

UK BUSHMEAT WORKING GROUP

Alternative livelihoods/foods, improved bushmeat management and sustainable forest management as potential tools for reducing overexploitation of wild meat

14th June 2011

14:30-17:30

Council Room, Zoological Society of London

Meeting report

Attendees

Rui Sa	Cardiff University
Lauren Coad	Oxford Centre for Tropical Forests
Edmund Kingcott	Independent
Ian Watson	Watson Fish Consulting
Ian Redmond	Ape Alliance
Ana Nuno	Imperial College London
Adina Farmaner	Jane Goodall Institute-UK
Ellen Brown	Independent
Mike Ridd	Bioclimate Research & Development
Helen Schneider	Fauna and Flora International (FFI)
Elisabetta Bizzarri	University College London (UCL)
Hannah Thomas	Durrell Institute of Conservation and Environment (DICE)
Cambria Finegold	Worldfish Center
Filipa Soares	University of Lisbon
Nick Hill	Imperial College London/ ZSL Institute of Zoology
Juliet Wright	Lebialem Hunters' Beekeeping Initiative
Marcus Rowcliffe	ZSL Institute of Zoology
Adam Barlow	ZSL-Bangladesh
David Gill	ZSL-Equatorial Guinea
Chris Ransom	ZSL
Vanessa Evans	ZSL
Paul De Ornellas	ZSL
Johanna Segal	ZSL
Noëlle Kümpel	ZSL

Apologies

Matthew Hatchwell	Wildlife Conservation Society (WCS)–Europe
Katherine Homewood	UCL
Neil Maddison	Bristol Conservation and Science Foundation
Katharine Abernethy	University of Stirling
E.J. Milner-Gulland	Imperial College London
Kate Ciborowski	ZSL Institute of Zoology
Guy Cowlshaw	ZSL Institute of Zoology
Andrew Cunningham	ZSL Institute of Zoology
Mark Baxter	Department for Environment, Food and Rural Affairs (Defra)
Jacquie Teera	Uganda Conservation Foundation
Luke Parry	Lancaster University
Mike Bruford	Cardiff University
Rebecca Drury	FFI
Thomasina Oldfield	TRAFFIC

Ruth Malleson	Consultant
Tom Clements	WCS
Ian Tucker	Her Majesty's Customs and Excise (HMCE)
Sophie Allebone-Webb	WCS
Christina Greenwood	ZSL-Bangladesh

The Chair, Noëlle Kümpel, outlined the purpose of the UK Bushmeat Working Group (UKBWG) as a forum for discussion on bushmeat-related research and policy amongst government, industry, NGOs and academia, particularly, but not exclusively, in relation to the UK. ZSL took over secretariat responsibilities of the UKBWG from the Tropical Forest Forum in 2006 and is funded by Defra (the UK Department for Environment, Food and Rural Affairs), which she thanked.

Noëlle welcomed attendees to this focused meeting which would include a series of presentations on alternative livelihoods/foods, improved bushmeat management and sustainable forest management as potential tools for reducing overexploitation of wild meat. In addition an update would be provided from Lauren Coad on the joint meeting of the CBD Bushmeat Liaison Group and the CITES Central Africa Bushmeat Working Group recently held in Nairobi (7-10th June 2011). She hoped that the presentations would then lead into a discussion at the end of the meeting. Noëlle went on to request any ideas for topics for future meetings from the attendees, and distributed the agenda and the minutes of the previous meeting held on the international bushmeat trade on 20th January 2011.

She then asked attendees to introduce themselves before introducing **Ian Redmond (Ape Alliance)** who gave the first presentation providing an update on the FAO (Food and Agriculture Organization of the United Nations) / GEF (Global Environment Facility) bushmeat project.

Ian Redmond, Ape Alliance
An update on FAO's work on sustainable use of bushmeat

Ian began by acknowledging Edgar Kaeslin (Wildlife and Protected Area Management, Forestry Department, FAO) who presented at the symposium 'The relevance of community-based natural resource management (CBNRM) to the conservation and sustainable use of CITES-listed species in exporting countries', hosted by the Federal Ministry of Agriculture, Forestry, Environment and Water Management, Vienna, Austria, and the European Commission, 17–20th May 2011. Edgar's presentation, 'FAO's work on sustainable use of bushmeat: engaging in international policy processes and finding practical solutions at the local level', formed the basis of **Ian's** update.

Ian expressed his excitement for the opportunity to present to such an interested audience and encouraged them to visit the website www.4apes.com to access circulars and discussions relating to the conservation and welfare of apes.

Ian outlined that the FAO, as the UN body responsible for forests and food security, was concerned with bushmeat and the problems affecting biodiversity via overharvesting. Currently there is little regulation and where regulation exists it is not enforced. **Ian** explained that the bushmeat crisis was a driving force in the formation of the Ape Alliance some 15 years ago (1996) yet the situation appears to be getting worse. Hence the FAO decided that a new approach was required as previous solutions have all failed. This has resulted in the FAO GEF bushmeat project.

