



# TRANSFORMING CONSERVATION

A Practical Guide to Evidence  
and Decision Making

EDITED BY WILLIAM J. SUTHERLAND





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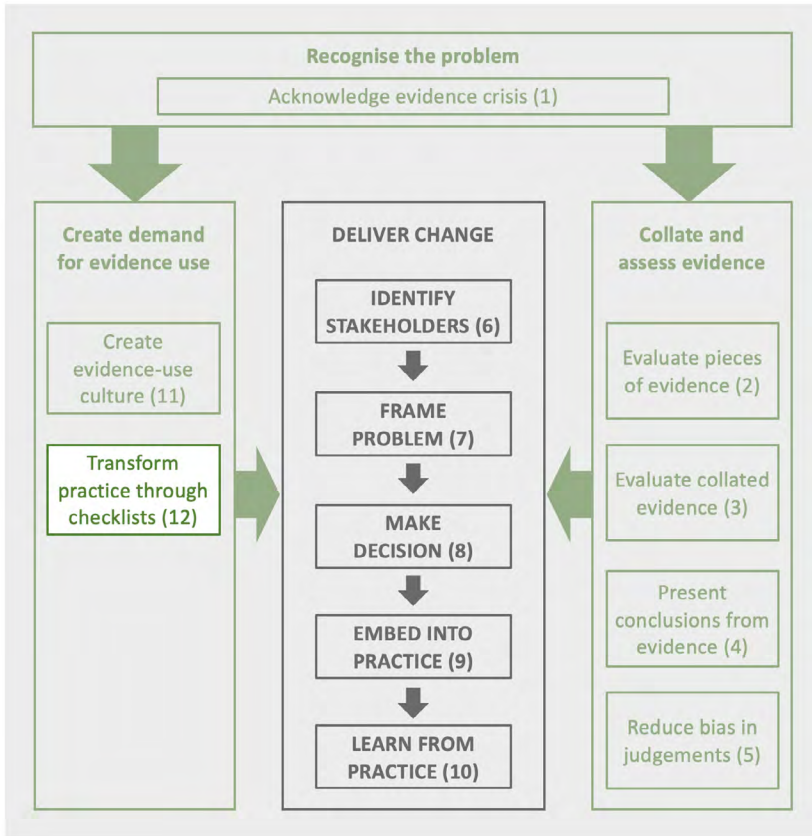
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# 12. Transforming Practice

## Checklists for Delivering Change

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Delivering a revolution in evidence use requires a cultural change across society. For a wide range of groups (practitioners, knowledge brokers, organisations, organisational leaders, policy makers, funders, researchers, journal publishers, the wider conservation community, educators, writers, and journalists), options are described to facilitate a change in practice, and a series of downloadable checklists is provided.



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## 12.1 The Importance of Checklists

A checklist is a list of systematically ordered actions that enables users to consistently perform each action and record its completion while reducing any errors that may be caused by missing out crucial steps (Gawande, 2010). Checklists can be used to help organisations and individuals consistently measure and monitor outputs and outcomes, and hence develop a culture of continuous quality improvement. They have been shown to be effective in improving outcomes in other areas of practice, powerfully described in *The Checklist Manifesto* (Gawande, 2010). Aircraft safety has been transformed by the use of checklists. This was exemplified in the ‘Miracle of the Hudson’ landing of US Airways Flight 1549 on the River Hudson, where the pilots ran through a checklist before flying, worked through the engine failure checklists when attempting to restart the engines after colliding with a flock of geese, and then, after landing on the Hudson River, ran through the evacuation checklist.

Gawande (2010) organised the creation of a checklist for use in surgery: the World Health Organization’s Surgical Safety Checklist (Figure 12.1). Some of the 19 questions appear obvious. Are you operating on the correct patient? Is it the correct operation? Are you at the correct site for operation? Are you operating on the correct side of the patient? Has the area been disinfected recently? Have all the tools and swabs been removed after the operation? A randomised controlled experiment to test if the checklist was actually effective (Haugen et al.,

# WHO Surgical Safety Checklist

(adapted for England and Wales)

## SIGN IN (To be read out loud)

Before induction of anaesthesia

Has the patient confirmed his/her identity, site, procedure and consent?

Yes

Is the surgical site marked?

Yes/ Not applicable

Is the anaesthesia machine and medication check complete?

