

Application Cover Page

Page 3 contains instructions for completing this form.

Program: Wildlife Without Borders - Africa

Project Title: Evaluating Risks of Bushmeat in Cameroon to Improve Sustainability

Project Location (region or protected area/country): Cameroon

Project Coordinates (latitude/longitude): 3.8667 / 11.5167

Proposed Period of Project Activity: 06-01-15 to 05-31-17

Amount Requested from USFWS:	\$261,081.63		USD
Applicant's Contribution:	\$0.00		USD
Other Partner Contributions:	\$0.00		USD
Total Project Cost:	\$261,081.63		USD

Applicant Organization: EcoHealth Alliance

DUNS Number:

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Tax ID Number:

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Funds should be made payable to: EcoHealth Alliance - DUNS# 0770900660000

Provide DUNS if payee is not applicant

Project Manager (provide name, title, organization, phone number, email and mailing address):

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Alternate Contact Person:

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Organization: University of Minnesota

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Partner organizations contributing cash or in-kind support to this project:

<u>Organization</u>	<u>Contribution Amount (USD)</u>
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The U.S. Fish and Wildlife Service is interested in engaging partners for international wildlife conservation. To achieve this goal we may share your proposal with qualified organizations or individuals that have the potential to enhance the proposed conservation effort. If you prefer that your proposal not be shared, please check this box ☐


SIGNATURE OF AUTHORIZED REPRESENTATIVE

15 January 2015
DATE

NAME OF AUTHORIZED REPRESENTATIVE: Aleksei Chmura

TITLE: Authorized organizational representative

APPLICATION COVER PAGE INSTRUCTIONS

Program Name:	Select program name from the drop down box or, if completing a printed form, insert the name of the grant program under which you are submitting your application. The programs are: African Elephant Conservation Fund; Asian Elephant Conservation Fund; Great Ape Conservation Fund; Marine Turtles Conservation Fund; Rhinoceros and Tiger Conservation Fund; Wildlife Without Borders-Africa, Latin America & the Caribbean, Mexico, Amphibians in Decline, and Critically Endangered Animals.
Project Title:	Project title should reflect the nature of the work to be performed, and include specifics on the location and country where the work will take place.
Project Location:	List either the protected area or region in which the project will take place.
Project Coordinates:	Enter the latitude and longitude of the project site in decimal degrees. If there are multiple project sites, identify coordinates for the primary site or project headquarters.
Proposed Period of Project Activity:	Enter the month and year of the start and end of the project.
Amount Requested from FWS:	State the amount being requested from the FWS (in U.S. Dollars)
Total Applicant Contribution:	State the amount your organization will contribute to the project (in U.S. Dollars)
Total Partner Contributions:	State the sum total of all contributions from other partners (in U.S. Dollars)
Total Project Cost:	This is the sum of the three amounts listed above (in U.S. Dollars)
Applicant Organization:	This is the organization or individual submitting the application.
DUNS #:	U.S. Governmentwide policy requires all applicant organizations and individuals, both domestic and non-domestic, to apply for, and include a Dun & Bradstreet Data Universal Number System (DUNS) number on their application. Applicants without a DUNS number should go to http://fedgov.dnb.com/webform/pages/CCRSearch.jsp . You will be prompted to select your country and then search the database for your organization/name. If your organization/name is not found, you will be routed to a web page that allows you to select "Request a New D-U-N-S Number". Follow the instructions for obtaining a new number. Applicants who already have a DUNS number are responsible for updating changes to their address or business name with Dun and Bradstreet directly. The organizational address to be used in the event an award is made must match the information in Dun & Bradstreet's system. An application will not be considered eligible for funding until the applicant provides a valid DUNS number.
TIN #:	Tax Identification Number. Required for all U.S.-based organizations. If you are located outside the United States and do not pay employees within the U.S., you are not required to provide a Taxpayer Identification Number.
Funds should be made payable to:	This is the name of the organization or individual who will receive payment from the U.S. Treasury in the event of an approved grant. The organization or individual listed here should be the same as the Applicant Organization listed above. Other organizations or individuals are not typically permitted to receive funds on behalf of the Applicant Organization without appropriate justification and verifiable written approval from the Applicant Organization.
Project Manager:	The Project Manager is the primary person responsible for overseeing the project activities, and can be contacted for technical, biological, or other questions related to the proposal. Provide: Name; Title; Organization; Mailing Address*; City/Province/State/Country; Zip/Postal Code; Telephone number (include country and city code, if applicable); Fax number; and E-mail address.
Grant Administrator:	In the event an award is granted, the Project Administrator is the person who will receive all grant-related documentation from FWS. If the Grant Administrator will be someone other than the Project Manager provide: Name; Title; Organization; Mailing Address*; City/Province/State/Country; Zip/Postal Code; Telephone number (include country and city code, if applicable); Fax number; and E-mail address. <i>*The mailing addresses you provide must accept delivery of express/courier mail (DHL/FedEx/Airborne Express). Typically express/courier mail is only deliverable to an actual street address. Do not provide a P.O. Box unless your in-country courier service will deliver express/courier mail to your P.O. Box.</i>
Alternate Contact Person:	The Alternate Contact Person should be available in the absence of the Project Manager and should be familiar with the project activities. For Alternate Contact Person provide their name, organization, telephone, and e-mail address.
Partner organizations:	List each partner organization name and amount of cash and/or in-kind support to be contributed to

	this project. Amounts should be listed in U.S. Dollars. The total of these contributions should equal the amount under Total Partner Contributions above.
Signature:	Cover page must include the signature of your organization's authorized representative. Below the signature and the date, include his/her full name and title.

NOTICE

In accordance with the Paperwork Reduction Act (44 U.S.C. 3501), please be advised that:

1. The gathering of information from potential grant recipients is authorized under Section 8 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531-43, the African Elephant Conservation Act (16 U.S.C. 4201-4203, 4211-4214, 4221-4225, 4241-4246); the Rhinoceros and Tiger Conservation Act (16 U.S.C. 5301-5306); the Asian Elephant Conservation Act (16 U.S.C. 4261-4266); the Great Ape Conservation Act (16 U.S.C. 6301-6305); and the Marine Turtle Conservation Act (P.L. 108-266).
2. The submission of requested information is required for all entities competing for financial assistance awards under the *Wildlife Without Borders* Programs and the Multinational Species Conservation Funds.
3. You are not required to respond to a collection of information unless it displays a currently valid OMB control number.
4. This information collection has been approved by OMB and assigned clearance number 1018-0123.
5. The requested information may be subject to disclosure under provisions of the Freedom of Information Act (5 U.S.C. 552).

The public reporting burden for the information collected on this form is 1 hour. This burden estimate includes time for reviewing instructions, gathering data, and completing and reviewing form. The public reporting burden for completing a full proposal is 21 hours, which amounts to a total estimated time of 22 hours to fully respond to this information collection.

B. Project Summary

Cameroon has a wide range of landscapes and climates, from grasslands and highlands to dense rain forests. With its varied geography and habitats, Cameroon has remarkable diversity and an abundance of wildlife (Republique du Cameroun, 2014). Cameroon is also an important distribution hub for goods going to the Central African Republic, Equatorial Guinea, Gabon, and Chad. Recently, there has been increased investment in major infrastructure projects, including transportation, water supply, and power generation in areas that were once largely inaccessible. The combination of increasing natural resource extraction and infrastructure development has led to increasing human-wildlife interactions. Furthermore, wildlife populations are being pushed into ever-smaller areas, and hunting pressure has simultaneously increased (Brashares et al., 2011). To reduce threats to key wildlife populations, and enhance institutional conservation capacity in Cameroon under the **Cameroonian Environment Management Framework and Forestry and Environment National Program**, we are submitting this proposal to advance our understanding of wildlife-sourced protein acquisition, bushmeat consumption, and commercial trade to inform efforts to reduce demand and improve sustainability.

Recent economic progress has led to advancing education levels and improved health in Cameroon, yet poverty remains high at 40%, and life expectancies are lower relative to the regional averages (World Bank, 2014). Bushmeat represents one of the main sources of animal protein in extractive industries throughout of Cameroon. Additionally, wildlife hunting is important for rural food security and income. However, it has placed extreme pressure on some wildlife populations, as urban and rural demand for bushmeat has increased. Hunting and **wildlife meat processing** carries a substantial risk for cross-species **exposition and transmission of zoonotic pathogens of wildlife origin**. Despite the increasing demand for bushmeat in Cameroon, the goal for this project is to reduce bushmeat consumption and its commercial trade, to reduce the risk of pathogen exposition, transmission and spread.

Wildlife pathogens, including new retroviruses, have been detected in people that hunt and butcher wild animals in Cameroon (Wolfe et al., 2004, 2005; Zheng et al., 2010). Importantly, this high-risk activity in Western Africa was the likely pathway by which multiple zoonotic diseases emerged in people. Preventing the emergence of zoonotic diseases requires an enhanced understanding in human food preferences, nutrition, cultural practices, and behaviors. Especially in areas with recent anthropogenic disturbance and high-risk human-wildlife contact, which increases the likelihood of emergence and spread of zoonotic pathogens. We will study these complex and interacting preferences, practices, and behaviors in Yaoundé, the capital of Cameroon, due to the high population density and thus increased likelihood of disease spread. Furthermore, education and outreach activities are likely to be more impactful in a densely populated city. Via community outreach, assessment, and education, we hope to identify the social and human factors that contribute to the consumption of bushmeat in hope of reducing consumer preferences for bushmeat and its consumption in Cameroon.