Entitled 'Sustainable management of the wildlife and bushmeat sector in Central Africa', **Ian** went on to explain that the project was endorsed by the GEF CEO in early May 2011 and will last 5 years. The project aims to test / implement a new approach to bushmeat: the legal,

sustainable use of selected non-threatened species through participatory wildlife management.

Initially it is a project for Gabon, the Republic of Congo, Democratic Republic of Congo and the Central African Republic and will lead to a full-scale regional project. Within these pilot sites the aim is to demonstrate how to overcome the main barriers to participatory wildlife management (PWM):

- (1) constraints in existing policy/legal frameworks;
- (2) insufficient tools;
- (3) insufficient institutional capacities;

and show that community-based conservation and management of wildlife can be an effective strategy for conserving the integrity of wildlife, forest ecosystems and biodiversity in the Congo Basin.

Ian outlined that the project will address these three areas by:

- (1) giving communities exclusive well-defined rights to wildlife and developing a regional wildlife management policy;
- (2) developing PWM tools;
- (3) building institutional capacity for PWM of major stakeholders, including for replication;

whilst recognising that this is both ambitious and complex. To date no effective solutions have been found to make consumption sustainable, hence tools are required for communities to understand the impacts of overharvesting. It also requires a multi-dimensional approach which both empowers local communities and involves various stakeholders. For example, hunters currently do not have the right to sell bushmeat hence all trading is illegal, as previously it has been felt that legalisation would increase the bushmeat trade.

Recognising that the consumption of bushmeat will never cease, this project attempts to create 'LSD' bushmeat i.e. that which is legal, sustainable and disease-free, through community based natural resource management (CBNRM). Whilst this is not a new concept, and has produced some results, its potential has not been fully utilised. It is a huge challenge as legalised bushmeat is a contentious subject with some NGOs believing it will lead to increased trading and eventual extinction of some species. **Ian** explained that the project will necessitate community-based controls and regulations with locally-managed hunting areas. **Ian** stressed that only selected bushmeat would be legalised and not all species would be affected, and this needs to be carefully monitored in the pilot sites.

Ian expects that the project will be welcomed by the communities as it offers new opportunities albeit restricted and controlled ones. The main challenge is getting the balance right. **Ian** concluded that the current stage of the project is the provisional ID of sites, though these still need to be finalised and the FAO and partners are awaiting final approval from GEF.

Noelle asked when it was likely to start to which he replied probably next year. **Vanessa** asked if the project was aimed at legalising all hunting. **Ian** explained that currently in the four countries there is a right to hunt but not to sell. Also the right to hunt and sell would be restricted to select species (obviously not threatened ones). The project will seek to determine the sustainable amount of hunting that would be permissible for each species. One part of the solution may be curtailing city demand. He elaborated that essentially the project is trying to find a way to address conservation of biodiversity and secure a future for dependent people. Finding the correct balance would be the biggest challenge.

Noelle thanked Ian for his contribution and introduced the next speaker, **Adam Barlow (ZSL)**.

Adam Barlow, ZSL

Assessing impact and designing solutions for poaching of tiger prey in the Bangladesh Sundarbans

Adam began by explaining that Asia largely lags behind Africa in terms of bushmeat research. His project is focussed upon assessing the impact of tiger prey consumption as bushmeat, assessing the drivers resulting in this consumption and developing and implementing solutions.

Adam described Bangladesh as the most densely populated place in the world with approximately 3-4 million forest dependant people. The Sundarbans is the largest mangrove forest in the world and supports a population of 300-500 tigers. Hence the problem here is one of scale and potential competition.

Adam outlined the first stage of the project – assessing the impact of tiger prey consumption. Eight hundred randomly selected local households were surveyed and asked about the scale and nature of consumption of tiger prey (spotted deer). The results indicated that the consumption per household was low – 1.1kg deer meat/household/p.a., however given the number of households this approximates to over 10,000 deer every year. There are no formal markets for deer meat: it is obtained via personal contacts and consumed within the home. The price of deer meat is cheaper than domestic meat though almost a third of consumers obtained the deer meat for free.

Adam went on to describe the possible drivers which were assessed via focus group discussions and semi-structured questionnaires. Positive drivers (benefits) were identified as:

- Taste: 'king of meats';
- Tradition;
- Use of skills;
- Help in paying off previous fines for poaching;

whilst negative drivers (barriers) were:

- Against the law;
- Shame/guilt, resulting in hiding the practise from children/others;
- Sympathy for deer in pain.

Adam suggested that the poaching is not driven by profiteering, but rather a social context / taste preference, though there was also a feeling of guilt associated with consumption. Adam went on to describe prey consumption as a human behaviour, and as such requires social marketing to change that behaviour. This social marketing has three elements:

- Regulation;
- Education and awareness;
- Alternatives/incentives.