Yes

Does the patient have a:

Known allergy?

No

Yes

Difficult airway/aspiration risk?

No

Yes, and equipment/assistance available

Risk of >500ml blood loss (7ml/kg in children)?

No

Yes, and adequate IV access/fluids planned

Name: \_\_\_\_\_

Signature of Registered Practitioner: \_\_\_\_\_

## PATIENT DETAILS

Last name: \_\_\_\_\_

First name: \_\_\_\_\_

Date of birth: \_\_\_\_\_

NHS Number: \_\_\_\_\_

Procedure: \_\_\_\_\_

\*If the NHS Number is not immediately available, a temporary number should be used until it is.

## TIME OUT (To be read out loud)

Before start of surgical intervention for example, skin incision

Have all team members introduced themselves by name and role?

Yes

Surgeon, Anaesthetist and Registered Practitioner verbally confirm:

What is the patient's name?

What procedure, site and position are planned?

Anticipated critical events

Surgeon:

How much blood loss is anticipated?

Are there any specific equipment requirements or special investigations?

Are there any critical or unexpected steps you want the team to know about?

Anaesthetist:

Are there any patient specific concerns?

What is the patient's ASA grade?

What monitoring equipment and other specific levels of support are required, for example blood?

Nurse/ODDP:

Has the sterility of the instrumentation been confirmed (including indicator results)?

Are there any equipment issues or concerns?

Has the surgical site infection (SSI) bundle been undertaken?

Yes/ Not applicable

• Antibiotic prophylaxis within the last 60 minutes

• Patient warming

• Hair removal

• Glycaemic control

Has VTE prophylaxis been undertaken?

Yes/ Not applicable

Is essential imaging displayed?

Yes/ Not applicable

Name: \_\_\_\_\_

Signature of Registered Practitioner: \_\_\_\_\_

## SIGN OUT (To be read out loud)

Before any member of the team leaves the operating room

Registered Practitioner verbally confirms with the team:

Has the name of the procedure been recorded?

Has it been confirmed that instruments, swabs and sharps counts are complete (or not applicable)?

Have the specimens been labelled (including patient name)?

Have any equipment problems been identified that need to be addressed?

Surgeon, Anaesthetist and Registered Practitioner:

What are the key concerns for recovery and management of this patient?

Name: \_\_\_\_\_

Signature of Registered Practitioner: \_\_\_\_\_

This checklist contains the core content for England and Wales

[www.npsa.nhs.uk/nrls](http://www.npsa.nhs.uk/nrls)

Figure 12.1 The World Health Organization checklist for surgeries (adapted for England and Wales). (Source: Panesar et al., 2010, © 2010, with permission from Elsevier)

2015) found that when the checklist was used, rates of complications during surgery decreased from 19.9% to 11.5%, and the mean length of a hospital stay was reduced by 0.8 days. The reduction in mortality from 1.6% to 1.0% was not statistically significant.

This chapter provides a series of checklists, each aimed at a different group of users, to help improve processes in using evidence and making decisions. Whilst the narrative of this chapter focuses on conservation, the checklists are equally applicable to other disciplines. These checklists are available on the associated website at <https://doi.org/10.11647/OBP.0321#resources> so can be modified for individual use. They are open access (Creative Commons CC-BY-4.0). Whilst attribution is welcome, it is not essential.

The checklists provided here differ from those in surgery or aircraft safety in which the user has to check every applicable box. These are checklists of what ideal evidence-based practice looks like and thus are targets, providing the opportunity to reflect on actions that are not checked. The checklists are inevitably somewhat repetitive across groups.

## 12.2 The Decision-Making Process

The heart of this book is a set of processes for delivering more effective conservation through improving the use of evidence in policy and practice. The process for making decisions based on evidence is summarised in Checklist 12.1, as a way to enable a simple check of whether good practice is being adopted.

## 12.3 Organisations

As the importance of using evidence becomes accepted, organisations will need a shift in emphasis such that evidence use is routinely embedded in decision making, as described in Chapter 9.

Embedding evidence use will require organisations to build capacity, train and mentor staff, and commit to employing new recruits skilled in using evidence. Recruitment and training should ensure conservation practitioners develop the motivation and necessary skills to embed evidence in practice. Checklist 12.2 describes the activities that can be considered by organisations interested in becoming evidence based.

