

SUME workshop in Lima, 26-27 October 2017

The meeting was kindly hosted by Instituto de Ciencias de la Naturaleza, Territorio y Energía Renovables, Pontificia Universidad Católica del Perú (INTE-PUCP), with support also from IUCN-CEM, International Association for Falconry & Conservation of Birds of Prey, Wild Sheep Foundation and Guira Oga.

The first seven abstracts below, re-ordered slightly after introductions from [Augusto Castro](#) and [Angela Andrade](#), provide examples of the conservation of species and ecosystems through sustainable use of wildlife, as organised by communities from international to local levels. The last three abstracts present the rationale for new internet tools to encourage and guide these approaches for much wider application, based on a multilingual hub with national language satellites, and illustrate their use by CEM-SUME. Finally, there was also project planning and training in use of the internet tools.

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Project planning and training

Two breakouts for building project actions in South America

- Community conserved ecosystem services
- Falconry and conservation

Training to run the Multilingual Online Research/Restoration Project Hosting system.

- The social network
- The national and local nodes: sites in the System for Community Liaison (SYCL)

Reporting from break-outs

General discussion and commitments to projects

SUME planning: continental D-Groups and national SYCL nodes

Overall conclusions and close of meeting

Citation of this report:

Marina Rosales Benito de Franco, Eduardo Moraes Arraut & Robert Eyres Kenward. 2017. Report of the Lima workshop on sustainable use and management of ecosystems. IUCN Commission on Ecosystem Management.

Author: Kurt Alt, Wild Sheep Foundation

Title: Federal Aid in wildlife restoration and wild sheep restoration and enhancement in North America and beyond (click **Title** for Powerpoint)

In 1937, the U.S. Great Depression was in full swing; people were destitute and wildlife at their lowest numbers. The operative conservation language of the day was protection, with a capital “P”. State agencies were primarily focused on enforcement of early game laws and ant-poaching activities. The Federal Aid in Wildlife Restoration Act was passed by the U.S. Congress and signed into law by President Roosevelt in 1937. The Act provided, for the first time, reliable funding for research, science-based management, restoration, and hunter education at the State level. The Act transformed state agencies from a conservation approach focused primarily on protection and enforcement to one of science-based management. This was a purposeful change because law enforcement activities were made ineligible for funding generated under this Act. The Act established federal excise taxes on the sale of firearms, ammunition and archery equipment. These taxes are paid by the manufacturer and deposited in the Federal Aid in Wildlife Restoration Account. Revenue from this account is allocated to the States, each state eligible for between 0.5% and 5% of available funds. Language critical to the Act’s success was: “...and which shall include a prohibition against the diversion of license fees paid by hunters for any other purpose than the administration of said State fish and game department...”. This language (the Act’s 29 most important words) penalizes any state that uses license fees other than for fish and wildlife by loss of access to all Federal Aid dollars. A similar law was passed in 1950 called the Federal Aid in Sport Fish Restoration Act. Federal Aid requires a 25% non-federal match to obtain a 75% federal match from Federal Aid funds.

It has been estimated that in the 1800’s there were 1.5 to 2 million bighorn sheep (*Ovis canadensis*) in the western U.S. By 1960 it was estimated there were $\leq 25,000$ bighorn sheep, range-wide in North America. Restoration efforts, primarily through trapping and translocation, have been ongoing since 1922. Over 22,000 bighorn sheep have been relocated into historic range since that time. Today $\geq 85,000$ bighorn sheep are found range-wide, but their numbers are still a long way from the 1800’s estimate. Much of the success in restoration has resulted in relatively isolated and often small populations. Among the many factors affecting bighorn recovery, it is respiratory disease, often associated with spillover from domestic sheep and goats, that is most problematic. It often expresses itself in relatively sudden (3-5 months) all age die-offs, with mortality rates as high as 80%, plus. It is further complicated by respiratory disease carry over, possibly by survivors that are carriers, resulting in very poor lamb survival and lengthy (many years) population recovery.

