



Conservation Medicine and EcoHealth Working Group Report

2008 CBSG Annual Meeting, Adelaide, Australia

Participants

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After brief introductions of participants and agreement on the framework for the workshop two presentations were given.

Introduction to Conservation Medicine and EcoHealth – Wayne Boardman

- These new disciplines have emerged in response to human impacts on a range of habitats resulting in progressive biological impoverishment, emerging infectious diseases, global climate change and pathogen and chemical pollution.
- A recent example is the Gyps vulture die-off in the Indian subcontinent due to diclofenac poisoning. This anti-inflammatory drug is commonly used in cattle. Cattle are considered sacred and not eaten and the vultures perform an important role in scavenging their carcasses when they die. With the widespread use of diclofenac the scavenging vultures ingested a toxic load resulting in a >99% die-off over a 5-6 year period. The loss of these scavengers resulted in an increase in feral dogs which, in turn, resulted in a increase in transmission of rabies from dogs to people. Other significant social impacts were experienced by Parsi people who traditionally leave the bodies of their dead to be scavenged by vultures. A large, multi-disciplinary team was needed to investigate this problem and develop a response plan.
- A key feature of the EcoHealth/Conservation Medicine approach is the concept of complexity. This recognises that disease in nature occurs within a complex system comprising multiple variables with a high level of uncertainty and requires an integrated, flexible and adaptive approach using a mix of specialist skills.
- In 2004 participants of the One World One Health conference in New York formulated the “Manhattan Principles” which provide a useful synopsis of the EcoHealth/ Conservation Medicine approach. These are attached in summary form as an appendix to this report.

Conservation Medicine in New Zealand - Richard Jakob-Hoff

Key drivers to establishment of the first national Centre for Conservation Medicine have been:

- Development of partnership relationships with key Government regulatory agencies over a period of years resulting in increasing demand for the Zoo’s specialist wildlife health services (research, training, technical advice).
- Increasing zoo involvement in native species breeding for release programs and associated veterinary support in terms of disease risk assessment and mitigation for wildlife translocations.
- The extension of an integrated conservation medicine practice from within the Zoo to in situ conservation projects. (Zoo veterinarians consider the interaction of environmental, animal and human health as standard practice).
- The finding of *Babesia* blood parasites in free-living kiwi. This organism was considered exotic to New Zealand and a potential threat to the country’s cattle industry and domestic dogs. Although, subsequently, this species of *Babesia* was found to be specific to kiwi and of minimal clinical significance, its discovery raised the interest of biosecurity authorities in the potential role of wildlife as disease reservoirs.
- A symposium on Conservation Medicine demonstrated clear interest in, and benefits from, closer collaboration between scientists in the human, animal and environmental health sectors.
- A feasibility study established clear community support for the construction of the Conservation Medicine Centre and, driven by the Zoo’s Charitable Trust and a professional fund raiser, \$4.6 million was raised from the community over a two year period.

The new Centre incorporates the zoo’s wildlife hospital with dedicated research and teaching facilities and a public gallery that provides conservation medicine-focussed displays and viewing into the zoo’s hospital and laboratory. The establishment of the physical structure has resulted in approaches by a number of conservation, research and academic organisations seeking to establish formal links with the Centre.



Discussion

These presentations were followed by a discussion of the potential for application of Conservation Medicine by participants to local wildlife health issues. Examples included:

- The potential value of taking a transdisciplinary approach in responding to TB in captive rhinos in South Africa within the context of a challenging regulatory environment.
- Conservation Medicine has been practiced at The Wilds in Ohio for the last 6-7 years. It was important to demonstrate the value of this approach through practical local application. An example was the study of stress in freshwater bivalves in the Ohio River Valley. These bivalves had virtually disappeared due to environmental degradation over a number of years and a reintroduction program was planned. However, before this was initiated it was important to be able to monitor stress in free-living bivalves. A very successful method of sampling bivalve haemolymph, using implanted pericardial catheters, was developed by Barbara Wolf. This enabled stress to be measured without disturbing the bivalves. The work in solving this problem then resulted in further approaches for help.
- Another example is the study of health in hellbender salamander populations to understand why these animals were thriving in West Virginia but doing poorly in Ohio. It was shown that blood parameters in the two populations were quite different and that the Ohio population was suffering chronic stress and toxicity. This could then be linked to a water quality issue and provided an objective measure to monitor hellbender response to changes in water management.
- In Western Australia detailed Environmental Impact Assessments are required prior to the issue of mining permits. Mining companies are required to purchase 'environmental off set' lands to mitigate adverse environmental impacts. This could provide opportunities to apply ecosystem health monitoring.
- Three years ago the National Zoo in Pretoria, South Africa was declared a national research facility required to contribute research towards biodiversity conservation and human resources development. It was suggested that this may provide an opportunity for the Zoo to become the National Centre for Conservation Medicine.
- White Oak and the University of California at Davis deliver "EnviroVet" an intensive 3 week course in Conservation Medicine followed by two weeks of hands-on field work in Kenya and South Africa. This is a very successful training model involving 25 – 30 students from all over the world annually.
- Ohio State University, Columbus Zoo and The Wilds also have a successful training program in which each institution gains benefits without money changing hands.

