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Engaging End-users to Inform the Development of the Global Standard for the Identification of Key Biodiversity Areas

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Abstract

We report results from an end-user engagement process, convened by the International Union for Conservation of Nature (IUCN), which informed the development of the Global Standard for the Identification of Key Biodiversity Areas. Key Biodiversity Areas are sites contributing significantly to the global persistence of biodiversity. We used a mixed methods approach involving interviews and an online questionnaire with end-users to determine their needs and concerns in relation to the Key Biodiversity Area approach. We found a remarkable level of convergence in end-user opinion on 12 important topics. Four topics resulted in a divergence in end-user opinion requiring further dialogue and consideration, including: (i) the value of a global standard compared to various national approaches; (ii) the prioritisation of Key Biodiversity Areas over other areas; (iii) whether Key Biodiversity Area data should be made freely available; and (iv) whether or not development activities should be permitted in Key Biodiversity Areas. Our results informed the development of the Global Standard for the Identification of Key Biodiversity Areas and a new governance structure, the Key Biodiversity Area Consultative Forum, which provides a mechanism for ongoing dialogue with end-users. We conclude by sharing five good practice recommendations for future end-user engagement processes.

Keywords: end-user engagement; knowledge production; biodiversity; Key Biodiversity Areas.

Highlights

- End-user input informed the development of a new global conservation standard.
- Revealed remarkable convergence in end-user opinion on many topics.
- End-user opinions diverged on scale, cost, prioritisation, and development activities.
- Stimulated the establishment of the KBA Consultative Forum for sustained engagement.
- Five good practice recommendations proposed for successful end-user engagement.
1. Introduction

Development of strategies to understand and address global environmental challenges, including biodiversity loss, requires the production, transfer, exchange, and use of knowledge between scientists, policy makers, practitioners, and the wider public (Fazey et al. 2013; Graham et al. 2006; Jolibert and Wesselink, 2012). Engagement with end-users to understand their needs is an important component of global knowledge production processes as it provides insight into how, and even whether, the resultant knowledge may be used and by whom.

The demand for applied and impactful research and decision support tools is increasing (Matthies et al. 2007; Reed et al. 2014; Shove and Rip, 2000). The growing expectation, and at the same time challenge, for knowledge producers is to develop user-inspired and user-meaningful knowledge collaboratively (Raymond et al. 2010). In response to this, end-users are increasingly being engaged in knowledge production processes, resulting in changes in the way that knowledge producers, end-users, and other stakeholders interact (Contandriopoulos et al. 2010). End-user engagement processes have been used in various disciplines, sectors, and geographies; however, empirical analyses of global scale end-user engagement processes, specifically those related to global transdisciplinary knowledge production, remain relatively scarce (Garard and Kowarsch, 2017; Hulme, 2010; Montana, 2017; Shove and Rip, 2000; Turnhout et al. 2016).

Biodiversity conservation is often referred to as a transdisciplinary field because it incorporates a plurality of perspectives and motivations (Mace, 2014; Wilson, 1999) to inform decision-making in policy and practice (Hadorn et al. 2006; Pruitt and Waddell, 2005; Tress et al. 2005). The International Union for Conservation of Nature (IUCN) is a global environmental network with a transdisciplinary governance structure and a membership that consists of members from government, civil society, indigenous communities, business, and academia (Holdgate, 1999). IUCN is known for co-developing biodiversity and conservation knowledge products by bringing together stakeholders with diverse perspectives and motivations (Brooks et al. 2015; Stuart et al. 2017). The development and maintenance of these knowledge products requires considerable resources, as documented in Juffe-Bignoli et al. (2016).

A Global Standard for the Identification of Key Biodiversity Areas (hereafter referred to as the KBA Standard) (IUCN, 2016), and the World Database of Key Biodiversity Areas, are examples of a standard and a decision support tool drawn from the knowledge of experts, end-users, and additional stakeholders. KBAs are defined as “sites contributing significantly to the global persistence..."
of biodiversity” (IUCN, 2016: 9). The World Database of Key Biodiversity Areas\(^1\) hosts data on KBAs of global and regional significance (BirdLife, 2018). The KBA Standard provides the methodology (definitions, criteria, thresholds, and delineation procedures) to identify KBAs (IUCN, 2016). The KBA Standard builds upon over 30 years of experience in identifying areas of importance for the different taxonomic, ecological, and thematic subsets of biodiversity and aims to provide a methodology to consolidate and harmonise these existing approaches (Bennun et al. 2007; Eken et al. 2004; Foster et al. 2012; IUCN, 2016; Knight et al. 2007; Langhammer et al. 2007). Table 1 provides an overview of the approaches that the KBA Standard aims to consolidate and harmonise.

<table>
<thead>
<tr>
<th>Approach</th>
<th>Organisation/Institution</th>
<th>Year of Establishment</th>
<th>Key Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identification Approaches</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Important Bird and Biodiversity Areas</td>
<td>BirdLife International</td>
<td>1979</td>
<td>Osieck and Mörzer-Bruyns, 1981, Donald et al. (in press)</td>
</tr>
<tr>
<td>B-ranked sites (USA)</td>
<td>The Nature Conservancy</td>
<td>1970s</td>
<td>TNC, 2001</td>
</tr>
<tr>
<td>Important Fungus Areas (UK)</td>
<td>Plantlife International, Association of British Fungus Group and the British Mycological Society</td>
<td>2001</td>
<td>Evans et al., 2001</td>
</tr>
<tr>
<td>Alliance for Zero Extinction Sites</td>
<td>Alliance for Zero Extinction</td>
<td>2005</td>
<td>Ricketts et al. 2005</td>
</tr>
<tr>
<td>Important Freshwater Biodiversity Areas</td>
<td>IUCN Freshwater Programme</td>
<td>2005</td>
<td>Darwall and Vie, 2005</td>
</tr>
<tr>
<td>Designation Approaches</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Special Areas of Conservation (SAC) (EU)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Emerald Network of Areas of Special Conservation Interest (EU)</td>
<td>Council of Europe</td>
<td>1989</td>
<td>Bern Convention, 1982</td>
</tr>
<tr>
<td>Private Sector Safeguard Policies and International Sustainability Standards</td>
<td>High Conservation Value Areas</td>
<td>1999</td>
<td>Jennings, 2004</td>
</tr>
</tbody>
</table>

\(^1\)http://www.keybiodiversityareas.org
It is difficult to trace the exact time at which, and processes through which, the KBA concept gained wider international recognition; however, the first indication of a growing awareness and diffusion of the concept appears to be a side event during the Convention on Biological Diversity (CBD) Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA9) in 2003 that was hosted by Birdlife International, Conservation International, and Plantlife International. There were also KBA concept workshops held during the IUCN World Parks Congress (WPC) in 2003 and a KBA criteria development workshop, supported by the MacArthur Foundation in 2004 (Eken et al. 2004). Eken et al. (2004) present an early iteration of the KBA criteria, which were based upon the concepts of irreplaceability and vulnerability, and they also proposed provisional KBA thresholds.

