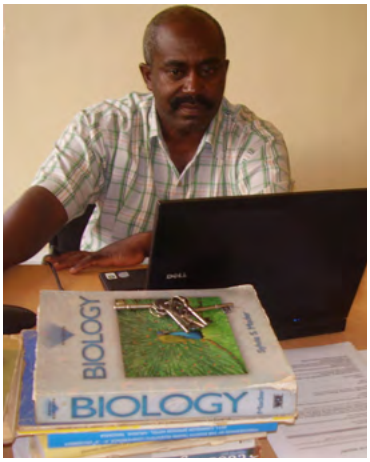
Overall, four carnivores species were behind the human-wildlife conflict, which essentially was intense, resulting to direct and indirect costs either way. While pastoralists experienced costs associated with predation of their livestock and sleepless nights in the course of guarding livestock against predators, wildlife suffered from retaliatory events particularly wildlife killings as result of negative attitude towards conservation borne by the pastoralists. Apparently, the loss of livestock to predators was estimated around USD 139, 974 for the past five years, whereas the cost of wildlife killed by local communities in retaliation amounted to USD 105,403 in the same period. On the other hand, the hidden costs of the conflict include social unrest among local community members, loss of time used in care and treatment of the casualties, waste of time spent hunting predators and risk of infections such as rabies and brucellosis from intruding wildlife. The hidden costs overall, outweighed the direct costs of the conflict suggesting the urgency with which to address the issue in the region. Raising conservation awareness and use of effective preventive measures such as predator-proof fences around livestock penal together with compensation and benefit sharing may help in managing livestock-wildlife conflict in the area.

Areas of interest: Wildlife, ecology, biology



Changes in bushmeat hunting in the Campo Ma'an area of Cameroon after 10 years

Ignas Heitkönig, Miila Kauppinen, Linda van Os, Christiaan van der Hoeven
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The level of wildlife hunting and trade in the tropics has reportedly become unsustainable in many areas due to increased extraction and commercialization of the bushmeat trade. We assessed the change in wildlife yield over a period of 10 years through semi-structured interviews with hunters in villages around the now national park of Campo Ma'an, Cameroon. We indirectly assessed the pressures hunters pose on wildlife - mostly threatened or protected by law - 10 years after an earlier study in the area, and after the establishment of the national park. While hunting still occurred inside the now national park to almost the same extent, estimated animal densities inside the park appeared to have increased, whereas estimated densities outside the park appeared not to have decreased over the course of the decade. Most harvested were rodents and ungulates, while primates - hunted with guns - formed a larger proportion of the catch and of the hunters' incomes compared to earlier studies. Hence, (1) commercialization of hunting increases; (2) gun hunted vulnerable (primate) species contribute increasingly more to incomes of certain hunters, which (3) puts these species at greater risk; (4) the actual impact on wildlife populations remains hard to assess.

Areas of interest: Wildlife ecology, bushmeat, human-wildlife-conflicts

Bad teeth and lumpy bones – a cautionary tale of wildlife co-existing with industry

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Most discussions around wildlife health tend to focus on infectious diseases. While infectious diseases are highly significant from a public health, wildlife/livestock interface and conservation point of view, it is important to also consider other types of disease, especially those which are a result of human activity. One such example is chronic fluoride toxicity (fluorosis). Fluoride is found in the environment as a result of natural sources, such as geothermal activity and volcanic eruption, but also, significantly, as industrial emissions. In Australia, there are currently over 900 industrial emitters of fluoride, emitting a total of around 8.5 tons of fluoride every year. This presentation will describe the effects of, and challenges around, chronic exposure to elevated fluoride in the environment of two populations of eastern grey kangaroos (*Macropus giganteus*) resident near fluoride-emitting industrial facilities in south-eastern Australia. Lesions found in affected kangaroos included dental disease, as well skeletal changes including severe, lumpy, new bone growths on the major long bones of the hindlegs and a high prevalence of degenerative joint disease in the stifle and hock. Differences in circumstance and approaches to management of these outbreaks will briefly be described.

