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Qualitative methods for ecologists and conservation scientists

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Abstract

1. Conservation of biodiversity involves dealing with problems caused by humans, by applying solutions that comprise actions by humans. Understanding human attitudes, knowledge and behaviour are thus central to conservation research and practice.
2. The special feature brings together authors from a range of disciplines (ecology, human geography, political science, land economy, management) to examine a set of qualitative techniques used in conservation research: Interviews, Focus group discussion, The Nominal Group Technique and multi-criteria decision analysis.
3. These techniques can be used for a range of purposes—most notably to understand people’s perspectives, values and attitudes and to gather information about approaches to management of species, ecosystems or natural resources.
4. Incorporating human values, perceptions, judgements and knowledge into conservation decision making is an important role for qualitative techniques; they provide robust means for submitting this information or knowledge as evidence.
5. The articles in this special feature highlight a worrying extent of poor justification and inadequate reporting of qualitative methods in the conservation literature.
6. To improve and encourage greater use of these techniques in conservation science, we urge improved reporting of rationales and methods, along with innovation, adaptation and further testing of the methods themselves.

Keywords

expert elicitation, focus groups, multi-criteria decision analysis, nominal group technique, policy making, qualitative interviews, qualitative research

Main body of paper

These are exciting but challenging times for conservation science, which has long been recognised as an inter-disciplinary research field focused on understanding, protecting and managing biodiversity (Soule, 1985). In the twenty-first century, conservation science has explicitly recognised the coupling of social and natural systems, including the role of humans in sustaining biodiversity (Everard, 2017; Karieva & Marvier 2014) and the various roles of biodiversity in supporting continuing human security and providing opportunities (Millennium Ecosystem Assessment, 2005). Increasingly, conservation scientists come from a range of academic backgrounds, with those educated in geography, sociology, anthropology, psychology or economics joining those educated in biological or environmental sciences to form a vibrant, stimulating research community that is actively addressing one of the most pressing global challenges of our time: the continuing global-scale loss of biodiversity (Butchart et al., 2010).

While old-style conservation biology was dominated by biological approaches and almost exclusively quantitative in its analytical techniques, the new conservation science frequently uses qualitative approaches developed in the social sciences to gather information, or determine why and how decisions are made. Qualitative approaches are essential to tackle the “wicked” problems facing conservation today, framed by incomplete knowledge and potentially contradictory outcomes (Rittel & Webber, 1973). They are needed, for example to take account of experiential, tacit or indigenous and local knowledge that may be key to solving conservation challenges (Haddaway & Dicks, 2017;

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Sutherland, Gardner, Haider, & Dicks, 2014), or to explore the diversity of value positions among different stakeholder groups.

In our view, there remains substantial work to do, to bring the disciplines together in conservation science, and avoid siloed, disciplinary thinking. As an example, the global Intergovernmental Science Policy Platform on Biodiversity and Ecosystem Services (IPBES), should surely have a balanced representation of all disciplines in conservation science, but Kovács and Pataki (2016) showed that social sciences and indigenous and local knowledge are both poorly represented among its expert communities, which they suggested was because they are “not captured by the communication avenues of the peer-reviewed ‘traditional’ ecological sciences.”

A frustration we have experienced in conservation research is the tendency for scientists from one part of the discipline to use techniques from another improperly, inexpertly, or without proper reference to the relevant literature (St. John, Keane, Jones, & Milner-Guland, 2014). Examples we have come across include poor questionnaires designed by ecologists without consulting the target community; inappropriate use of quantitative survey questionnaires when qualitative interviews are needed; and over-simplified ecological surveys tacked onto sociological studies.

One way to avoid this is to work in truly interdisciplinary teams, with expertise appropriate for the techniques being used. Such teams are increasingly enabled, as international funding bodies recognise the need for inter-disciplinary research to address societal challenges relating to broad areas such as environment and health.

Another route to solving the problem, which must occur in parallel, is to support correct use of standard methods by providing guidelines, written in non-technical language, with cross-linkages to sources in the various disciplinary literatures where specific methods were developed, described and justified.

