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Essay

# Eighteen reasons animal behaviourists avoid involvement in conservation

Tim Caro [a,*], Paul W. Sherman [b,1]

[a] Department of Wildlife, Fish and Conservation Biology and Center for Population Biology, University of California, Davis, CA, U.S.A.
[b] Department of Neurobiology and Behavior, Cornell University, Ithaca, NY, U.S.A.

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We summarize 18 common misgivings that animal behaviourists raise about becoming involved in conservation. We argue that many of the supposed institutional and interdisciplinary differences break down under scrutiny; that the supposed basic-applied dichotomy is often imaginary or insufficient to prevent interchange of ideas between behaviour and conservation; and that arguments about professional lifestyle, scientific inflexibility and despair are not adequate justifications for remaining on the sidelines. We suggest that many studies of animal behaviour are relevant to solving conservation problems, and we therefore encourage behaviourists to contribute more strongly to finding practical solutions to the contemporary conservation crisis.


Despite almost two decades of discussions of the role that animal behaviour might play in conservation biology (Clemmons & Buchholz 1997; Caro 1998; Gosling & Sutherland 2000; Festa-Bianchet & Apollonio 2003), and recent syntheses of its potential contributions to conservation solutions (Buchholz 2007; Blumstein & Fernández-Juricic 2010; Candolin & Wong 2012), there is still reticence about applying concepts and methods of animal behaviour to solving conservation problems. Although attempts to relate the behaviour of animals to conservation are increasing in the academic literature (e.g. Slabbekoorn & den Boer-Visser 2006; Husby et al. 2009; Dolenec et al. 2011), and have reached the stage of literature reviews (e.g. Brown 2012; Møller 2012; Rosenthal & Stuart-Fox 2012), animal behaviour studies have generally failed to penetrate conservation biology or wildlife management practice and vice versa (Caro 2007; Angeloni et al. 2008). Lack of the anticipated cross-fertilization between animal behaviour and conservation biology surprises and concerns us.

Recently, we challenged behavioural ecologists to help stem human-imposed losses of species and habitats (Caro & Sherman 2011a). We argued that such losses adversely affect not only researchers' own study organisms but also their academic discipline itself, obfuscating, for example, such fundamental approaches as quantifying fitness, use of comparative methods and interpretation of adaptations. The field of animal behaviour will also suffer if unique behaviours of populations of extant species continue to disappear due to anthropogenic changes (Caro & Sherman 2012).

Most animal behaviourists are aware of these developments, some acutely, others only vaguely, but they are not sure how to contribute to solving them. When challenged to help provide conservation or management solutions, they often appear perplexed about how to proceed, and they raise a number of specific impediments that concern them. In this Essay, we will pose, and address, the toughest of these concerns. We have personally heard colleagues and students voice every one of them to justify staying on the sidelines. We hope that honest evaluations of these arguments will encourage readers of *Animal Behaviour* to become more involved in conservation.

## MAJOR IMPEDIMENTS

### *Academic Issues*

*(1) 'My university does not reward applied biology'*

This comment might have been valid two decades ago, but today most academic institutions (especially land grant colleges) have specific faculty positions in conservation biology or environmental science, as well as in animal behaviour. Many institutions have entire departments of applied biology centred on wildlife and conservation (North America) and natural resources and population management (Europe), and there are a good number of

* Correspondence: T. Caro, Department of Wildlife, Fish and Conservation Biology and Center for Population Biology, University of California, Davis, CA 95616, U.S.A.
*E-mail address:* tmcaro@ucdavis.edu (T. Caro).
[1] *E-mail address*: pws6@cornell.edu (P. W. Sherman).

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endowed chairs in conservation biology. Moreover, there is now a list of faculty who are willing to mentor students in conservation behaviour (http://animalbehaviorsociety.org:8786/Committees/ABSConservation/Mentor). Given the current conservation crisis and society's concern about it, we can expect to see more undergraduate and graduate courses and endowments for chairs in areas such as conservation science, sustainability, climate change biology and biodiversity. With donors' willingness to contribute rising, grant funds from nongovernmental organizations (NGOs) and government funding bodies increasing, and students' interest in classes and research opportunities soaring, university administrators will undoubtedly seize opportunities and put more of their own resources into conservation science.

*(2) 'There is no targeted funding for studies in animal behaviour or behavioural ecology that apply to conservation issues'*

Unfortunately, this is partially true: it is difficult to secure large-scale funding from government research councils to support doctoral students or relieve faculty from teaching obligations. However, there are many smaller grant sources (see http://animalbehaviorsociety.org:8786/Committees/ABSConservation/ABSConservationFunding). Moreover, many of the species that animal behaviourists commonly study provide conservation services, for example, as pollinators (Greenleaf & Kremen 2006) or as indicators of pollution or spread of fungal diseases (Fisher et al. 2012), and animal behaviourists' field sites are sometimes in threatened habitats. Therefore, animal behaviourists who incorporate conservation into their research can actually expand their funding horizons by seeking new sources (e.g. see http://www.conservationleadershipprogramme.org/), different federal granting agencies (e.g. Departments of Defense and Agriculture, Environmental Protection Agency, U.S. Geological Survey), NGOs or private donors.