During the 2004 World Conservation Congress (WCC) the IUCN membership negotiated Resolution 3.013 on the uses of the IUCN Red List of Threatened Species and requested that the Species Survival Commission (SCC) work in partnership with IUCN members to:

"...convene a worldwide consultative process to agree a methodology to enable countries to identify Key Biodiversity Areas, drawing on data from the IUCN Red List of Threatened Species and other datasets, building on existing approaches and paying particular attention to the need to: (i) enlarge the number of taxonomic groups used for site-based priority-setting approaches; (ii) have quantitative, transparent and objective criteria to identify Key Biodiversity Areas; and (iii) report on progress towards achieving this objective at the 4th IUCN World Conservation Congress.""  

IUCN (2005: 16 – emphasis added)

This WCC Resolution 3.013 marked the beginning of the global stakeholder engagement process that informed the development of the KBA Standard.

Langhammer et al. (2007) then expanded upon the initial criteria and thresholds developed by Eken et al. (2004), provided additional guidelines on the identification and delineation of KBAs and presented an extensive review of KBA related literature and applications.

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2 Margules and Pressey (2000) provided a pivotal review of global conservation planning strategies and suggest a conceptual framework for the measure of biodiversity irreplaceability and vulnerability. The spatial rarity of biodiversity features can be measured as irreplaceability and the degree of threat can be measured as vulnerability.
In 2007 there was a debate in the KBA literature wherein Knight et al. (2007) critiqued the KBA approach, identified five limitations, and suggested three practical modifications and Bennun et al. (2007) provided responses to these recommendations to clarify the KBA approach. Of particular relevance to this research is the recommendation that the KBA Standard should not be developed and implemented in a top-down way and should instead aim to engage stakeholders using a bottom-up approach (Knight et al., 2007). At the time of this exchange there was no internationally recognised standardised approach for identifying KBAs, as the KBA Standard was still in its inception phase; however, this debate, and others that have taken place throughout the development of the KBA Standard, provided important input that informed the global stakeholder engagement process and the evolution of the KBA approach.

The IUCN, under the leadership of its Species Survival Commission (SSC) and the World Commission on Protected Areas (WCPA), convened a multi-year (2004 – 2016) global stakeholder engagement process to inform the development of the KBA Standard. This process included four main activities: (i) technical workshops with subject experts; (ii) regional stakeholder engagement events; (iii) two rounds of online consultation on drafts of the KBA Standard; and (iv) end-user interviews and an online end-user questionnaire. Here, we examine the outcomes of the fourth of these, the end-user engagement component of the global stakeholder engagement process.

We conclude by sharing five good practice recommendations for future end-user engagement processes.

2. Research design and methods

This transdisciplinary research was problem-oriented and reached across different disciplines, concepts, and methods to inform practice (Klein, 2004; Robinson, 2008). We used semi-structured interviews complemented by a quantitative questionnaire for the following reasons: (i) the qualitative data were used to determine the most important topics and the quantitative questionnaire data were used to quantify perspectives on these topics; (ii) the combined qualitative and quantitative data enhanced the comprehensiveness and validity of the findings; and (iii) the qualitative data provided detailed contextual understanding and the quantitative data provided
broader generalisable findings (Brannen, 2005; Bryman, 2008; Johnson and Onwuegbuzie, 2004).

The purpose of our combined use of end-user interviews and the online questionnaire engaging end-users was to seek, document, and consider end-users’ needs and concerns to inform the development of the KBA Standard. We did not aim to reach consensus on any specific topics.

2.1 Qualitative interviews

We conducted semi-structured end-user interviews and focus groups between 2012 – 2014 with representatives from intergovernmental agencies, private sector, national and regional government agencies, and civil society. A typology of end-user groups to target for the interviews was developed through deliberation during the first technical workshop (IUCN, 2012). We interviewed 45 end-users; however, as some end-user opinions were solicited in focus groups, this resulted in a total of 24 interviews. The end-user groups interviewed are described in Table 2, including sector specific categories and organisations.

Table 2. End-user interview details (see Dudley et al. (2014) for further information).

<table>
<thead>
<tr>
<th>#</th>
<th>End-user Sector Category / Organisation</th>
<th>Number of end-users interviewed</th>
</tr>
</thead>
<tbody>
<tr>
<td>#</td>
<td>Civil Society</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>BirdLife International</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td>The Nature Conservancy (TNC)</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>Conservation International (CI)</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>Bat Conservation International</td>
<td>2</td>
</tr>
<tr>
<td>5</td>
<td>Zoological Society of London (ZSL)</td>
<td>2</td>
</tr>
<tr>
<td>6</td>
<td>Grupo Jaragua, Dominican Republic</td>
<td>1</td>
</tr>
<tr>
<td>7</td>
<td>NatureServe and Natural Heritage Network</td>
<td>2</td>
</tr>
<tr>
<td>8</td>
<td>Indigenous Peoples’ and Community Conserved Areas (ICCA Consortium)</td>
<td>1</td>
</tr>
<tr>
<td>#</td>
<td>National and Regional Government Agencies</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>ASEAN Centre for Biodiversity</td>
<td>1</td>
</tr>
<tr>
<td>10</td>
<td>Parks &amp; Wildlife Finland</td>
<td>1</td>
</tr>
<tr>
<td>11</td>
<td>European Union</td>
<td>5</td>
</tr>
<tr>
<td>12</td>
<td>South Pacific Regional Environment Programme (Pacific Region)</td>
<td>2</td>
</tr>
<tr>
<td>#</td>
<td>Private Sector</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Oil and Gas</td>
<td>3</td>
</tr>
<tr>
<td>14</td>
<td>Mining and Metals</td>
<td>2</td>
</tr>
<tr>
<td>15</td>
<td>Commercial Banks</td>
<td>4</td>
</tr>
<tr>
<td>16</td>
<td>Food Industry</td>
<td>1</td>
</tr>
<tr>
<td>17</td>
<td>High Conservation Value (HCV) Areas</td>
<td>2</td>
</tr>
<tr>
<td>#</td>
<td>Intergovernmental Agencies</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>Ramsar Convention (Ramsar Sites)</td>
<td>2</td>
</tr>
<tr>
<td>19</td>
<td>World Heritage Convention (World Heritage Sites)</td>
<td>2</td>
</tr>
<tr>
<td>20</td>
<td>Convention on Biological Diversity (Ecologically and Biologically Significant Areas, EBSAs)</td>
<td>2</td>
</tr>
<tr>
<td>21</td>
<td>United Nations Development Programme (UNDP)</td>
<td>1</td>
</tr>
<tr>
<td>22</td>
<td>Global Environment Facility (GEF)</td>
<td>1</td>
</tr>
<tr>
<td>23</td>
<td>Critical Ecosystem Partnership Fund (CEPF)</td>
<td>1</td>
</tr>
<tr>
<td>24</td>
<td>World Bank Group</td>
<td>3</td>
</tr>
<tr>
<td>#</td>
<td>Total</td>
<td>45</td>
</tr>
</tbody>
</table>
The interviewees were selected from IUCN’s existing network of collaborators and contacts using a combination of non-probability sampling techniques: (i) purposive sampling (selected based on characteristics of the population and the objectives of the research); (ii) convenience sampling (selected due to convenient accessibility), and (iii) snowball sampling (selected based upon existing interviewee recommendations). Our interviewees consisted mainly of end-users with an existing level of engagement with, or knowledge of, the KBA Standard. The interviewees were involved in co-editing and co-authoring the interview transcripts, which enabled us to gain permission for their publication in Dudley et al. (2014).