Funding for management, restoration, enhancement and research comes from hunting license revenue (25%) and matching Federal Aid funds (75%). In addition, State, Provincial, First Nations/Tribal Jurisdictions often offer a sheep tag or two for auction. The Wild Sheep Foundation usually conducts the auction at their annual Sheep Show, returning 90% to 100% of the auction price to jurisdictions for sheep and habitat conservation. If the sheep concerned are in the U.S., those dollars can be used by the jurisdiction to increase its funding for conservation by 75% with a Federal Aid match. For example, Montana offers about 797 democratically drawn sheep licenses and one auction tag. The auction tag generates about 50% of its sheep and sheep habitat conservation funds. Efforts are underway to use auction tags from the northern states of Mexico to generate funds to restore free-ranging desert bighorns ($\approx 12,000$) to historic suitable habitat.

Authors: Tom Seaton, Alaska Department of Fish and Game

Kurt Alt, Wild Sheep Foundation

[Title:](#) Alaska wood bison restoration, a resource for the people (click **Title** for Powerpoint)

Wood bison are being restored to their former range in Alaska for two reasons: (i) restoration of the species to its former range; (ii) as a food, economic, and cultural resource for local people. There are only about 10,000 wild bison in the world today, of which 4,400 are wood bison. In 2015, 130 wood bison were released into the wild to extend their existing range westward. Wood bison original range was in the western boreal forest of North America. Northern bison distribution today is composed of relatively small isolated populations of both wood and plains bison. Oral history from elders in Northeast Alaska and input from archaeologists and palaeontologists helped document the historic range in Alaska and Canada.

Grassroots support has been key: 28 public groups worked over the last 24 years to create the management plan. These groups included landowners, oil and gas interests, hunting groups, and animal welfare and conservation groups. About \$5 million has been spent on wood bison restoration, about the same as constructing one mile of paved road. The return in 50 years is expected to be about \$290 million: \$81million in meat value, \$205 million in hunts, \$3 million paid for landowner access. Other benefits will include increased human health and activity, and social and cultural values, etc. Benefits will continue as long as regulated hunting and modern wildlife management exists. Keys to success were education, scoping and outreach. Importantly, building relationships with local people, involving them in stewardship training, providing regulations that are easy to comply with and engaging them in restoration efforts are all important outreach efforts.

Author: Dr Marina Rosales - Federico Villarreal National University, Peru.

Title: Wildlife conservation through sustainable use in South America (click **Title** for Powerpoint)

Sustainable use is crucial. It is one of three pillars of the Convention on Biological Diversity. It is defined as the use of components of biological diversity in a way and at a rate that does not lead to the long-term decline of biological diversity, thereby maintaining its potential to meet the needs and aspirations of present and future generations (<https://www.cbd.int/convention/articles/default.shtml?a=cbd-02>). Sustainable use is a cross-cutting issue to be developed in all sectors for our sustainable development. According to the United Nations Food and Agriculture Organization - FAO, [40% of the world's economy is based directly and indirectly on the use of biological resources](#). On the other hand, we need to consider sustainable use taking account of resilience-based ecosystem stewardship.

Resilience is a concept that embraces change as a prominent feature of systems, responding to and shaping change in ways that benefit society. We should address ecosystems as interrelated and providing a suite of ecosystem services, rather than a single resource, such as fish, fauna or trees. Hence, it is vital to focus on stewardship, which recognizes the management as an integral component of the system that is managed. The challenge is to anticipate change and shape it for sustainability in a manner that does not lead to loss of future options (Folke et al. 2003 in Chapin et al., 2009). Ecosystem stewardship should consider that society's use of resources must be compatible with the capacity of ecosystems to provide services, which, in turn, is constrained by the life-support system of the planet (Chapin et al., 2009).

Economic theory acknowledges that there is an increasing complexity of issues as there is a move from managing risk, to supporting resilience, and ultimately enabling sustainability. Resilience should be focused on short and long term adaptability, while sustainability takes a longer term 'future generations' stance (Saunders et al., 2015 in Chapin et al., 2009). Therefore, risk management, sustainability, and resilience are key. Furthermore, in the face of climate change we must focus on integrated use of sustainability and resilience in an environmental management context.

The sustainable use and benefit sharing are also effective tools to combat poverty, and, consequently, to achieve sustainable development. In this context, there are recommendations for applying sustainable use in the "[Addis Ababa Principles and Guidelines for the Sustainable Use of Biodiversity - AAPG](#)" and the "[Satoyama Initiative](#)". The first consists of fourteen interdependent practical principles, operational guidelines and a few instruments for their implementation that govern the uses of components of biodiversity to ensure the sustainability of such uses. The second initiative makes use of both the ecosystem approach and the AAPG for the sustainable use of biological diversity.