The mix of these elements depends upon the drivers of the behaviour.

Based upon these findings and the results of brainstorming workshops, **Adam** outlined the proposed solution was to build a social movement against deer meat consumption. This was built around two complementary campaigns (fear and love) to reinforce the effectiveness of barriers and increase awareness of the benefits of not consuming deer meat (respectively).

The fear campaign focuses upon the barriers to consumption:

- Regulation: Wildlife crime unit, hotline, raids, increased penalties. This has been seen to have an effect.
- Education: Posters/radio/'*jatra*' (local plays) explaining the risks of punishment.
- Alternatives: '*Mushleka*' bonds to reduce previous cases against poachers and thus prevent reoffending.

Adam explained that the love campaign was still in its early stages and was largely focused upon education via school programmes and general village programmes (posters, film shows, radio shows, *jatra*).

Adam rounded up by explaining that the focus of the campaigns was aimed at the most influential members of the community such as religious leaders and the household matriarch as community participation was a key to the success of the project. The campaigns are to be piloted in 4 villages initially.

Lauren Coad asked if they were also looking at the impact of declining deer populations upon tiger densities and the impacts of hunting pressures. She mentioned a similar study had been undertaken in Gabon researching leopards and hunters. **Adam** replied that they were quantifying the impact at the macro-level but are not looking at the micro-level (beyond the number of deer in the landscape) as yet.

Helen Schneider questioned whether the awareness campaign to reduce prey consumption was focused upon tigers. **Adam** explained that tigers were not mentioned in messages as they wished to keep them as simple as possible. **Helen** also asked if the messages would include stigma such as the CLTS (Community-Led Total Sanitation) campaign in Bangladesh.

Ian Redmond added that it might be worth stating that if deer consumption continued, tigers would have less to eat which could lead to an increase in human conflict including increased predation on goats. He also asked if there was any correlation between deer numbers and human-tiger conflict. **Adam** replied he has heard it said that falling deer numbers do lead to increased tiger-human conflict but the evidence contradicts this.

Mike Riddell asked if human groupings had been considered for targeted messages. **Adam** replied that they were targeting *imams* (religious figures) who are very influential as well as matriarchs of households.

Noelle thanked **Adam** for his contribution and introduced **Vanessa Evans (ZSL)** for the next presentation.

Vanessa Evans, ZSL
Community Hunting Zones in Cameroon

Vanessa began by outlining the legal context of hunting¹ in Cameroon, where wildlife falls into one of 3 categories:

- A (protected);
- B (moderate hunting allowed with specific permit);
- C (can be hunted freely).

Hunting of Class C wildlife is permitted by anyone, anywhere except in national parks or on private lands. The permitted methods of hunting are traditional methods or by gun-holders with permits, but in reality cable traps are commonly used (over 50% of instances) which despite being illegal is not penalised.

Vanessa continued by describing the legal context of bushmeat trading². Bushmeat is traded in areas designated by the government or in town halls. Traders are required to obtain a 'bushmeat collection permit', however there is no restriction on the quantities traded or any requirement to provide evidence of legal hunting methods.

Many communities however are reliant upon the forest and they wish to be able to hunt in the national parks. **Vanessa** described how Community Hunting Zones (CHZs) have been established in Cameroon. These are an area of protected forest conceded to the local communities for hunting and are subject to a management agreement between the community and the wildlife service, for the conservation and sustainable use of its wildlife in the interests of that community. The area of a CHZ must not exceed 5,000 hectares and the

¹ Law 94-01 on the regulation of forests, wildlife and fishing. Article 8, 86, 87, 90

² Decision 857 on bushmeat commercialisation. Article 3,4

zone must be free of any exploitation title or concession. **Vanessa** stated however that in reality 5,000ha is too small for sustainable wildlife management.

Vanessa went on to describe an alternative scheme, community-managed hunting concessions (ZICGC), which are set up around sport-hunting concessions (ZICs) to allow local populations to benefit from hunting revenues. The ZICGCs have no range restrictions (though usually range from 40,000-140,000 ha) and can overlap with forestry concessions such as logging. The only example at present is WWF's Jengi project – more information is available on their website:

http://www.panda.org/what_we_do/where_we_work/project/projects_in_depth/jengi_project/

From a community perspective, **Vanessa** explained that hunting is done largely for subsistence purposes with some bushmeat sold to traders (*byams*) to enable the purchase of soap and petrol. Within the local communities this bushmeat is sold at low prices as there is no alternative market opportunity. However the byams who have bought the cheap bushmeat then sell it in urban areas for up to 5 times the price paid locally. Hence the urban market is driving the trading of bushmeat from a commercial perspective.

Vanessa went on to explain the results of her fieldwork in Cameroon. After agriculture, hunting is the second most important activity for subsistence however it is seen as a chore. The communities also reported a visible reduction in bushmeat availability which they attributed to overhunting and possibly the noise from the logging concessions scaring away the wildlife. To address this they have developed voluntary anti-poaching initiatives, however these have struggled due to a lack of enforcement capacity.

