

Response to Gilchrist *et al.* 2005. “Can Local Ecological Knowledge Contribute to Wildlife Management? Case Studies of Migratory Birds”

## On Using Expert-Based Science to “Test” Local Ecological Knowledge

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The challenges and opportunities of incorporating information collected through scientific studies with the experience-based knowledge of resource-dependent communities have been the focus of numerous studies (e.g., Freeman 1992, Agrawal 1995, Weeks and Packard 1997, Turner et al. 2000). However, there are relatively few examples in which ecological science and local knowledge have both been successfully incorporated to provide meaningful input into resource management (Berkes 2004). In their recent article in *Ecology and Society*, Gilchrist et al. (2005) provide a thorough evaluation of Local Ecological Knowledge (LEK) using expert-based ecological studies often referred to as “western science.” Although we applaud their recognition of the value of and desire to promote LEK, it is unfortunate that they use expert-based ecological data as a “test” to determine the “reliability” of LEK. Even though the authors indicate their wish to use the two different approaches to identify “constraints and limitations of both approaches,” they fail to discuss the assumptions, limitations, or constraints of the ecological studies that they use. We do not take issue with their ecological studies; we presume they are of the highest quality. However, to assume that the ecological studies are error free and without any bias or limitation is perhaps somewhat misguided, albeit an assumption that many scientists still make (Harding 1991, Rykiel 2001). Indeed, Freeman (1992) provides examples in which conflicts occurred in the Canadian Arctic between LEK and expert-based science over aerial surveys of bowhead whales in the Beaufort Sea and caribou in

what is now Nunavut, where local perceptions of the state of these wildlife populations were initially considered “unreliable” but were resolved when biases in ecological studies were corrected using local knowledge. These case studies illustrate the limitations of ecological research and monitoring, and provide a cautionary tale against accepting them as “truth.”

Both LEK and data derived by expert-based science vary temporally and spatially. The areas that hunters frequent and the degree of familiarity vary tremendously among individuals. The responses received by researchers when interviewing local people also vary because of many other factors, including the context for the interviews, the level of familiarity with the interviewees and local culture as a whole, how the resulting data are interpreted, and how much opportunity there is for iterative interaction and feedback (e.g., Huntington and Fernandez-Gimenez 1999, Turner et al. 2000). Furthermore, interviews also reflect a world view. Other factors, including the personality and gender of the interviewer, influence the nature of the responses (Shank 2002). Similarly, ecological studies conducted at multiple scales often generate varying and, in some cases, contradictory results. For example, Schneider (2002) reviewed numerous studies that consistently showed the association between marine birds and their prey as being strong at some spatial scales and weak or nonexistent at others. Science experts also frequently disagree regarding data interpretation, which has prompted the adaptation of techniques, such as Delphi and

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consensus approaches, to generate much-sought-after agreement (e.g., Morgan et al. 2001). Thus, the commonality among all studies, whether they are based on scientific data on wildlife populations, documenting LEK, or incorporation of the two, is that the approach taken, the methods used, and the scale of consideration all fundamentally influence the study results.

If local knowledge is to be used in a respectful way that recognizes its inherent and use-value, community members should be meaningfully involved in most, if not all, aspects of a study, especially when making linkages between LEK and science. Weeks and Packard (1997) show that residents often use their own unique criteria when assessing scientific information and so will have novel contributions to any discourse regarding how linkages might occur or, indeed, if they even should be considered. Although Millar and Curtis (1999) found that the equitable interchange of local and scientific knowledge can produce synergistic outcomes that benefit both researchers and local communities, this interchange remains rare in the peer-reviewed literature. This, in large part, is because resource-dependent communities have often been politically, socioeconomically, and culturally marginalized in stark contrast to the relative privilege and influence that scientists enjoy. Indeed, the growing recognition of LEK can lead to appropriation and misuse, further marginalizing the original holders of this knowledge (McGregor 1999, Simpson 2003). The incorporation of both local and scientific knowledge is inevitably influenced by these power dynamics (Foucault 1980, Nadasdy 1999). Thus, when Gilchrist et al. (2005) suggest that the use of local knowledge is most appropriate in situations in which empirical data are unavailable and only when LEK is validated using scientific studies, it aids in maintaining the balance of power in the hands of the scientists and marginalizing the contribution of local people.

Although the table presented by Gilchrist et al. (2005) provides a succinct way of summarizing LEK, a more useful approach might be to examine each knowledge source, in isolation and in relation to the other, without making value judgements about reliability or validity. In this way, Nichols et al. (2004) indicate the level of agreement within each question among respondents. This strategy would identify, at best, how both approaches might complement and strengthen one another and, if needed, how any apparent contradictions might

merit further exploration and discussion.

A primary goal of any study that involves the application or collection of LEK should thus be to empower communities to contribute in meaningful ways and ensure that the studies are of local benefit (Berkes et al. 2005). An important first step for many scientists is to recognize how value-laden their research is. It is encouraging that some northern communities, such as in Nunavut and the Inuvialuit Settlement Region, have direct input into the research permitting process that then gives them some influence on the research process. However, scientists must recognize that the trust-based relationships that are needed to achieve true collaboration generally require many years of local action and commitment on the part of researchers. In this context, differences that inevitably remain between LEK and expert-based science tend to reflect differences in scales of consideration, limitations in methods of collection, or fundamental differences in world view, rather than any inherent unreliability in approach. Indeed, Agrawal (1995) emphasizes that it is time to break away from that “sterile dichotomy” between LEK and expert-based science. As such, the real challenge is to identify mutually affirming ways in which scientists and marginalized communities can all use their experiences and expertise to deal with environmental and socioeconomic problems that ultimately give meaning and urgency to these initiatives.

Responses to this article can be read online at:  
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