The open-ended questions presented were the following:

(i) What do you need from KBAs?
(ii) What tools and products do you require?
(iii) How do KBAs fit with your existing and emerging policies and procedures?
(iv) Do you have any fears/concerns about the application of the KBA Standard? If so, what are they?
(v) What are the main recommendations you have for the development of the KBA Standard?

The results from these interviews provided initial insights about end-users’ needs and concerns, which informed the development of the online questionnaire described below.

2.2 Online questionnaire

The online questionnaire was developed from the initial analysis of the qualitative interview data and was distributed via email through the IUCN network to more than 18,000 potential respondents. The full questionnaire can be found in the Supplementary Data A. The questionnaire was available for completion during the following periods: September 30th – November 30th 2014 (in conjunction with the first round of the global online consultation for the first draft of the KBA Standard); and September 9th – October 11th 2015 (during the second round of the global online consultation for the second draft of the KBA Standard). The questionnaire was available in the three official IUCN languages (English, French, and Spanish). 173 respondents from diverse sectors and regions completed the questionnaire, comprising 75 respondents during the first round and 98 during the second (completion rate of approximately 1%). Table 3 demonstrates the sector and UN Region categorisations of the end-user questionnaire respondents.

<table>
<thead>
<tr>
<th>Table 3</th>
<th>Sector and UN Region categorisations for end-user questionnaire respondents.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Western Europe and Others Group (WEOG)</td>
</tr>
<tr>
<td>Civil Society</td>
<td>21</td>
</tr>
</tbody>
</table>
The questionnaire entailed 22 questions, of which five were the same open-ended questions posed during the interviews (see Section 2.2.1) and 17 that were on a Likert scale. The 17 Likert scale statements were derived from our interpretation of the most prominent areas of convergence and divergence in opinion that emerged from the qualitative data. Table 4 outlines how the themes that emerged from the qualitative analysis informed the development of the 17 Likert statements. By targeting more respondents, we aimed to broaden the sample size and examine the prevalence of perspectives present in the qualitative data.

<table>
<thead>
<tr>
<th>Interview Category</th>
<th>Interview Code</th>
<th>Questionnaire Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Stakeholder engagement</td>
<td>1a. Communication</td>
<td>Clear communication regarding the added value of the KBA Standard is needed (Q16).</td>
</tr>
<tr>
<td></td>
<td>1b. Local level stakeholder engagement</td>
<td>Thoughtful engagement at the local level will be essential to the effective application of the KBA Standard (Q15).</td>
</tr>
<tr>
<td>2. Existing approaches</td>
<td>2a. Complementary or conflicting approaches?</td>
<td>A standardised approach to identify KBAs is needed (Q1).</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The KBA Standard will encourage collaboration among constituencies involved in identifying sites of particular importance for biodiversity (Q17).</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The KBA Standard should build upon the existing approaches used to identify sites of particular importance for biodiversity (such as Important Bird and Biodiversity Areas, Important Plant Areas, Alliance for Zero Extinction Sites and others) (Q2).</td>
</tr>
<tr>
<td>3. Issues of scale</td>
<td>3a. Global vs. national</td>
<td>One global standardised approach for identifying KBAs is preferable to multiple national level approaches that identify areas of particular importance for biodiversity (Q5).</td>
</tr>
<tr>
<td></td>
<td></td>
<td>A focus on KBAs may undermine national processes and priorities (Q6).</td>
</tr>
<tr>
<td>4. Implementation of the Standard</td>
<td>4a. Data and additional information</td>
<td>A lack of biodiversity data in many regions could limit the utility of the KBA Standard (Q10).</td>
</tr>
<tr>
<td></td>
<td></td>
<td>KBA documentation should include additional information when available (such as information on climate change impacts, ecosystem services and socio-economic data) (Q14).</td>
</tr>
<tr>
<td></td>
<td>4b. Timeliness of the KBA Standard</td>
<td>An initial KBA database, based on currently available data, should be developed quickly in order to be immediately useful (Q12).</td>
</tr>
<tr>
<td></td>
<td>4c. Resources</td>
<td>KBA data should be freely available for commercial use (Q9).</td>
</tr>
<tr>
<td>5. Informing decision</td>
<td>5a. Management options</td>
<td>KBA documentation should include management options for the site (Q13).</td>
</tr>
</tbody>
</table>
5b. ‘Sustainable use’ vs. ‘no go’

- Development activities should not be permitted in KBAs (Q11).
- KBA data should be used to inform the prioritisation of conservation action (Q3).
- KBAs themselves should be priorities for conservation action (Q4).
- An emphasis on KBAs could hinder conservation efforts outside of KBAs (Q8).
- KBAs should be ranked according to relative importance for biodiversity (Q7).

5c. Prioritisation

- KBA data should be used to inform the prioritisation of conservation action (Q3).
- KBAs themselves should be priorities for conservation action (Q4).
- An emphasis on KBAs could hinder conservation efforts outside of KBAs (Q8).
- KBAs should be ranked according to relative importance for biodiversity (Q7).

The questionnaire was structured as follows: optional questions regarding respondent’s sector of employment, institution/organisation, nationality, and country of employment were presented first. These were followed by 17 closed-ended five-point scale Likert scale statements (from Strongly Agree to Strongly Disagree). The five open-ended questions from the interviews were then presented at the end of the questionnaire. These questions were also optional.

2.3 Cost of engaging end-users

Designing and implementing meaningful end-user engagement processes requires considerable resources. The end-user engagement component of the broader global multi-stakeholder engagement process that informed the development of the KBA Standard took over five years (2012 – 2017) to design, implement, analyse, and interpret. Here we account for the time and resources used to undertake mixed methods engagement with end-users in order to evaluate the efficiency of this approach and to inform planning for future similar processes. Personnel time (both remunerated and volunteer) and participant time were recorded in terms of working days (one working day being eight hours). Table 5 illustrates our estimate of the personnel and participant time (258 working days) required to elicit input from end-users to inform the development of the KBA Standard.

| Table 5. Estimate of resources used for each component of the end-user engagement process. |
|-----------------------------------------------|-----------------------------------------------|-----------------------------------------------|
| Personnel time (remunerated and volunteer time of IUCN staff, IUCN commission members, external consultants, and/or researchers) | 2                                             | 148                                           | 72                                             |
| Participant time (time taken for participants to attend workshops, be interviewed and/or respond to the questionnaire) | 5                                             | 24                                           | 7                                             |
| Total (working days) = 258                      | 7                                             | 172                                           | 79                                             |
3. Results

3.1 Overview

We received 173 responses to the online questionnaire. There was remarkable convergence of opinion for many items (we defined convergence as questions with an inter-quartile range of one). Five items, however, resulted in a divergence of opinion (we defined divergence as questions with an inter-quartile range of two (see Supplementary Data B for the descriptive statistics)). Figure 1 provides an overview of the 173 responses to the 17 five-point scale closed-ended Likert statements. Items are ordered from higher levels of convergence (top) towards increasing divergence (bottom).

![Figure 1](image)

**Figure 1.** Responses to the Likert statements ordered from higher levels of convergence (top) towards increasing divergence (bottom). Percentages represent aggregates. Strongly disagree and disagree (left), agree and strongly agree (right), and neither agree nor disagree (far right).