Areas of interest: Conservation health, ecotoxicology, surveillance

Impacts of logging on tropical forest birds: Implications in forest management system

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The increasing need for intensive forest land use has motivated efforts to develop methods of sustainable management. This study examined the composition of understorey bird species in primary and logged forest. Bird survey was carried out using mist-nets in unlogged, 5-year-old and 10-year-old logged over forests at Sungai Lalang Forest Reserve, Selangor, Malaysia. The results indicated that a total of 20 families were captured, which were represented by 58 species (271 individuals), 62 species (288 individuals) and 61 species (386 individuals) in the primary, 5-year-old and 10-year-old logged forests respectively. The family Pycnonotidae, Nectariniidae and Timaliidae formed more than 50% of the total species captured in the three sites. The Pycnonotidae and Nectariniidae, which mostly comprised of secondary or colonizing species such as bulbuls and spiderhunters increased in number while the primary forest babbler species of Timaliidae decreased when condition shifted from primary to logged forests. Results also indicated that insectivore, which includes sallying insectivore, terrestrial insectivore, foliage-gleaning insectivore and bark-gleaning insectivore, represented the highest number of species captured in primary forest. In contrast, more frugivore/insectivore and nectarivore/insectivore species were captured in logged than in primary forest. Thus, the species belong to these guilds might be suitable indicators of forest condition due to their sensitivity to habitat disturbance and change. The maintenance of the key components of biodiversity such as avifauna with respect to their significant ecological roles may be an option that aids in the sustainable management and the long-term productivity of forests.

Areas of interest: Wildlife management, ecology, ornithology

One Health Institute: Working at the interface of animals, people and the environment

Chris Kreuder-Johnson*, Patricia A Conrad*, Kirsten Gilardi, Woutrina Smith, Tracey Goldstein, Mike Ziccardi, Karen Shapiro, Jonna Mazet
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The One Health Institute (http://www.vetmed.ucdavis.edu/ohi/) is active globally, working at the interface of animals, people and the environment to solve complex problems that impact health and conservation. In Talk 1 Chris Johnson will describe: a) the role of wildlife and environmental drivers in the emergence of zoonotic disease which is the PREDICT focus - a global wildlife surveillance program for emerging viruses (http://www.vetmed.ucdavis.edu/ohi/predict/index.cfm) and b) her studies at the human-wildlife interface which resulted in recent legislation on the use of lead shot by hunters in California. In Talk 2 Pat Conrad will briefly describe a) what we've learned from marine mammals about coastal and ocean 'pathogen pollution', b) the status and role of mountain gorillas living in national parks in Rwanda, Uganda, and the Democratic Republic of Congo which are cared for by the Gorilla Doctors (http://www.gorilladoctors.org/) and c) the benefits of collaborative research and capacity building at human-animal-environment interfaces as demonstrated by the Health for Animals and Livelihood Improvement (HALI) Project in Tanzania (http://haliproject.org). The One Health Institute grew out of the well-established Karen C. Drayer Wildlife Health Center and UC Davis School of Veterinary Medicine's deep commitment to the One Health approach to global health.

(*co-presenters, one talk each)


Chris Kreuder-Johnson


Patricia A Conrad

Reversing the trend of wildlife poaching in Tanzania

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Despite efforts to curb the wildlife poaching, it is still ranking at the top in the global conservation agenda. Tanzania is one of the most affected countries. The 2013 CITES Conference, held in Bangkok, classified Tanzania along with Kenya, Uganda, China, Thailand, Malaysia, Vietnam and Philippines as the 'Gang of Eight' or the worst offending countries in the Ivory Trade. This paper reviews the current situation of wildlife poaching in Tanzania focusing on the status, drivers, challenges and opportunities in addressing the crisis. As a way forward, the paper offers some policy recommendations to reverse the growing trend of poaching threatening the country's natural heritage.