C. Project Narrative

1. Statement of Need

Emerging infectious zoonotic diseases have existed for as long as man and animals have walked the Earth; however, only recently has the global impact of emerging infectious diseases been quantified in terms of cost to economies, biodiversity, and to public health (Jones et al., 2008). Specifically, in Western Africa, the very real threat of zoonotic diseases, like the Ebola Virus, poses danger to local and international communities alike. Evidence suggests that HIV-1, a zoonotic disease, emerged from geographically isolated chimpanzee communities in Cameroon (Keele et al., 2006). This likely occurred because blood and body fluid exchange with non-human primates via hunting, butchering, and pet contact are risk factors for human T-lymphotropic virus emergence (Wolfe et al., 2005). These findings suggest that reducing wildlife contact and bushmeat contact will reduce emerging infectious risk.

Bushmeat has been defined in multiple ways over the years. In this proposal, bushmeat is a term referring to the use of wild animals, ranging from cane rats to gorillas, for food. Bushmeat consumption is tied to health of the global economy, and the state of the economy contributes to the health of the environment (Sayer et al., 2012). Cultural, political, and economic factors have led to an increase in the bushmeat trade over the past 2 decades and thus increased the opportunities for the successful transmission of disease from a wild reservoir to a host, the first step in disease emergence (Karesh & Noble, 2009). This myriad of factors makes curtailing the trade and consumption of bushmeat a very difficult task.

Even the scale at which these factors (e.g., local, regional, national) are analyzed seems to play a role in the harvest and consumption of bushmeat. Even small-scale regional economics are a factor in the spatial location and types of bushmeat sold at markets (Fa et al., 2014). The relationship between wealth and wildlife consumption varies geographically (Brashares, Golden, Weinbaum, Barrett, & Okello, 2011). Wealthier households tend to consume more bushmeat in settlements nearer urban areas, but the opposite pattern is observed in more isolated settlements. Bushmeat hunting is an important source of income in rural areas of Africa, and Cameroon produces 88% of all ungulate bushmeat throughout Africa (Davies & Brown, 2008). The price of bushmeat at local markets is dependent on seasonality and the method of capture used by hunters (Allebone-Webb et al., 2011). An inventory of the four main markets in the Cameroonian capital, Yaoundé, from 1995 to 1996, found that 70–90 tons of bushmeat was sold monthly. Similarly, the overall annual bushmeat trade in Gabon has been valued at about \$25 million (Nasi et al., 2008). Bushmeat is not only a primary source of protein for many families in Cameroon, but also a source of income and wealth.

Unfortunately, animal husbandry is not a viable income source in rural areas, and forest, concession, and conservation lands are increasingly being controlled by local management with the local communities acting as stewards (Russell, Mbile, & Tchamou, 2011). This focus on sustainable forest management, which may require sourcing timber from plantations, means managing natural forests for the provision of non-traditional forest products and forest services

like ecotourism and habitat for wild animals (Ndoye & Tieguhong, 2004). Thus, forest protection is providing habitat for the wild game hunted in Cameroon. Community investment and compensation for conservation should be directly related to the benefits generated by the areas protected, including the community's wages, income, sustainable access to meat, and non-timber forest products; investments should simultaneously improve community-based social services and infrastructure (Schmidt-Soltan, 2004). Despite these observations and findings, compensation for conservation is not offsetting the benefits of bushmeat acquisition and trade.

Finding a consensus solution to the bushmeat crisis is a difficult task because of the many competing interests and social factors involved (Karesh & Noble, 2009). In 2006, Edderai and Dame identified 15 bushmeat markets and 145 restaurants and cafeterias selling roughly 1,000 bushmeat dishes per day in Yaoundé. This trade provided employment for 249 people. A vast network of routes transported Bushmeat, in particular from the savannah and central provinces, which are rich in wildlife and contain National Parks and safari hunting areas. In addition to the underlying economic and infrastructure factors related to the bushmeat trade, individuals are able to discern the type of protein being consumed. Despite individual's ability to identify bushmeat, individual preference seems to play a role in the choice of protein (Schenck et al. 2006). These preferences seem to be influenced by familiarity with the protein, tradition, prestige, and price. Therefore, we need to understand the difference between stated and observed preferences for bushmeat, by each species type, while evaluating the combined quality and preferences for alternative protein sources.

Despite individual differences and preferences of bushmeat, several possible solutions to the bushmeat crisis (e.g., legalization and taxation of the bushmeat and wildlife trade) are unlikely to be effective due to insufficient tax revenue and will not likely reduce demand for wildlife in Cameroon (Wilke et al., 2006). More investment in Africa, in areas that ensure education and political stability and move beyond resource depletion, would go a long way in controlling the bushmeat trade and reducing emerging infectious disease risk (Karesh & Noble, 2009). Furthermore, a better understanding of the specific social factors that influence bushmeat consumption and trade will help inform outreach efforts to reduce bushmeat consumption and associated disease risk. This study seeks to explore the social factors influencing bushmeat consumption and trade, the barriers to alternative sources of protein, and indicators for change in consumption and trade patterns.

2. Project Goals & Objectives

The term bushmeat holds different meanings for different people. For many people bushmeat is a necessary protein source, and for others the bushmeat trades represents an overzealous exploitation of endangered and threatened species that can result in disease spread. Our primary goal in this study is to understand the complex interactions of culture, food security, food safety, and wildlife conservation, and social factors like economics, anthropology, and sociology. These factors drive hunting behaviors, consumption of bushmeat, and wildlife management strategies at local, national, and international levels.

Our goals are to:

- understand what protein sources are available (all types) for consumption;
- understand how and why individuals and families make bushmeat consumption decisions;
- develop and promote best practices for bushmeat consumption;
- use the best practices identified to promote less risky choices to community leaders and to the general public; and,
- develop and implement indicators that will measure changes in bushmeat attitudes, awareness, consumption, and trade.

Our supporting objectives are to:

1. develop, design, and conduct a seasonal longitudinal survey in Yaoundé, Cameroon;
2. design risk management strategies for bushmeat consumption in terms of food safety conservation, and sustainability of natural resources;
3. engage local authorities and community leaders on the reduction and safe - sustainable commercial bushmeat trade where culturally appropriate;
4. engage the general public to understand bushmeat risks and reduce overall bushmeat consumption; and,
5. understand the drivers of the bushmeat value chain from baseline over time by measuring bushmeat attitudes, awareness, consumption, and trade patterns using key indicators from our seasonal survey, while measuring the impact of our activities over time.

3. Project Activities, Methods, & Timetable

Objective 1: Design and conduct a seasonal, longitudinal survey in Yaoundé, Cameroon.

Activity 1 - Focus Groups: Our Partners in Cameroon will lead and conduct focus groups in Yaoundé. Focus groups will consist of 10 participants, aiming for a mix of rural residents, local government officials, non-governmental organization representatives, and wildlife professionals. There will be 4 focus groups for a total of 40 participants. Sessions will be recorded and detailed notes taken in accordance with obtaining informed consent in accordance with international IRB standards. Results from focus groups will be thematically coded using qualitative software for key patterns and distilled to inform indicators of change in bushmeat consumption and trade patterns as well as best practices.

Activity 2 - Structured Interview-based Survey: We will conduct structured interviews with residents in Yaoundé. We will draw our sampling frame from a stratified random sample after dividing Yaoundé into gridded squares. We will also interview organizational leaders, industry, and government officials involved in wildlife preservation, food systems, and bushmeat regulation. These interviews will focus on bushmeat hunting activities and awareness, bushmeat consumption, cultural factors, demographics. We aim to conduct 400 repeated measures interviews. Interviews will be audio-recorded, data will be automatically entered into survey software via iPads taken out into the field, and field notes will be taken.

Objective 2: Design culturally appropriate risk management strategies for bushmeat consumption.

Activity 3 - Risk management strategy development. During interviews and focus groups with leaders, industry, and government officials, we will co-develop risk management strategies appropriate for the governance context of the country. Interviews will be audio-recorded with permission from participants and transcripts will be thematically coded for relevant patterns and consensus on strategy development. Stakeholders will approve copies of strategies.

Objective 3: Engage local authorities and community leaders on reduction of commercial bushmeat trade.

Activity 4 - Community forums. Local partners in Cameroon will host community workshops and forums to train community leaders and authorities on bushmeat risks and the benefits of using bushmeat management strategies in their communities, and will provide training on how to provide their newly acquired knowledge and skills to others.

Objective 4: Engage the general public to reduce bushmeat consumptions

Activity 5 - Disseminate materials on effects of bushmeat consumption. Brochures, posters, websites, text messages, and radio announcements will be assembled that highlight current statistics and potential negative consequences of bushmeat consumption and trade.

Objective 5: Take a baseline measurement of bushmeat attitudes, awareness, consumption, and trade patterns using key indicators from our seasonal survey.

Activity 6 - Survey key stakeholders and general public using indicators. A sub-sample of the participants from *Activity 2* will be re-surveyed using the indicators developed from survey results on what factors are most related to bushmeat consumption and trade.

