

## CHAPTER ONE

# Making a difference in conservation: linking science and policy

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### 1.1 Introduction

Jamie Gundry's dramatic image of a white-tailed eagle (*Haliaeetus albicilla*) on the cover of this book reflects the twisting changes in fortune experienced by this species, with a revival that can be attributed to a successful interplay of science, policy and practice. White-tailed eagles were historically much more widely distributed than they are today (Yalden, 2007), once breeding across much of Europe, but by the early twentieth century the species was extinct across much of western and southern Europe. The main cause of its decline was persecution by farmers and shepherds, who considered the eagles a threat to their livestock, but, along with other raptors, white-tailed eagles were also seriously affected by DDT in the 1960s and 1970s, which had disastrous effects on the breeding success of remaining populations. However, over the past four decades the species has seen a remarkable reversal in its fortunes. Changes in public attitude and policy have resulted in several reintroductions of the species, returning breeding populations to Scotland and Ireland (Evans et al., 2009; O'Rourke, 2014), and a recent licence has been approved for a release on the Isle of Wight in southern England. White-tailed eagles also recently started nesting in the Oostvaardersplassen, part of the Netherlands that just over 50 years ago was reclaimed polder destined for industrial development, but has

since become the most influential example of the concept of rewilding. The recovery of this species has required a significant shift in perception among a diverse range of stakeholders; this has resulted in positive changes in both policy and practice, with bans on the use of organophosphate pesticides and the re-setting of attitudes from those that allowed persecution, to create a context which allowed populations to be reintroduced. The spectacle of this wonderful species in locations where it was once absent is a tribute to the successful linking of science and policy, but elsewhere these links are often problematic: this book sets out to examine the range of challenges and successes.

Even before the first attempted reintroduction of a white-tailed eagle population in 1959, conservation researchers have had a long history of involvement in policy issues. One early example was Arthur Tansley, an English botanist and pioneer in the discipline of ecology. In 1913, Tansley and his colleagues established the British Ecological Society (BES), the first ever learned society in this science. By the 1940s, he was a committed conservationist, chairing the BES committee that formulated UK policies on nature reserves, and was instrumental in the formation of the Nature Conservancy, the first government agency to support ecological research. It is therefore fitting that this book has emerged from a highly successful conference entitled 'Making a Difference in Conservation: Improving the Links between Ecological Research, Policy and Practice' that was supported, in part, by the BES.

Over recent decades, conservation has evolved into a global dynamic trans-disciplinary field, which embraces the two-way relationships that occur between people and nature at many different levels (Mace, 2014). At the same time, the ways in which information is communicated have altered dramatically as a result of a progressively more complex and interconnected networks of technologies and practices. The policy landscape, both within and between nations, has also changed. The shifts in these interlinked disciplines have had a significant impact on how evidence derived from research is used in conservation decision-making. This book brings together a series of conservation experts to share their experiences of the different aspects of, and approaches to, working constructively at the research-policy/practice interface.

The process linking science and practice is rarely linear and often complex (Owens, 2015). Policy and practice responses may be driven by a scientific discovery (such as the impact of neonicotinoids on pollinating insects), political change (such as the overhaul of land-use policies that may result from the UK's decision to leave the European Union) or even communication (such as the rapid responses of businesses, individuals and governments following the dramatic television footage of a blue whale and albatrosses consuming plastic

in the BBC David Attenborough TV series *Blue Planet II*). However, dig down and each of these apparent initiation points are usually built upon other elements.

This book begins with a scene-setting chapter written by the Chief Scientific Adviser of the UK Department for Environment Food and Rural Affairs, who provides insights into how governments make decisions and the challenges of developing evidence-based policies. The remainder of the book is divided into three sections. The first covers the identification of priorities for research and approaches for collating relevant information, to ensure it is readily available for use by decision-makers. The second section examines the practicalities of engaging decision-makers and stakeholders with evidence. The final section considers how messages related to conservation can be communicated, such as by the use of social marketing or behaviour nudging, to make a tangible difference for biodiversity.

## 1.2 Identifying priorities and collating the evidence

The research–policy/practice interface may not function adequately if either there is insufficient relevant information available at the time when decisions need to be made (evidence generation failure) or information exists but is not successfully incorporated into the decision-making process (evidence use failure). If researchers are to help inform decision-making, then the emerging policy/practice issues need to be sufficiently well researched and the resulting evidence must be collated in an easily accessible form. This process may vary greatly depending on the conservation issues under scrutiny (Chapters 4–7) and can be made more effective via the considered inclusion of indigenous and local knowledge (Chapter 6), as well as meaningful engagement with a diverse array of stakeholders (Chapter 5).

One example of evidence generation failure was the sudden decision to move rapidly towards increased biofuel use announced by President George Bush in his 2006 State of the Union address, with the European Union adopting similar policies soon after. These decisions had substantial unforeseen environmental impacts. As a consequence of the policies, demand for agricultural land for biofuel crop production increased dramatically. However, uncertainties quickly emerged about the greenhouse gas benefits associated with many biofuel crops (Koh & Ghazoul, 2008). The wider problem revealed by this policy announcement was that it had not been foreseen by the environmental and conservation communities, who were therefore poorly prepared to respond, in particular lacking a relevant body of necessary evidence. A welcome development over the last decade has therefore been the growing interest in horizon scanning (Chapter 3) to identify forthcoming conservation problems.