Vanessa outlined some possible elements that the local communities felt would assist them manage a ZICGC:

- Wildlife inventories and established hunting restrictions;
- Legalised anti-poaching vigilante committee;
- Technical aid for the development of agriculture, livestock rearing and other micro-projects;
- Provision of more employment for local young men in the concessions;
- Technical assistance to legalise hunting and bushmeat trade.

Vanessa concluded by proffering ZICGCs as a potential solution to manage bushmeat hunting at the community level. This would require wildlife inventories to be conducted to assess and establish possible hunting zones. Anti-poaching patrols would then be required to enforce the hunting restrictions, potentially along with the creation of a legalised bushmeat market. Vanessa outlined how discussions have been underway with Pallisco (a logging company in the area) with regards to potential collaboration to enable transport of bushmeat to market thus enabling the communities to obtain higher prices for bushmeat sold. The underlying assumption behind this is that increased income from agriculture and bushmeat trading coupled with alternative protein sources from livestock would lead to a reduction in hunting.

Mike asked if the ZICGCs would also include land tenure rights, or whether they only addressed hunting rights. **Vanessa** explained that they were only for sport hunting concessions. Mike elaborated that he has been working in the same area and they have been looking at extending payments for ecosystem services (PES) e.g. the right to carbon and that this could potentially create another income stream and hence relieve the pressure of hunting.

Hannah Thomas raised the point that as Pallisco was Forest Stewardship Council (FSC) certified, this in itself meant that law enforcement capacity should be available locally to meet its requirements. She asked about the possibility of a scare campaign leading to a problem in that people will not admit to hunting in logging concessions and hence the scale may be understated. She also went on to ask about the potential collaboration with the logging companies as FSC does not allow the transport of bushmeat on logging vehicles. **Vanessa**

responded that they were investigating the possibility of using non-logging vehicles of the company for meat transportation.

Ned Kingcott asked whether any postmortem checks were performed for diseases to which **Vanessa** replied no and that the meat was smoked. **Ned** also asked if any there was any information on exports to Europe as a lot of bushmeat ends up in Paris. This had not been addressed in the field surveys.

Noelle thanked Vanessa for her contribution and introduced **Lauren Coad** (Oxford Centre for Tropical Forests) who provided an update from the recent CITES/CBD meeting in Nairobi.

Lauren Coad (Oxford Centre for Tropical Forests)

The role of small-scale livelihood alternatives in reducing unsustainable use of bushmeat; report back from the joint CBD Bushmeat Liaison Group and CITES Central Africa Bushmeat Working Group meeting in Nairobi, 7th – 10th June 2011

Lauren introduced herself and also acknowledged **David Gill** who also attended the meeting in Nairobi representing ZSL. She explained that both the CITES Central Africa Bushmeat Working Group and the CBD Bushmeat Liaison Group had common aims hence the joint meeting. These aims, a continuation of the initial 2009 Buenos Aires CBD Bushmeat Liaison Group meeting, were:

- Revised recommendations of the CBD Liaison Group on Bushmeat, for the consideration of the next SBSTTA meeting (15th meeting in November);
- Recommendations on small-scale livelihood alternatives;
- Agreed work plan for CITES Central African Bushmeat Working Group;
- Outline for electronic media toolkit;
- Presentation and discussion of report on 'Small-Scale Livelihood Alternatives to the Unsustainable Use of Bushmeat, Based on the Sustainable Use of Biodiversity' (by Nathalie van Vliet).

Another key aim of the meeting was to re-engage with all interested parties hence there was a broad range of global participants including CITES and CBD Parties, organisations and indigenous and local community groups.

Lauren described the four-day agenda with the first two days taken up with national presentations and then two days of workshops to address the following three areas:

- A: Sustainable use and livelihood improvements;
- B: Legislation, enforcement and monitoring;
- C: Capacity development and awareness-raising.

From a personal perspective Lauren felt the national presentations were the most informative and interesting (as they gave an idea of plans even if activities were not being implemented), outlining:

- Socio-economic importance of bushmeat;
- Status and trends of bushmeat harvesting;
- Status and trends of forest-dependent species (e.g. IUCN Red List, other data);
- Observed impacts on populations and species;
- National policies, enabling legislation and strategies that promote conservation and sustainable use of wildlife resources and related products;
- Summary of key national activities in 2011 and 2012;
- Major opportunities and challenges to address the unsustainable harvesting of bushmeat (e.g. obstacles at national level).

Lauren noted that the challenges for most were very similar and largely concerned funding and capacity.

Natalie van Vliet's background paper covered the following livelihood alternatives:

- Production of domesticated sources of meat;
- Mini-livestock breeding with indigenous peoples;
- Community-Based Natural Resource Management (CBNRM);
- Game ranching;
- Payment for Ecosystem Services (PES) and Certification (legalisation?).