Taking account of these background concepts, initiatives on wildlife sustainable use in South America were reviewed, noting that many countries use a higher proportion of wild-sourced than captive bred and ranched fauna specimens. Ornamental plants are artificially propagated, vegetatively and in-vitro. Four of twelve South American countries have [export quotas authorized for ornamental plants in 2017 by CITES](#): Colombia, from wild and captive bred, six species and 12,295 specimens; Guyana, from mainly wild, 56 species and 176,148 specimens; Peru, from wild, one species (*Swietenia macrophylla*) for 281,694 m³ of sawn wood; and, Surinam for 43 species and 151,916 specimens mainly wild-sourced.

The data on South America species from Bolivia includes *Caiman crocodilus* "spectacled caiman", *Arapaima gigas* "arapaima", *Pecari tajacu* "collared peccary", *Tayassu pecari* "white-lipped peccary", *Swietenia macrophylla* "mahogany", *Cedrela odorata* "cedar" and *Vicugna vicugna* "vicuña", mostly wild-sourced. However, this country also exported *C. crocodilus* skins and *A. gigas* meat until 2007, peccary's skins until 2008 and *S. macrophylla* sawn wood until 2012 (Sinovas et al., 2017). Brazil has managed orchids by artificially propagating live plants, captive breeding and ranching, also *A. gigas* and

C. crocodilus, captive bred *Chelonoides carbonarius* “red-footed tortoises”, and wild-sourced mahogany. Colombia has exported *C. crocodilus* derived from captive breeding as skins, tails and meat, *B. constrictor* “boa” and *Iguana iguana* “green iguana” from captive breeding, *Strombus gigas* “queen conch” meat from wild- sources and orchids from artificial propagation. Ecuador has been exporting wild-sourced brown sea cucumber (*Isostichopus fuscus*) and artificially propagated live orchids. Guyana exports from the wild more than approximately 50 species including *Ara arana*, *A. chloropterus*, *Cebus appella* and *C. olivaceus*. Peru has been exporting peccaries, parrots, cedar, mahogany and vicuna from the wild, ranched *Podocnemis unifilis* “yellow spotted river turtle”, captive-bred *A. gigas*, and artificially propagated orchids and cacti. Suriname exports wildlife mainly as 43 wild-sourced species, including macaws *A. araruna*, *A. chloropterus*, *A. macao*, *A. severus* and monkeys *Saguinus midas* and *Saimiri sciureus*. Venezuela has exported spectacled caiman from wild sources and ranched, red-footed tortoises and yellow spotted river turtle from captive breeding, and artificially propagated orchids.

It is important to note also the international trade based on sustainable use by considering historical data trade. Peru exported 1’201,524 skins of collared peccary and 405,935 skins of white lipped peccary; these skins were derived from bushmeat activities, during 1985-2011 period (Rosales, 2014).

An annual average of approximately 770,000 skins were exported from the South America over the period 2005-2014, with the majority (87%) reported as captive-bred *C. crocodilus fuscus* from Colombia (Sinovas et al., 2017). Globally, mahogany was exported mainly from Brazil (410,359 m³), Peru (342,352 m³), Fiji (326,403 m³) and (211,469 m³) as sawn wood during 1995-2011. Cedar was also exported as sawn wood by Brazil (879,132 m³), Bolivia (368,405 m³) and Peru (212,607 m³) (Rosales, 2014). Since 2007, export volumes declined over the ten-year period as a result of trade controls and restrictions, including a zero export quota for mahogany set by Bolivia since 2011, following concerns over sustainability, regarding overexploitation and reduction of commercial populations. The yellow-spotted river turtle is being managed by local communities and its population increased from around 40,000 in 2005 to over 500,000 in 2014 (Sinovas et al., 2017). The vicuña’s huge population has been managed sustainably in the wild and with enclosures by local Andean communities. Peru has the largest population (approximately 80% of the total) and been the principal exporter of fiber from live animals, exported 47,319 kg of fibre during 1995-2011 (Rosales, 2014). Eighty per cent of wool reported by weight was exported by Peru, with the remainder from Bolivia during 2005-2014 (Sinovas et al, 2017). It is central to highlight that vicuña fibre trade derives from live animals, and the populations are not harvested for this activity; Andean communities only use the wool of live animals.