		Year 1				Year 2			
		Summer	Fall	Winter	Spring	Summer	Fall	Winter	Spring
Planning	Project kick-off meeting in Cameroon	x							
	Identify target audiences and sample survey participants	x	x	x					
	Build survey instrument		x	x					
	Test survey instrument on focus groups		x	x					
Implement	Implement survey		x	x	x	x	x	x	
	Analyze survey data			x	x	x	x	x	x
	Develop campaign message	x	x	x	x	x	x	x	x
	Project follow-up meetings in Cameroon			x				x	
	Develop indicators to measure changes in bushmeat consumption and trade					x	x		
	Year 2 kick-off meeting					x			
	Identify barriers to changing bushmeat consumption patterns						x	x	
	Community forums and workshops				x	x	x	x	x
	Train the trainer events						x	x	x
	Baseline measurement using indicators of change								x
	Interview community leaders, industry and government stakeholders		x				x		
Evaluation and Deliverables	Mid-term and final reports			x				x	x
	Present proposed work and results at conferences		x		x				x
	Prepare and submit publications							x	x
	Disseminate bushmeat and protein consumption information			x	x	x	x	x	x
	Final meeting in Cameroon								x

4. Stakeholder Coordination/Involvement

The program is designed to be highly collaborative and multidisciplinary in nature, and aims to work closely with the following list of individuals, organizations, and agencies in establishing, developing, and implementing the program:

- University of Minnesota, USA (Veterinary Population Medicine and School of Public Health; Dr. Dominic Travis and Dr. Mac Farnham)
- Association Epidémiologie Santé Publique Vétérinaire, Cameroon (Dr. Serge Tchuenteu Nzietchueng)
- Ministry of Forestry and Wildlife (MINFOF) Cameroon (Yaoundé Education Unit; Dr. Kuete Fidèle)
- Ministry of Livestock, Fisheries and Animal Industries, Cameroon (MINEPIA; Dr. Loul Séverin)
- Linnaeus University (Sweden), Cameroon (Department of Pedagogy and Psychology; Dr. Dapi Nzefa)
- **The local community and community leaders in Yaoundé, Cameroon**
- **The Ministry of Forestry and Wildlife**

5. Project Monitoring and Evaluation

Project activities will be monitored and administered by EHA. We will measure project success continuously, and in a comprehensive yearly project update and report to USFWS. Success is defined by meeting our target units for measurable results. We will seek feedback from local community leaders and stakeholders at our kick-off and follow-up meetings, and at community forums and workshops to continually improve our research and education materials. At the conclusion of outreach events, we will request feedback and record the number of participants.

The measurable results used to evaluate the project's effectiveness will include:

- Execution of at 1 longitudinal survey in Yaoundé, Cameroon to identify and quantify the contributing factors to bushmeat consumption (e.g., economic, consumer preferences, availability, cultural).
- The number of participants not lost to follow-up.
- The number and percentage of individuals reached through the 'train the trainers' event to promote peer-to-peer learning.
- Peer-reviewed publications and conference submissions.
- Write and disseminate a bushmeat consumption guide with input from key community leaders. The intended audience is Yaoundé residents. It will not contain, but rather will compare alternate sources of protein in terms of nutritional value, average costs, flavor and taste, and individual health risks.
- The number of attendees at five community bushmeat workshops. We will create interactive sessions for participants to discuss the costs, benefits and preferences

associated with bushmeat and alternate sources of protein. The forum will follow in the evening with information sharing.

Conservation outcomes will be achieved using bushmeat consumption indicators developed through our survey instrument, engaging with key partners in Cameroon. We will develop a best practices guide for reducing bushmeat consumption. The guide will be based on the indicators identified in our longitudinal survey that will capture seasonal variation in bushmeat trade and consumption patterns. This best practices guide and associated indicators will form the basis of continued monitoring of bushmeat consumption and the factors that lead to decreased bushmeat consumption in urbanized Cameroon.

Our partners in Cameroon will continue the longitudinal survey to monitor the effectiveness of trainers, to understand how many people are reached through this peer-to-peer network, how effective trainers are in reducing bushmeat consumption, and how cultural factors change as a result of the outreach performed in this study. Our goal is to roll this pilot study into a more regional platform using the USAID Emerging pandemic Threats program of which we are all participants (PREDICT, RESPOND, Building One Health Work Force). This will provide expansion and sustainability platform in culturally appropriate manner.

6. Description of Organizations Undertaking the Project

EcoHealth Alliance's work spans the U.S. and more than 20 countries in Central and South America, the Caribbean, Africa and Asia to research ways for people and wildlife to share bioscapes for their mutual survival. Our strength is built on our innovations in research, education and training and our accessibility to international conservation partners. Internationally, our programs support conservationists in over a dozen countries at the local level to save endangered species and their habitats and to protect delicate ecosystems for the benefit of wildlife and humans via the PREDICT program. Our staff serve as advisors to USG, IUCN, WHO and FAO and have recently been developing bushmeat consumption guidelines for WHO and FAO.

The University of Minnesota has led technical programs for the U.S. Agency for International Development's (USAID) Emerging Pandemic Threats RESPOND project, with a particular focus on applying One Health methodologies and collaborative approaches towards capacity building in disease outbreak response for countries in Eastern and Central Africa. The College of Veterinary Medicine and School of Public Health includes faculty with expertise in epidemiology, virology, infectious disease ecology, wildlife-human interactions, conservation, food security, biodiversity, disease surveillance, risk analysis, animal product exports, marine biology, wildlife control, and agricultural extension (e.g., One Health Work Force & RESPOND) .

The Association Epidémiologie Santé Publique Vétérinaire (ESPV) in Cameroon aims to promote epidemiology, veterinary medicine, and public health. ESPV assists with training public health practitioners and veterinarians in public health. ESPV publishes a periodical in epidemiology and public health and promotes and strengthens collaboration between

community stakeholders in One Health. ESPV performs epidemiological research of animal diseases and then provides community outreach, veterinary extension services, and population health education of human and animal diseases to local communities in Cameroon.

7. Sustainability

EHA staff and partners have been working in Western Africa for over 25 years and the strength and success of our programs is centered on our long-term presence in building local capacity in country. Protocols, collaborative agreements, informational and communication networks will remain in place for the reporting longitudinal survey data for future analysis after the life of this grant. Additionally, computer equipment and software will allow future survey collection and analysis for the next stages of behavioral studies to continue. Education outreach directed at communities to minimize their consumption and trade of bushmeat will persist and expand through EHA and our partnerships. Ongoing training and professional development (capacity building) of Cameroon personnel will facilitate continuity in all aspects of our program.

8. Literature Cited

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Wolfe, N. D., W. Heneine, J.K. Carr, A.D. Garcia, V. Shanmugam, U. Tamoufe, J.N. Torimiro, A.T. Prosser, M. LeBreton, E. Mpoudi-Ngole, F.E. McCutchan, D.L. Birx, T.M. Folks, D.S. Burke, and W.M. Switzer. 2005. Emergence of unique primate T-lymphotropic viruses among central African bushmeat hunters. *Proceedings of the National Academy of Sciences*, 102(22): 7994-7999.

Wolfe, N.D., W.M. Switzer, J.K. Carr, V.B. Bhullar, V. Shanmugam, U. Tamoufe, A.T. Prosser, J.N. Torimiro, A. Wright, E. Mpoudi-Ngole, F.E. McCutchan, D.L. Birx, T.M. Folks, D.S. Burke, and W. Heneine. 2004. Naturally acquired simian retrovirus infections in central African hunters. *The Lancet*, 363(9413): 932-937.

World Bank. 2014. Cameroon. Available at: <http://data.worldbank.org/country/cameroon>. Accessed May 2014.

Zheng, H., N.D. Wolfe, D.M. Sintasath, U. Tamoufe, M. LeBreton, C.F. Djoko, D. JleDiffo, B.L. Pike, W. Heneine, and W.M. Switzer. 2010. Emergence of a novel and highly divergent HTLV-3 in a primate hunter in Cameroon. *Virology* 401(2): 137-145.

9. Map



Figure 1. Two-panel map of the location of the study area. The latitude and longitude of Yaoundé, Cameroon, is 3.8667° N, 11.5167° E using the simple cylindrical projection and WGS84 datum.

10. Governmental Endorsement

EcoHealth Alliance worked under an MOU with the government of Cameroon for the PREDICT project (USAID Cooperative Agreement # GHN-A-00-09-00010-00). A letter of support for this particular project is currently being obtained.

11. Detailed Notification of Security Forces

We will not be working with any security forces or law enforcement officials in Yaoundé, Cameroon.

Andrew G. Huff

Curriculum Vitae

Cell Phone: 212-380-4497 Email: huff@ecohealthalliance.org

EDUCATION

- 2011-2014 University of Minnesota, Minneapolis, MN
Doctor of Philosophy in Public Health – Environmental Infectious Disease
- 2010-2011 University of Minnesota, Minneapolis, MN
Master of Science in Security Technologies, Geographic Information Science Minor
- 2006-2010 University of Minnesota, Minneapolis, MN
Bachelor of Arts in Psychology

RESEARCH MANAGEMENT

EcoHealth Alliance

- United States Department of Defense, Defense Threats Reduction Agency (DTRA) (\$2,800,000 annually)
United States Department of Agriculture (USDA) (\$45,000)
USAID – PREDICT-2 (\$40,000)

Sandia National Laboratories – Federally Funded Research and Development Center

- United States Department of Veterans Affairs Office of Public Health (\$450,000 annually)
United States Department of Homeland Security - Food and Agriculture Sector (\$450,000 annually)
United States Department of Defense, Defense Threats Reduction Agency (DTRA) (classified - unable to disclose award amount)

University of Minnesota

- U.S. Department of Homeland Security grant (No. 2010-ST-061-FD0001) awarded to the National Center for Food Protection and Defense at the University of Minnesota – P.I. Amy Kircher - (\$1,200,000)

ACADEMIC APPOINTMENTS

- 2014-Present EcoHealth Alliance
Spatial Data Analysis, Infectious Disease Ecology, Technical Research & Development
Senior Research Scientist
- 2014-Present Columbia University
Ecology, Evolution, and Environmental Biology
Adjunct Faculty
- 2013-2014 Sandia National Laboratories
Epidemiology, Environmental Health, Food and Agriculture, & Public Health Systems
Senior Member of the Technical Staff
- 2011-2013 University of Minnesota
National Center for Food Protection and Defense
Research Fellow
- 2008-2010 University of Minnesota
Center for Interest Measurement Research
Psychological Research Assistant