There is also a need to add to the existing evidence base by testing actions and ensuring the results are made available to others, for example, by publishing results, adding them online and documenting methods, results and data on open science platforms (such as the Center for Open Science). Some journals have a specific objective of attracting articles from practitioners such as *Ecological Solutions and Evidence*, the associated Applied Ecology Resources platform (<https://www.britishecologicalsociety.org/applied-ecology-resources/>) and the *Conservation Evidence Journal*, which also encourages the publication of short papers by practitioners.

Documenting actions that are not successful, or which are only partially successful, is as informative as documenting those that *do* work. This allows practitioners to learn from the problems faced or mistakes made by others and thus avoid potentially costly errors. In a review



## 12.1 Checklist of components of evidence-based decision making

Note that numbers refer to the relevant book chapter or section.

- Have relevant stakeholders and local partners been identified, consulted, and involved in formulating goals and strategies appropriately? (6)
- Have the features of interest been identified? (7.2)
- Have the problems been identified? (7.3,7.4)
- Is the aim of the project clear? (7.5)
- Have the range of possible solutions to those problems been identified? (7.6)
- Have the knowledge needs been identified? (7.7)
- Has the evidence been gathered and assessed? (2,3,4)
- Have the costs and acceptability of these options been evaluated in a standardised and inclusive manner? (2.4)
- Have decisions been made, and expert advice solicited, in ways that reduce bias? (5)
- Has an appropriate structured decision-making process been adopted? (8)
- Have the decisions been embedded in the organisation's processes? (9)
- Has the testing of options been embedded in the proposed project? (10)
- Has an evidence-based organisational culture been created? (11)

This checklist can be downloaded from <https://doi.org/10.11647/OBP.0321#resources>. It can be modified and tailored for specific uses.

of the papers in the *Conservation Evidence Journal*, Spooner et al. (2015) showed that 31% of tested interventions were considered as unsuccessful.

Ideally, at least annually, organisations should establish a test (which can be very simple) to examine the effectiveness of an action. This could be done by comparing the action to no treatment, or by directly comparing different treatments or different means of carrying out a technique in one study (Smith et al., 2014).

### 12.3.1 Easy wins for organisation leaders

A key role of leaders is to create a culture where evidence use is encouraged and to enable the activities described in Checklist 12.1. This can be achieved through a combination of processes to ensure evidence use is embedded, such as those in Chapter 9, and routinely asking about the basis of decisions.

## 12.2 Checklist of evidence use by organisations

- Do job descriptions for posts that involve making decisions mention effective use of evidence?
- Do interviews for posts that involve making decisions include questions about evidence use and structured processes for making decisions (do interviewees use evidence and how)?
- Are audits routinely (e.g. annually) completed on the extent and effectiveness of evidence use in the organisation?
- Is there a plan outlining how evidence use will be conducted and improved in the organisation?
- Do decision makers have access to relevant evidence in an accessible form?
- Is it routine for staff to reflect on the existing evidence before carrying out actions?
- Do managers routinely ask about the use of evidence?
- Do those who overview plans and decisions routinely ask why the choice was made and how evidence was used?
- Do processes exist so that decision makers routinely (e.g. monthly) reflect on the documented evidence underpinning their work?
- Do those deciding on management actions routinely reflect on alternative management options and means of improving effectiveness?
- Is the evidence underpinning statements and decisions made clear in guidance documents?
- Is it made explicit whether the guidance used was evidence-based (e.g. Downey et al., 2022)?
- Is it routine to combine (evidence-based) guidance document recommendations with additional up-to-date evidence to justify management actions?
- Do goal-setting or performance evaluations for staff include questions about evidence use?
- Is training available, and taken up, on the use of evidence and testing actions?
- Is training available to help test actions and publish results?
- Are there processes by which, as an organisation, gaps in the available evidence are highlighted and filled by testing?

- Is it routine (at least annually) to create an experimental test to compare the effectiveness of an action against a control, or to compare different treatments?
- Are results of tests documented and made available regardless of the outcome?

This checklist can be downloaded from <https://doi.org/10.11647/OBP.0321#resources>. It can be modified and tailored for specific uses.

While some of the proposals in this chapter will take time to deliver, there are easy wins that the leaders of organisations could put into action very simply, listed in Checklist 12.3.