As depicted in Figure 1, end-users agreed on most items; however, the answers to Q5, Q6, Q8, Q9, and Q11 demonstrated divergence in end-user opinion. The topics of divergence were: (i) the relative value of a global standard compared to varying national approaches (Q5, Q6); (ii) the prioritisation of KBAs over other areas (Q8); (iii) whether KBA data should be made freely available (Q9); and (iv) whether development activities should be permitted in KBAs (Q11). To further explore this divergence in opinion, we combined the results from the qualitative and quantitative data. The full end-user interviews, from which the qualitative quotes below are derived, can be found in Dudley et al. (2014). Quotes from the open-ended questionnaire questions are also included. For simplicity, from this point onwards, ‘disagree’ represents a consolidation of ‘disagree’ and ‘strongly disagree’. Likewise, ‘agree’ is a consolidation of ‘agree’ and ‘strongly agree’. We do not interpret ‘neither agree nor disagree’ responses here; however, this response option allowed us to keep...
undecided opinions separate from the rest of the data. In this case, as responses become more divergent the number of 'neither agree nor disagree' responses increases, which could be further indication of the challenging nature of these particular topics.

3.2 Relative value of a global standard compared to varying national approaches

During the interviews, the end-users questioned the difference between sites of global importance and sites of regional/national significance. Many, particularly those involved in natural resource use and land-use decision-making, indicated that they required information about sites of national importance, as well as sites of global importance. Others indicated that they needed guidance on how to bridge global KBA data to local contexts. Concerns were also raised about the global focus KBAs, including whether: (i) global priorities could undermine national priorities; (ii) it could be perceived as a top-down approach; and (iii) this could result in a lack of interest or engagement at the national and/or sub-national level.

One end-user stated that:

"While [a] global approach is desirable for broad decisions, national KBAs will be useful for specifics - because important areas could lose out in global KBAs due to [a] myriad [of] challenges (eg: poor data, lack of cohesion among stakeholders locally, interferences from powerful groups contributing to biodiversity loss etc.)"

Civil society questionnaire respondent

Conversely, some noted that KBAs could add validation and attention to nationally important sites due to the involvement of international organisations:

"...KBAs help to add more weight to particular sites when communicating with environmental authorities, particularly with the 'endorsement' provided by the IUCN, as they are not only of local importance but also of global importance."

Civil society interviewee

Q5 and Q6 were designed to gain additional understanding about these contrasting perspectives. Most questionnaire respondents agreed (72%) that a global approach was preferable, with only 15% disagreeing. Slightly more end-users (40%) believed that a focus on KBAs would not undermine national processes and priorities; but 31% believed that national processes would be undermined.

3.3 Areas outside KBAs
End-users raised concerns regarding the status of areas outside KBAs. Some felt as though a site that is not a KBA would be very difficult to conserve and that an emphasis on KBAs could reduce the attention given to other aspects of conservation.

"I think [a] global standard for identification of important sites for biodiversity is necessary. However [...] the communication of KBA should not give [the] connotation that areas outside KBAs are not biodiversity-significant."

Civil society questionnaire respondent

Some end-users were concerned that areas outside KBAs would be viewed as being less important and therefore open to being freely developed:

"More guidance is needed on the way in which nature outside KBAs is supposed to be viewed: does KBA analysis mean (or can it be interpreted as meaning) that anything outside a KBA is open for development?"

Intergovernmental agency interviewee

Conversely, one private sector end-user substantiates this concern by stating that they would use the KBA Standard in order to better understand where development safeguards could be less strictly applied:

"This means that the KBA standard must also differentiate significant sites from the rest of the landscape where the application of safeguards results in fewer mitigation measures."

Private sector interviewee

This informed the development of Q8: 'an emphasis on KBAs could hinder conservation efforts outside KBAs'. More than half of the end-user questionnaire respondents agreed (56%) and fewer disagreed (25%).

3.4 Who bears the cost of generating KBA data?

The resources needed to develop, implement, manage, and maintain the database of sites identified under the KBA Standard (the World Database of Key Biodiversity Areas) was another issue raised by end-users. The cost of KBA identification to date has been estimated at US$100 million, with a little less than US$1 million now invested annually. It is estimated that US$21 million is needed to deliver global baseline KBA identification, and US$2 million annually is necessary to maintain those data once that baseline is reached (Juffe-Bignoli et al. 2016). Despite this obvious resource need, many of
our respondents requested that the data be freely available and accessible to all institutions and sectors:

"Cost is an important factor [...], and at least the basic data should be available for free to all institutions and sectors."

Private sector interviewee

End-users also discussed challenges related to securing funding and resources for KBA identification. One end-user with national level KBA assessment experience stressed that considerable effort and funds are required to undertake a KBA assessment. Given limited resources, the end-users pointed out that the KBA approach should demonstrate clear added value and conservation outcomes to justify expenditure on the identification of KBAs. Another declared their concerns about the IUCN’s capacity and the resourcing needed to coordinate the implementation and management of the KBA Standard, following its launch. One end-user summarises these perspectives by stating:

"...a consistent standard is needed but there are parallel needs for increased resources for data collection and capacity building... [We need a] global KBA database which is free and accessible online, and kept updated, with all documentation (e.g. what triggered each KBA, process of delineation, any associated information)."

Civil society questionnaire respondent

These perspectives on resource challenges resulted in the development of Q9: ‘KBA data should be freely available for commercial use’. The largest percentage of respondents agreed with the statement (42%), but only slightly fewer disagreed (32%).

3.5 Should KBAs be strictly protected?

End-users commented on whether development should be allowed in KBAs or, conversely, if KBAs should be strictly ‘no go’ for development during the end-user engagement process. ‘No go’ areas for development are areas where human activities are limited, typically in protected areas and other areas of importance for biodiversity. Some end-users expressed concerns that KBAs may become ‘no go’ areas for development. The concept of permitting sustainable use in KBAs was also mentioned by many. One private sector end-user was concerned:

"That KBAs may become or are advertised as ‘no go’ areas for development. KBAs should help to identify areas of high biodiversity importance that need to be safeguarded, but should not be prescriptive of the management actions. Action plans can then be put in place to ensure that [...] activities in or near KBAs are managed to avoid and minimise any
potential impact. Otherwise, the KBA approach may be counterproductive, and may not get the support it needs from governments and other stakeholders.”

Private sector interviewee

This informed the development of Q11: ‘development activities should not be permitted in KBAs’.

Only marginally more end-users agreed (38%) with this statement, than those who disagreed (34%).

The use of mixed methods therefore enabled us to determine and understand end-users’ needs and concerns in great depth and breadth. The high level of convergence in opinion for many of the topics provides a good level of corroboration and certainty for these findings and suggests that these are areas of broad consensus. We further explore and interpret the main areas of divergence in opinion here and reflect upon how they were considered and/or addressed during the development of the KBA Standard and through an evolving KBA governance structure.

4. Discussion

The end-user input was incorporated into the process of developing the KBA Standard and it also informed decisions related to the establishment of new KBA governance structures to support the implementation of the KBA Standard. This was done to ensure the usefulness and relevance of the resulting KBA Standard and associated data and demonstrates the pragmatic and applied nature of the end-user engagement process.