In this regard, we should highlight also the historical recorded data on international trade and ask questions if this management adequately applied principles of sustainable management and use. Furthermore, has this management integrated resilience in the framework of an ecosystem approach? On the other hand, has this management contributed to the conservation these wildlife species and their habitats? And have the local communities benefited from the wildlife management and reduced their poverty index?

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Authors: Mariana Montoya and Emiliana Isasi-Catalá.
Wildlife Conservation Society

Title: Importance of local communities in conservation: a case of effective hunting management in the Communal Tamshiyacu Tahuayo Regional Conservation Area (click **Title** for Powerpoint)

There is no discussion regarding the importance of local communities in conservation, in particular in conserving the forest. In many places, [deforestation rates are lower in communal territories](#) than in areas outside communities or protected areas. However, this will depend upon the level of involvement of communities. They can participate in conservation in different ways, being beneficiaries, participating in different processes or making decisions regarding [natural resource management and conservation](#). The Communal Tamshiyacu Tahuayo Regional Conservation Area ([ACRCTT](#)), located in Loreto, is surrounded by communities of riverine people that for more than 15 years have been managing wildlife resources for hunting. Local communities established their hunting quotas and agreed on control mechanisms that they have to comply with. Communities also are in charge of control and vigilance activities preventing outsiders to hunt in their communities or in the protected area and also have been monitoring hunting records for more than a decade. With technical support from WCS, these communities have been able [to assess the effectiveness of their hunting management using occupancy models](#) in addition to their own data on hunting records. Results showed that for most of the hunting species, occupation is in general higher further away from the populated centers, navigable rivers and inside the ACRCTT. In addition, occupation is higher near communities that are complying with local agreements including control and vigilance, versus areas near communities that are not organized and that do not have local agreements, where occupation is low (0.15 for *Cuniculus paca*). This indicates that hunting management and hunting agreements are being effective to control hunting pressure and that hunting populations are in good shape. These results are also being taken into consideration in the preparation of the ACRCTT management plan and therefore, includes strategies to promote local agreements and control in communities that are not yet managing hunting or committed to control outsiders. Local communities are leading this process and after learning that their management is being effective, they will continue with their activities and agreements, for which they have never being paid, and implement their management plan under an adaptive approach.

Authors: Adrian Reuter and Adrian Lombard,
International Association for Falconry and Conservation of Birds of Prey (IAF)

Title: Falconry: global community conservation through sustainable use by a minority interest

Falconry is defined as the hunting of wild quarry with the use of trained birds of prey. It has been practiced by many cultures for thousands of years, following sustainability criteria, with a great respect for prey species and the conservation of natural systems both for predators and prey. Falconry has elicited development of laws to protect raptors and nesting sites in Europe since the middle ages, and promoted research on different fronts related to raptors and their life cycles. Techniques finessed over all this time have been used not only for the practice of this hunting art, but also adopted to pursue other activities such as bird abatement in farmlands, airport safety, education, veterinary medicine, rehabilitation and reintroduction of various type of fauna to the wild. Many raptor conservation projects and initiatives have been initiated and implemented by falconers across the world, addressing threats to species such as the peregrine falcon, saker falcon, harpy eagle, California condor, orange-breasted falcon, Mauritius kestrel and even the American kestrel, once believed to be the most abundant falcon in the Americas. However, the falconry community is small, even though its conservation contributions to raptors and other species has been big. This minority group faces challenges, not only to continue the practice of this activity which is considered a Cultural Heritage of Humanity by UNESCO, but also to guarantee the passing of knowledge and experience from generation to generation, while continuing to support and promote conservation actions with other actors such as academia, governments and other organisations. Nonetheless, there are opportunities to improve this situation and ensure that efforts are coordinated and promoted, through effective collaboration and partnerships between falconers and other interests.

Author: Maya Basdeo, Conservation and Outreach Liaison, Ontario Hawking Club

Title: [Recent conservation projects by falconers in North America](#) (click **Title** for Powerpoint)

North American falconers, particularly in Canada and the United States, have had a history of participating in raptor conservation. Playing a key role in peregrine falcon recovery efforts inspired the creation of organizations dedicated to raptor conservation, and enshrined a conservation ethic in the North American falconry community.