### 12.3 Checklist of eight ‘easy wins’ for leaders to consider enacting

- Ensure that job advertisements for decision makers specify the need to understand evidence-based practice.
- Make someone responsible for creating and delivering a strategy for evidence use.
- Establish a process of providing training on the principles of evidence use.
- State that reporting on evidence use (e.g. an outline of how evidence was incorporated) is expected in plans and reports produced by the organisation.
- Establish a process so that contracted reports require a statement on evidence use.
- Include the standard question, ‘Does your manager routinely ask about the underlying evidence?’, in annual reviews of practitioners and decision makers.
- Create a process that ensures applications for funding include reflections on the underlying evidence.
- Make someone responsible for ensuring that tests of an action are regularly initiated, for example at least annually, and results published.

This checklist can be downloaded from <https://doi.org/10.11647/OBP.0321#resources>. It can be modified and used.

### 12.4 Knowledge Brokers

The fundamental aim of this book is to facilitate the process of embedding evidence into practice, in order to make conservation actions more effective and efficient. Many of the anticipated changes will occur through practitioners and decision makers being more involved



in research, by researchers being more involved in practice, and by organisations encouraging such collaborations.

Knowledge brokers can be useful in creating these cross-disciplinary communities (Checklist 12.4 suggests possible actions for knowledge brokers). Evidence-based medicine, for example, has a network of knowledge brokers bridging the gap between the researcher and frontline doctors and nurses. These serve to translate research findings into implications for clinical practice. Similarly, there is a need to create a cohort of evidence-based conservation knowledge brokers. These advisors could either be employed within organisations or within established external entities providing services to a range of organisations, for example, research institutes such as universities (Cook et al., 2013). Kadykalo et al. (2021) call such individuals and organizations 'evidence bridges' that would help foster research-practitioner connections and synthesise and distribute research. Knowledge brokers would have three main roles:

1. **Aiding the interpretation of evidence for decision-making:** As evidence-based conservation becomes increasingly accepted, the evaluation and interpretation of evidence will likely become more important. This consists of both evaluating the strength of evidence from different sources and relating the relevance of research to local conditions. For example, we expect that sometimes this interpretation will be provided in response to questions about an individual case (such as an advisor answering a question from a land manager) and sometimes provided as generic advice (such as an organisation providing advice to their staff about how they can treat invasive plants in their region). Interpreting the evidence for local conditions should be done in close consultation with practitioners.
2. **Producing accessible information that incorporates evidence:** Knowledge brokers can also help the creation of evidence-based guidance. As described in Chapter 9, this is key, in particular as an accepted standard for actions undertaken by ecological consultants.
3. **Assisting with the design of tests to assess effectiveness:** It is unreasonable to expect that most practitioners have the training and skills to design experiments, collect and analyse data or disseminate the results. There is a need for knowledge brokers who can assist with these tasks.

The Woodland Trust (UK) is one example of an organisation fulfilling this knowledge broker role through their Outcomes and Evidence team, which consists of 21 staff members (at the time of writing) whose expertise includes woodland ecology, citizen science, evidence use, land management, monitoring and evaluation, tree health, carbon and soil science, data science, and more. The team funds, co-designs, and co-delivers research with policy makers and practitioners, provides evidence syntheses and summaries, produces evidence-based guidance, provides bespoke advice to landowners, helps in the design of projects and experiments, disseminates results, and engages with internal and external stakeholders to enable evidence-based delivery of conservation outcomes in a wide variety of accessible formats.

## 12.4 Checklist for evidence use by knowledge brokers

- Have the knowledge needs of the target organisation been determined?
- Has there been an exploration of the range of possible actions that could be taken, including variations in implementation?
- Has the evidence been collected, shared, and stored in a manner that aligns with the community's best interests and rights?
- Is evidence made available to practitioners in a usable manner?
- Are there means for informing users of the full range of possible actions?
- Can evidence-based guidance be created for repeated activities?
- Have processes been adopted to ensure the evidence used is as up-to-date as possible?
- Is the range of evidence used appropriate to the questions being asked?
- Is help provided, where necessary, to ensure tests of actions are designed effectively?
- Is assistance provided, where necessary, to enable analysis and documenting of tests of effectiveness?
- Have processes been adopted to reflect on practice, especially where there were problems?

This checklist can be downloaded from <https://doi.org/10.11647/OBP.0321#resources>. It can be modified and tailored for specific uses.

