# [Title]: [Type of review]

**Title**: The title must indicate that it is a systematic review protocol, and must indicate if it is an update/amendment: e.g. "A systematic review update protocol. . . ". (The title should normally be the same or very similar to the review question.)

**Type of review**: Select one of the following types of review: systematic review, systematic review update, systematic review amendment, systematic review from a systematic map (See CEE Guidance on amendments and updates [1])

## Authors contacts

The full names, institutional addresses, and email addresses for all authors must be provided.

[1] Bayliss, H.R., Haddaway, N.R., Eales, J., Frampton, G.K. and James, K.L., 2016. Updating and amending systematic reviews and systematic maps in environmental management. Environmental Evidence, 5(1), p.20.

## Abstract

Abstract must not exceed 350 words and must include two sections 1) Background, the context and purpose of the review, including the review question; 2) Methods, how the review will be conducted and the outputs that are expected (specifically mention search strategy, inclusion criteria, critical appraisal, data extraction and synthesis).

**Keywords:**
Use terms that cover the core content of your article. Keywords improve discoverability so it is important to use terms not already mentioned in the title or abstract that will help readers find your paper.

## 1.1 Background

Describe the rationale for the review in the context of what is already known. Protocol must indicate why this study was necessary and what it aims to contribute to the field. (A theory of change and/or conceptual model can be presented that links the intervention or exposure to the outcome.)

## 1.2 Stakeholder engagement

The planned/actual role of stakeholders throughout the review process (e.g. in the formulation of the question) must be described and explained (using a broad definition of 'stakeholder', including e.g. researchers, funders and other decision-makers; see )[2]

## 1.3 Objective of the review

**Objective**: Describe the primary question and secondary questions (when applicable). (The primary question is the main question of the review. Secondary questions are usually linked to sources of heterogeneity (effect modifiers).)

**Definitions of the question components**: Break down and summarise question key elements e.g. population, intervention(s)/exposure(s), comparator(s), and outcome(s). (For other question types see [3][4])

[2]Haddaway, N.R., Kohl, C., da Silva, N.R., Schiemann, J., Spök, A., Stewart, R., Sweet, J.B. and Wilhelm, R., 2017. A framework for stakeholder engagement during systematic reviews and maps in environmental management. Environmental Evidence, 6(1), p.11.

[3]Collaboration for Environmental Evidence. 2018. Guidelines and Standards for Evidence synthesis in Environmental Management. Version 5.0. www.environmentalevidence.org/information-for-authors.

[4]Leeds Institute of Health Sciences. https://medhealth.leeds.ac.uk/info/639/information_specialists/1500/search_concept_tools. Accessed 12/11/2017.

## 2. Methods

### 2.1 Searches

**Search strategy**: Detail the planned search strategy to be used, including: database names accessed, institutional subscriptions (or date ranges subscribed for each database), search options (e.g. 'topic words' or 'full text' search facility), efforts to source grey literature, other sources of evidence (e.g. hand searching, calls for evidence/submission of evidence by stakeholders). (Details regarding search strategy testing should be provided.)

**Search string**: Provide Boolean-style full search string and state the platform for which the string is formatted (e.g. Web of Science format)

**Languages – bibliographic databases**: List languages to be used in bibliographic database searches.

**Languages – grey literature**: List languages to be used in organizational websites searches and web-based search engines.

**Bibliographic databases**: Provide the number of bibliographic databases to be searched.

**Web – based search engines**: Provide the number of web – based search engines to be searched.

**Organisational websites**: Provide the number of organisational websites to be searched.

**Estimating the comprehensiveness of the search**: Describe the process by which the comprehensiveness of the search strategy was assessed (i.e. list of benchmark articles).

**Search update**: Describe any plans to update the searches during the conduct of the review. (Optional. A search update is good practice if original searches were performed more than two years prior to review completion.)

### 2.2 Article screening and study inclusion criteria

**Screening strategy**: Describe the methodology for screening articles/studies for relevance/eligibility.

**Consistency checking**: Describe clearly the process for checking consistency of decisions including the levels at which consistency checking will be undertaken and estimated proportion of articles/studies that will be screened and checked for consistency by two or more reviewers (e.g. Titles (10%), abstracts (10%), full text (10%)).