Recent and ongoing raptor conservation by local communities of falconers in North America is typically exercised through Provincial and State falconry clubs when conservation efforts are at a local or regional geographic scale. Some of the raptor conservation projects that will be highlighted include:

- The Ontario Hawking Club's 'Project Goshawk' in partnership with the University of Waterloo in Ontario, Canada, and American kestrel nest box program in partnership with the Peregrine Fund.
- The Saskatchewan Falconers Association's conservation work with prairie falcons, and also the Cooperative Falcon Project.
- Collaboration between members of the Association Quebecoise des Fauconniers et Autoursiers and McGill University to establish a raptor banding station for boreal diurnal raptors.

The North American Falconers Association (NAFA) is instrumental in conducting conservation projects that occur at the physical and cultural landscape scale or in multiple jurisdictions. NAFA facilitates communication about local conservation efforts throughout the network of falconry clubs in North America, and is an example of an organization that transcends national boundaries and exemplifies cooperative falconry in the world.

Raptor conservation is a part of the North American falconry ethos. Currently, information about local conservation projects is disseminated through individual club websites, NAFA, and through visiting guest speakers attending club field meets. A centralized web-network with the specific focus of 'Falconry and Conservation' might be of use to aid in discussion and sharing of raptor conservation projects in the Americas, and might be facilitated by working with large falconry and conservation organizations such as NAFA.

Authors: Agustin Anzoategui. First Veterinarian. Rescue, Rehabilitation and Breeding Wildlife Center “Guira Oga”. Fundacion Historia Natural “Felix de Azara”. Argentina.

Henrique Rezende. Argentinian Falconers Club

[Title:](#) Scope to expand conservation projects by falconers in South America (click **Title** for Powerpoint)

Throughout history, falconers have been the first to gather knowledge about wild birds of prey, behaviour, capture, restraint, training, captive management, hunting techniques and captive breeding. In the second part of the 20th century, with the raptors populations decreasing due to habitat loss and agrochemicals, that knowledge became essential to breed and release birds of prey as a part of successful conservation projects, many of them led by falconers.

In South America, many birds of prey face serious conservation issues. Because of that, various conservation projects have been developed, many by falconers and other have benefited by technical knowledge from falconry.

- Projeto Harpía (Harpy Eagle Project), in Brazil. Harpy eagle rescue and rehabilitation in the Amazon and Atlantic Forest.
- CRARSI: Centro de Rehabilitación de Aves Rapaces “San Isidro” (San Isidro Birds of Prey Rehabilitation Center, in Colombia. Operation from 2000 to date in raptor research, rehabilitation and release, receiving about 800 injured birds of prey of which most have been released. Among these have been harpy eagle (*Harpia harpyja*), crested eagle (*Morphnus guianensis*), ornate hawk-eagle (*Spizaetus ornatus*), black hawk-eagle (*Spizaetus tyrannus*), and black and chestnut Hawk-eagle (*Spizaetus isidori*).
- Centro de Rescate, Rehabilitación y Recría “Guira Oga”. Rescue, Rehabilitation and Breeding Wildlife Center “Guira Oga”, in Argentina. Since its foundation in 1997, the centre has worked with various species of forest raptors. Currently there is a collared forest falcon breeding and release project, and a reproduction project for the crowned-solitary eagle, the most endangered bird of prey in Argentina. Director and Founder Jorge Anfuso and his team are also making a field survey of the southernmost harpy eagle population.
- ZooCriadero “El Huayco” (“El Huayco” Breeding Center). Peru. Since the early nineties, Jose Antonio Otero carries out a ex situ reproduction project of neotropical birds of prey. He is currently working in Andean condor rehabilitation, release and captive breeding.
- CECARA- IAF: Survey on mortality of raptors associated with power lines, in Argentina.

To enhance communication, with exchange of information and experience, discussion and protocols for case studies, it will be useful to use a Global-to-Local approach. To achieve that, creation of a multilingual module is initially desirable, as a hub in a System for Community Liaison (SYCL) network. This system would involve institutions and NGOs that work in raptor conservation in South America, and be a platform to share information about topics with the local community, thereby establishing as an important tool in education for conservation.