Areas of interest: Wildlife, poaching, Tanzania

Etiology and lesions associated with a novel skin disease affecting Giraffe in Ruaha National Park, Tanzania

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The present study attempts to determine the etiology and describe the histopathology of an emerging disease in a population of Giraffe (*Giraffa cameropardalis*) in Tanzania. Twenty-four animals with clinical and two without clinical signs were immobilized using Etorphine-HCL (dose 18-20mg per animal). Skin scrapings and biopsies were sampled. Skin scrapings were subjected to standard microbiological culture to isolate potential pathogenic bacteria and fungi. Skin biopsies apportioned and kept for pathological examinations and nematode culture. Tissue samples were subjected to histopathological examination using H&E stained tissue sections. Results indicated a number of bacterial and fungal growths on both sick and apparently healthy individuals. Histologically, variable numbers of spiraled nematodes (larvae) were observed in sub-epidermal spaces possibly lymphatic vessels of clinically sick animals. Many of them were surrounded by inflammatory cells, predominantly eosinophils, with fibrous connective tissue. Tissue culture revealed slender elongated motile worm like organisms whose identity is yet to be specified. The spiraled nematodes are thought to be the primary etiology while the bacterial and fungal isolates are secondary agents that contribute towards the development of the disease. Further studies are recommended to identify the spiraled nematodes and the impact of the disease on the population of giraffe in Tanzania.

Area of interests: Wildlife immobilization, diseases, mega-herbivores ecology

Health challenges at wildlife-livestock-human interfaces in Uganda

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Uganda has critical challenges occurring at wildlife-livestock- human interactions due to it's fast growing human population. Wildlife protected areas (PAs) like national parks, game reserves and sanctuaries occupy over 23% of it's total area, representing a variety of ecosystems: savannah, woodlands, rainforests, semi-arid rangelands, wetlands and mountains. These areas are a home to ungulates, primates, carnivores, birds, rodents, bats, amphibians, reptiles, insects and fish. At wildlife-livestock-human interfaces, humans have invaded wildlife habitats and vice versa is true. Activities like livestock keeping, crop farming, hunting, industrialization, petroleum extraction, mining, road construction and tourism do occur inside PAs. In such arrangements, there is transmission of diseases among these three groups of animals. Outbreaks of emerging and re-emerging diseases have been reported. Some diseases are endemic. Outbreaks of ebola, Marburg disease, anthrax, foot and mouth disease, trypanosomosis, brucellosis, tuberculosis, sylvatic plague, echinococcosis, cysticersosis, leshimaniasis, cryptosporidosis, hepatitis and toxoplasmosis has been reported. Threat of avian flu does occur. Inside and outside PAs, pollution from water runoff from agricultural land and mines do occur. It was against the above background that out Department has repositioned itself to become a Centre of Excellence in Wildlife Health Research so as to tackle these challenges in collaboration with regional and international partners.

Areas of interest: Health, wildlife-livestock-human interfaces

Environmental racism and struggles for recognition of people in the Amazon forest

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Racism is an ideology, a form of oppression and violence and a system of privilege. The race-ethnicity as an analytical category of social sciences has been an effective indicator to evaluate the distribution and access to natural resources, the direction of environmental public policy and the allocation of ordinary and toxic waste. In the Amazon, natural resources and the negative externalities produced in the environment have been distributed over the years, according to the race-ethnicity of the people living in the region, which has established an inexorable link between access to environmental heritage, ecological problems and race-ethnicity inequalities. On the other hand, the concept of environmental racism has helped researchers and community leaders to leave the simple debate about conservationism x nature of preservationism toward a denser debate on social justice. Thus, the struggle for recognition of land rights and the management of commodities in the Amazon (such as water, natural gas, gems, etc.) by indigenous and traditional riparian communities will be discussed during this presentation. We will explore how these communities are being threatened by major infrastructure projects and reform proposals of regulatory frameworks aimed to protect their rights. The purpose of this presentation is to demonstrate how the concept of environmental racism provides elements and a compatible language to understand the current socio-environmental conflicts in the Amazon, currently laying in opposition and tension between traditional communities and large capital investments.

Areas of interest: Environmental racism, struggles for recognition, amazon, riparian communities

Game numbers, the predator pit and the occurrence of zoonotic diseases

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With the changes in land use all over Europe, but also at many other places on Earth, due to the changes in markets and human demography, the question arises what sort of future there is for wildlife. On the one hand, the agri-industry becomes less and less tolerant of wildlife, but on the other hand much land gets abandoned. In these abandoned lands, wildlife can take hold again as one sees in many parts of the world. From a zoonosis point of view, one can ask oneself whether it is desirable to have very high numbers of deer, boar, or antelopes, and the issue then becomes whether these animals can kept at reduced levels or not.
The same change in demography is leading to an ever-decreasing hunter population, and those hunters increasingly do not want to continue hunting on a weekly basis but only when they are eager to go into the countryside for shooting. This leads presently to quite a substantial reduction of the number of hunting days per year as evidenced in France or the Unites States. In Japan there even is a programme to get more women as hunters to help reduce the number of wild boar in the country side: there are not enough men anymore who are willing and able to go out.

