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Short communication

Understanding individual risk perceptions and preferences for climate change adaptations in biological conservation

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ABSTRACT

Too little attention has been paid to the psychological factors (e.g., beliefs and perceptions) that determine the acceptability of conservation measures, despite the fact that all conservation occurs within a social context. Climate change in particular will demand adaptation strategies that may be cognitively difficult to accept. We conducted a survey online (n = 312) to examine preferences and perceived risks associated with a set of proposed adaptation strategies in a sample of the public. Preferences for proposed adaptation policies were significantly and negatively correlated with perceived risk in every case. Preferences also exhibited widespread conservatism with the greatest acceptance for measures most similar to the status quo, while environmental worldview and emotions of fear and anger appeared to influence perceived risk and acceptability. These results suggest that conservation planning should include considerations for risk perceptions, and greater support for certain conservation measures may be generated by deemphasizing their perceived novelty and emphasizing their contemporary usage.

1. Introduction

Climate change poses a major challenge to conservation efforts worldwide, from habitat shifts (e.g., Parmesan, 2006) to the threat of new invasive species (e.g., Hellmann et al., 2008). As a result, a number of adaptations for biological conservation have been proposed (Lawler, 2009). These include, among others: assisted colonization (e.g., Hoegh-Guldberg et al., 2008); the use of non-native species to restore ecosystem services (Hershner and Havens, 2008); the creation and expansion of protected areas, corridors and networks (e.g., Hannah et al., 2007); and, conservation triage (i.e., explicitly prioritizing conservation objectives to maximize efficient use of limited conservation resources).

While the need for adapting conservation policy is recognized, some strategies have received broad support while others have been markedly controversial, even within groups of scientists, conservationists and the public (e.g., Hagerman et al., 2010a; Hewitt et al., 2011; Marris, 2007). How can this diversity of views be explained? As the implementation success of adaptation strategies depends at least in part on their perceived risk and acceptability (Adger, 2003; Tompkins and Adger, 2005), identifying the factors that shape risk perceptions and policy acceptability is a key question for conservation (Hagerman and Chan, 2009). In particular, public

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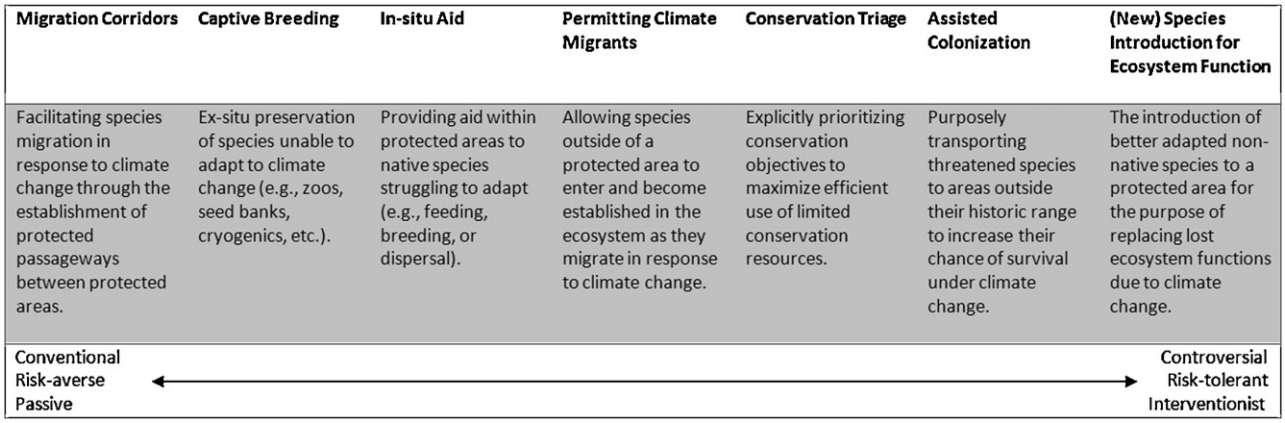

Fig. 1 – The seven adaptation policies investigated in this study organized along a continuum of risk-averse to risk-tolerant.

perceptions are important for implementation by narrowing or widening the set of plausible alternatives available to conservation practitioners and policy makers.