Author: Robert Kenward, lead in IUCN-CEM on Sustainable Use and Management of Ecosystems

Title: Progress to TESS and beyond: a rationale for the work of CEM-SUME (click **Title** for Powerpoint)

This workshop as a whole is a journey to understand an emergent IUCN toolkit, for global-with-local (glocal) communication. We will see how the toolkit's System for Community Liaison can be used to network websites in one cultural language, by planning projects(s) in Spanish for South America, and how a 'glocaliser' translation module can link such networks across other languages for the Americas.

Origins of this 'glocal' knowledge-transfer concept.

This story goes back before 2000, when the International Association for Falconry and Conservation of Birds of Prey (IAF) worked with WWF and BirdLife for an [IUCN resolution recommending that saker falcons and their breeding habitats be preserved by management for sustainable use](#). The resolution attracted the interest of Steve Edwards, then leading IUCN's Sustainable Use Initiative, which led to my secondment to IUCN from UK government's Centre for Ecology and Hydrology. Tasks were to work on implementing the saker resolution, and to do a review, contracted by Council of Europe for a UNEP agri-environment conference, on [the potential of sustainable use activities for de-intensifying farmland](#).

The process for CBD's [Addis Ababa Principles and Guidelines for Sustainable Use](#) (AAPG) revealed findings by IUCN's Southern African Sustainable Use Specialist Group (SASUSG) that relatively arid land could be more valuable for producing wildlife than farming livestock. Although there was little land most valuable for wildlife harvest in Europe, work by what is now UK's Game & Wildlife Conservation Trust showed that measures which reduced crop yields very slightly could offset that yield loss by increasing land value for producing game. Long before the Millennium Assessment started people thinking about Ecosystem Services, this was work in IUCN on private Payments for (Cultural) Ecosystem Services (PES).

A major insight gained from the CoE/UNEP review was that de-intensifying land-use through sustainable use of wild resources would require much science. It would be much more complex than conserving species and areas merely by protecting them, as it involved managing interactions between different wild species, cultivated species, and people. This was recognised already in CBD's Ecosystem Approach as well as AAPG, which emphasised conservation at local level and using adaptive management.

At that time, individual projects to restore rare species were already being conducted by conservation organisations. However, each project tended to need its own expert, and even the 'cloning' of successes by enthusiasts for raptors, wild ungulates and other animals was not getting land managers generally engaged everywhere in conservation. It was clear that providing complex integrated knowledge very simply to guide decisions in local communities everywhere would be challenging. Training enough experts would be costly and take years, so the best means of knowledge transfer would be the internet.

Technology for exchanging knowledge through the internet

On my return to CEH from secondment, there was opportunity to review scope for outreach to UK local communities (parishes) with government-based decision support tools. The idea was that if government provided software tools which helped local managers to benefit both livelihoods and biodiversity, data returned on the actual decisions by the managers and their resulting benefits could enable iterative improvement of the tools, in a virtuous cycle for conservation. UK government liked this idea (albeit wanting to own it, not commission from CEH), but then an election removed the inter-ministerial integrating fund to which we agreed to bid.

Therefore, the ideas were developed further in two projects by IUCN's European Sustainable Use Specialist Group (ESUSG) for European Commission (EC). A first project raised awareness of the

economic and volunteer potential from biodiversity-dependent recreational (cultural) activities. Across Europe the Private PES are about €60 billion annually, similar to the whole of the state Common Agricultural Policy of the European Union. [Regular surveys reveal even larger engagement](#) and Private PES values in the US. [Another important finding, from a survey of more than 30 case studies globally](#) was that local knowledge-leadership (as would be provided by a decision-support system) and adaptive management (as recommended in AAPG and which an iterative decision-support system would enable) were the most important local factors favouring conservation of biodiversity and ecosystem services.

The second project was to design a [Transactional Environmental Support System](#) (TESS). It surveyed 30 countries at national and local government levels, and among individual managers of land and species, using questionnaires in each language. We found not only that support on socio-ecological decision and fine-scale mapping were a particular need of local communities across Europe, but also that [local people were adept at the mapping if helped to do so](#). It was especially convenient that people were so good at mapping, because although some of what is now called Indigenous and Local Knowledge can itself be for sophisticated management, the mapping of habitats, animal populations and animal locations, which local people can help collect, can be combined for decision support based on predictive modelling.