## 12.5 Practitioners and Decision Makers

Those who make decisions and those who convert these into actions are central to the use of evidence in practice (see Checklist 12.5). These include a diverse range of individuals (e.g. nature reserve managers, reserve wardens, farmers, rangers, environmental site managers, and foresters). As a result of changes in expectations and requirements, and as evidence-use skills become essential for employment, over time we expect that evidence use will become standard practice.

## 12.6 Commissioners of Reports and Advice

Checklist 12.6 looks at means of establishing whether reports are evidence-based. These may be reports from consultants or internal reports. There is research indicating that conservation guidance documents, and actions then commonly recommended, are weakly based on

## 12.5 Checklist for evidence use by practitioners and decision makers

- Is it routine to consider whether other management options may be more effective and/or cost-effective?
- Is it routine to consider whether modifications to actions put in place might improve efficiency?
- Is it routine to consult a wide variety of evidence sources including documented evidence, professional experience, practitioner knowledge and local and indigenous knowledge when deciding upon actions?
- Are there processes for making the evidence used in plans and decisions transparent?
- Are there processes by which gaps in the evidence are highlighted within the community and filled by testing (and sharing of results)?
- Is there an evidence use plan?
- Are tests of effectiveness routinely embedded within conservation action?
- Are the results of tests of actions documented and shared regardless of the outcome?
- Are practitioners/decision makers involved in work to help apply and expand the evidence base?
- Is it routine to search for evidence when planning new projects?
- Are practitioners/decision makers appropriately trained in evidence use (e.g. how to find and synthesise evidence)?

This checklist can be downloaded from <https://doi.org/10.11647/OBP.0321#resources>. It can be modified and tailored for specific uses.

evidence. Hunter et al. (2021) showed that ecological mitigation and compensation measures recommended in practice often have a limited evidence base backing them up, and most actions were justified by using guidance documents. However, Downey et al. (2022) showed that the majority of guidance documents for the mitigation and management of species and habitats in the UK and Ireland do not cite scientific evidence to justify the recommended actions and are often outdated. This risks carrying out actions that are ineffective, or not carrying out the most cost-effective action. As a result of ineffective actions, limited funds could be wasted, staff or volunteer morale could be damaged, and there is a risk of bad publicity or reputational effects.



## 12.6 Checklist for ensuring reports are evidence-based

- Are sufficient resources allocated to finding and synthesising evidence?
- Does the report include a transparent process for evidence use?
- Does the evidence used in the report appear appropriately comprehensive and up-to-date?
- Does the report clarify any knowledge gaps?
- Does the report appropriately reflect on the uncertainties of the evidence?
- Have any conflicts of interest that might influence evidence use in the report been declared?
- Does the guidance look into the costs and acceptability of different actions, and do statements of financial costs specify what is included?
- Do consultants have a statement about their approach to evidence use on their website?
- Do consultants have robust processes for evidence use and testing?

This checklist can be downloaded from <https://doi.org/10.11647/OBP.0321#resources>. It can be modified and tailored for specific uses.

## 12.7 Funders and Philanthropists

Funders may be in the best position to deliver a fundamental change in evidence use. Conservation practice would be transformed if funders expected transparent evidence use, and agreed to fund work that improves the evidence base (see Checklist 12.7). Furthermore, the expected efficiency gains, as outlined in Chapter 1, should result in the delivery of substantially enhanced outcomes for the same funding. In turn, such increased efficiency may make funding conservation more attractive.

The most important questions for funders to ask applicants are: Does the applicant have a history of using evidence? What processes are in place for using evidence? How well are the proposed actions evidenced? The main ways in which funders can help increase and embed the use of evidence in practice are listed below. They can:

1. *Ask applicants why they believe their proposal will work:* There is a range of ways (see Chapter 9) in which funders can ask why the applicant believes their proposal will be effective and ensure that evidence has not been cherry-picked to support a particular course of action.
2. *Encourage rigorous testing of actions:* Funders can encourage experimental testing, analysis and publication of the effects of interventions by allowing a) a percentage

of grant money to be spent assessing the effectiveness and b) sufficient time to complete this evaluation. This could be an expected component of large projects and an optional element of small grants focussing on those opportunities where testing is appropriate (Section 10.3).