Evidence use failure can result if the relevant evidence exists but is unavailable to decision-makers. For instance, it may be hidden behind paywalls or

presented in academic papers that busy practitioners and policy-makers do not have time to find and assimilate. Alternatively, it can result from ‘evidence complacency’ – ‘a way of working in which, despite availability, evidence is not sought or used to make decisions, and the impact of actions is not tested’, by practitioners and/or policy-makers (Sutherland & Wordley, 2017). Evidence use failure occurred during the review of the Common Agricultural Policy of the European Union. The process to decide which agri-environment interventions would be supported by billions of euros in agricultural subsidies resulted in the selection of interventions that had little evidence demonstrating their effectiveness; the little evidence that did exist suggested that the chosen measures would not be effective (Dicks et al., 2014). This was despite the existence of other interventions that were both more effective and had a stronger evidence base. Tools and approaches to avoid such evidence use failure by enhancing the incorporation of evidence into policy-making at different levels are described in Chapter 8.

### 1.3 Decision-making

Incorporating evidence with other aspects of decision-making may be fraught with difficulties. This is illustrated by attempts to tackle climate change by reducing emissions of greenhouse gases. Despite overwhelming scientific consensus on the anthropogenic origins of recent changes in climactic conditions reported all over the world, many countries are still refusing to curb their reliance on fossil fuels, and little progress has been made in reducing global emissions (Tol, 2019). In contrast, the use of global research evidence successfully underpinned calls to ratify the Montreal protocol, which limited the use of CFCs that had been demonstrated to deplete the ozone layer (Mäder et al., 2010).

Pathways to influence ultimately rely on a good understanding of who to approach with evidence. The first step in the successful communication of evidence to support decision-making is a clear identification of the relevant decision-makers (Chapter 10). Decision-making among local practitioners and policy-makers involves completely different processes compared with decision-making at the global level, with the two often involving people with markedly different backgrounds and priorities (Chapter 9).

Evidence derived from research is only one of the types of evidence considered by decision-makers (Chapters 11 and 12). It is important to acknowledge that science is not, and should not be, the only factor driving decisions for society – something that can be difficult for scientists to accept (Chapter 14). In addition, evidence is never ‘perfect’, and ignoring the uncertainty associated with findings can lead to poor decisions (Chapter 11). However, communicating uncertainty to policy-makers and practitioners is challenging and can risk research findings being dismissed altogether. Nonetheless, innovative

solutions to this problem do exist. For example, The Centre of Excellence for Biosecurity Risk Analysis (Chapter 13) has helped deliver evidence-based policy in Australia and New Zealand by establishing a formal institution through which researchers and government policy-makers take shared responsibility in the development of state-of-the-art methods (tools, guidelines, procedures) to assess and minimise environmental risks.

Differences in worldviews can result in polarised opinions and different interpretations of evidence, leading to conflict (Chapter 14). However, by engaging with the process of negotiating international conventions and agreements, scientists can contribute to making a difference (Chapter 15).

#### **1.4 Communicating the message**

Ultimately, most conservation issues are a consequence of human activities, meaning that a positive future for biodiversity is reliant on changing people's behaviour. Policy-makers, practitioners and researchers cannot depend on education, regulation and incentives alone, as raising awareness and delivering penalties are known to be insufficient to instigate and sustain extensive shifts in behaviour. Conservationists are therefore starting to draw on techniques and methods developed in other sectors of society, such as the business world, to alter people's behaviour through beneficial exchange mechanisms (Chapters 19 and 20). Moreover, an understanding of digital and mobile communication is becoming an increasingly powerful way to engage the public and decision-makers with conservation research. Many attempts at promoting messages through the media are ineffective (Chapter 16), but the impact of conservation communication can be enhanced by collaboration with communication scholars who are experts in media and journalism (Chapter 17). Campaigning, also described as advocacy, is a common mechanism by which non-governmental organisations try to influence decision-makers and the public, often involving media engagement. While it can be a successful approach, there are a plethora of potential pitfalls that warrant careful consideration (Chapter 18).

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## References

- Dicks, L. V., Hodge, I., Randall, N., et al. 2014. A transparent process for 'evidence-informed' policy making. *Conservation Letters*, 7, 119–125.
- Evans, R. J., Wilson, J. D., Amar, A., et al. 2009. Growth and demography of a re-introduced population of White-tailed Eagles *Haliaeetus albicilla*. *Ibis*, 151, 244–254.
- Koh, L. P. & Ghazoul, J. 2008. Biofuels, biodiversity, and people: understanding the conflicts and finding opportunities. *Biological Conservation*, 14, 2450–2460.
- Mace, G. M. 2014. Whose conservation? *Science*, 345(6204), 1558–1560.
- Mäder, J. A., Staehelin, J., Peter, T., et al. 2010. Evidence for the effectiveness of the Montreal Protocol to protect the ozone layer. *Atmospheric Chemistry and Physics*, 10, 161–171.
- O'Rourke, E. 2014. The reintroduction of the white-tailed sea eagle to Ireland: people and wildlife. *Land Use Policy*, 38, 129–137.
- Owens, S. 2015. *Knowledge, Policy, and Expertise: The UK Royal Commission on Environmental Pollution 1970–2011*. Oxford: Oxford University Press.
- Sutherland, W. J. & Wordley, C. F. 2017. Evidence complacency hampers conservation. *Nature Ecology & Evolution*, 1, 1215–1216.
- Tol, R. S. J. 2019. *Climate Economics: Economic Analysis of Climate, Climate Change and Climate Policy*. London: Edward Elgar.
- Yalden, D. W. 2007. The older history of the white-tailed eagle in Britain. *British Birds*, 100, 471–480.