TESS therefore designed a mapping system for knowledge exchange. Model-based decision support could be produced centrally, to be used with local knowledge in terms of maps needed for modelling, with iteration to improve the models. Unfortunately, the EC did not consider that funding construction of the system would be a good research project. However, the TESS design had also proposed delivery through a portal that could self-fund while it developed the decision support, so a small group of partners from the projects decided to keep developing the socio-technology design. We already had software for translating information and tools in many languages, and a multilingual team in [European Sustainable Use Group](#) (successor to ESUSG) to do the translation. We put www.naturalalliance.eu online in 2011, and easy-to-edit sites networked in several ways within some 15 languages by 2015.

Re-vitalisation by IAF, and expansion within IUCN

The ESUSG projects had also shown that the organisation and innovation of activities dependent on biodiversity was inversely related to the numbers engaged. There is little international organisation of those gathering fungi and plant products. With about a third as many participants, angling supports half a federative job in Brussels. With a third as many hunters as anglers, hunting is well-organised from Brussels downwards, and five of eight mapping projects at local level in TESS were organised by hunters. There are far fewer falconers, but IAF rapidly understood the potential of the multilingual networking for their requirements, to build trust between falconers across many Central Asian countries for managing the saker falcon. IAF joined UNEP's Convention on Conservation of Migratory Species in 2014 to commission www.saker-staging.net for informing and surveying in 5 expertly translated languages.

Having seen the ease of building Sakernet, IAF appreciated that the system could also be used as a multilingual platform to help restore small-game, pollinators and other biodiversity across vast areas of agri-desert in Europe. By this stage, IUCN had created a [Sustainable Use and Livelihoods group](#) across IUCN's Species Survival Commission (SSC) and Commission on Environmental Economic and Social Policy (CEESP). ESUSG (now ESUG), which had also adopted independent legal identity in order to engage in EU projects, was acting as a support group for SULi in Sakernet, which is close to SULi core interests of trade in wildlife. However, ESUG emphasis had always tended towards conserving ecosystems through use of species, and with www.Perdixnet.org was to move further into the ambit of Commission on Ecosystem Management. It was therefore appropriate that CEM had agreed not only to adopt ESUG's outreach programme in a group for [Sustainable Use and Management of Ecosystems](#) but also mandated it to go global. Thus, thanks to so many of you, here we are in Lima.

Author: Eduardo Arraut, joint-coordinator for South America of IUCN-CEM's group on Sustainable Use and Management of Ecosystems

Title: [Improving \(eco\)system management by bridging local with scientific knowledge \(Click **Title** for ppt\)](#)

Like an economic system, an ecosystem to provide services efficiently needs to be stable or quite resilient. For example, a large-scale monocultural system depends on huge quantities of soil enhancers, herbicides and pesticides, which cost a lot of money and act towards the degrading the ecosystem itself, while one in which the landscape is strategically shared with trees, birds, mammals, insects and fungi can be more productive and self-sustainable. The reason is that the former constantly loses a greater part of the energy introduced into it, so more is always needed, while the second conserves more of it within its structure via a series of feedback loops and redundancies, and is resilient. The former kind of system may be thought of as a 'resource sink'. It is highly unstrategic to develop an economy around it.

The above ideas will be illustrated with examples from the English and Brazilian (southeast) countryside. In the first, the government is forced to spend millions of dollars annually to combat floods and control the outbreaks of bovine tuberculosis, rats and other agricultural pests, while the second tells the story of the collapse of an entire economic system a few years after it was number one in the world. Its legacy is highly visible today, in the 'dead cities of Vale do Paraíba', the depauperate land and the dormant economy.

As ecosystem management usually requires synthesizing, simulating and exchanging data and information in quantities that exceed what human brains can handle, scientific modelling is a valuable tool. We illustrate conservation success stories in Europe and the middle East where deer, partridges, saker falcon and alpine landscape are being managed using models created by scientists and other citizens. With the common buzzard as example, we show a model capable of predicting animal home range structure and population density within a map of the current landscape or a management scenario. Together, these studies show that people in the field of science, agriculture, politics, business and other activities all possess useful knowledge and benefit from learning from others, and that strengthening the right connections tends to catalise good conservation.