3. *Fund learning organisations*: Funders can favour organisations that are learning by evaluating and testing interventions and ideas; they can rate applicants on their past record of project evaluation and their record of making results publicly available. Funders should, however, make it clear that the criterion relates to whether their evaluation is rigorous and the organisation is learning, rather than to claims about how wonderful the programme is.
4. *Promote open data*: Funders can make it a requirement that the data collected, such as species recorded or responses to interventions, is stored in standard open access databases (using adequate geospatial data protection where necessary in order to protect vulnerable species and habitats), and they can provide funds for the necessary data curation work.
5. *Encourage submission to journals that are making progress toward open science*, for example by following the Transparency and Openness Promotion Guidelines (<https://www.cos.io/initiatives/topguidelines>).
6. *Ensure evidence base and infrastructures are funded*: Effective delivery of evidence-based practice requires that the evidence is collated, synthesised and made available for use, for example, through guidance or decision support tools. There is also a need for funding of adequate training/capacity building and materials.
7. *Accept publication as part of the reporting process*: A major barrier to dissemination is that many organisations do not have the time to both write a report for the funders and to publish a scientific paper. Accepting a final report in the form of a draft paper, or papers, reduces this problem.
8. *Establish a common register of projects*: Funders can establish an open register of funded projects (preferably a joint register across many funders), which also raises the expectation that robust data will be generated and subsequently made available to practitioners and scientists. This is also useful for testing for publication bias (e.g. on the success of a given type of project) and reducing duplication of projects or tests of interventions.
9. *Fund organisations committed to evidence use*: Funders can show a preference for funding organisations with a clear, demonstrated commitment to evidence-based practice (e.g. Conservation Evidence ‘Evidence Champions’). There is a need for evidence certification such as through professional bodies.

## 12.7 Checklist for philanthropists and funders to encourage evidence use

- Does the funding call include a requirement to reflect on the evidence underpinning the proposal?
- Is the applicant asked to outline their history of evidence use?
- Are there processes for reviewing the use of evidence in proposals?
- Is there a process for encouraging and supporting projects to embed tests within actions?
- Is there a process to encourage data collected to be made openly available, when it does not cause ethical issues or conservation risks?
- Is there a plan to pre-register the work, and to analyse the sample effort required to detect important changes?
- Are project funder reports detailing outcomes made freely available online? Can draft publications, for submission to peer-reviewed journals, be accepted as a replacement for reports?
- Is there a stated expectation for an honest appraisal, including when the project is much less successful than expected?
- Does the funding call favour teams that include practitioners or decision makers alongside researchers?
- Is sufficient funding available, across the discipline or subject area, for evidence synthesis, guidance creation, training and capacity building?

This checklist can be downloaded from <https://doi.org/10.11647/OBP.0321#resources>. It can be modified and tailored for specific uses.

## 12.8 The Research and Education Community

Evidence-based medicine depends on an enormous pool of scientists who conduct basic research to underpin medical practice. It also relies on entire institutions that conduct syntheses of evidence, including members of the Cochrane Collaboration. Researchers and the education community have a large part to play in the practice of evidence-based conservation. Their roles are to:

1. *Identify priorities for evidence synthesis:* Engage with stakeholders, practitioners, managers, and policy makers to identify gaps in synthesis; to decide whether an evidence map, subject-wide evidence synthesis, systematic review, or dynamic synthesis is the most appropriate approach; and to create a process for delivering.