4.1 Addressing divergent end-user opinions

The difference between the answers to Q5 and Q6 (relative value of a global standard compared to varying national approaches) is informative as this suggests that approximately half of respondents who think that national processes may be undermined by KBA identification see this as a negative implication, whereas the other half as a positive implication. The implications of national level KBA identification was the subject of many exchanges that occurred during the wider global stakeholder engagement process and clarification and guidance was consequently integrated into the KBA Standard. The KBA Standard clarifies that although the KBA criteria are intended for the identification of KBAs meeting thresholds of global significance, the criteria can also be applied with less stringent thresholds to identify sites of national/regional significance (IUCN 2016a: S). The KBA Partnership Agreement (KBA Partnership, 2016) includes further information about applying the KBA Standard at regional and national levels, and states that detailed guidance will be produced by the KBA Partnership in due course (the KBA Partnership is discussed further in Section 4.2).

Commented [RV4]: Suggest rephrase – the stakeholder views are divergent (on some topics), not the topics themselves

Commented [JM5]: IUCN colleagues: can we add any more detail here about the detailed guidance at this time?
The item on the prioritisation of KBAs over other areas (Q8) was intentionally silent on whether the respondents believed that this was a good or a bad thing. It could be interpreted that the majority of end-user respondents believed that an emphasis on KBAs could result in negative outcomes for conservation, by limiting the diversity of conservation efforts and creating opportunities to perceive anything outside KBAs as open for development and/or as not important for biodiversity.

Alternatively, it could be interpreted as a majority believe that a focus on KBAs could result in positive outcomes for conservation by focusing conservation effort and scarce resources and by directing development towards less important areas for biodiversity. That 91% of respondents agreed that a standardised approach to KBA identification is needed (Q1) suggests the latter – that most respondents see the focus of attention towards globally important sites and away from other sites as an advantage of the KBA Standard. The KBA Standard contains two paragraphs discussing caveats to this point (IUCN 2016: 2–3), acknowledging that areas outside of KBAs are not necessarily of lesser importance because they may not have been identified as KBAs yet or may be important for other reasons.

Whether or not KBA data should be made freely available for commercial use (Q9) presents a tension between the need for immediate high quality data and ensuring it is freely available to all end-users. The cost of identifying KBAs and developing, managing, and maintaining the World Database of Key Biodiversity Areas is significant (Juffe-Bignoli et al., 2016) and may compete with other conservation expenditures. This resource challenge has been addressed in part through the establishment of a KBA Partnership (discussed further in Section 4.2), comprising 12 international conservation organisations. Each organisation in the partnership has committed a minimum of US$1 million over 5 years to support the identification of KBAs. This helps to address some of the resource challenges and also addresses concerns about IUCN’s capacity to coordinate the implementation of the KBA Standard, and the management of KBAs, as this responsibility is now shared through the KBA Partnership. The KBA Partnership Agreement (KBA Partnership, 2016) also includes details on terms and conditions of use (including copyright and ownership of the KBA data), a structure for licensing data for commercial use through the Integrated Biodiversity Assessment Tool with different access options for different end-uses (including IBAT for Business3), and a fundraising protocol.

Respondents were almost evenly split on whether or not development activities should be permitted in KBAs (Q11). While some stressed the need to ensure that the implementation of the KBA Standard would not result in strict prescriptive land-use restrictions, others viewed the KBA

3 https://www.ibatforbusiness.org/
approach as playing an important role in restricting development in, and around, important places
for biodiversity. This is not a new area of divergence in opinion. The debate between sustainable use
and strict protection has been on-going for decades (Adams, 2004), with the concept of sustainable
use (or ‘sustainable utilisation’) first appearing in the World Conservation Strategy (IUCN, 1980).

This area of divergence in end-user opinion contributed to the development of a subsequent project
led by IUCN’s Global Business and Biodiversity Programme, referred to as ‘Guiding Responsible
Business Operations in Key Biodiversity Areas’. The project developed guidelines for responsible
business operations in and around Key Biodiversity Areas (KBA Partnership, 2018). The guidelines
build upon input provided by end-users during an end-user consultation workshop (July, 2016) and
input submitted during a public consultation process (December 2016 – March 2017). The guidelines provide the recommended minimum requirements for business operations having direct, indirect, and cumulative impacts on a KBA, unless the national or local law is more stringent, in
which case the law shall prevail.

This divergence was also reflected in the KBA Standard (IUCN 2016: 8) by stating that although the
identification of a KBA implies that a site should be managed to ensure the persistence of
biodiversity, KBA status has no bearing on a site’s legal or protected status. Many KBAs are or will
become protected areas, but many will not be formally protected and will need to be safeguarded
through other management approaches (Butchart et al. 2012). The KBA Standard also states that
KBAs are not necessarily priorities for any particular conservation action. This is an area that the KBA
business guidelines described above attempt to clarify.

4.2 An evolving KBA governance structure

In conjunction with the finalisation of the KBA Standard in 2016, a KBA Partnership was established
(KBA Partnership, 2016) to map, monitor and safeguard KBAs. The KBA Partnership comprises 12
Alliance, Conservation International, Critical Ecosystem Partnership Fund, Global Environment
Facility, Global Wildlife Conservation, NatureServe, Rainforest Trust, Royal Society for the Protection
Partnership Agreement, a number of governance bodies were established: a KBA Committee (to
govern the implementation of the KBA Standard), a KBA Secretariat (to coordinate KBA activities and

\[\text{Commented [RV7]: ...and how have the guidelines dealt with this issue?}\]

\[\text{Commented [JM8]: IUCN colleagues: can we say anything more specific about how the guidelines and the KBA Standard have dealt with this issue here. Shall we be explicit about the fact that KBAs are not 'no go' areas?}\]

\[\text{Shall we bring in a brief discussion about the WCC decisions 26, 33 and 64 here?}\]

\[\text{http://www.keybiodiversityareas.org/business-guidelines}\]
manage KBA data), a KBA Community (to support and connect institutions identifying KBAs on the
ground and in the water), a KBA Standards and Appeals Committee (to develop and update
guidelines for the application of the KBA Standard and to adjudicate appeals), and, importantly in
light of this research, a KBA Consultative Forum (to convene feedback from end-users) (KBA
Partnership, 2016).

The purpose of the KBA Consultative Forum\(^5\) is to provide a mechanism to elicit on-going input and
feedback from a range of end-users on the use and application of the KBA Standard and to continue
to communicate their needs and concerns to the KBA Partnership. The KBA Consultative Forum
represents a continuation of the end-user engagement process and is an important component of
maintaining and supporting knowledge transfer and exchange with end-users. It also encourages
sustained dialogue, particularly on the topics that resulted in a divergence in opinion amongst end-
users.

4.3 Good practice recommendations for future end-user engagement processes

The end-user engagement process was informed by eight principles of good practice in international
standard setting (ISEAL, 2014) and five principles for effective knowledge exchange (Reed et al.
2014) (see Supplementary Data C). We have consolidated five good practice recommendations
(Table 6) that we consider to be important for future similar processes seeking to engage end-users.

Table 6. Summary of good practice recommendations.