However, very few of the studies had any impact measurement or monitoring methodologies of the alternatives under review, thus limiting the scope of the review.

The participants were then split into three groups to each consider one of the three areas highlighted above. As **Lauren** was in Group A she was only able to comment upon their findings. **Lauren's** group made the following observations concerning the list of alternatives:

- Most of the existing alternatives target rural areas, whereas in many countries supply is driven by demand from urban areas.
- Partnerships with extractive industry should be created, providing alternative sources of protein for employees and villages created within concessions.
- Rural development (including health, education etc.) in some cases increases the likelihood of success of conservation action.
- In many places (for instance rural forest villages), there is no alternative to support the sustainable use of bushmeat.
- We need to ensure that the alternative livelihood/protein resource is actually replacing bushmeat hunting. So far very few projects have monitored conservation outcomes.

All three groups addressed the lessons learned and came up with a group of 20 recommendations as detailed below:

1. **Increase capacity to fully evaluate the bushmeat issue and establish appropriate policies and management regimes** (*market visibility, monitoring of harvest and consumption*)
2. **Engaging the private sector and extractive industries** (*management plans, safeguards*)
3. **Rights and tenure, and traditional knowledge** (*access and rights transferred*)
4. **Review of national policies and legal frameworks** (*coherent, feasible, protection of high-risk species*)
5. **Landscape-level management** (*including protected areas in the wider landscape*)
6. **Science** (*management based on science, monitoring*)
7. **Substitution and other mitigative measures** (*short term*)
8. **Capacity-building and awareness-raising.** (*governance, enforcement, monitoring, alternatives, etc.*)
9. **Health** (*tracking, working with other ministries*)
10. **Climate change** (*biodiversity and REDD, safeguards*)
11. **Special management areas** (*game management*)
12. **National and international strategies to address bushmeat** (*strengthening of existing agreements*)
13. **Participatory processes**
14. **Policy processes**
15. **Impacts of international trade on natural resources** (*better assessment, monitoring*)
16. **International trade in wild bushmeat** (*cooperation between CBD and CITES*)
17. **International policy environment** (*integrated local, national, transboundary cooperation*)
18. **Science**
19. **Incentives** (*REDD, PES, CDM*)
20. **Forest certification** (*safeguards*)

However **Lauren** did feel that there was a tendency throughout to look at bushmeat in isolation, many of the recommendations are contentious and would require new legislation, and the recommendations that were set in 1998 are simply being built upon, an approach

which may be too static. There was much discussion over whether to legalise the trade and make more 'visible', and perhaps too much focus on alternative livelihoods.

Lauren concluded with details of the all the meeting documents which can be found at <http://www.cbd.int/doc/?meeting=LGBUSHMEAT-02>

Ian Watson concurred that many projects were poor at measuring impacts and continued that even where this did happen most projects did not work commercially, costing a lot to set up and not making as much money as bushmeat. Local communities were often left worse off than before the project implementation. **Lauren** noted that this was raised by many country delegations and that while there were many reasons why projects didn't work (often projects were too small-scale and too short-term to have lasting impacts, and substitution did not always occur), the evidence is not there in the literature so people keep attempting the same projects again regardless. **Ian** continued that he felt previous lessons were not being learned and there was too much focus on the alternatives themselves rather than their effectiveness.

Ian Redmond commented upon the lack of linkages to REDD and climate change. Forest hunting is a form of forest degradation and should be viewed in that context. Therefore there is a need for its inclusion in REDD and he pleaded with everyone to spread the word that hunting results in far greater degradation than logging / charcoal collection etc. as when wildlife declines so does the forest ecosystem. **Lauren** noted a McDonald paper on REDD and biodiversity indicating that certain groups of species could benefit from REDD. **Noelle** confirmed a need to include biodiversity with REDD for it to work long-term but that there were two challenges to this: the conservation community has a relatively weak voice in international climate negotiations in comparison to the social NGOs and this would be adding another layer to an already complicated process. She noted that getting biodiversity properly included in the timber certification process had been a gradual process and lessons might be learnt from that. **Ian Redmond** stated there was a need to raise it for inclusion in REDD. **Lauren** agreed and commented that people are saying that REDD is now being asked to do everything: pay for the forest, the poor, biodiversity and next our mortgages. She also noted that timber certification was initially driven by western consumers whereas REDD is driven by national governments.

Nick Hill stated that he has been starting to look at alternative livelihoods and how they do not work in general but added that where they do work, they often have other unforeseen impacts which vary greatly from project to project.

Noelle thanked **Lauren** for her contribution and introduced **David Gill (ZSL)** for the next presentation.

