Natural England Standard
Analysis of Evidence

1:0 About this standard

Introduction
The way in which evidence is analysed, interpreted and conclusions drawn needs to be appropriate to the question being addressed. Analytical methods must be appropriate to the topic and stand up to scrutiny. The principles of transparency and quality assurance apply. The certainty of conclusions drawn and any evidence gaps, uncertainties or competing interpretations must be made clear and expressed for each relevant stage in the analysis.

What does this standard cover?
The way we use and analyse data, research findings and other information to develop our evidence base.

Who is this standard for?
All members of Natural England staff who analyse evidence, whether generate in-house, by partners or commissioned.

2:0 The Standard

This standard provides:

2.1 A set of principles for the analysis of Evidence and

2.2 Five mandatory steps that must be followed when undertaking an analysis of evidence.

2.1 Principles for the analysis of Evidence	
Evidence	The Evidence used is of a quality and relevance appropriate to the research question or issue requiring advice or decision
Analysis	The Analysis carried out is appropriate to the evidence available and the question or issue under consideration
Conclusions	Conclusions are drawn which clearly relate to the evidence and analysis
Uncertainty	Uncertainty arising due to the nature of the evidence and analysis is clearly identified, explained and recorded.

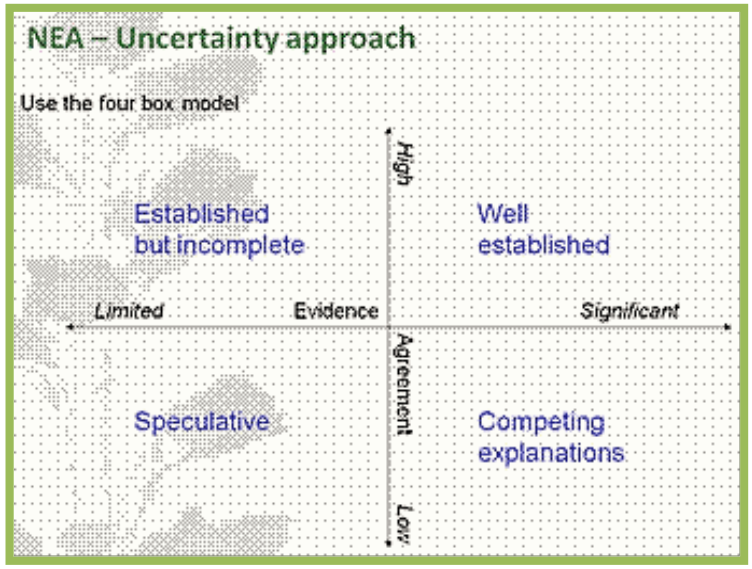
2.2 Mandatory steps to follow when undertaking analysis of Evidence		
Steps	**What**	**How**
1. Defining or clarifying the evidence requirement.	At the start of any analysis, carefully consider the nature of the proposed use of evidence. The evidence requirement may require a range of sources to be used and different analyses to be carried out. These will need to be identified individually. You should self-assess the appropriate tier of Quality Assurance your analysis requires and alert the people needed to assist with any additional tiers of QA. The QA will apply to the approach, methods and techniques used, the need to work to external standards, guidance or codes of practice and the conclusions you've drawn.	• Quality Management Standard
2. Use best available evidence to address the question/ issue.	The options for analysis will be dependent upon the types of information available. As many information sources as possible should be evaluated for their appropriateness to the question or issue to be addressed. Examples of information which may be available include: • Primary data (i.e. data not yet subjected to analysis), for example large-scale multi-partner, or Government datasets, such as the BTO Breeding Bird Survey, Countryside Survey and Population Census. • GI data layers • Outputs from mathematical models • Peer reviewed scientific and technical publications • Technical and scientific reports from official and other sources • 'Grey' literature (e.g. academic working papers, non-peer reviewed articles). **Evaluation criteria** In each case it is important to evaluate the quality of the information and record conclusions/judgements, including by reference to any meta-data supporting the information. Key criteria to consider when evaluating information sources are: • Relevance • Completeness e.g. are there geographical or time gaps in data sets • Accuracy e.g. are there obvious mistakes in species identification • Timeliness i.e. is the information of an appropriate date or period of collection	• Records Management Standard

	• Permissions for use have been obtained (where information is not the property of Natural England) • Apply any agreed or mandatory information handling protocols in requesting and taking ownership of personal or otherwise sensitive data. Where information is lacking or incomplete you should note the extent to which this constrains your analysis. Make the relevant Specialist and Community of Practice aware of evidence gaps, and uncertainties with or limits to the evidence base. If you are analysing commissioned data or research findings you should check that the agreed methodology has been followed by the contractors. Where you have queries you should refer to the technical expert on the project steering group or project board. Alternatively contact the project officer for an update on any changes that were agreed. Where agreed methods have not been followed you should contact the project SRO with your concerns. **Individual and Corporate Experience** Our individual or shared experience is of great importance to Natural England, and it is a main reason why we are consulted and respected by others. It also informs the judgements we take when we draw conclusions from information and analysis, and translate this into advice and decisions. However such experience is not, here, considered formally to be "evidence".	
3. Analysis	You should use the most appropriate analytical methods, follow agreed internal best practice, apply external standards and codes of practice where required and follow the agreed Quality Management approach. Make sure you are aware of any limitations in the data, for example limited sample size, confidence limits, weightings etc. These may be detailed in an appendix or separate technical report. Definitions of technical terms should follow best practice or external guidelines.	• Quality Management Standard

4. Drawing conclusions	In preparing conclusions (including developing advice to government and others), you should ensure: • these relate clearly to the information used and the analysis carried out • the evidence on which the conclusions have been drawn should be clearly explained in the written results • Quality Assurance processes have been followed. Drawing conclusions in many instances may require professional judgement. It is important that all conclusions drawn from statistical results are evaluated considering other relevant studies, for example sites, regions or species where observations support or contradict the analytical findings.	• Quality Management Standard
5. Determining the level of certainty	The overall validity of your conclusions is reliant on the integrity of the data collected/used and how the analysis was conducted. There are different aspects to 'validity' that you may need to clarify when presenting your analysis: measurement, construct, content, internal, external or ecological validity. In drawing conclusions and formulating advice it is important to explain clearly any attached uncertainty (see Figure 1). This is important to ensure that those using the conclusions for advice or to make decisions are aware of any associated risks of unexpected outcomes. For example: • data analysed may have incomplete geographical coverage and the risks associated with extrapolation to other geographical area may be unknown • data may be old and may not represent the current situation • relevant previous studies may have drawn different conclusions or the results contradict current theoretical understanding • conclusions drawn from a literature review or meta-analysis may represent the balance of evidence, but a proportion of studies analysed drew different conclusions and that should be noted • the method used is novel and may have technical limitations not yet properly	

	understood by the research community • there may be practical limitations of the methodology used and these should be stated, with reasons Use of the term 'significant difference' should be avoided unless it can be qualified.	

Figure 1: National Ecosystem Assessment four box model for communicating uncertainty



Quick reference	
Type of Standard	**Operational standard**
Purpose:	The purpose of this standard is to ensure that the analysis of data and other information on which our evidence is based is appropriate, uses recognised good practice methods and that the conclusions drawn reflect the balance of the evidence available and make clear the level of uncertainty that is present in the evidence
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