<table>
<thead>
<tr>
<th>Recommendations</th>
<th>Description</th>
<th>Relevance to the KBA End-user Engagement Process</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 – Define, Categorise, and Identify</td>
<td>Define, categorise, and identify who end-users are early on in the process. Ideally this would be done in a participatory way with end-users and other stakeholders to clearly define the scope of the issue and identify all those with a stake or interest in it. Relates to ISEAL (2014) (Principles 2 and 3) and Reed et al. (2014) (Principle 2).</td>
<td>Early in the process (during the Framing Workshop (IUCN, 2012)), we defined, categorised, and identified end-users in a participatory way. We also co-developed a typology of end-users that is documented in the Framing Workshop Report (IUCN, 2012: 24-25). This helped to target specific end-user groups for the interviews and helped us to evaluate the representativeness of our questionnaire respondents (Table 2).</td>
</tr>
</tbody>
</table>

\(^5\) http://www.keybiodiversityareas.org/kba-partnership/kba-consultative-forum
### 2 – Mixed Methods

<table>
<thead>
<tr>
<th>Process Transparency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use a mixed methods approach to determine end-users’ needs and concerns. Qualitative end-user interviews are useful for determining their main needs and concerns and for providing in depth understanding; however, these should be complemented and substantiated using additional methods, such as a questionnaire, with a larger group of end-users for an increased breadth of understanding.</td>
</tr>
<tr>
<td>We used mixed methods to determine end-users needs and concerns during the engagement process. This paper provides a detailed account of the results obtained through the use of mixed methods. This helped to identify the main areas of convergence and divergence in end-user opinion (Figure 1). It also helped us to explore these topics in great depth and breadth.</td>
</tr>
</tbody>
</table>

### 3 – Process Transparency

| Design, document, and communicate a clear and transparent decision-making process for how end-user input will be integrated. Ensure that this process is openly communicated to end-users and feedback mechanisms are in place to evaluate the process and outcomes. It is important to systematically and transparently consider and address the input received and follow-up with end-users with decisions/results/outcomes as early as possible. Relates to ISEAL (Principles 4, 6, 7, and 8) and Reed et al. (2014) (Principle 4). |
| We documented end-user interviews in Dudley et al. (2014), including each interview report being reviewed and co-authored by the end-user interviewees themselves. End-user questionnaire details and results are provided in this paper (Figure 1). Further process transparency on decision-making processes would have clarified how we planned to use end-user input to inform the development of the KBA Standard. By evaluating our engagement process against existing good practice principles (ISEAL, 2014; Reed et al. 2014) we were able to reflect upon how we could have better communicated how we planned to use end-user input. |

### 4 – Resources

| The design and implementation of a meaningful end-user engagement process requires resources. Consider the financial and human resources that will be needed. Do not underestimate how long end-user engagement will take and be prepared to adapt the process based upon the available resources, context, and needs and concerns of end-users. |
| We reported on the time and resources required to engage end-users here in this paper (Section 2.3). This helped us to consider the efficiency and effectiveness of the approaches that we used and will help to inform the work of the KBA Consultative Forum and the design of future similar processes. |

### 5 – On-going Engagement

| Design and implement on-going end-user engagement processes and/or governance structures beyond the initial project where relevant and/or needed. Relates to Reed et al. (2014) (Principle 5). |
| Ongoing engagement with end-users is supported through the establishment of the KBA Consultative Forum (Section 4.1). This helped to enable on-going dialogue with end-users. |

#### 5. Conclusions

This end-user engagement process helped to advance our understanding of global scale transdisciplinary knowledge production and use. The kind of user-oriented approach featured in this process aligns closely to a trend towards increasingly transdisciplinary and accountable engagement observed in a number of contexts around the world (Jolibert and Wesselink, 2012; Phillipson et al. 2012; Shove and Rip, 2000); however, it represents a novel approach for engaging end-users in the context of global conservation standard setting. We have demonstrated how the use of a mixed methods approach enabled us to determine, consider, and address end-users’ needs and concerns during the development of the KBA Standard.
The high level of convergence in end-user opinion for many of the topics suggests that these are areas of broad consensus. In contrast, our focus on the main emergent topics of divergence helped us to understand these diverse perspectives and incorporate them into the development of the KBA Standard. The areas of divergence can be linked to concepts and debates that reach beyond the context of KBAs. Challenges related to scale, cost, prioritisation, and development activities can be found in many discussions about biodiversity conservation, land-use change, and resource management (Adams, 2004; IUCN, 1980). These challenges also relate to differences in opinion about where responsibility lies for natural resource management. These areas of divergence are the topics that require ongoing consideration from the KBA Partnership and further dialogue through the KBA Consultative Forum.

The knowledge needed to develop solutions to complex environmental problems is produced, exchanged, and used in science, policy, and practice and in the interfaces between them (van den Hove, 2007). Recognising the diversity of knowledge needed to address environmental challenges, and the range of different perspectives relating to how these challenges should be addressed, are both important if we are to encourage collaboration and build bridges among people operating within different disciplines, sectors, and geographies (Gibbons et al., 1994; Lövbrand, 2011; Nowotny et al., 2003). The goal of this research was to learn through practice and to inform ongoing stakeholder engagement and governance mechanisms. Our sharing of good practice recommendations helps to bridge the gap between the theories of knowledge production and the practice of end-user engagement.

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Supplementary Data

A - End-user questionnaire.

B - Descriptive statistics.

C – Summative evaluation principles.

References


KBA Partnership, 2016. The Key Biodiversity Areas Partnership Agreement.


Vitae

Jessica Lynch Maxwell is a Research Fellow at the James Hutton Institute. Her current research investigates the relationship between placemaking, planning, and ecosystem services in order to build capacity towards integrated land use planning. Jessica’s former research focused on natural resource management, land-use change, biodiversity conservation, and stakeholder engagement. She has also worked on a variety of cross sector knowledge exchange projects in collaboration with intergovernmental, private, and civil society organisations. Her PhD investigated the global stakeholder engagement process that informed the development of the International Union for Conservation of Nature’s Key Biodiversity Area Standard.

Nigel Dudley is an environmental consultant, focusing primarily on issues relating to protected areas and landscape approaches to conservation, particularly in forest ecosystems. Clients include NGOs, UN agencies and governments around the world. He is chair of the IUCN World Commission on Protected Areas specialist group on Natural Solutions, which addresses ecosystem services from protected areas, and has been closely involved in the development of the KBA concept.

Janet Fisher works on XYZ

Simon Allen is a Lecturer in the School of GeoSciences at the University of Edinburgh. Originally trained as a botanist and ecologist, he has developed broad interdisciplinary interests in sustainable development, with a particular focus on the impacts and mitigation of climate change. Since 2000, he has directed the MSc Environmental Sustainability programme.
Genevieve Patenaude works on XYZ

Penny Langhammer is Director of Key Biodiversity Areas for Global Wildlife Conservation and the Amphibian Survival Alliance, where she supports local partners in identifying, monitoring and safeguarding KBAs. She is Co-chair of the IUCN WCPA-SSC Joint Task Force on Biodiversity and Protected Areas and was lead editor of *A Global Standard for the Identification of Key Biodiversity Areas*. Her background is in conservation planning and priority-setting, conservation impact assessment, and emerging infectious diseases of amphibians. Penny is Adjunct Professor in the School of Life Sciences and a Research Affiliate with the Center for Biodiversity Outcomes at Arizona State University.

