Conservation Medicine

BY ROBYN G. ALDERS

Conservation medicine, an interdisciplinary field concentrating on the nexus of human and animal health and environmental conditions, has emerged in the last two decades in response to complex health issues as varied as highly pathogenic avian influenza, which connects humans, poultry management, and wild birds; amphibian declines, which involves an introduced fungal disease; and poaching, linked to population pressures, a lack of livelihood opportunities, and poultry disease. Addressing such interconnected problems requires multidisciplinary teams and integrated techniques, according to the Consortium for Conservation Medicine (**http://www.conservationmedicine.org/wcm.htm**), a collaborative institution that brings together leading academic, government, and nongovernmental organizations (NGOs) in the field.

The perspective that health and disease are fundamentally related to the integrity of ecosystems closely allies the conservation medicine field to conservation biology, although practitioners of the former include ecologists, veterinarians, public health professionals, epidemiologists, climate scientists, anthropologists, economists, and political scientists. The "Who we are" and "CCM partners" sections on the Consortium for Conservation Medicine's site provides helpful information about programs and practitioners.

The consortium shares a similar philosophy with other programs, including EcoHealth (**http://www.ecohealth.net/association.php**), which promotes the sustainable health of people, wildlife, and ecosystems; the One Health Initiative (**http://www.onehealthinitiative.com/mission.php**), which emphasizes links between human and animal health; One World, One Health (**http://www.oneworldonehealth.org**), which recognizes the essential link between human, domestic animal, and wildlife health and the importance of maintaining functioning ecosystems; and the Global Health Council (**http://www.globalhealth.org**), a membership alliance that links medical and social science research focusing on determinants and distribution of human health issues in an international context.

While no single Web site provides a comprehensive conservation medicine bibliography, narrowly focused guides, such as the University of Buffalo Health Science Library's resource guide on protozoan parasites (**http://ublib.buffalo.edu/hsl/resources/guides/trypanosomes.html**), give some sense of the scope of even very specific conservation medicine problems.

Conservation medicine is explored in depth through graduate and other coursework and programs at several universities around the world. Programs include a Master of Veterinary Studies in Conservation Medicine at Murdoch University in Perth, Australia (**http://www.vetbiomed.murdoch.edu.au/vet/grad_courses/MVS_consmed.html**); honors Bachelor of Veterinary Science in Veterinary Conservation Medicine at the University of Liverpool (**http://www.liv.ac.uk/vets/study/vcm1.htm**); Masters of Science in Wild Animal Health (**http://www.rvc.ac.uk/Education/Postgraduate/MScWildAnimalHealth/index.cfm**) and in Wild Animal Biology (**http://www.rvc.ac.uk/Education/Postgraduate/MScWildAnimalBiology/Index.cfm**) at the Royal Veterinary College, University of London; and graduate specialization in Fish & Wildlife Disease Ecology & Conservation Medicine (**http://www.fw.msu.edu/graduates/conservationmedicine.htm**) at Michigan State University.[1]

As the conservation medicine philosophy gains popularity, many observers look to translate this interest into concrete action. *Conservation Medicine: Ecological Health in Practice* (**http://books.google.com/books?vid=ISBN0195150937**) documents practical examples of conservation medicine at work across the globe.

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In southern Africa, two initiatives addressing illegal hunting and diseases associated with village chicken production illustrate how the field can help solve wildlife conservation problems while attending to human and animal health.

In many developing countries in sub-Saharan Africa, expanding human populations has resulted in significant numbers of poor people living near protected wildlife populations. Inevitably, the needs of people and wildlife come into conflict. Communities adjacent to national parks and other wildlife conservation areas often illegally hunt wildlife, a practice that has had severe impacts on migratory and nonmigratory wildlife populations. Subsistence bushmeat hunting, which makes up a significant proportion of poaching, is attributed primarily to a lack of sufficient alternative sources of protein and income.

Developing more alternative protein sources has emerged as a viable approach to reducing bushmeat hunting and its consequent threats to biodiversity. A study in Tanzania found that households raising small domestic livestock were less likely to

participate in bushmeat hunting (**http://www.thenrgroup.net/info/people/KC/pdfs/Loibooki_Bushmeat.pdf**).

Many poor rural households in southern Africa rely on village chickens for food, fertilizer, pest control, and other family needs (**http://www.tufts.edu/vet/ivm/healthy_poultry.html**). In rural households affected by HIV/AIDS (**http://www.fao.org/docrep/x0259e/x0259e00.htm**), they play a particularly important role because village poultry provides a source of high quality nutrition and income without requiring much in the way of labor or financial inputs. Poultry also significantly contributes to food security, reducing the reliance on bushmeat.

