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Comments and debate on the issues surrounding the treatment of different animal taxa raised in the article above can be directed to the Editor of the Newsletter.

Workshop Reviews

The ISBE conference in Montreal this past summer was a venue for discussion on a variety of issues. Three of these topics were formalized into workshops, and the following reports are synopses of those discussions.

The function of avian duets: defining hypotheses, discussing advances and clarifying future directions

Many tropical birds coordinate their vocalizations in the form of strikingly precise duets. Despite numerous hypotheses, there is no current consensus about the function of these remarkable acoustic displays. Development of new experimental techniques and a resurgence of interest in avian duets, as exemplified by a burgeoning number of studies of individually-marked duetting populations, set the stage for a meeting of researchers interested in avian duetting. A half-day workshop involving 23 participants was held on July 7, 2002, in conjunction with the 9th ISBE congress, with the goals of formally defining duets and hypotheses for their function, discussing theoretical and experimental advances, and clarifying future directions in this field of research.

The identity of duet contributors is an important feature of classical definitions of duets. Previous reviews suggested that duets are formed by males and females of a mated pair or extended family group (Thorpe 1972, Farabaugh 1982), but participants agreed that the definition of duetting should be revised to include species that produce coordinated vocalizations outside of an established male-female pair. Emily DuVal (UC Berkeley, Berkeley, USA) highlighted the coordinated acoustic displays of unrelated male-male pairs of lance-tailed manakins (*Chiroxiphia lanceolata*) and Amy Rogers' observed that female eastern whipbirds (*Psophodes olivaceus*) readily duet with neighbors and strangers as well as their social mate. Participants agreed, however, that counter-singing contests between territorial neighbors should not be confused with duets. Descriptions of duets studied by participants highlighted tremendous structural diversity; duets vary in the degree of overlap and synchrony, in complexity and length, and there is variation among species in the sex of the duet initiator, in the similarity of the male and female contributions, and in the frequency with which duets occur relative to solo song. Participants agreed that a working definition of duetting must be broad enough to encompass this diversity and emphasize the temporal properties of the duet rather than the identity of the participants.

Michelle Hall argued that progress in the study of duet function has been impeded by a large number of poorly defined hypotheses for the adaptive significance of duetting. When evaluating these hypotheses, Michelle emphasized the necessity of assessing the costs and benefits of participating in a duet to each

individual, rather than the pair. She stressed the importance of distinguishing between *why both birds sing* and *why they coordinate their songs into precise duets*. Michelle tabulated twelve hypotheses for the function of duets, defining them in terms of whether they suggest a cooperative or conflicting function, whether they feature intra- or inter-pair signaling, and what type of information is conveyed by the duet responder.

Laura Molles (University of Waikato, Hamilton, New Zealand) highlighted the importance of quantifying characteristics of duets (for example, Susan Farabaugh's 1982 methods) for elucidating duet function. In addition, she suggested that thorough investigations of the social and ecological context of duets can provide insight into why some animals produce coordinated vocalizations, in particular by comparing differences in patterns of dispersal, territoriality, and mate attraction between duetting and non-duetting species. Participants agreed that the formation of exclusive, testable predictions based on measurable differences observed in duet structure and duet context would provide a useful expansion of Michelle's theoretical outline.

Nigel Mann, (St Andrews University, St Andrews, Scotland) presenting a written report *in absentia*, highlighted the importance of considering evolutionary history and argued that comparative studies remain a virtually unexplored source of information on duetting. Nigel described his current study which involves mapping vocal characteristics of *Thryothorus* wrens onto a molecular phylogeny, identifying points of transition towards more complex duets, and comparing which ecological and social factors are associated with these transition points. Participants agreed that rigorous comparative studies are an important tool in the study of duets and their function.

Amy Rogers discussed the use and interpretation of removal experiments performed both in isolation and in combination with playback experiments. Amy demonstrated how removals can be used to test predictions of hypotheses relating to joint territory defense and to elucidate the role of duets in mate attraction and pair formation. The length of time birds were removed from the territory was identified as an important factor; participants discussed the necessity of weighing potential information gained against the ethical and practical issues presented by longer term removals.

Daniel Mennill discussed innovative playback and recording techniques that could be employed in the study of duetting animals. Daniel presented a playback design using two-channel playback stimuli to mimic duet contributions through the left and right channels of stereo speakers, which would allow tests of predictions not possible with conventional single-speaker playback. David Logue (Colorado State University, Fort Collins, USA) is piloting the use of a two-speaker design in the study of duetting wrens. In other methodological advances, participants discussed the utility of interactive playback as a tool for evaluating duetting, and microphone array recording as a tool for investigating the contact maintenance and territory defense functions of duetting.

In summary, the workshop revised the definition of duetting, outlined a new theoretical framework, and described innovative experimental techniques that will facilitate the study of duets and their function. Participants discussed the need to identify formalized, exclusive predictions for hypotheses, to obtain more information on the social context of duets, and to conduct comparative studies. The importance of a broader perspective on duetting was also highlighted. For example, the need for research on proximate questions such as ontogeny and mechanisms of duetting, and the relationship of definitions, hypotheses and functions of avian duets with duetting in taxa such as mammals, frogs and insects.

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Discussion on Conservation, Movement and Habitat Selection

Preamble. We organized this workshop for two reasons. First, we wanted to identify common interests pertinent to conservation, movement, and habitat selection among diverse taxonomic and conceptual foci. Second we hoped to provide a springboard for potential subsequent meetings or symposia concerning these topics. The workshop was advertised prior to and at the conference and 55 people attended the lunch time discussion. Prior to the meeting, we circulated a list of questions for discussion to those who planned to attend. These questions were fairly narrowly focused on movement and habitat selection issues and we realized at the meeting that participants were interested in a wider range of questions, and that more people were participating than we'd anticipated. Accordingly, we attempted to broaden the topics for discussion. The original guiding questions are available from Colleen (cstclair@ualberta.ca) if you are interested.

Opening. Judy began with a 10-minute overview intended to introduce some of the reasons and ways that behavioral ecologists can make a contribution to conservation issues. She addressed three themes. The first considered the contexts in which behaviour is most relevant to conservation biology and focused on vital rates, distribution patterns, and assessments of management efficacy. The second suggested that gaps in our knowledge about conservation solutions sometimes stem from missing behavioral information or understanding. The third theme addressed the issue of scale by describing both spatial extent and configuration of habitat as important contributors to conservation issues related to animal movement and habitat selection.

Introductions. We followed these opening comments with a round of self-introductions which, owing to the size of the group, took much of our time. This portion of the discussion revealed a wide base of disciplinary and taxonomic interest in the specific topics of habitat selection, movement, dispersal, and the more general interface between conservation and behaviour. It also revealed interest among graduate students, faculty, and government biologists.

Discussion. To initiate the discussion, Judy posed the broad question: What are some of the untapped situations where behavioral ecologists can make some useful conservation contributions? The remaining minutes of the lunch are summarized here; detailed minutes of the comments are available from Colleen. Many participants expressed the need to work closely with managers to determine conservation issues relevant to them and their jurisdictions. Some noted the untapped potential of working outside of protected areas, on topics or species which are not of direct concern to