RELEVANT PEER REVIEWED PUBLICATIONS & PATENTS

- Huff, A. G., Beyeler, W. E., Kelley, N. S., & McNitt, J. A. (Pending review). How resilient is the United States food system to pandemics and what can society do to increase food system resiliency?. *Journal of Environmental Studies and Sciences*.
- Huff, A. G., Hodges, J., Kennedy, S. P., & Kircher, A. (Pending review). Analysis of the Food and Agriculture Systems Criticality Assessment Tool (FASCAT) and collected data. *Risk Analysis*.
- Huff, A. G. (2014). Enhancing Food Defense: *Risk managers' perceptions, criticality assessments, and novel method for objectively determining food systems' criticality* (dissertation). University of Minnesota, Minneapolis, MN.
- Huff, A. G., Hodges, J. Kircher, A., & Kennedy, S. (2014). State officials' perceptions of Food and Agriculture Sector Criticality Assessment Tool (FASCAT), food-system risk, and food defense funding. *Journal of Homeland Security and Emergency Management*, 0, 1-16.
- Huff, A. G., Kircher, A., Hoffman, J., & Kennedy, S. P. (2013). The development and use of the Food and Agriculture Systems Criticality Assessment Tool (FASCAT), *Food Protection Trends*, 33, 218-223.
- Huff, A. G., Lambert, G. L., Finley, P. D., Evans, L. Mecher, C. E., & Davey, V. J. (2014). Ranking of pandemic influenza mitigation strategies: Why local population demographics matter. Unpublished manuscript.
- Huff, A. G., Ramsey, W., & Kennedy, S. P. (2013). Chapter 4 Assessing Vulnerabilities. Barach, J. T. (Edition 1)., *A systems approach using preventive controls for safe food production; Part 2 Food defense planning: Prevention of intentional adulteration of food*; GMA, 1350 I Street, N. W. Washington, D.C., 20005.
- Huff, A. G., Kircher, A., Hoffman, J., & Kennedy, S. P. (2014). Criticality Spatial Analysis (CRISTAL). Filed by the University of Minnesota. Patent number 61784675.

TEACHING

- | | |
|------|---|
| 2015 | Columbia University, E3B, New York, NY
Adjunct Faculty
How does food preference affect systems-level food production, environmental health, and pathogen emergence? |
| 2014 | Georgetown University, School of Medicine, Washington, D.C.
<i>Guest Lecturer</i>
Agroterrorism |
| 2012 | University of Minnesota, School of Public Health, Minneapolis, MN
<i>Teaching Assistant</i>
Spatial Epidemiology |
| 2012 | University of Minnesota, College of Science and Engineering, Minneapolis, MN
<i>Teaching Assistant</i>
Biosecurity: Security Science & Technologies Foundations |

Maureen Miller, PhD

250 West 99th Street #3C, New York, NY 10025 | 646.303.1372 | miller@ecohealthalliance.org | [@mmepinyc](https://twitter.com/mmepinyc)

Social epidemiologist with experience targeting systems level change in circumstances of limited resources. Skill set includes institutional research and evaluation infrastructure development; data-driven, learning oriented problem solving; managing projects from concept through final deliverable; and building and developing teams of interdisciplinary professionals to move projects forward on time and on budget.

PROFESSIONAL EXPERIENCE

EcoHealth Alliance, New York, NY

- Senior Scientist, Anthropology and Epidemiology 09/14-present

Columbia University, Mailman School of Public Health, New York, NY

(<http://www.mailman.columbia.edu/our-faculty/profile?uni=mm35>)

- Adjunct Associate Professor, Department of Epidemiology 03/11-present
- Assistant Professor, Department of Epidemiology 07/00-02/11
- Assistant Research Scientist, HIV Center for Clinical and Behavioral Studies, New York State Psychiatric Institute 05/94-12/94

MMEpidemiology Inc, New York, NY

- President/Owner, Public Health/Evaluation Consultant Services (www.mmepi.com) 07/00-12/14

New York Medical College, School of Public Health, Valhalla, NY

- Associate Professor, Department of Epidemiology and Biostatistics 10/06-10/09

New York City Department of Health and Mental Hygiene, New York, NY

- Director of HIV Prevention, Bureau of HIV Prevention and Control 08/05-06/06
- Epidemiologist, Injury Prevention Program 03/95-11/95

National Development and Research Institutes, Inc, New York, NY

- Principal Investigator, Center for Drug Use and HIV Research 12/99-05/01
- Project Director, Institute for AIDS Research 11/96-01/98

SELECTED ACCOMPLISHMENTS

Governmental, Non- and Inter-Governmental Organization Public Health Experience

- Global Fund to Fight AIDS, Tuberculosis and Malaria, Geneva, Switzerland
 - Developed applied guidance for health equity/human rights assessment with implementation tools
 - Harmonized gender equity monitoring and evaluation framework
- World Health Organization, Geneva, Switzerland
 - Drafted HIV mortality surveillance guidance for the evaluation of national AIDS programming
- Medecins Sans Frontieres/Doctors Without Borders, Malawi, India
 - Developed tools and implemented trainings for outbreak investigations for District Health Officers
- New York City Department of Health and Mental Hygiene, New York, NY
 - Instituted HIV prevention priorities that established a clear, measurable agenda for 2007-2011
 - Rebid the NYC HIV prevention portfolio (\$12 million annually) in support of developed priorities
 - Developed and field tested a weapon related injury surveillance system
- INSERM (National Institute of Health and Medical Research), Paris, France
 - Evaluated sexual behavior changes resulting from the introduction of successful HIV antiretroviral therapies (Seminal publication: *AIDS* 2000;14(4):F33-F39)

- *Folkehelse (National Institute of Public Health), Oslo, Norway*
 - Evaluated the Oslo city syringe exchange program (2 publications)
 - Research findings resulted in national expansion of program
- *Accion Contra el Hambre (Action Against Hunger), Madrid, Spain*
 - Designed national level studies to prevent pediatric HIV deaths in Malawi
- *United States Centers for Disease Control and Prevention, Atlanta, GA*
 - Conducted a Georgia statewide outbreak investigation of congenital syphilis
 - Investigation results established active reporting requirements of all positive newborns

Management and Community Building Skills

- Funded, established and staffed a successful community-academic partnership (*Bed Stuy West Community Studies*) between Columbia University and the largest African American community in North America
 - The research center served as a primary source of health screenings for participants
- Managed a staff of 60 civil servants at the New York City Department of Health and Mental Hygiene
 - Restructured department into 4 teams in support of developed priorities

Scientific and Research Activities

- Principal Investigator or other leadership roles on Federal Grants totaling more than \$20 million.
- Peer reviewed author of 40 scientific articles and over 60 conference presentations
- Peer reviewer for National Institutes of Health Center for Scientific Review and many scientific journals
- Research and policy content areas: Infectious disease; structural determinants of health; research and evaluation methods; gender health and human rights; risk mitigation; collective impact approaches

EDUCATION

Degrees

PhD, Epidemiology, Columbia University, New York, NY	1997
MS, Epidemiology, Columbia University, New York, NY	1994
BA, Anthropology, Columbia University, New York, NY	
Graduated magna cum laude; Phi Beta Kappa	1992

Additional Training

Institut National de la Sante et de la Recherche Medicale, Post-Doctoral Fellow, Paris, France	09/98-08/99
National Institute on Drug Abuse (NIDA) Pre-Doctoral Research Fellow, New York, NY	05/94-11/96
National Center for Prevention Services, Division of STD/HIV Prevention, CDC, Atlanta, GA	06/93-08/93

SELECTED PEER REVIEWED PUBLICATIONS

1. Gwizdala RA, Miller M, Bhat M, Vavagiakis P, Henry C, Neaigus A, Shi Q and Lowy FD. *Staphylococcus aureus* Among Drug Users: Identification of Hidden Networks. *American Journal of Public Health*. 2011;101:1268-76.
2. Miller M, Korves CT, Fernandez T. The social epidemiology of HIV transmission among African American women who use drugs and their social network members. *AIDS Care*. 2007;19(7):858-65.
3. Miller M, Neaigus A. An economy of risk: resource acquisition strategies of inner city women who use drugs. *International Journal of Drug Policy* 2002;13(5):399-408.
4. Miller M, Neaigus A. Networks, resources and risk among women who use drugs. *Social Science & Medicine* 2001;52(6):967-978.
5. Lowy FD, Miller M. *Staphylococcus aureus* disease among drug users: understanding transmission dynamics and pathogenesis. *Lancet Infectious Diseases* 2002;2:605-612.

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.
Follow this format for each person. **DO NOT EXCEED FOUR PAGES.**

NAME William B. Karesh		POSITION TITLE Executive Vice President for Health and Policy, EcoHealth Alliance	
eRA COMMONS USER NAME (credential, e.g., agency login) Karesh			
EDUCATION/TRAINING <i>(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable.)</i>			
INSTITUTION AND LOCATION	DEGREE <i>(if applicable)</i>	MM/YY	FIELD OF STUDY
Clemson University, SC	BS	05/77	Biology
University of Georgia, GA	DVM	05/82	Veterinary Medicine
Zoological Society of San Diego	Residency	05/84	Wildlife Health

A. Personal Statement

As a wildlife veterinarian and infectious disease specialist, I have worked on wildlife disease investigations over the past twenty-five years in over 50 countries, and I have strong technical background in targeted surveillance, wildlife sampling design, specimen collection and international collaborative research. I have worked with government agencies and Inter-governmental organizations to design sound, evidence-based policy and regulations. In relationship to disease risk and the international movement and trade of wildlife products, I serve as the President of the OIE (World Organisation for Animal Health) Working Group on Wildlife Diseases. In addition, I have extensive experience directing projects requiring high levels of coordination among multiple institutions. I served as Technical Director of the \$75M USAID Emerging Pandemics Threats PREDICT program, in which I provide general program leadership as well as oversee disease surveillance in wildlife for emerging human pathogens in over 20 countries. The program has collected over 350,000 specimens from a wide range of wild species, yielding detection of over 900 novel viruses to date. In my role as Chief of Party for the USAID-funded \$8M Global Avian Influenza Network for Surveillance of Wild Birds (2004-2009), I designed, organized and managed the implementation of a wildlife disease surveillance network operating in 34 countries and involving dozens of government agencies, NGOs, universities and private businesses around the world. Additionally, I have been highly involved with MERS-CoV and Ebola response efforts, both directly with local governments as well as through my appointments to the World Health Organization and FAO.