David Gill, ZSL

Evaluating the feasibility of different bushmeat management options in Equatorial Guinea

David began by introducing himself and provided an overview of Equatorial Guinea. Split between the African mainland and Bioko and three other islands in the Gulf of Guinea, Equatorial Guinea consequently has very high biodiversity. Following independence in 1968, the country went into freefall under dictatorship rule, however the commencement of oil production in 1995 has led to massive levels of development and Equatorial Guinea now sees growth of 14%pa in GDP. A new national development strategy entitled 'The Future Vision for 2020' is under development and this offers opportunities as well as threats to national conservation in terms of ensuring input now.

ZSL began work in Equatorial Guinea in 2002 and has built up a knowledge base via 3 PhD and 3 MSc theses alongside other applied research. This has shown the problem to be

complex in nature requiring a variety of conservation measures. Whilst research has shown that bushmeat hunting has declined as development has increased (apparently due to the migration of hunters away from the forests to alternative employment within the oil industry), many local communities (and evidence from the latest wildlife surveys) suggest that hunting is also increasing due to growing levels of human conflict with for example elephants, which are being displaced by the development of infrastructure such as roads. Another factor to bear in mind is that the local populace are individualistic, preferring to be self-sufficient and do not naturally form co-operatives, making it more difficult to introduce community-based projects.

David went on to describe the current ZSL project initiated in 2009 which aims to investigate the feasibility and potential impacts of different potential bushmeat management options, build capacity for implementation, analyse barriers / opportunities to conservation success and monitor outcomes. Following consultation via field-based socio-economic surveys in local communities, a series of participatory multi-stakeholder workshops and key informant interviews, **David** outlined the locally-specific barriers to conservation and possible solutions that were proposed (see table 1).

Table 1: Local context: barriers to conservation in EG

Primary Barriers	Possible Solutions	Secondary Barriers
Lack of alternatives	Income / protein generating activities	Tradition / culture Individualistic behaviour
Negative impacts of pest species	Compensation / conflict mitigation	Low market access Few extension services
Low capacity to manage and monitor	Training	Inexperience Irregular funding Low profitability of alternatives

David then turned his attention to the potential threats and opportunities arising from development within Equatorial Guinea at the macroeconomic level (table 2). These were identified at a multi-stakeholder workshop in Equatorial Guinea in April 2011.

Table 2: Macroeconomic context: threats and opportunities of development for conservation

Threats	Opportunities
Construction leads to displacement of species increasing human-animal conflict	Human exodus from rural areas
Increased unsustainable hunting near new roads	Increased funds for training and education
Creation of new cities, e.g. Oyala, leads to increasing hunting pressure	Use of degraded land for agricultural production
Large-scale agriculture and use of pesticides	Increased market access for a number of 'alternative' products
Port construction impacting marine species and food security	Ecotourism
Short-term employment	REDD +

David presented the various bushmeat management options sourced from a feasibility analysis prepared by **Vanessa Evans** et al (Evans et al, 2010, available as a background document for the CBD/CITES Nairobi meeting) and a multi-stakeholder workshop in Bata 2011 (see table 3).

Table 3: Evaluation of bushmeat management options for Equatorial Guinea

Option	Strengths	Weaknesses	Opportunities	Threats
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Alternative protein marketing (e.g. frozen imports)	Affordable substitute, popular with youths	Not considered a substitute by urban elite	Increased trade and power networks – increased availability	May lead to high dependence on imports
Livestock	Under-developed sector	Limited extension services	Part of government's development plans	Deforestation / other environmental impacts
Bushmeat rearing	Preferred food; less susceptible to disease	Low production rates and profitability	May be appropriate in post-depletion areas	Spread of zoonotic diseases
Fisheries	Past experience / preferred food	Over-exploited rivers (and seas?)	Part of government's development plans	Shifting use to another over-exploited resource
NTFPs	Consumption and small-scale trade exists	Unlikely to be alternative; low demand in EG	High international trade, potential for domestication	Without management leads to over-exploitation of species; attracts hunting (?)
Regulation	Focus on most harmful aspects of the trade	Requires legalisation; capacity for enforcement and monitoring	Well developed security system	Potential for associated corruption
Forest management	May also act as form of employment	Weak tenorial law, requires additional incentives	Possible links to REDD, GEF and PACEBCo projects	Potential negative impacts on poor; leakage to other forests

In conclusion, **David** recognised the unique opportunity in Equatorial Guinea – a country with high biodiversity, a low human population and money to spend on conservation if it could be persuaded to do so. However he went on to recognise the need for careful control and implementation of bushmeat management options so that they represent a benefit for both biodiversity and local communities. There is a need for full participatory consultation within the broader national plans for economic development. **David** wrapped up by thanking all contributors to the project.