Author: Bridget Kenward, Tanglewood Farm and Research Ltd, UK (click **Title** for Powerpoint)

Title: [What nature data do local people in UK want and what can they provide?](#)

Pan-European survey and detailed analysis in case studies in 2009-10 showed that detailed information for management at the lowest level of government administration was poor. There was great need for fine-scale maps of species and habitats, while demand for decision support on socio-economic aspects of the environment was least met by supply of decision support models. In any case, a small minority of models registered by scientists in international databases were available for local people to use, and none in more than two languages. On the other hand, eight case studies in communities at lowest level of government found that local people were good at mapping, which the EU-funded project to design a Transactional Environmental Support System proposed to exchange for decision support, and enjoyed the project work. With no high-level support to build a TESS, work continues to seek funds by providing other internet services, for example to local councils and clubs.

Author: Robert Kenward, lead in IUCN-CEM on Sustainable Use and Management of Ecosystems

Title: Concepts and socio-technology tools for a Global-with-Local approach (click **Title** for Powerpoint)

To be global-with-local, a system must be able to work in all local languages, at least for its essentials. At a time of increasing use of computers and smartphones within all cultures, glocal internet systems (e.g. Microsoft, Google, Facebook, Twitter) are ubiquitous. Like IUCN-SUME's system, they are based on simple yet powerful software. However, the IUCN system differs from these in one respect: it is mainly designed for networking between cultures, as well as within cultures. Facebook enables networks for German-speaking Swiss, and these networks would be understandable by Austrians and German, but not well enough for others to engage constructively in detailed discussions even using Google-Translate. This means that new concepts in conservation can take more than a decade to cross language barriers.

The IUCN-SUME system enables rapid transfer of new concepts, and facts on which they are based, using a 'glocaliser' module, within which Commission or Member experts translate important generic aspects agreed by a content-design team. This is mostly done on a voluntary basis, although there may be small payments to ensure timely completion and checking of translation. The glocaliser then allows users to select not merely the language in which they access but also the culture, for example separating Peru from Argentina if the details for the topic (species, laws) might differ between countries. Clicking a prominent glocaliser link to the national site can then access a site or network for the relevant culture.

The second important part of IUCN toolkit is the System for Community Liaison (SYCL) network. This could also be called the system for 'cultural liaison' or even for 'centred-localism'. The facilities on pages in these sites were designed by asking local administrations and clubs what facilities they would like on an ideal web-site, and then also including four ways to link the sites within a network:

- Insertion of links for document downloads, other pages or external sites anywhere within site content;
 - Common pages across sites within a culture can signpost other systems in that culture (see "Nature Actions" at <http://arne-parish-council.sycl.net>, www.tanglewood-farm.co.uk, <http://esug.sycl.net>);
 - Horizontally, by searching for other SYCL sites and networks (a map is foreseen) and using 'contact-us';
 - Vertically, via other web-services (e.g. the proposed decision support) operating to global level.
- SYCL currently operates independently, with full internal instructions, in 15 languages which cover Europe, the Americas and North Asia. The intention is to total about 40, for good coverage of Africa and East Asia. However, SYCL sites can also be in other languages, provided the administrators understand one of the languages in which instructions are provided. The SYCL sites can not only treat issues in different ways but also may look quite different (see <http://perdix-de.sycl.net>, <http://perdix-uk.sycl.net>).

As the outreach of the whole glocal system is to local level, it is especially important not only **to use** local languages, but also **not to use** science jargon. For www.perdixnet.org we had a notional target of the 16-year-old daughter of the local farmer, in the hope that she would say "Daddy, look at this". To translate a concept simply is challenging. Naturalliance was a bit too hurried for perfection, but the ESUG-based team is quite good now and mostly managed to convert e.g. "What pays, stays" to idiom in Perdigetnet.

Using such systems, a very small number of people can disseminate sound environmental thinking and good practice rapidly across cultures, not only to help local people with managing land and species (so that higher levels of government feel more comfortable to delegate responsibility, as recommended by Ecosystem Approach and AAPG), but also to help build more accurate and sophisticated decision support for the future. Funded by [IAF](#) and working with [GWCT](#), knowledge from 50 years of research is being spread rapidly across Europe, and even used for modelled recommendations based on local maps. Such local decision support initially needs translation at national level. However, if demand grows, it should be possible to start automated map-and-model-based decision support as designed in the EC-funded projects. There is huge flexibility and scope for innovation in distributed social networks like these, in which global organisations work with local people to purvey trustworthy information.