B. Positions and Honors**Positions and Employment**

1989-2007	Director, International Field Programs, Wildlife Conservation Society
2004- P	Co-Chair, Wildlife Health Specialist Group, IUCN, Switzerland
2005-2006	Advisor/Consultant, Food and Agriculture Organization of the U.N.
2006-2009	Chief of Party, USAID Global Avian Influenza Network for Surveillance
2006- P	Consultant/Advisor, Bio Economics Research Associates (Bio-ERA)
2008-2010	Vice President & Director, Global Health Programs, Wildlife Conservation Society
2008- P	Adjunct Professor, Mount Sinai School of Medicine
2008- P	President, Working Group on Wildlife Diseases, World Organisation for Animal Health (OIE)

2009- P Technical Director, USAID EPT PREDICT
 2010- P Executive Vice President for Health & Policy, EcoHealth Alliance
 2011- P Adjunct Faculty, Columbia University, Department of Ecology, Evolution and Biology
 2013- P Appointment to the WHO International Health Regulation Roster of Experts
 2013- P Appointment to the WHO MERS Informal Research Network
 2013- P Appointment as a WHO Advisor to the Expert Panel on MERS

C. Selected Peer-reviewed Publications (selected from over 150 peer-reviewed publications)

1. Leroy, E.M., Rouquet, P., Formenty, P., Souquiere, S., Kilbourn, A., Froment, J.M., Bermejo, M., Smit, S., **Karesh, W.B.**, Swanepoel, R., Zaki, S.R., and Rollin, P.E. (2004) Multiple Ebola Virus Transmission Events and Rapid Decline of Central African Wildlife. *Science*, 303, 387-390. 14726594
2. **Karesh, W.B.**, Dobson, A., Lloyd-Smith J.O., Lubroth, J., Dixon, M.A., Bennett, M., Aldrich, S., Harrington, T., Formenty, P., Loh, E.H., Machalaba, C.C., Thomas, M.J., Heymann, D.L. (2012) Ecology of zoonoses: natural and unnatural histories. *Lancet*, 380(9857),1936-45. 23200502
3. **Karesh, W.B.**, Cook, R.A., Bennett, E.L., Newcomb, J. (2005) Wildlife trade and global disease emergence. *Emerging Infectious Diseases*, 11(7), 1000-2. PMC3371803
4. Smith, K.M., Anthony, S.J., Switzer, W.M., Epstein, J.H., Seimon, T., Jia, H., Sanchez, M.D., Huynh, T.T., Galland, G.G., Shapiro, S.E., Sleeman, J.M., McAloose, D., Stuchin, M., Amato, G., Kolokotronis, S.O., Lipkin, W.I., **Karesh, W.B.**, Daszak, P., Marano, N. (2012). Zoonotic viruses associated with illegally imported wildlife products. *PLoS One*, 7(1), e29505. PMC3254615

D. Research Support

Ongoing Research Support

USAID EPT PREDICT Mazet (PI) 10/01/09 - 09/30/2014
 Oversee and coordinate zoonotic disease surveillance and pathogen discovery activities in twenty developing countries, provide leadership across the \$75M PREDICT program, and liaise with management teams of other EPT programs. The program has built a coalition of organizations, university scientists, foreign government agencies and laboratories to enhance capacity for surveillance of emerging human pathogens of wildlife origin, predictive modeling and information sharing for developing countries.
 Role: Technical Director

USAID RDMA Daszak (PI) 10/1/2013 – 9/30/2016
 Infectious Disease Emergence and Economics of Altered Landscapes (IDEEAL)
 Economic assessment of emerging zoonoses as a consequence of development and land use change in Sabah, Malaysia.
 Role: Policy Lead

New York Community Trust Karesh (PI) 06/11/13 – 06/10/2014
 One Health in Action
 Development and implementation of scientific investigations of zoonotic diseases related to wildlife trade and food safety in New York City.
 Role: PI

US FWS Wildlife Without Borders Epstein (PI) 09/13/2012 – 09/13/2014
 Development of a Great Ape Health Unit in Sabah, Malaysia
 Role: Advisor

Bibliographical Data

Name/Role: Dominic A Travis DVM, MS, Principle Investigator

Current Position:

¹Associate Professor, Ecosystem Health, Department of Veterinary Population Medicine, College of Veterinary Medicine, University of Minnesota, 495F ANSC/VM, 1988 Fitch Ave, St. Paul MN, 55108; ²Adjunct Associate Professor, Department of Environmental Health, School of Public Health, UMN; ³Resident Fellow, Institute on the Environment, UMN.

Education/Training:

School	Field	Degree	Year
VA-MD Regional CVM	Epidemiology	Residency	2000
University of Maryland	Epidemiology	MS	2000
Michigan State University	Veterinary Medicine	DVM	1997
North Carolina State University	Zoology	BS	1992

Previous Positions and Honors:

Positions:

2010-2008	Vice President of Conservation and Science, Lincoln Park Zoo
2008-2007	Senior Director, Conservation and Science, Lincoln Park Zoo
2007-2005	Director, Davee Center for Epidemiology and Endocrinology, LPZ
2005-2000	Veterinary Epidemiologist, Lincoln Park Zoo

Advisory Committees:

2009 – present	Gorilla Doctors, University of California, Davis: Member - Science Advisory Committee
2003 – present	International Union for the Conservation of Nature, Conservation Breeding Specialist Group: Strategic Associate
2010 - 2014	Morris Animal Foundation: Trustee - Board of Trustees
2004 – 2008	Morris Animal Foundation: WSAB
2006	Office of Science and Technology Policy (White House): Member - Blue Ribbon Panel investigating the potential use of domestic animals as sentinels for infectious disease surveillance
2002 – 2003	Pan American Health Organization: Member – Zoonotic/Arboviral Working Group - West Nile virus surveillance coordination team.
2003	Centers for Disease Control and Prevention: Member - Microbial Threats Strategic Planning Committee - CDC five year plan for addressing emerging infectious diseases at the human-animal interface.
2001 – 2008	USDA Animal Care: Member - Wildlife TB Working Group – provided consultation on TB in wildlife with special emphasis on ungulates and elephants. Review of several cases of TB in zoos and circus elephant outbreaks as well as surveillance, biosecurity, diagnostic testing and treatment protocols.

Selected Peer-Reviewed Publications:

1. Wolf TM, Mugisha L, Miyagaki Shoyama F, O'Malley MJ, Flynn JO, Asimwe B, **Travis DA**, Singer RS, Sreevatsen S. **(submitted)**. Noninvasive test for Tuberculosis detection in primates. Emerging infectious Diseases. **(Wolf MAF graduate fellowship)**

2. Parsons MB, Gillespie TR, Lonsdorf EV, **Travis DA**, Lipende I, Gilagiza B, Kamenya S, Pintea L, Vazquez-Prokopec GM. 2014 Global Positioning System Data-Loggers: A field tool to quantify fine scale movement of domestic animals to evaluate potential for zoonotic transmission to an endangered wildlife population. PLoS ONE 9(11): e110984.doi:10.1371/journal.pone. (**Parsons MAF summer fellow; MAF funded project**)
3. **Travis DA**, Chapman DW, Craft ME, Deen J, Farnham MW, Garcia C, Hueston WD, Kock R, Mahero M, Mugisha L, Nzietchueng S, Nutter FB, Olson D, Pekol A, Pelican KM, Robertson C, and Rwego IB. 2014. One Health: lessons learned from East Africa. Microbiol Spectrum 2(1):OH-0017-2012. doi:10.1128/microbiolspec.OH-0017-2012.
4. Wolf TM, Sreevatsen S, **Travis DA**, Mugisha L, Singer RS. 2013. The risk of tuberculosis transmission to free ranging great apes. American Journal of Primatology 76(1): 2-13. (**MAF graduate fellow**)
5. Terio KA, Kinsel MJ, Raphael J, Mlengeya T, Lipende I, Kirchhoff CA, Gilagiza B, Wilson ML, Kamenya S, Estes JD, Keele BF, Rudicell RS, Liu W, Patton S, Collins A, Hahn BH, **Travis DA**, Lonsdorf EV. 2012. Pathologic lesions in chimpanzees from Gombe National Park, Tanzania, 2004-2010. Journal of Zoo and Wildlife Medicine 42(4): 597-607.
6. **Travis DA**, Watson RW, Tauer A. 2011. The spread of pathogens through the international trade in wildlife. *Rev. sci. tech. Off. int. Epiz.*, 30(1): 219-239.
7. Lonsdorf EV, Murray CM, Lonsdorf EV, **Travis DA**, Gilby IC, Chosy J, Goodall J, Pusey AE. 2011. A retrospective analysis of factors correlated to chimpanzee (*Pan troglodytes schweinfurthii*) respiratory health at Gombe National Park, Tanzania. *EcoHealth* (8) 26-35.
8. Keele BF, Jones JH, Terio KA, Estes JD, Rudicell RS, Wilson ML, Li Y, Laern GH, Beasley TM, Schumacher-Stankey J, Wroblewski E, Mosser A, Raphael J, Kamenya S, Lonsdorf EV, **Travis DA**, Mlengeya T, Kinsel MJ, Else JG, Silvestri G, Goodall J, Sharp PM, Shaw GM, Pusey A, Hahn BH. 2009. Increased mortality and AIDS-like immunopathology in wild chimpanzees infected with SIVcpz. *Nature* 460: 515-519.
9. **Travis DA**, Lonsdorf EV, Mlengeya T, Raphael J. 2008. A science-based approach to managing disease risks for ape conservation. *American Journal of Primatology* 70: 745-750.
10. Weston-Murphy H, Miller M, Ramer J, **Travis DA**, Barbiers R, Wolfe ND and Switzer WM. 2006. Implications of simian retroviruses for captive primate population management and the occupational safety of primate handlers. *Journal of Zoo and Wildlife Medicine* 37(3): 219-233.
11. Decision Tree Writing Group. 2006. Clinical response decision tree for the Mountain Gorilla (*Gorilla beringeii*) as a model for great apes. *American Journal of Primatology* 68: 909-927. (**MAF funding**)
12. **Travis DA**, Hungerford L, Engel GA, Jones-Engel L. 2006. Disease risk analysis, a tool for primate conservation planning and decision making. *American Journal of Primatology* 68: 855-867.
13. Lonsdorf EV, **Travis DA**, Pusey A, Goodall J. 2006. Using retrospective health data from the Gombe chimpanzee study to inform future monitoring efforts. *American Journal of Primatology* 68: 897-908.
14. Engel G, Hungerford LL, Jones-Engel L, **Travis DA**, Eberle R, Fuentes A, Grant R, Kyes R, Schillaci M, and the Macaque Risk Analysis Workshop Group. 2006. Risk Assessment: a model for predicting cross-species transmission of simian foamy virus from macaques (*M. fascicularis*) to humans at a monkey temple in Bali, Indonesia. *American Journal of Primatology* 68: 934-948.