Hannah Thomas noted that whilst the economic model here differed from many other countries, the problems appeared to be the same. She went on to mention the power to effect change of the logging companies in the Republic of Congo as a result of developing and enforcing management plans in their concessions and wondered if that was a model that could be applied in Equatorial Guinea by the oil companies. **David** explained that at this stage there has been little progress on that front and the oil companies have not got actively involved in conservation efforts. There is little political drive as corporate social responsibility funds are being focused on urban areas and health and education programmes. **Noelle** noted that while the link between oil and wildlife is less obvious than that between timber and wildlife, there is a strong link nonetheless (as it is oil revenues causing the economic boom increasing demand for bushmeat in Equatorial Guinea). The Equatoguinean government currently requires oil companies to fund social programmes so this presents an opportunity for livelihoods-focused biodiversity conservation as well, with the requirement for evidence-based research to put forward the case to the government and these companies.

Cambria Finegold stated here it seems that we need to aid the investment decision-making process, they have the means to invest but not a clear understanding of how, and this is where we can help, perhaps by targeting companies at their London-based headquarters.

Lauren also pointed out that the oil companies should be open to discussions and participation as they do not want public relations disasters. One solution could be to layer hunting concessions. **Ian** Redmond added that it could become a sackable offence for employees to trade in bushmeat.

Noelle thanked David for his contribution and introduced **Ian Watson (Watson Fishing Consulting)** for the final presentation of the day which provided a wider perspective on alternative types of food production to bushmeat.

Ian Watson, Watson Fishing Consulting
Beware what you ask for: the law of unintended consequences

Ian Watson opened by stating that there is a need to consider bushmeat and domestic meat in the global context as the supply chain is often multi-continental. Impacts can be geographically distant and this should not be forgotten. He continued by highlighting that farmed meat is NOT a direct substitute to bushmeat. Whilst it may be an alternative or an addition to bushmeat it is a private good (and cows are expensive) whereas bushmeat is a common good and sometimes free. The economic realities cannot be ignored: many bushmeat states have food security issues, many are protein/calorie deficient and per capita animal protein is often in decline. In addition, food prices globally are soaring and this in itself may lead to livestock expansion with bushmeat interventions.

Ian proceeded by outlining the part livestock currently plays and the impacts of increased production. Representing 40% of agricultural GDP, livestock provides a livelihood for some 987 million poor people. The demand on land is immense – 26% of ice-free land given over to grazing, 1/3 of arable land for feed crops, as well as rangeland conversion and deforestation. More livestock equals more food crops with the growth mainly in developing countries and terrestrial ecosystems (1/3 threatened) and biodiversity hotspots (2/3 threatened) are put under huge strain. The impacts are often felt some way away, for example the impact of nitrogen and phosphorus upon rivers, the oceans and coral reefs, and the links between conversion of land for livestock in Africa and production of feed such as soy in Latin America.

Ian then considered at what point livestock farming can turn from being beneficial as a bushmeat alternative to detrimental to biodiversity. Stall-fed dairy cattle have little environmental impact and few external inputs, eating cut-and-carry fodder and producing manure for vegetable gardens. However a cow is expensive compared to bushmeat snares, and yields take time. Such agriculture is also dependent upon an external market for dairy produce. A big problem is the capital cost of entry (where banks do not lend to the poor), and the fact that if a farmer must wait 8 months for a cow to produce milk, which is a long time for his investment to be tied up.

Moving up a scale to low intensity grazing, **Ian** explained how cattle and bushmeat can co-exist. However, as livestock expansion occurs, more grazing area is needed, resulting in deforestation/depletion of rangeland, increase in nutrient inputs and significant trampling. Wildlife becomes competition or a threat to livestock, and this leads to the question of where to locate livestock production. The current trend is peri-urban farming which minimises distribution problems but does not benefit forest-dependent people. There is also the question of where to grow feed crops – do farmers sacrifice their own land or clear more forest?

Ian switched the focus away from cattle and considered other alternatives. Again it is a question of scale; a few free-roaming pigs and chickens have little impact but penned animals require feeding which demands land conversion. Marine fisheries are all fully or over-exploited, so no real increase in total supply is possible though there may be some scope for a reallocation of fishing effort. Freshwater fisheries produce low yields, and fish are

perishable and hard to transport. And taking into account the taste driver for bushmeat, he argued that fish is not a viable alternative. Low-intensity aquaculture may be relatively benign, but once expansion occurs, feed and hence land is required again. He felt there were no good examples in Africa but wasn't sure why.

Ian proceeded to say that the motives for hunting and consuming bushmeat need to be properly understood (for example, whether the hunter is hunting for income or cash, such as to raise funds to start a cocoa business). However, bushmeat farming will have the same problems as any other livestock and to date has not proved profitable. The problems of management and overharvesting of non-timber forest products (NTFPs) are increased if there is not an accessible and profitable market or a suitable supply chain. Frozen produce is not viable if the infrastructure is not in place; ornamental fish are site-specific; snails and other invertebrates have not proven viable and he questioned the demand for honey. Agroforestry also impacts upon forests, bushmeat can become a pest, and prices are very volatile so a niche market may be needed.

Ian summarised by reiterating the adverse affects of livestock production, the geographical separation of impacts, the profitability of the enterprise and the implications if too profitable. He concluded that replacing bushmeat could lead to the forest being devalued and how else would forest-dependent people survive?