If that is the case, what then is the alternative? A good substitute may be found in large predators. In our talk we will present a model that shows what you have to do to get a wildlife population of zebra or wildebeest as large game, and impala as small game out of a predator pit (of lion, cheetah and leopard) or to keep it in that predator pit. The model is based on the respective body masses of prey species and predator species, and can thus easily be applied to other animal species such as moose, deer and roe deer on the one hand, and wolf on the other.

Why owls? Using nocturnal birds to improve nature conservation in Malaysia

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In Malaysia, there are a total of 17 resident owl species, which are segregated according to habitats and elevation. Despite this, only a few studies on these birds are available. My talk covers my previous and on-going research on ecological and socio-economic aspects of the owls in Malaysia. The combination of radio-telemetry and call playback methods provided ecological baseline with respect to spatial requirements of the Sunda Scops Owl (*Otus lempiji*) in lowland forests. In agricultural areas, assessing owl pellets suggested that Barn Owl (*Tyto alba*) may respond functionally and numerically to changes in prey numbers and this justifies its role in biological control of rodents. A questionnaire survey conducted in local universities and residential areas indicated that, regardless of certain misbeliefs, the majority of respondents supported the protection of owls particularly in relation to the birds' ecological roles. All these findings are essential in improving our understanding and protection of the little known taxon in Southeast Asia in view of its interspecific interactions, being a predator, as well as its associations with humans.

Areas of interest: Raptor ecology, avian migration, conservation biology

Technology advances for vertebrate pest eradication

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Internationally, over the last 20 years the number of registered toxins for the control of small mammals has declined. Through the efforts of research we have bucked this trend in NZ and retained and developed new tools. For example, three new toxins have been researched and are now registered for field use in NZ, namely para-aminopropiophenone (PAPP) in 2011 for stoats and feral cats, microencapsulated zinc phosphide (MZP) for possums in 2012 and encapsulated sodium nitrite (ESN) in 2013 for possums and feral pigs.

The development of PAPP and ESN (also referred to as red-blood cell toxins) represent the first new vertebrate pesticides registered for field control of mammalian pests anywhere in the world for > 25 years. Research on other species-specific rodenticides including norbormide continue, and the first successful field trials of a self-resetting, toxin delivery device for possum (using MZP) and stoat (using PAPP) control were completed in 2013 and 2014. Aerial PAPP application is being explored and this could enable localised eradication of stoats in NZ.

Continued research on improved deployment strategies, integration of humane and selective toxins, lures of greater potency and species-recognition technology will greatly transform ground control for endangered species protection in NZ.

Areas of interest: Toxins, local eradication, wildlife monitoring

Wildlife management studies at the Agriculture and Veterinary School, Bologna University (Italy)

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The Agriculture and Veterinary School at Bologna University have wide opportunities of studies in wildlife management and "one health" concept. The two faculties forming the school have a long tradition in agricultural ecology, landscape planning, forestry, environmental and natural history sciences as well as the veterinary themes. Is rooted in the territory of the Emilia Romagna Region that has many excellences in agricultural production, dairy and livestock industry, as well as built a network of protected areas and enhanced its forests and wildlife heritages. Nevertheless also the largest Italian university has relationships with research and production institution in all the national territory and much international collaboration. My researches are mainly devoted to mammal ecology, using bats as principal model, investigating ecology and conservation of the group. Small mammals, meso-predators and birds of prey are also considered in their role as bioindicators. In an area were the increasing of urbanisation is changing the relationship among people, land use and wildlife, generating very different interests in the management also the role of the wildlife in the "one health" concept are under study, trying to better understand the evolution human-wildlife relationship by this point of view.