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors in the order listed on Form Page 2.
Follow this format for each person. **DO NOT EXCEED FOUR PAGES.**

NAME MacDonald White Farnham	POSITION TITLE Assistant Professor , College of Veterinary Medicine Adjunct Instructor , School of Public Health University of Minnesota		
EDUCATION/TRAINING <i>(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable.)</i>			
INSTITUTION AND LOCATION	DEGREE	MM/YY	FIELD OF STUDY
University of Saint Thomas, St. Paul, MN, USA	BA	June 1995	Biology & Environmental Studies
Graduate School, University of Minnesota, Minneapolis, MN, USA	MS	May 2002	Veterinary Medicine (Virology)
College of Veterinary Medicine, University of Minnesota, St. Paul, MN, USA	DVM	May 2006	Veterinary Medicine
College of Veterinary Medicine, University of Minnesota, St. Paul, MN, USA	DVM Diploma	May 2006	Swine Medicine
College of Veterinary Medicine, University of Minnesota, St. Paul, MN, USA	Postdoctoral Residency Certificate	June 2010	Veterinary Public Health

A. Personal Statement

Mac Farnham is an Assistant Professor at the College of Veterinary Medicine and Adjunct Instructor in the School of Public Health at the University of Minnesota. From May 2010 through September 2014, Dr. Farnham provided technical leadership for the USAID Emerging Pandemic Threats Program's RESPOND project in Eastern and Central Africa, focused on applying One Health methodologies and collaborative approaches towards disease outbreak response capacity building. With formal training and work experience as a public health veterinarian, epidemiologist, virologist, animal product export officer, marine biologist, wildlife control technician and agricultural extension volunteer – Dr. Farnham strives to help other health professionals become 'One Health' practitioners. He is an experienced collaborator who has worked across cultural, disciplinary, government, academic and private sectoral boundaries to produce valued partnerships and networks across the world. Mac is committed to developing and strengthening local collaborative methodologies to address complex global issues such as food insecurity, antimicrobial resistance, trans-boundary animal diseases, and emerging disease threats in and between human, domestic animal and wildlife populations.

B. Positions and Honors

June 2010 – Current	Assistant Professor , Ecosystem Health Initiative, College of Veterinary Medicine and Adjunct Instructor , School of Public Health, University of Minnesota
June 2010 – Sept 2014	Senior Technical Advisor / Regional Technical Lead / Assistant Professor , USAID Emerging Pandemic Threats: RESPOND Project, One Health Central and Eastern Africa (OHCEA) University Network, College of Veterinary Medicine, University of Minnesota, Saint Paul, Minnesota, USA

Mar 2008 - June 2010 **Postdoctoral Fellow / Veterinary Public Health Resident**, Center for Animal Health & Food Safety, College of Veterinary Medicine, University of Minnesota

Sept 2006 - Jan 2009 **Veterinary Technical Supervisor**, New Zealand Food Safety Authority, Verification Agency, Dannevirke, New Zealand

July 2006 - Sept 2006 **Veterinary Research Assistant**, Institute of Food, Nutrition and Human Health, Massey University, Palmerston North, New Zealand

May 2004 – Sept 2004 **Research Assistant**, West Nile Virus Surveillance Project, College of Veterinary Medicine, University of Minnesota

Oct 2002 – Dec 2004 **Animal Health Technician**, Chronic Wasting Disease Surveillance Project, Minnesota Department of Natural Resources, Madelia, Minnesota

C. Selected Peer-Reviewed Publications

Travis DA, Chapman DW, Craft ME, Deen J, **Farnham MW**, Garcia C, Hueston WD, Kock R, Mahero M, Mugisha L, Nzietchueng S, Nutter FB, Olson D, Pekol A, Pelican KM, Robertson C, Rwego IB. (2014). One Health: Lessons Learned from East Africa, p 285-302. In Atlas R, Maloy S (ed), One Health. ASM Press, Washington, DC. doi: 10.1128/microbiolspec.OH-0017-2012

Travis DA, Chapman DW, Craft ME, Deen J, **Farnham MW**, Garcia C, Hueston WD, Kock R, Mahero M, Mugisha L, Nzietchueng S, Nutter FB, Olson D, Pekol A, Pelican KM, Robertson C, Rwego IB. (2014). One Health: Lessons Learned from East Africa. Microbiol Spectrum 2(1):OH-0017-2012. doi:10.1128/microbiolspec.OH-0017-2012.

M.W. Farnham, B. Norby, T.J. Goldsmith, S.J. Wells. (2012). Meta-analysis of field studies on bovine tuberculosis skin tests in United States cattle herds. Preventive Veterinary Medicine. 103(2-3):234-243.

S. Otake, S.A. Dee, R.D. Moon, K.D. Rossow, C. Trincado, **M.W. Farnham**, C. Pijoan. (2003). Survival of porcine reproductive and respiratory syndrome virus in houseflies. Canadian Journal of Veterinary Research. 67(3):198-203.

M.W. Farnham, Y.K. Choi, S.M. Goyal, H.S. Joo. (2003). Isolation and characterization of porcine circovirus type-2 from sera of stillborn fetuses. Canadian Journal of Veterinary Research. 67(2): 108-113.

Y.K. Choi, S.M. Goyal, S.W. Kang, **M.W. Farnham**, H.S. Joo. (2002). Detection and subtyping of swine influenza H1N1, H1N2 and H3N2 viruses in clinical samples using two multiplex RT-PCR assays. Journal of Virological Methods. 102: 53-59.

Y.K. Choi, S.M. Goyal, **M.W. Farnham**, H.S. Joo. (2002). Genetic characterization of H1N2 isolates of swine influenza viruses throughout the United States. Virus Research. 87: 173-179.

D. Research Support

Co-Ag # 14-9794-2252-CA Farnham (PI) 09/30/14 – 09/29/15
 USDA APHIS High-Priority Transboundary Animal Disease Sampling Partnership in Uganda.
 Role: PI

Grant # 1000-11676-MNF01-2909030 Hueston and Kircher (co-PIs) 07/01/14 – 06/30/15
 Creating a flexible professional masters in Food Systems with concentrations focused on Food Industry and Regulatory Science.
 Role: Co-Investigator

Co-Ag # GHN-A-00-09-00015-00 Deen (PI) 10/01/09 – 09/29/14
 USAID Emerging Pandemic Threats RESPOND Project, USAID / DAI
 Role: Co-Investigator (Technical Advisor)

CURRICULUM VITAE

I. GENERAL INFORMATION

LOUL Séverin

Cel: (+237) 679 10 89 15

E-mail: severinloul@yahoo.fr
severinloul@gmail.com

Years of professional experiences: **17**

II. DIPLOMANTE FORMATIONS OF UNIVERSITY

Master of Science in Animal Tropical Health (Orientation: Collect and analyzes of the epidemiologic data) obtained at the Institute of Tropical Medicine of Antwerp-Belgium (Academic year 2008 -2009)

Certificate of Higher Study in Animal epidemiology obtained than the National Veterinary School of Alfort-French (Academic year 2005-2006)

Doctorate of Veterinary medicine obtained at the Inter-state School of Sciences and Veterinary medicine (EISMV) of the University Cheik Anta Diop of Dakar in Senegal (1998)

Diploma of Study Higher Specialized - Certificate of Administration of the Companies (D.E.S.S-CAE) obtained at the Institute of Training in Administration and Creation of Companies (I.F.A.C.E.) - Faculty of Science Economic and Management (F.A.S.E.G) - University Cheik Anta Diop (U.C.A.D) of Dakar (Senegal); Academic year 1996-1997 ;

III. PROFESSIONAL EXPERIENCE

2013 - 2015	Chief of the Prevention and the Fight against Zoonoses Services in Ministry of Livestock, Fisheries and Animal Industries (MINEPIA)éa <ul style="list-style-type: none">• Principal task:Collect, analyzes and treatment of the zoonotic diseases for the reportage near the Animal World Health Organization (OIE), FAO and AU-IBAR
2010 – 2013	Chief of epidemiosurveillance Service in Ministry of Livestock, Fisheries and Animal Industries (MINEPIA): <ul style="list-style-type: none">• Principal task: Collect, analyzes and zoo-medical data processing for the reportage near the Animal World Health Organization (OIE), FAO and AU-IBAR
2007-2008	Focal Point of Cameroun for the Wildlife health of near the Animal World Health Organization (OIE)