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Supplementary data

A - End-user Questionnaire

(made available in English, French and Spanish)

Key Biodiversity Areas – End-User Questionnaire

During the 2004 World Conservation Congress, IUCN Members requested that the IUCN “convene a worldwide consultative process to agree a methodology to enable countries to identify Key Biodiversity Areas” (WCC 3.013). Key Biodiversity Areas (KBAs) are sites contributing significantly to the global persistence of biodiversity. A great deal of collaborative work and research has been undertaken since that time, convened through the IUCN Species Survival Commission (SSC) and the World Commission on Protected Areas (WCPA) Joint Task Force on Biodiversity and Protected Areas.
The aim of the consultation process is to develop a globally agreed standard for the identification of KBAs, which draws and builds on existing approaches, while responding to end-users needs for a scientifically rigorous yet pragmatic methodology. End-users are considered to be those involved in decision-making processes linked to mechanisms to secure biodiversity or to avoid biodiversity loss. The purpose of this end-user consultation is to seek opinions on how the information produced through the application of the KBA Standard can:
- be used to inform policy and practice;
- best suit end-user needs; and
- result in the best outcomes for biodiversity.

This questionnaire is being conducted in association with the IUCN SSC/WCPA Joint Task Force on Biodiversity and Protected Areas as part of research underway at the University of Edinburgh. Further information on data protection and ethics can be found at the end of the questionnaire. Your time and input are greatly appreciated.

* Required

1. Sector *
2. Institution/Organisation *
3. Nationality *
4. Country of employment *

Interviews were conducted with 26 existing and potential KBA end-users throughout 2013 and 2014. Interviewees were selected from a wide range of sectors. The purpose of the interviews was to determine their needs, data requirements, concerns and recommendations in relation to the development of the KBA Standard. The interviews documented end-user perspectives and did not seek unanimity.

The questions below seek to solicit broader input from existing and potential end-users on the main themes that emerged from the interviews. In addition, the same five open-ended questions posed during the interviews are also included at the end of the questionnaire for optional additional input.

Please indicate your level of agreement/disagreement with each statement.

A standardized approach to identify KBAs is needed.

- [ ] Strongly Agree
- [ ] Agree
The KBA Standard should build upon the existing approaches used to identify sites of particular importance for biodiversity (such as Important Bird and Biodiversity Areas, Important Plant Areas, Alliance for Zero Extinction Sites and others).

KBA data should be used to inform the prioritisation of conservation action.

KBAs themselves should be priorities for conservation action.

One global standardised approach for identifying KBAs is preferable to multiple national level approaches that identify areas of particular importance for biodiversity.

A focus on KBAs may undermine national processes and priorities.
KBAs should be ranked according to relative importance for biodiversity.

An emphasis on KBAs could hinder conservation efforts outside of KBAs.

KBA data should be freely available for commercial use.

A lack of biodiversity data in many regions could limit the utility of the KBA Standard.

Development activities should not be permitted in KBAs.

An initial KBA database, based on currently available data, should be developed quickly in order to be immediately useful.
KBA documentation should include management options for the site.

- [ ] Strongly Agree
- [ ] Agree
- [ ] Neither Agree nor Disagree
- [ ] Disagree
- [ ] Strongly Disagree

KBA documentation should include additional information when available (such as information on climate change impacts, ecosystem services and socio-economic data).

- [ ] Strongly Agree
- [ ] Agree
- [ ] Neither Agree nor Disagree
- [ ] Disagree
- [ ] Strongly Disagree

Thoughtful engagement at the local level will be essential to the effective application of the KBA standard.

- [ ] Strongly Agree
- [ ] Agree
- [ ] Neither Agree nor Disagree
- [ ] Disagree
- [ ] Strongly Disagree

Clear communication regarding the added value of the KBA standard is needed.

- [ ] Strongly Agree
- [ ] Agree
- [ ] Neither Agree nor Disagree
- [ ] Disagree
- [ ] Strongly Disagree

The KBA Standard will encourage collaboration among constituencies involved in identifying sites of particular importance for biodiversity.

- [ ] Strongly Agree
- [ ] Agree
- [ ] Neither Agree nor Disagree
- [ ] Disagree
- [ ] Strongly Disagree

Any additional comments or questions?

Open Ended End-User Interview Questions (optional)

What do you need from KBAs?
What tools and products do you require?

How do KBAs fit with your existing and emerging policies and procedures?

Do you have any concerns about the application of the KBA Standard? If so, what are they?

What are the main recommendations you have, based on your answers above, for the development of the KBA Standard?

Would you be willing to answer some follow up questions in relation to the KBA Standard?

If yes, please provide your name and email below.

[ ] Yes
[ ] No

Name:

Email:
Data Protection and Ethics

All information provided by respondents will be processed and stored electronically in an encrypted format in accordance with the UK Data Protection Act (1998) and the University of Edinburgh’s Data Protection policy. This information will be used to inform the ongoing KBA consultation process and for academic research purposes. The data will not be shared. All efforts will be made to maintain confidentiality and anonymity.

Please note that by participating in this questionnaire you have indicated your acceptance of the data protection terms and conditions indicated above.

If you have any further questions or if you are interested in receiving a copy of the final publication(s) please let Jessica Boucher know (jessica.boucher@ed.ac.uk).

Further information regarding the IUCN SSC/WCPA Joint Task Force on Biodiversity and Protected Areas can be found at the following link:

http://www.iucn.org/about/work/programmes/gpap_home/gpap_biodiversity/gpap_wcpabiodiv/gpap_abiodiv/key_biodiversity_areas/

Thank you for your time and input.

B - Descriptive statistics

Table 7 lists the questionnaire statements in the same order as Figure 1 (i.e. from those resulting in the highest level of convergence (top) towards increasing divergence (bottom)) and includes the mode, median, and interquartile-range (IQR) for all statements.

Table 7. Responses to the Likert statements (including mode (Mo), median (Md), and inter-quartile range (IQR) ordered from highest level of convergence (top) towards increasing divergence (bottom) (Strongly Agree = 5, Agree = 4, Neither Agree nor Disagree = 3, Disagree = 2, Strongly Disagree = 1). Higher IQR values in bold = more divergent opinions.

<table>
<thead>
<tr>
<th>#</th>
<th>Question</th>
<th>Mo</th>
<th>Md</th>
<th>IQR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q16</td>
<td>Clear communication regarding the added value of the KBA Standard is needed.</td>
<td>5</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>Q15</td>
<td>Thoughtful engagement at the local level will be essential to the effective application of the KBA Standard.</td>
<td>5</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>Q3</td>
<td>KBA data should be used to inform the prioritisation of conservation action.</td>
<td>5</td>
<td>5</td>
<td>1</td>
</tr>
</tbody>
</table>
C – Summative evaluation principles

The end-user engagement process was informed by principles of good practice in international standard setting (ISEAL, 2014). We undertook a summative evaluation of our end-user engagement process using eight of the most relevant ISEAL principles, which we grouped into three categories: (i) stakeholder identification; (ii) stakeholder engagement; and (iii) process transparency.