This is particularly true in Zambia, which has had difficulty maintaining its 19 national parks and 34 game management areas—representing respectively about 8 percent and 24 percent of the total land area (**http://www.zawa.org.zm**)—while struggling to provide basic services to its human population. The Zambian government and its NGO partners have a long tradition of working with communities bordering its best-known parks in North and South Luangwa. The Community Markets for Conservation (COMACO; **http://www.itswild.org**) initiative addresses the multifaceted needs of biodiversity conservation and sustainable development with due consideration of communities living within the area. To do so, the initiative brings government agencies, communities, NGOs, and commercial ventures together to stimulate economic linkages, local participation, and partnerships that promote biodiversity and increased well-being among local communities.

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One important part of the COMACO initiative involves training poachers in alternative trades, such as beekeeping, carpentry, metal work, and, crucially, poultry husbandry (**http://www.itswild.org/transform-a-poacher**). The poultry trade, however, is significantly limited by Newcastle disease (**http://www.aciar.gov.au/publication/PR103**, see chapter 11 for Zambia; see also **http://www.nal.usda.gov/awic/pubs/newcastle/newcastle2.htm**), a virus that affects respiratory, nervous, and digestive systems and can spread quickly through chicken flocks. Wild birds can also carry the disease (**http://www.ars.usda.gov/is/AR/archive/oct99/front1099.htm**), and it can cause conjunctivitis in humans. However, in low-income countries like Zambia, families feel the main impact of the disease in terms of lost income and sustenance due to high mortality in village chicken flocks. With support from the Wildlife Conservation Society's Animal & Human Health for the Environment and Development (AHEAD) initiative (see **http://www.wcs-ahead.org** and **http://www.wcs-ahead.org/book/AHEADbook27MB.pdf**), COMACO has partnered with the International Rural Poultry Centre of the KYEEMA Foundation (IRPC/KF; **http://www.kyeemafoundation.org/irpc.php**) to vaccinate village chickens against the disease. In collaboration with the partnership, the communities select local men and women to conduct vaccinations on a fee-for-service basis, resulting in more chickens and eggs in communities bordering South Luangwa National Park (**http://www.zawa.org.zm/southl_luangwa.htm**). By paying for the vaccination, the owners demonstrate that they value the vaccine. The funds cover the vaccinators' labor costs and contribute to the cost of importing the heat-tolerant vaccine (**http://www.aciar.gov.au/system/files/sites/aciar/files/node/2178/mn86.pdf**). The program improves not only human well-being but also the capacity of rural communities to manage their flocks and build on the experience to strengthen their endorsement of wildlife management. Good poultry management, then, can lead to good wildlife management and, hopefully, more wildlife.

The AHEAD initiative has a similar program in the Great Limpopo Transfrontier Conservation Area (which includes Mozambique, South Africa, and Zimbabwe; see **http://www.greatlimpopopark.com/** and **http://www.wcs-ahead.org/workinggrps_limpopo.html**). There, the initiative provides a forum to address the risks of disease transmission between humans, domestic animals, and wildlife as well as ways in which the developmental needs of Africa can be realistically met without compromising its environmental heritage. With a seed grant from the U.S. Agency for International Development (**http://www.wcs-ahead.org/gltfca_grants/grants.html**), the AHEAD initiative enables the IRPC/KF to work with communities by focusing on the sustainable control of Newcastle disease in village poultry; improved village poultry husbandry and management strategies, including marketing; and improved household welfare, including better nutrition and food security as a means of reducing the need for communities surrounding the Limpopo National Park to hunt, eat, and sell bushmeat (**http://www.wcs-ahead.org/gltfca_march2007/faiela.pdf**).

More than 20 years ago, long before anyone had coined the term "conservation medicine," the work in both areas in southern Africa began as collaborative efforts between wildlife ecologists, veterinary scientists, social anthropologists, economists, human health professionals, and national and local government authorities. Many of those involved understood the importance of working together. But they did not foresee it one day falling under the umbrella of a new field that brings the old adage, "a bird in hand is worth two in the bush," back to its literal roots.

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1. For a longer list of programs and coursework, see G. E. Kaufman, J. H. Epstein, J. Paul-Murphy, and J. D. Modrall, "Designing Graduate Training Programs in Conservation Medicine—Producing the Right Professionals with the Right Tools," *EcoHealth*, 11 February 2009, http://www.springerlink.com/content/y28625u622g4r712/ (accessed 30 April 2009).