2000 -2006	<p>Supervisor in Cameroun of research on the bushmeat and wildlife at the "Prevention of the AIDS in Cameroun Project (PRESICA)) - Military Hospital of Yaounde"</p> <ul style="list-style-type: none"> • <u>Objective:</u> seek emergent zoonotic diseases in Cameroun • <u>Activities:</u> <ul style="list-style-type: none"> - Planning management and execution of the missions of collections of the samples on the bushmeat at the hunters; - Planning management and execution of the missions of collections of the samples at the noncaptive animals; - Formation of the data sinks on wildlife - Analysis quantitative and qualitative of the data and development of the epidemiologic Charts;
1998-2000	<p>Assistant of research in the Community the Forests Project (PFC)</p> <ul style="list-style-type: none"> • <u>Principal task:</u> supervision of the investigations for the bushmeat carried out near the households with the Site of a forestry development (Company PALLISCO) and four villages of the Messamena Sub-division (East-Cameroon Region): <ul style="list-style-type: none"> - <u>Inquire into the bushmeat:</u> Numbers game, taken species, instrument used for the capture of game, etc. - <u>Inquire into the food of the menages:</u> Food in households, - <u>Inquire into the daily activities in households:</u> activities carried out by the members of each concession - <u>Inquire into the census:</u> population and flows of their displacement

IV. ASSETS

1. DATA PROCESSING: SOFTWARE USED WELL

- **Basic software:** Word ; Excel ; PowerPoint ; Publisher
- **Statistical and GIS software:** Stata, R ; Arcviews ; Quantum GIS

2. LANGUAGES

- **French:** Well ; **English:** Passable

3. OTHERS

- Good analysis and processing capacity of the quantitative and qualitative data
- Several continues formation in the animal health, animal epidemiology and wildlife health
- Joint authors of 12 publications on the emergent diseases of wildlife

I certify that this information's provided above is exact.

CURRICULUM VITAE

Léonie Prudence **Dapi Nzefa**

Born on: 14 Nov 1971 in Cameroon

Södra-Järnväsgatan 21A, 35234 Växjö, Sweden.

Phone: 0046733358842

dapileo@hotmail.com

PoBox 16355 Yaoundé, Cameroon .

Phone: 00237670713640



EDUCATION and DEGREES

Feb 2010: PhD in Public Health, Umeå University, Sweden, Thesis title: *Socioeconomic and sex differences in adolescents dietary intake, anthropometry and physical activity in Cameroon, Africa*

2005-2010: PhD education in Public Health and Epidemiology, Umeå University, Sweden.

Certificates in Women and Children Health in Low Income Settings: Uppsala University. Advance Biostatistics, Ethic in research; Umeå University, Sweden.

2003-2005: Master's Degree in Public Health and Epidemiology, Umeå University, Sweden.

1998-1999: Certification in Hygiene Procedures within Food Sciences, Haute Ecole Lucia de Brouckère, Brussels, Belgium. Certification in Allergies and Foods Intolerances in Children, Namur, Belgium.

1995-1998: Degree in Dietetic and Nutrition, Institut Arthur Haulot Brussels, Belgium and Erasmus exchange students at Umeå University, Sweden

WORK EXPERIENCE and EMPLOYMENTS

Oct 2013-Jan 2014: Supervisor of six Swedish students in Cameroon from Department of Pedagogy and Psychology, Linnaeus University, Sweden

Since March 2010: Senior Lecturer and researcher in Global Public Health, Gender Inequality, Global Nutrition, Immigration, the impact of colonization in Africa at Universities in Sweden, Holland and Cameroon. Distance and Campus courses.

Since 2012: Main supervisor of Masters Students from Catholic University of Yaoundé, Cameroon

Since Feb 2012: Main supervisor of Master students and nurses, Kristianstad University, Sweden

Since 2011: Research Work; Study about infant feeding practices in urban and rural Cameroon (manuscript).

Sept 2011-Feb 2012: Research Work; Study about Somali infant feeding living in the Kronoberg region of Sweden.

Since Sept 2010: Senior lecturer about Integrative Health, distance courses at Kristianstad University.

Sept- Nov 2011: Work as writing a curriculum, study plan for the International Public Health for Kristianstad University.

2005-2010: Work as doctoral student at Umeå University, Sweden. Assistant-Lecturer at the department of Nutrition and at the department of Infectious Diseases. Co-supervisor of more than 50 Swedish students in Cameroon.

2004-2005: Evaluation of the Umeå MPH program. Evaluation of the Swedish doctoral booklet. Co-supervisor of Swedish medical students, nurses, dieticians, social workers student doing their projects and essays in Cameroon. Co-supervisor of one MPH student in Umeå University, Sweden.

2000-2003: Dietician, public Hospitals, private clinics in Cameroon,

ORIGINAL PUBLICATIONS

1. Dapi NL, Janlert U, Stenlund H, Håglin L (2009). Socioeconomic and gender differences in adolescent nutritional status in urban Cameroon, Africa. *Nutr Res* 9, 313-319.
2. Dapi NL, Janlert U, Stenlund H, Hörnell A, Larsson C (2010). Energy and nutrient intakes in relation to sex and socio-economic status among school adolescents in urban Cameroon, Africa. *Publ Health Nutr*. DOI: 10.1017/S1368980010003150.
3. Dapi NL, Nouedoui C, Janlert U, Håglin L (2005). Adolescents' Food Habits and Nutritional Status among in urban and Rural Areas in Cameroon, Africa. *Scand J Nutr* 49, 151-158.
4. Dapi NL, Omoloko C, Janlert U, Dahlgren L, Håglin L (2007). "I eat to be happy, to be strong and to live". Perceptions of rural and urban adolescents in Cameroon, Africa *J Nutr Educ Behav* 39, 320-326.
5. Léonie N. Dapi, Joacim Rocklöv, Georges Nguéack, Tord Kjellstrom (2010). Heat impact on schoolchildren in Cameroon, Africa. Potential health threat from climate change. *Global health action*. DOI: 10.3402/gha.v3i0.5610
6. Georges Nguéack-Tsague and Léonie N. Dapi (2011). Multidimensional nature of undernutrition: a statistical approach. *J Med & Med Sciences* 2, 690-695.
7. L Nzefa Dapi (Dec 2011). The impact of climate change on students in Yaoundé, Cameroon. *African Newsletter* 21; Finnish Institute of Occupational Health.
9. L Nzefa Dapi, Ericsson E. Breastfeeding among Somalia women in Sweden (on going)

ABSTRACT

Title: Nutritional status and food habits of adolescences according to socioeconomic status in Cameroon, Africa. Oral presentation to the Swedish Medical annual meeting in Oct 2008 in Goteborg, Sweden.

Several Oral presentations about Cameroon health, people and nutrition in Sweden to NGOs, Universities, municipalities and hospitals.

Other

President and founder of the *Swedish Cameroon organization*, a non-profit and apolitical organization
President and founder of the *Center for Youths in Bandja Village*, a non-profit and apolitical organization
Director and founder of the *Center for Health Promotion-Dapi Welfare*; Yaoundé Cameroon since 2012.

CURRICULUM VITAE

1 - GENERAL INFORMATIONS

Name and Surname: KUETE Fidèle
Sex : Male
Born: 1963
Nationality: Cameroonian
Matrimonial Status: Married, father of 4 kids
Address : Ministry of Forestry and Wildlife (Cameroon)
Phone: (237) 696 86 37 71/ 673 33 73 83/ 633 77 92 40
Email: kuete_al@yahoo.fr & fidelekuete@gmail.com
Title: *Engineer of Agricultural Works & General Engineer of Water and Forestry*



2 - COMPETENCIES

- Gazettment of protected areas and hunting zones;
- Development and implementation of management plans of protected areas and hunting zones;
- Valuation of wildlife and protected areas;
- Community management of wildlife and forest resources;
- Management of Human/Wildlife conflicts;
- Health of wildlife and ecosystems;
- Environmental education, information and communication;
- Environmental impacts and audits studies;

3- PROFESSIONAL EXPERIENCE: Close to 27 years

2012 till date: In Charge of Studies Education Unit /Ministry of Forestry and Wildlife-MINFOF (Yaoundé)
2008-2012: Chief of Service Participatory and Communitary Management of Wildlife-MINFOF (Yaoundé)
2006-2008: Conservator of Campo-Ma'an National Park (Campo)
2001-2006: Conservator of Douala-Edéa Wildlife Reserve (Mouanko)
1998-2001: Chief of Littoral Regional Service of Wildlife and Protected Areas (Douala)
1996-1998: Chief of Bureau of Protected Areas in Littoral Region (Douala)
1990 : Chief of Babong Agricultural Post (Loum Subdivision, Mounjo Division)

4 – STUDIES

Involvement in many studies and consultancies:

- Environmental Impact Assessment of many Forest Monitoring Units in Cameroon (08 00, 08002, 09015, ...)
- Environmental Impact Assessment for the Memve'élé and Bini à Warak dams projects
- Study of the environment of Campo-Ma'an landscape
- Field investigation on the Monkey pox outbreak
- Study on the enrichment of protected areas
- FAO/EC LNV/GTZ/UICN/ICRAF/CIFOR study on the management of secondary forests for