Areas of interest: Wildlife ecology, emerging infectious and zoonotic diseases, human-wildlife conflicts

Threats and opportunities for wildlife: Experiences from Uganda

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Wildlife plays a major role in sustaining ecosystem services. Plants are primary producers and components of biogeochemical cycles. Animals are important in dispersal, pollination and decomposition. Loss of wildlife affects the stability, resistance and resilience of ecosystems. Globally, 52% of vertebrate species were lost between 1970 and 2010. In Uganda, the primary threat to wildlife is habitat loss. The drivers of habitat loss are; encroachment of protected areas (PAs) for agriculture, water development, pollution, and exploration of below-ground resources. Other threats include; poaching for food and bushmeat trade, snare injuries, trans-species infections, and human-wildlife conflicts. The threats have affected Uganda's wildlife, with many species being endangered or extinct. Uganda is implementing strategies to manage the threats. The strategies present opportunities for wildlife. The extinct white rhinos were re-introduced. Mpokya corridor between Kibale and Queen Elizabeth National parks was restored. Park boundaries were delineated and collaborative management of resources implemented around PAs to curb conflicts. Research stations have been established in PAs to monitor wildlife health. Wildlife ecology is integrated into the curricular for forestry, tourism, agriculture, among other degree programs. The strategies, in addition to improved implementation of relevant polices, are hoped to reduce the threats and enhance the role of wildlife in sustaining ecosystem services.

Areas of interest: Forestry, restoration, wildlife

Positive and negative effects of wildlife on the spread of infectious zoonotic diseases

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Although land use is known to have negative effects on wildlife, many people live intrinsically connected to wildlife in many parts of the world (especially in the least developed countries) and a strong wildlife comeback occurs in other parts (in many developed countries). Interactions between people and wildlife often create challenges such as increasing disease transmission between wild and domestic animals that also poses risks to human health. On the other hand, increasing wildlife diversity is known to reduce disease transmission, i.e. the so-called dilution effect. In this presentation, we will show under what conditions the negative and positive effects of wildlife on the spread of infectious zoonotic diseases occur. Therefore, we first explore the fundamentals of the diversity-disease relationship. Using simple models, we show how landscape structure modifies this diversity-disease relationship due to effects on wildlife movement and diversity. The net impact of landscape structure on disease risk can be either positive or negative, depending on the relative importance of the facilitation effect (through increasing movement rates) versus the dilution effect (through increasing wildlife diversity). Our study contributes to the current debate on the positive and negative effects of wildlife on the spread of infectious zoonotic diseases.

Areas of interest: Wildlife ecology, diseases, wildlife-livestock interactions

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Johan Schnürer
Carl-Gustaf Thulin

Practical information

All lectures and workshop activities will be held at Loftet (marked with a blue dot on the map).

Transport to Loftet
By bus: Busstop "Campus Ultuna" then follow the signs for the workshop.

You have received 3-day local bus ticket in your bag. Bus no 1 and bus no 12 departs from B3 and Bus no 20 from A1 at Uppsala station across the street from your hotel Svava (see map).

Timetable:	Departure Uppsala Station	Arrival Campus Ultuna
Bus no 1 (B3)	08.00	08.22
	08.08	08.30
	08.15	08.37
	08.23	08.45
Bus no 12 (B3)	08.03	08.20
	08.33	08.50
Bus no 20 (A1)	08.07	08.24
	08.36	08.56
	Departure Campus Ultuna	Arrival Uppsala Station
Bus no 20	18.57	19.19
	19.28	19.50
	19.58	20.20
	20.26	20.48
	20.56	21.18
	21.26	21.48
	21.56	22.18
	22.26	22.48