### Stakeholder identification

- **Principle 1.** "At the outset of a standards development or revision process, the standard-setting organisation shall develop or update lists of sectors that have an interest in the standard and key stakeholder groups within those sectors, based on the standard’s scope and its social, environmental and economic outcomes [...] Scope includes the sector and geographies to which the standard applies." ISEAL (2014: 12 – Clause 5.2)

- **Principle 2.** "The standard-setting organisation shall: a. seek to achieve representative participation in its standard-setting activities; and b. to this end, set participation goals for interest sector engagement that can be evaluated and updated over time." ISEAL (2014: 12 – Clause 5.2 – Aspirational Good Practice)

<table>
<thead>
<tr>
<th>Question</th>
<th>Description</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q1</td>
<td>A standardised approach to identify KBAs is needed.</td>
<td>5 5 1</td>
</tr>
<tr>
<td>Q2</td>
<td>The KBA Standard should build upon the existing approaches used to identify sites of particular importance for biodiversity (such as Important Bird and Biodiversity Areas, Important Plant Areas, Alliance for Zero Extinction Sites and others).</td>
<td>5 4 1</td>
</tr>
<tr>
<td>Q3</td>
<td>KBA documentation should include additional information when available (such as information on climate change impacts, ecosystem services and socio-economic data).</td>
<td>5 5 1</td>
</tr>
<tr>
<td>Q4</td>
<td>KBAs themselves should be priorities for conservation action.</td>
<td>4 4 1</td>
</tr>
<tr>
<td>Q5</td>
<td>Development activities should not be permitted in KBAs.</td>
<td>2 2 2</td>
</tr>
<tr>
<td>Q6</td>
<td>A focus on KBAs may undermine national processes and priorities.</td>
<td>3 3 2</td>
</tr>
<tr>
<td>Q7</td>
<td>One global standardised approach for identifying KBAs is preferable to multiple national level approaches that identify areas of particular importance for biodiversity.</td>
<td>4 4 2</td>
</tr>
<tr>
<td>Q8</td>
<td>An emphasis on KBAs could hinder conservation efforts outside of KBAs.</td>
<td>2 2 2</td>
</tr>
<tr>
<td>Q9</td>
<td>KBA data should be freely available for commercial use.</td>
<td>3 3 2</td>
</tr>
<tr>
<td>Q10</td>
<td>A lack of biodiversity data in many regions could limit the utility of the KBA Standard.</td>
<td>4 4 1</td>
</tr>
<tr>
<td>Q11</td>
<td>The KBA Standard will encourage collaboration among constituencies involved in identifying sites of particular importance for biodiversity.</td>
<td>4 4 1</td>
</tr>
<tr>
<td>Q12</td>
<td>An initial KBA database, based on currently available data, should be developed quickly in order to be immediately useful.</td>
<td>5 5 1</td>
</tr>
<tr>
<td>Q13</td>
<td>KBA documentation should include management options for the site.</td>
<td>4 4 1</td>
</tr>
<tr>
<td>Q14</td>
<td>KBAs should be ranked according to relative importance for biodiversity.</td>
<td>4 4 1</td>
</tr>
<tr>
<td>Q15</td>
<td>A standardised approach to identify KBAs is needed.</td>
<td>5 5 1</td>
</tr>
<tr>
<td>Q16</td>
<td>The KBA Standard will encourage collaboration among constituencies involved in identifying sites of particular importance for biodiversity.</td>
<td>4 4 1</td>
</tr>
<tr>
<td>Q17</td>
<td>One global standardised approach for identifying KBAs is preferable to multiple national level approaches that identify areas of particular importance for biodiversity.</td>
<td>4 4 2</td>
</tr>
<tr>
<td>Q18</td>
<td>An emphasis on KBAs could hinder conservation efforts outside of KBAs.</td>
<td>2 2 2</td>
</tr>
<tr>
<td>Q19</td>
<td>KBA data should be freely available for commercial use.</td>
<td>3 3 2</td>
</tr>
<tr>
<td>Q20</td>
<td>Development activities should not be permitted in KBAs.</td>
<td>2 2 2</td>
</tr>
<tr>
<td>Q21</td>
<td>A focus on KBAs may undermine national processes and priorities.</td>
<td>3 3 2</td>
</tr>
<tr>
<td>Q22</td>
<td>One global standardised approach for identifying KBAs is preferable to multiple national level approaches that identify areas of particular importance for biodiversity.</td>
<td>4 4 2</td>
</tr>
</tbody>
</table>

The end-user engagement process was informed by principles of good practice in international standard setting (ISEAL, 2014). We undertook a summative evaluation of our end-user engagement process using eight of the most relevant ISEAL principles, which we grouped into three categories: (i) stakeholder identification; (ii) stakeholder engagement; and (iii) process transparency.
• **Principle 3.** "The standard-setting organisation shall: a. identify stakeholder groups that are not adequately represented; and b. proactively seek their contributions. This shall include addressing constraints faced by disadvantaged stakeholders." ISEAL (2014: 13 – Clause 5.4–4)

**Stakeholder engagement**

• **Principle 4.** "The standard-setter proactively engages with stakeholder groups that are likely to have an interest in the standard or that are likely to be affected by its implementation, and provides them with mechanisms for participation that are appropriate and accessible. Stakeholders feel that their views are represented in the consultation process and in decision-making." ISEAL (2014: 9 – Credibility Principle 5)

• **Principle 5.** "The standard-setting organisation shall ensure that participation in the consultation process: a. is open to all stakeholders; and b. aims to achieve a balance of interests in the subject matter and in the geographic scope to which the standard applies."

**Process transparency**

• **Principle 6.** "The standard and information about its development are made freely and publicly available at a minimum via an organisation’s website. This includes, at least, draft and final versions of the standard, information on governance (how decisions are made and by whom, and how to participate in decision-making and standards development), and information on consultation (stakeholder input and how it was addressed in standards development)." ISEAL (2014: 9 – Credibility Principle 7)

• **Principle 7.** "The standard-setting organisation shall: a. compile all comments received during a consultation period; b. prepare a written synopsis of how each material issue has been addressed in the standard revision; c. make the synopsis publicly available; and d. send it to all parties that submitted comments." ISEAL (2014: 13 – Clause 5.4–5)

• **Principle 8.** "The standard-setting organisation shall make original comments received during a consultation period publicly available."

The end-user engagement process was also informed by five principles for effective knowledge exchange (Reed et al. 2014).

• **Principle 1 – Design:** Know what you want to achieve with your knowledge exchange (goals) and design a flexible knowledge exchange strategy that can respond to changing user needs and priorities.

• **Principle 2 – Represent:** Systematically identify your likely users, represent and embed their knowledge needs and priorities into your research and consider ethical implications of engaging with different stakeholders.

• **Principle 3 – Engage:** Build long-term trusting relationships based on two-way dialogue with users, understand what motivates users, work with them to produce new knowledge and interpret the implications of your joint efforts for policy and practice.

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6 A balance of interests in stakeholder participation cannot be ensured but the standard-setting organisation should make efforts to engage all those stakeholder groups identified in the stakeholder identification process.

7 Original comments that are made publicly available can be attributed to the stakeholder group but should not be attributed to individual stakeholders unless those stakeholders have consented to be identified.
Principle 4 – Impact: Focus on delivering tangible results to as many users as possible and as early as possible.

Principle 5 - Reflect and Sustain: Monitor and reflect on your knowledge exchange work and its effectiveness regularly, use this to learn from and refine your knowledge exchange practice, share good practice and consider how to sustain a legacy of knowledge exchange beyond project funding.