5 -ATTENDANCE OF WORKSHOPS, CONFERENCES, FIELD TRIPS AND SPECIAL MISSIONS

Nov 4-6, 2014 (Douala): Ebola Preparation and Response Scenario. Regional West Africa Preparedness & Response Planning Workshop
Dec 8-12, 2014 (Yaoundé) : Strategic Preparedness and Response for Biological Incidents. Emergency Operations Center Staff Engagement for the Republic of Cameroon's Workshop. Organized by DTRA/CBRN Preparedness Program
Sept 19-20, 2014 (Yaoundé) : Concertation workshop between the Ministry in charge of Fisheries and animal husbandry and partner laboratories in light of the development of an active Ebola surveillance system on wildlife
July 04, 2014 (Yaoundé) : One Health Concept workshop : The role of wildlife health managers on Ebola
07-12 July, 2014 (Mbargué, Minta): Joint investigation mission on the outbreak of Monkey pox disease in the Mbargue Chimpanzee Rescue Centre
Feb 12-22, 2014 (Nyabisan) : 2nd Field training on One Health Concept with Global Viral Cameroon
Dec 02-05, 2013 (Garoua) : Workshop on the finalization of the Protected Areas Management Master Degree Curricula for the Garoua Wildlife School
May 13-28, 2013 (Garoua) : Training on wildlife inventory in savanna ecosystems
Augt 13-24, 2012 (Lopé, Gabon) : International USAID/RESPOND/AU-IBAR initial training workshop on One Health Concept: Incidence of wildlife on the outbreak of domestic animal diseases

	and public health
May 2-4, 2012 (Libreville, Gabon) :	ECCAS regional Workshop on Integrated Regional Coordination Mechanism (IRCM) for the Prevention and Control of Transboundary Animal Diseases and Zoonosis in Central Africa
March 02, 2012 (Yaoundé) :	National Validation Workshop of the Cameroon's National Program for the Prevention and Fight against Emergent and Re-emergent Zoonosis
October, 10-15, 2011 (Gbayanga, CAR) :	UNESCO/ WWF/WCS/RCA/Congo/Cameroun Experts workshop on the gazettment process of the TNS (Tri-National de la Sangha) as a world Heritage Site
Sept 22-23, 2011 (Yaoundé) :	National workshop on the promotion of One Health Concept and Ad hoc Committee workshop in charge of the development of Zoonosis Program)
Feb 28, 2011 (Yaoundé) :	Contributor on the workshop on the redynamization of the Cameroon's national and transboundary anti-poaching strategy organized by the Wildlife and Protected Development
Nov 6-10, 2010 (Kinshasa, DRC) :	Contribution on the TNS working group on the 6 th COMIFAC ministerial Conference session
Jan 19-22, 2010 (Kampala, Uganda) :	CITES International Workshop for anglophone and lusophone countries on the non detrimental trade of wild species of fauna and flora: Identification of priorities for capacity building and development of technical assistance
July 21-22, 2009 (Yokadouma) :	GTZ/WWF workshop for the capacity building of Wildlife Resources Valorization Commitees (COVAREF) and Councils on the management of wildlife royalties
June 3-5, 2008 (Kribi):	TRAFFIC Central Africa Program workshop on the capacity building and on the use of ETIS tools by forestry, Customs and border Police staffs.
June 9-11, 2008 (Kribi):	RAPAC international workshop on the exchange of experience for the development of responsible tourism in Central Africa protected areas
October 4-6, 2007 (Douala):	RAPAC international workshop on the development of protected areas efficiency assessment using PAMAETT tool
March 26-31, 2007 (Libreville, Gabon):	RAPAC international workshop on the development of protected Areas business plans
Nov 28-29, 2006 (Campo) :	MINFOF/WWF Workshop on the development of strategic surveillance plan for Campo Ma'an National Park
2005 (Douala) :	MINFOF staff Capacity building workshop on the forestry and wildlife control strategy
May 2003 (Edea) :	Central/West Africa Regional "In the Hands of Fishers (IHO) workshop on mangrove management and sustainable fisheries". In collaboration with Cameroon Wildlife Conservation Society (Mouanko Project)
March 2003 (Mfou) :	MINEF/GRASP workshop on Great Apes National Management Plan
July & sept, 2002 (Yaoundé & Mfou):	MINEF/WWF national workshops on the Cameroon protected areas network assessment
2001 (Douala):	United States Fish & Wildlife Service Bush Meat international workshop held at Sawa Hotel
2000 (Yaoundé):	National workshop on Cameroon's national anti-poaching strategy development
May 2000 (Yokadouma):	MINEF/WWF international workshop on the Cameroon's national management plan for elephant
1998 (Douala) :	MINEF/DFID training workshop on the Community forestry Development Manual of Procedures
1996 (Douala) :	MINEF sensitization workshop on the launching of forestry law N°94/01 of 20/01/94 and its implementation texts
1993 (Bafoussam) :	MINEF workshop on the National Environment Management Program

6 - OTHERS:

- ◆ Member of Wildlife Health Specialist Group of IUCN Species Survival Commission.
- ◆ Focal point of the Ministry of Forestry and Wildlife for One Health and Zoonosis, and this light, member of national experts in charge of the training and sensitization on the One Health concept
- ◆ Monthly participation with other ministries and partners on the EPT/One Health group meetings since December 2012
- ◆ Member of the Ad hoc Committee in charge of the elaboration of the Cameroon Zoonosis Program
- ◆ Close relationships with national forestry and wildlife training institutions and great interface with MINFOF staffs be it in central and de-concentrated services, some key ministries , development partners and institutions, NGOs
- ◆ Congratulations in 2008 from Hon. Janet GARVEY, US Ambassador in Cameroon, for the quality of the management of Campo-Ma'an national Park (upon completion of her visit on the field)
- ◆ Congratulations in 2000 from the Ministry of Environment and Forestry for anti-poaching operations Douala and its neighborhoods

Certify true all above informations.

Serge Tchuenteu Nzietchueng
Phone: (+237) 651913936
Email: nitch_cm@yahoo.fr

Career statement

Professional veterinarian with more than seven (7) years of experience engaging and working with academic institutions, research institutions, government, regional and international organizations in developing and developed countries. I led and coordinated the multi-sectoral, multi-disciplinary and institutional process that culminated in the integration of the One Health approach into national the One Health strategic documents in Cameroon and Rwanda - the first countries on the continent to achieve this critical milestone. I was part of the team that for the first time in Africa used the network analysis methodology to describe the spread of Marburg virus in Uganda in 2012. My areas of interest include livestock production, food security and safety, One Health, infectious diseases, teaching and policy.

Key skill and competencies

Livestock production at the environment-animal and human interface, Value chain analysis, One Health, Epidemiology and participatory epidemiology, Disease surveillance, outbreak investigation and disease management, Risk analysis, network analysis. Confidently assume management roles. I have developed, planned and managed activities for a total amount of US\$ 1,585,943 during the last 4 years.

Education

2006: *Veterinary Degree in animal health and production in tropical countries.*

National Veterinary School of Toulouse (ENVT, France)

Dissertation title: Introduction and dissemination of Newcastle disease virus in North Cameroon: Models and qualitative risk analysis (Cameroon)

2005: *Master of Science in livestock productions in tropical countries.*

University of Montpellier 2 (UM II, France)

Thesis title: Participatory epidemiology investigation on priority diseases of sheep in Lake Alaotra Region (Madagascar)

2004: *CEAV: Certificate for specialization in livestock infectious diseases and disease surveillance in Tropical countries*, National Veterinary School of Toulouse (ENVT, France)

Dissertation title: Elaboration of performance indicators for the animal disease surveillance network, (Mali)

2003: *Doctor of Veterinary Medicine*, National Veterinary School of Algiers (ENVA, Algeria)

Thesis: Contribution to improve method of heats synchronization in cattle in Algeria.

Professional experience

Period	May 2010-June 2014
Location	Kinshasa, Democratic Republic of Congo, Kigali, Rwanda
Organization	Tuft University, College of Veterinary Medicine (May-June 2010) University of Minnesota, College of veterinary medicine, University of Minnesota (June 2010-June 2014)
Position	<ul style="list-style-type: none"> • Technical Advisor, USAID Grantee project, Tufts University • Adjunct Professor, Ecosystem Health Initiative Adjunct Instructor, School of Public Health University Technical Advisor, USAID Grantee RESPOND Project University of Minnesota Department of Veterinary Population Medicine
<p>Cameroon Lead the national process to design the One Health National Strategy and the National Program for Prevention and control of emerging and re-emerging zoonotic diseases Coordination of the One Health sensitization and the operationalization of One Health</p> <p>Rwanda, Ghana, Gabon, Burundi Coordination of the Wildlife investigation, livestock and public health project (WILD project)</p> <ul style="list-style-type: none"> • Adapt the WILD training material for each African agro-ecology system • Implement One Health training on wildlife investigation, livestock and public health • Establish an African network of wildlife health practitioners <p>Rwanda</p> <ul style="list-style-type: none"> • Coordination of the national process to design the One Health National Strategy plan and the One Health action plan <p><u>Teaching</u></p> <p>1. Learning Mentor for Emerging Infectious Diseases and Extractive Industries Master of Forest Management and Conservation, National School of forestry and Water, University of Libreville, Gabon</p> <p>2. Public Health Institute, University of Minnesota (UMN)</p> <ul style="list-style-type: none"> • Co-teacher “Topics in infectious diseases: Emerging and re-emerging infectious diseases” (2012, 2013) to graduate students at UMN. • Co-teacher ” 	

Period	March 2007 to December 2008
Location	Nairobi, Kenya, Addis Ababa, Ethiopia
Organization	International Livestock Research Institute (ILRI), Market opportunities theme
Position	Assessment of Rift Valley Fever outbreak response lead Epidemiological coordinator (Kenya and Ethiopia) Pro-poor HPAI H5N1 Risk Reduction Strategies Project ILRI/IFPRI/FAO/RVC
<ul style="list-style-type: none"> • Risk assessment introduction of H5N1 virus into Ethiopia • Participatory outbreak assessment of Rift Valley fever outbreak in Kenya and Tanzania 2006-2007 • Guidelines for the Prevention and Control of RVF in Kenya and Tanzania Participatory assessment of Rift Valley fever surveillance and response activities in Arusha region of Tanzania 	