**Inclusion criteria**: Describe the inclusion criteria used to assess relevance of identified articles/studies. These must be broken down into the question key elements (e.g. relevant subject(s), intervention(s)/exposure(s), comparator(s), outcomes, study design(s)) and any other restrictions (e.g. date ranges or languages).

**Reasons for exclusion**: State that you will provide a list of articles excluded at full text with reasons for exclusion.

### 2.3 Critical appraisal

**Critical appraisal**: Describe here the method you propose for critical appraisal of study validity (including assessment of individual studies and the evidence base as a whole).

**Critical appraisal strategy**: Describe how the information from critical appraisal will be used in synthesis.

**Consistency checking**: Describe how repeatability of critical appraisal of study validity will be tested.

### 2.4 Data extraction

**Meta-data extraction and coding strategy**: Describe the method for meta-data extraction and coding for studies (potentially providing forms/data sheets (ideally piloted), list if variables to be extracted as meta-data and those that will be coded).

**Data extraction strategy**: Describe the method for extraction of qualitative and/or quantitative study findings (potentially providing forms/data sheets (ideally piloted))

**Approaches to missing data**: Describe any processes for obtaining and confirming missing or unclear information or data from authors.

**Consistency checking**: Describe how repeatability of the meta-data/data extraction process will be tested.

### 2.5 Potential effect modifiers/reasons for heterogeneity

Provide a list of and justification for the effect modifiers /reasons for heterogeneity that will be considered in the review. Also provide details of how the list was compiled (including consultation of external experts). (The list should not be exhaustive but a short list of those variables thought to be most important and amenable to analysis.)

### 2.6 Data synthesis and presentation

**Data synthesis and presentation**: State the type of synthesis conducted as part of the systematic review (narrative only, narrative and quantitative, narrative and qualitative, narrative, qualitative and quantitative, narrative and mixed-methods)

**Narrative synthesis strategy**: Describe methods to be used for narratively synthesising the evidence base in the form of descriptive statistics, tables (including any map databases) and figures. (Vote-counting (tallying of studies based on the direction or significance of their findings) must be avoided. Must include a summary of the outputs of critical appraisal of the evidence base as a whole.)

**Quantitative synthesis strategy**: If data are appropriate for quantitative synthesis, describe planned methods for calculating effect sizes, methods for handling complex data, statistical methods for combining data from individual studies, and any planned exploration of heterogeneity (e.g. sensitivity analysis, subgroup analysis and meta-regression). If all studies may not be selected for synthesis explain criteria for selection (e.g. incomplete or missing information). (Compulsory if appropriate for data)

**Qualitative synthesis strategy**: Describe methods to be used for synthesising qualitative data and justify your methodological choice. Describe if and how you plan to analyse subgroups/subsets of data. If all studies may not be selected for synthesis explain criteria for selection (e.g. incomplete or missing information). (Compulsory if appropriate for data)

**Other synthesis strategies**: Describe any other approaches to be used for synthesising data or combining qualitative and quantitative synthesis (e.g. mixed-methods) and justify your methodological choice. (Compulsory if appropriate for data)

**Assessment of risk of publication bias**: Describe planned methods for examining the possible influence of publication bias on the synthesis. (For quantitative syntheses this may be done using diagnostic plots or statistical tests)

**Knowledge gap identification strategy**: Describe the methods to be used to identify and/or prioritise key knowledge gaps (unrepresented or underrepresented subtopics that warrant further primary research). (Optional)

**Demonstrating procedural independence**: Describe the role of systematic reviewers (who have also authored articles to be considered within the review) in decisions regarding inclusion or critical appraisal of their own work. (Reviewers who have authored articles to be considered within the review should be prevented from unduly influencing inclusion decisions, for example by delegating tasks appropriately.)

### 2.6 Declarations

**Competing interests**: Describe of any financial or non-financial competing interests that the review authors may have.