*(3) 'The academic establishment thinks conservation biology is less prestigious than animal behaviour'*

Snobbery rears its ugly head. For many academics, basic and theoretical fields of inquiry do have higher status than applied and empirical fields. Some older members of the academic community may feel that animal behaviour is a more prestigious biological subdiscipline than conservation biology. These elders (>55 years old) were born when the world's population was around 2 billion, and for them overpopulation and anthropogenic change are relatively new phenomena. They also are the people who were looked down upon early in their careers by, for example, physiologists, geneticists and functional morphologists, who regarded the new field of ethology as a 'soft' science, lacking in theory and experimental rigour. But younger colleagues see things differently. They were born into a world containing 5 or more billion people, and have spent their entire lives hearing about and dealing with global changes caused by anthropogenic forces. They are unlikely to accord greater prestige to a colleague working on game-theoretic models of animal behaviour than to one studying, say, how crowding affects disease transmission, climate change affects mammalian community structure, or how herbicides affect amphibian reproduction.

Perceptions of the importance of conservation biology are changing too. Today there are numerous conservation-related societies, and they have large memberships. For example, the Society for Conservation Biology has approximately 4000 current members; by contrast, the Animal Behavior Society has about 2000 members and the Association for the Study of Animal Behaviour has about 1100 members. That the Animal Behavior Society values conservation-related research is evidenced by its online publication, The Conservation Behaviorist, and the E.O. Wilson Conservationist Award that recognizes students pursuing conservation behaviour. Conservation biologists are regularly elected to National Academies of Sciences and Royal Societies, and they win prestigious international awards (e.g. the Crafoord Prize, Tyler Prize for Environmental Achievement, World Wildlife Fund Gold Medal). Society at large recognizes the crucial role of conservation in the 21st Century, as evidenced by media attention, monetary donations and volunteer efforts. Note that no comparable private contributions of time, energy and money go to animal behaviour. The prestige of conservation biology outside academe is bound to influence outdated perceptions within ivory towers.

*Conservation Issues*

*(4) 'Professional wildlife managers deal with practical problems; they won't listen to me'*

There also is some truth to this assertion. Federal and state biologists and managers, especially the older generation, often distrust the advice of academic biologists. There are many reasons, prominent among which are that academics have rarely stepped forward to help them solve practical problems. Also, managers and academics do not often get to know each other personally or professionally: they rarely attend the same conferences and meetings, and they read different technical literature (Blumstein & Fernández-Juricic 2010).

But things are gradually changing. Nowadays managers of captive breeding programmes recognize the importance of behavioural training before releasing animals (e.g. how to forage and avoid predators); managers of lands with endangered species acknowledge that they need to know about all aspects of their subjects' biology, including physiological, behavioural and social requirements; zoo keepers understand that behavioural enrichment can be key to breeding success; and reserve designers realize that knowledge of variations in dispersal and migration can be used to predict how close habitat patches must be in order to support viable populations, as well as biogeographical range shifts under climate change (Kokko & Lopez-Sepulcre 2006). Even hunters and commercial fishermen understand that knowledge of social structure, breeding behaviour and population trajectories of wild game is essential for ensuring long-term sustainability. And all the large NGOs, which have a disproportionate say in conservation decision making, have a group of biologists in charge of strategic planning units. Yes, communication barriers remain, but they are eroding in the most influential conservation decision-making arenas.

*(5) 'Conservation is mainly the province of state and federal agencies and NGOs; university people like me are peripheral'*

Management actions have traditionally been conducted by government agencies and NGOs, but academic wildlife and fisheries biologists have always been involved in management decision making (especially regarding game species and their habitats). Contemporary management increasingly involves species of conservation interest or invasive species and, as a result, university personnel are becoming engaged at more levels. For example, they have conducted targeted research and advised government decision makers on effects of badger, *Meles meles*, culling on the spread of bovine tuberculosis in the U.K. (Donnelly et al. 2006) and on sizes of lion, *Panthera leo*, and leopard, *Panthera pardus*, hunting quotas in Tanzania (Packer et al. 2011). University personnel also conduct research in concert with NGOs and governments at local, national and global scales, as exemplified, respectively, by listing of the California tiger salamander, *Ambystoma californiense* (Stokstad 2004), in the Wildlife Conservation Society's Report on corridors to the government of Tanzania (Jones et al. 2009), and in the Royal Society Policy Centre Report (2012), the 'People and the planet',

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