In other domains, risk perception is a significant research topic and is identified as conceptually (Adger et al., 2009) and empirically important for motivating climate change adaptation (Grothmann and Patt, 2005). Evidence from broader risk perception and climate adaptation studies suggest that risk perceptions can influence adaptation outcomes (e.g., Grothmann and Patt, 2005; Patt and Schröter, 2008). However, research on the perceived risks of climate change adaptation in biological conservation has only just begun. Overall, studies find high recognition among scientists, experts and managers that climate change poses a significant risk to biodiversity and the need for adapting policy, but divergence in what is perceived to be the most appropriate and feasible courses of action and the importance of climate change relative to other threats (Schliep et al., 2008; Hagerman and Satterfield, personal communication; Lemieux and Scott, 2011; Rudd, 2011). However, no study, to our knowledge, has investigated public perceptions.

Research in cognitive psychology and behavioral economics has long demonstrated that people frequently make judgments that stray from normative precepts. Such 'biases' include greater preferences for the status quo over alternative futures (Samuelson and Zeckhauser, 1988), 'over-sensitization' to emotions as the basis of judgment (e.g., Loewenstein et al., 2001) and rigid adherence to prevailing worldviews (e.g., Kahan et al., 2009). According to the theory of Cultural Cognition (Kahan and Braman, 2006; Kahan et al., 2006), worldviews (or belief systems) predispose people to think about risks and hazards in ways that align with a person's values (Kahan et al., 2006; Slimak and Dietz, 2006).

More than benign curiosities of human cognition, these perceptual patterns can have significant implications for conservation policy: the status quo bias may manifest as resistance to novel adaptations; negative emotions may trigger avoidance behaviors (Peters et al., 2006) and shift preferences away from particular adaptation alternatives; and, if existent norms and worldviews of conservation are inflexible in the face of climate change, policies that challenge the dominant paradigm may be prematurely rejected, inhibiting sound policy evaluation and implementation.

Given the cognitive patterns highlighted above, we expect that the perceived risk and acceptability of adaptation policies will be situated along a continuum, with the most novel and interventionist measures (e.g., pre-emptive interventions) judged to be the most risky and least acceptable (Fig. 1). In other words, risk and acceptability will be judged along a spectrum "from ... precautionary and robust to more risky or deterministic, but specifically anticipatory" (Heller and Zavaleta, 2009, p. 27). We also expect that more negative emotions will be associated with greater perceptions of risk and decreased acceptability. Finally, more pro-environmental worldviews are hypothesized to increase perceptions of risk and decrease the acceptability of more interventionist policies.

To test our hypotheses, we conducted an exploratory internet-based survey of a public sample of convenience. We quantified the link between risk perceptions and preferences for adaptation policies, and tested the correlation between these and measures of environmental worldview and emotions. Finally, we discuss the implications of our findings for adaptation in conservation and areas of future research.

2. Methods

2.1. *Data collection*

Data was collected via online surveys (approved by the University of British Columbia Behavioural Ethics Board; certificate number H09-02174) made available on the Internet to the general public from February 2010 to June 2010. The surveys were hosted on the Norms Evolving in Response to Dilemmas (W. Maurice Young Centre for Applied Ethics at the University of British Columbia) research group website using their survey platform (Danielson, 2010). Convenience sampling was used and participants (19 years and over) were recruited through online social networks (i.e., facebook), e-mail discussion groups, posters, online ad sites (e.g., craigslist), and word of mouth. A total of 370 people were recorded as accessing the survey, however only 312 people logged responses on the final page (of demographics). The 312 individuals were retained for subsequent analysis for an overall dropout rate of 15.7% ($n = 58$).