Role of CBSG

The group considered what role Conservation Medicine could play in the delivery of CBSG processes and how CBSG might advance the application of this integrative approach.

- A specific challenge of the new science is finding ways to communicate effectively across disciplines as each speciality uses its own technical language. Also, the approach of conservation biologists, for instance, is quite different to the approach of medical specialists.
- It was recognised that CBSG's strengths include its experience and tools for enabling very diverse groups of specialists to collaborate effectively in working through conservation problems.
- CBSG is also skilled in delivering training in a range of tools and processes. For example Phil Miller has been involved in the EnviroVet programme and the CBSG Disease Risk Analysis tools development for many years.



Recommendations

- Susan Hunt to recommend to WAZA that zoos encourage their veterinary staff to adopt the collaborative, integrative approach of Conservation Medicine and provide their skills to PHVAs, particularly those with a significant disease component.
- That Zoo's recognise that Conservation Medicine can provide a vehicle for involving their veterinary staff in field work and, through establishment of collaborative partnerships across the entire spectrum of health disciplines, open up opportunities for joint funding bids.
- That using local examples is the most effective way to explain and promote Conservation Medicine to local audiences (eg in New Zealand, invasive brush-tailed possums threaten human, domestic animal, wildlife and environmental health).
- That the CBSG 'MySpace' facility be promoted as a tool to enable discussion of issues relevant to Conservation Medicine by a wide range of stakeholders.
- That, as Conservation Medicine develops, CBSG become a repository of best practice methodology – a source of information of what works, what doesn't work.
- That CBSG consider ways in which its mass collaboration tools, disease risk assessment tools and collaborative processes can be deployed to further develop and promote the practice of Conservation Medicine.

Postscript

Workshop participants were challenged, over lunch, to come up with an easily understood description of Ecohealth/Conservation Medicine. Nicole Anderson won a copy of the book 'Conservation Medicine' by Aguirre et al (2002) for the following statement:

"Ecohealth/Conservation Medicine is monitoring and evaluating the response of species to their environment and assessing the flow-on effects to other members of a human or animal community using a multi-disciplinary and adaptive approach."

Appendix – The Manhattan Principles (abridged)

"We urge the world's leaders, civil society, the global health community and institutions of science to

1. Recognise the essential link between human, domestic animal and wildlife health and the threat disease poses to people, their food supplies and economies, and the biodiversity essential to maintaining the healthy environments and functioning ecosystems we all require
2. Recognise that decisions regarding land and water use have real implications for health.
3. Include wildlife health science as an essential component of global disease prevention, surveillance, monitoring, control and mitigation.
4. Recognise that human health programs can greatly contribute to conservation efforts
5. Devise adaptive, holistic and forward-looking approaches to the prevention, surveillance, monitoring, control and mitigation of emerging and resurging diseases
6. Seek opportunities to fully integrate biodiversity conservation perspectives and human needs (including those related to domestic animal health) when developing solutions to infectious disease threats
7. Reduce the demand for and better regulate the international live wildlife and bush meat trade not only to protect wildlife populations but to lessen the risks of disease movement, cross-species transmission, and the development of novel pathogen-host relationships.
8. Restrict the mass culling of free-ranging wildlife species for disease control
9. Increase investment in the global human and animal health infrastructure
10. Form collaborative relationships among governments, local people, and the private and public (i.e.- non-profit) sectors to meet the challenges of global health and biodiversity conservation.
11. Provide adequate resources and support for global wildlife health surveillance networks
12. Invest in education and raising awareness."