Lauren asked whether Ian felt that overpopulation was the problem driving the livestock increase. Ian answered that per capita consumption was increasing, so the problem was not necessarily an increasing population. He also added that as female education is improved the birth rate decreases, so getting girls to school helps in the long term.

Rui Sa asked for Ian's thoughts on genetically modified organisms (GMOs). **Ian** responded that he had fewer concerns with animals than he did with plants from a biodiversity perspective. However he felt that power would be concentrated within the industry and would not benefit the poor. **Rui** asked about the possibility of the poor competing with industry and Ian felt this was not likely.

David enquired that given that bushmeat is in decline and food production demand is increasing, what would be the better model: sacrifice some forest to produce food, or allow overharvesting of a larger forest? **Ian** referred to Brazil as the only real example where most people eat farmed meat but this has come at a massive cost to the forest. This is a difficult area which needs a resource allocation model, for example giving over the areas of least negative impact to livestock.

Noelle pointed out that bushmeat was less productive than farming in terms of total protein production. **Nick** commented that a model of the system in Belize suggested that leaving the habitat in its natural state resulted in ten times more iguanas than if it had been farmed. He also added that in terms of fishing, where fisheries are overexploited, non-intervention allows the seas to recover and production to eventually increase again. So here intensive 'farming' would not lead to increased production.

Marcus Rowclife added that he too had read about the iguanas however it would appear that it is unique to reptiles, being more productive, and this does not translate to mammals. **Nick** noted that reptiles may be a less desirable food so would perhaps need social marketing to stimulate demand in the way of UK celebrity chef trends.

Elisabetta Bizzarri raised three points. Often in the bushmeat states there is a lack of local veterinary provision and/or knowledge of drug use, hence promoting alternative farming practices could lead to disease as the people will not be equipped to manage the livestock properly. Also education is needed – consideration needs to be given to training people in new activities such as beekeeping. Thirdly, there is a need to consider anthropology as well as economics. Bushmeat hunting/consumption is very closely linked to tradition and culture,

as it represents status symbols and ritualises lifestyles. Farmed animals are simply not viewed in the same manner and are often – at least in Equatorial Guinea – of higher value.

Adam agreed that the risk of failure is very high if education/awareness-raising and regulation is ignored; it is also difficult to measure the effects of alternative livelihoods in isolation, and reiterated the anthropological issues. He cited the example that in Bangladesh people kill tigers not for food or money but to prove their bravery and community-standing. Hence he stressed the importance of understanding local motives for bushmeat hunting and consumption such as prestige, which cannot be directly replaced. **Nick** added that there is a need that things cannot be viewed in isolation, consideration has to be given to livelihoods, education, reproductive health and conservation. He also said that it was important to consider other aspects such as available resources and financial management – for example, in his experience, banks in the Philippines do lend to the poor as they can exploit them.

Noelle commented that it is a question of getting the balance right and we somehow need to be able to separate and evaluate each option. **Helen** thought that rather than talking about 'alternative livelihoods' we should be using the phrase 'sustainable livelihoods'. **Noelle** agreed that either 'sustainable livelihoods' or 'alternative management' were more useful terms as the need is not just for livelihoods. **Cambria Finegold** reiterated that we need to consider other aspects in addition to the financial side such as land tenure, etc.

Juliet Wright referred to **Ian's** comment about bees and honey production. She explained that she has been working in Cameroon on a beekeeping project, exporting honey to Wales, and the problem has not been one of demand as this definitely exists. The problem has been one of consistency in supply as the motivation for honey production is low whilst bushmeat is a more profitable alternative.

Hannah questioned the poor uptake of frozen protein in areas where a cold chain exists – was this down to cost or taste. **Ian Watson** suggested that frozen mackerel was a preferred taste and hence the issue is not as simple as one or the other. **Noelle** countered that it is often a case of price over preference – frozen is often cheaper so eaten more but not preferred; in Equatorial Guinea, people would prefer to eat bushmeat but cannot afford it in some areas. **Ned** added that in some cultures people are prepared to pay and the black market could become even worse. **Ian Redmond** agreed that often people prefer bushmeat to domesticated varieties and there is a need to find a taste replacement.

It was mentioned that in Rwanda rabbits are farmed over aquaculture fish ponds as they provide the fish with vegetable-based protein in return and this could be looked to as an alternative mode using cane rats in West/Central Africa. **Vanessa** commented that cane rats proved not to be profitable unless done on a large scale, and only where they and/or other bushmeat were not available in the vicinity. The only place it was successful was on the periphery of towns where bushmeat was not available.

As time was running short for further discussion, **Noelle** thanked the speakers and participants for a stimulating discussion and welcomed ideas for the next UKBWG meeting, likely to be in December 2011/January 2012. She then wrapped up the meeting and thanked everyone for coming.

Many thanks to all who attended