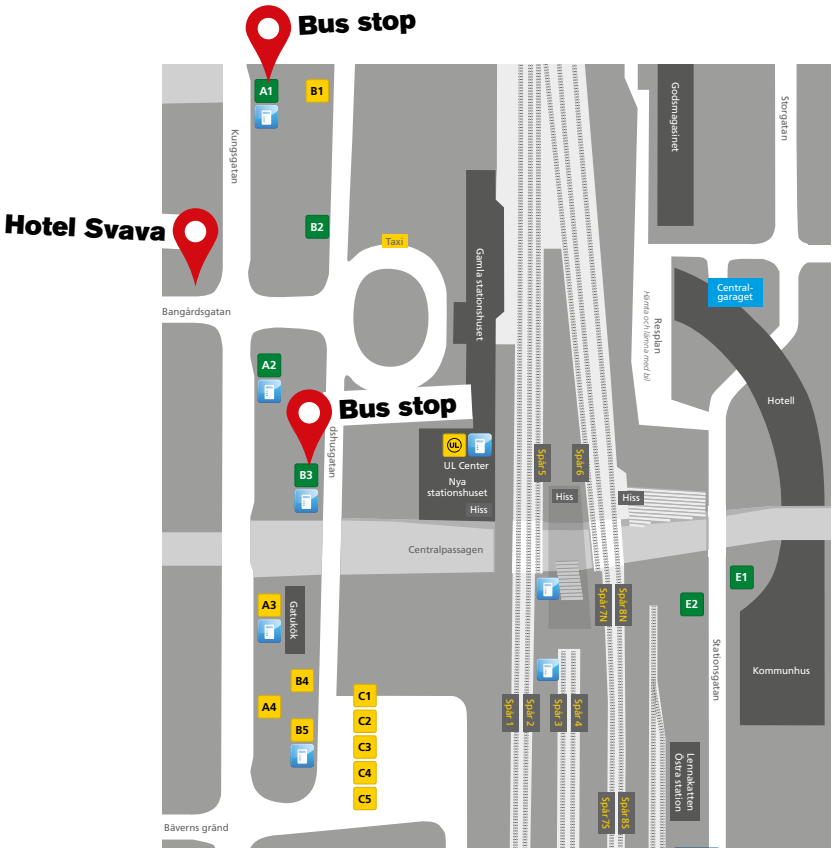
By taxi: The address is "Almas allé 10" and then follow the signs for the workshop.

Taxi Kurir can be reached at +46 18-12 34 56. The price from the hotel to Campus is approximately 200 SEK.

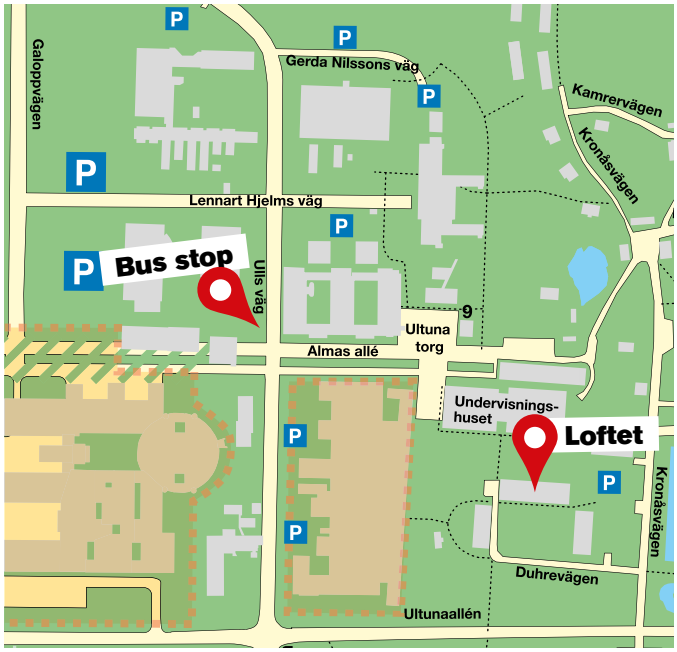
Meals during Workshop
On the reception at Uppsala Castle April 26, there will be a light buffet including drinks (wine, beer, soft drinks) served. During the workshop, lunch and coffee will be served adjacent to Loftet. On April 27, a light dinner will be served at Loftet after the workshop activities.

On the excursion, April 28, all meals including the conference dinner will be served at Äleby Estate. There will be outdoor activities (wildlife viewing), so bring clothes accordingly!

Map over the city centre of Uppsala with Hotel Svava and bus stop marked with arrows.



Map over SLU, Ultuna Campus with Loftet and bus stop marked with arrows.



Sveriges lantbruksuniversitet
Swedish University of Agricultural Sciences

– kunskap för en hållbar utveckling

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