2. *Conduct research that fills in gaps in the evidence base:* Questions suitable for research might be a) identified by policy makers or practitioners (Sutherland et al., 2006, 2009), b) identified as gaps in policy (Sutherland et al., 2010a), c) identified as gaps in systematic reviews or synopses of evidence (e.g. evidence synthesis for primate conservation identified numerous evidence gaps, Junker et al., 2020). Building relationships with policy makers and practitioners assists in identifying knowledge gaps and facilitating the dissemination of research findings.
3. *Facilitate timely publication, and dissemination, of research findings:* The average length of time between the end of data collection and the final date of publication for studies of conservation interventions has been estimated at 3.2 years (Christie et al., 2021); this delay is further hindering practitioners from accessing up-to-date evidence. Such delays can be reduced by disseminating findings to relevant stakeholders, and timely publishing of results, including preprints where appropriate, in open access sources if possible.
4. *Encourage a culture of evidence-based practice:* Routinely develop questions to test the evidence base, and disseminate the need for evidence synthesis or primary research. Setting an agenda for priority conservation activities would direct projects to areas where learning could provide the greatest benefits.
5. *Teach effective decision making:* We envisage a major growth area to be the provision of training in effective decision-making skills (as described in this book) in a range of languages and at different levels. Chapter 10 gives further details on how this could be achieved.
6. *Teach approaches to quantifying the effectiveness of interventions:* Opportunities for generating convincing evidence are often missed or ineffective experimental designs are employed. There is thus a need for improved knowledge of experimental design, data collation, data analysis and the publication process.
7. *Introduce, by journals, reporting standards:* It is often difficult or impossible to extract key data from papers. This situation would be improved by introducing reporting standards, in a machine-readable manner, for research papers to facilitate subsequent use of data in synthesis and meta-analysis; similar advances have been made by editors of medical journals (Pullin and Salafsky, 2010). One solution is to form an International Committee, similar to that of the Medical Journal Editors (<https://www.icmje.org/>), and publish 'uniform requirements for manuscripts' such as reference styles.
8. *Introduce, by journals, standards for evidence synthesis methodology and reporting:* Review articles vary considerably in their rigour and reliability. Editors should consider using published checklists to improve the standards of review articles that are attempting to synthesise existing evidence (Pullin et al., 2022; O'Dea et al., 2021).

9. *Request, by journals, that authors report the costs of interventions:* Encourage authors to report the cost of an intervention in a manner that allows policy makers to translate this information to their management context and to determine the most cost-effective alternative. Consistent methods for reporting costs would enable economic return-on-investment evaluations as part of evidence synthesis.
10. *Introduce, by journals, measures to reduce barriers to the publication of evidence:* Publishers can take a number of measures to reduce hindrance and delays in publication. For example, they could introduce less strict formatting requirements for the initial screening of articles, or conduct preliminary peer review before submission, or move to new publication models where articles are published before peer assessment.
11. *Standardise methods:* A major problem with reviewing environmental evidence is that a wide range of methods is used, which makes comparisons difficult. Some of this variation is for sensible reasons, but much appears not to be. Standardising methods and outcome measurements, as has been done for reintroductions (Sutherland et al., 2010b) is, therefore, a useful step that could be applied more widely.
12. *Standardise terminology:* When comparing studies, standard terminology is required. Salafsky et al. (2008) suggest standard terms for the major threats, actions and habitats. Similarly, Mascia et al. (2014) provide standardised terminology for approaches to monitoring and evaluation. A useful analogy is to consider medicine before common names were agreed for diseases and potential cures, greatly hindering systematic science.
13. *Agree upon and use standard information repositories:* Create effective, attractive information systems for storing the outcomes of evidence-based planning and decision making, and monitoring and testing. Applied Ecology Resources (<https://www.britishecologicalsociety.org/applied-ecology-resources/>), Conservation Evidence (<https://www.conservationevidence.com/>), Panorama (<https://panorama.solutions/en>) and GBIF (<https://www.gbif.org/conservation>) are some stores for such material.
14. *Proactively bridge gaps between practice and research* (see Kadykalo et al. 2021): Facilitate conversations and networking between researchers and practitioners to help identify evidence needs, disseminate evidence produced to the wider community. Consult practitioner groups frequently to help mould research plans, and identify practical effective solutions.

## 12.8 Checklist for researchers and educators to support evidence use

- Do researchers, practitioners and policy makers in the field regularly interact and identify knowledge gaps?
- Does the research question fill a gap in the existing evidence base for policy and practice? If not, can the question be adapted to do so?
- Is the experimental design as rigorous as practically possible?
- Can the research project (including the methods and questions to be asked) be pre-registered?
- Are methodological and reporting standards (for either primary studies or evidence syntheses, as appropriate to the research question) available and followed?
- Do publications testing actions routinely report the costs of those actions?
- Have any conflicts of interest that might influence interpretation of the research been declared?
- Does the research clarify any remaining knowledge gaps?
- Is there a plan in place for timely publication of research results?
- Is it possible to publish results as a preprint?
- Are the results documented and shared regardless of the outcome?
- Are the conclusions of research made available to relevant practitioners and policy makers in a manner that is useful to them?
- Is data added to widely used information repositories, where appropriate?
- Is training available, and taken up, on the use of evidence?
- Is training available on effective decision making?
- Is training available, and taken up, on the testing of actions?

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