In this context, this special feature of *Methods in Ecology and Evolution* provides a series of clear guidelines to qualitative methods commonly used in conservation or natural resource management research to elicit, process and use knowledge from stakeholders or experts. For four methods—interviews (Young et al., 2017), focus groups (Nyumba, Wilson, Derrick, & Mukherjee, 2017), nominal group technique (Hugé & Mukherjee, 2017) and multi-criteria decision analysis (MCDA) (Esmail & Geneletti, 2017)—guidelines are drawn from reviews of relevant literature with the articles giving overview of how the methods have been used in conservation research over the past two decades. A fifth paper (Mukherjee et al., 2017) critically analyses and compares six qualitative methods, also including the Delphi process (Mukherjee et al., 2015) and Q-methodology Zabala and Pascual (2016) for their use in conservation decision making.

The articles show that all four of the methods reviewed in detail have been used for an extensive range of conservation research purposes. Most notably, all the methods are used explicitly to understand people’s perspectives, values, preferences and attitudes. All are also used to gather information about approaches to management of species, ecosystems or natural resources. Interviews, focus groups and MCDA are often used to obtain basic ecological or socio-economic information about a place or group of people, whereas prioritisation of actions is an important role for MCDA and the nominal group technique.

Worryingly, a common strong message from the articles on interviews (Young et al., 2017), focus groups (Nyumba et al., 2017) and MCDA (Esmail & Geneletti, 2017) is that these methods are often poorly justified and inadequately reported in the conservation literature. For example pilot interviews represent an important stage in designing interviews, and should be requested by ethics

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committees. They allow researchers to check that the interview length and language are suitable for the target population, and that useful results can be obtained without bias. Yet of 227 papers using interviews for conservation decisions, 86% either did not use pilots or did not say whether pilots had been used (Young et al., 2017). Furthermore, focus group papers identified by Nyumba et al. (2017) frequently did not report sample size, group size or the number of focus group discussions held, although these are key pieces of information for interpreting the validity of the results.

In some cases, the methods are not being used to their full advantage. For example only a minority of the 86 studies using MCDA incorporated stakeholders (other than the authors) in identifying alternatives (15% of studies) and formulating criteria (35%) (Esmail & Geneletti, 2017). This is unfortunate, as MCDA is designed to place stakeholders values at the core of decision making, by engaging them in defining objectives and generating possible alternative solutions. An MCDA that does not meaningfully engage the key actors misses the point somewhat. For interviews, many of the papers identified by Young et al. (2017) did not report their methods of transcription (66%) or coding (39%); 73% did not provide a clear rationale for using interviews as a method. This implies that, at least in some cases, researchers using interviews are not setting out with a clear purpose and method of analysis, to ensure that useful data are gathered.

As shown by Mukherjee et al. (2017), the techniques covered in this Special Feature can all be used when making decisions in conservation, as means to incorporate human values, perceptions, judgements and knowledge from a range of stakeholders at various stages in a decision-making process. Together, the techniques provide a “how to” for assimilating knowledge from various sources, incorporating values and making judgements.

Importantly, the methods also provide a selection of robust means for submitting this information or knowledge as evidence. For example documenting the value of indigenous and local knowledge systems was one of four major themes that emerged from Nyumba et al.’s (2017) review of the use of focus groups. Twenty-eight studies (16% of those identified) used focus groups for this purpose, including, for example understanding traditional uses of natural resources or approaches to agriculture and climate change. When scientific knowledge is needed, directly consulting experts is often considered sufficient by decision makers, although evidence shows that experts can be more confident than is justified, and that rigorous means of consulting experts, such as the Delphi process, provide more accurate results (Sutherland & Burgmann, 2015).

Viewed collectively, these articles constitute a useful resource to facilitate selection and use of some common qualitative methods in conservation science. They provide a guide for inter-disciplinary researchers to gauge the suitability of each technique to their research questions, and serve as a series of checklists for journal editors and reviewers to determine appropriate reporting.

In convening this special feature, we urge greater collaboration across the disciplines within conservation, incorporating rigorous use of qualitative methods such as those described. We envisage a future in which conservation scientists test, modify and improve these techniques, so that they become even more relevant and widely used in applied ecology and conservation research.

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