

Table 1. The research process stages, examples of potential research waste and how ecology and conservation can limit these.

Research Stage	Examples of potential for research waste	Where ecology and conservation can reduce waste
Questions relevant to stakeholders	Irrelevant questions asked  Previous knowledge not properly taken into account	Co-development of research questions with stakeholders  Make use of evidence synthesis methods (e.g. cumulative meta-analysis, systematic mapping, systematic reviews, meta-analysis) to identify questions that are not satisfactory answered
Appropriate design and methods	Study poorly designed, under-powered (or over-powered. etc.)  Using inappropriate statistical tools (including overfitting etc.)  Previous knowledge not taken into account  Questionable research practices <sup>3</sup> lead to poor quality research	Use simulations or power-analysis prior to undertaking data collection. Predefine effect size of interest with stakeholders (i.e do not rely on rules of thumb for “statistical significance”)  Better training of early-career researchers in methods. Open code and data to ensure reproducibility of methods  Make use of evidence synthesis methods (e.g. cumulative meta-analysis, systematic mapping, systematic reviews, meta-analysis) to identify questions that are not satisfactory answered  Open science (open methods and data, reproducible methods, sharing code, etc.) Better training of early-career researchers in methods of open science and evidence synthesis.
Accessible full publication	Publications not available to practitioners and decision makers	Open access publishing
Unbiased reporting	Lack of open data	Open science (open methods and data, reproducible methods, sharing code, etc.)  Pre-registration of hypotheses

	<p>Hypothesising after the results are known</p> <p><i>p</i>-hacking</p> <p>File Drawer syndrome (only some studies are published)</p>	<p>Open science (open methods and data, reproducible methods, sharing code, etc.)</p> <p>Pre-registration of hypotheses and methods. Open publishing (including preprints)</p>
Evidence synthesis	Research not designed or presented in the context of the existing knowledge	Using systematic reviews, systematic maps, meta-analysis, etc. to shape research priorities. Research gluts should be synthesised providing evidence to relevant stakeholders. Research gaps should be the focus of primary studies.