

LITERATURE REVIEWS

SYSTEMATIC EVIDENCE REVIEW PROTOCOLS – SEARCH STRATEGY

Independent Research and Science Team (IRST) Meeting

3 May 2024



INSTITUTE FOR
NATURAL RESOURCES

Systematic Evidence Review Protocols

Spell out how the review will identify, appraise, and collate evidence, helping reviewers think through the different review stages beforehand, anticipate problems, and plan for them.

Promote transparency and replicability, and allow the review to be updated by others at a later date.

Protocol Components

Background context for the questions

Objective of the review

Methods

Potential conflicts of interest

Sources of support

References



Objective of the Review

Primary question

Secondary question, if applicable

Methods

A key purpose of the systematic evidence review protocol is to **determine a search strategy** that will identify all research relevant to the question.

The search must be sufficiently rigorous and broad to ensure that all studies eligible for inclusion are identified even though they may be excluded during the quality assessment phase of the review.



Methods

Search strategy

Study inclusion criteria & procedures

Study quality assessment (e.g., checklists & procedures)

Data extraction strategy

Data synthesis

Project timetable

EXAMPLE PROTOCOL

Question: Does instream wood placement affect salmonid growth, survival or habitat complexity?

Search Protocol: Revision on April 10, 2007



Search Strategy Example

WHERE

Identified and searched electronic databases (n=9) and listed them by database name and host/administrator (i.e., Treesearch: USDA Forest Service Research, Web of Science: Science Citation Index)

Meta-search engine (n=1), i.e., Google Scholar

Library collections (n=8), i.e., OSU Library, UW Library, Streamnet Library Columbia Basin

HOW

Use of keywords, **keyword sets**, and **keyword strings**

Example of Keyword Sets and Strings

Question: Does instream wood placement affect salmonid growth, survival, or habitat complexity?

| | Set 1: Species (n=23) | Set 2: Environment (n=3) | Set 3: Treatment (n=8) |
|--|------------------------------|---------------------------------|-------------------------------|
| | Oncorhynchus kisutch | Stream | Wood placement |
| | Coho salmon | River | Wood restoration |
| | Oncorhynchus keta | Channel | Woody debris placement |
| | Chinook salmon | | |

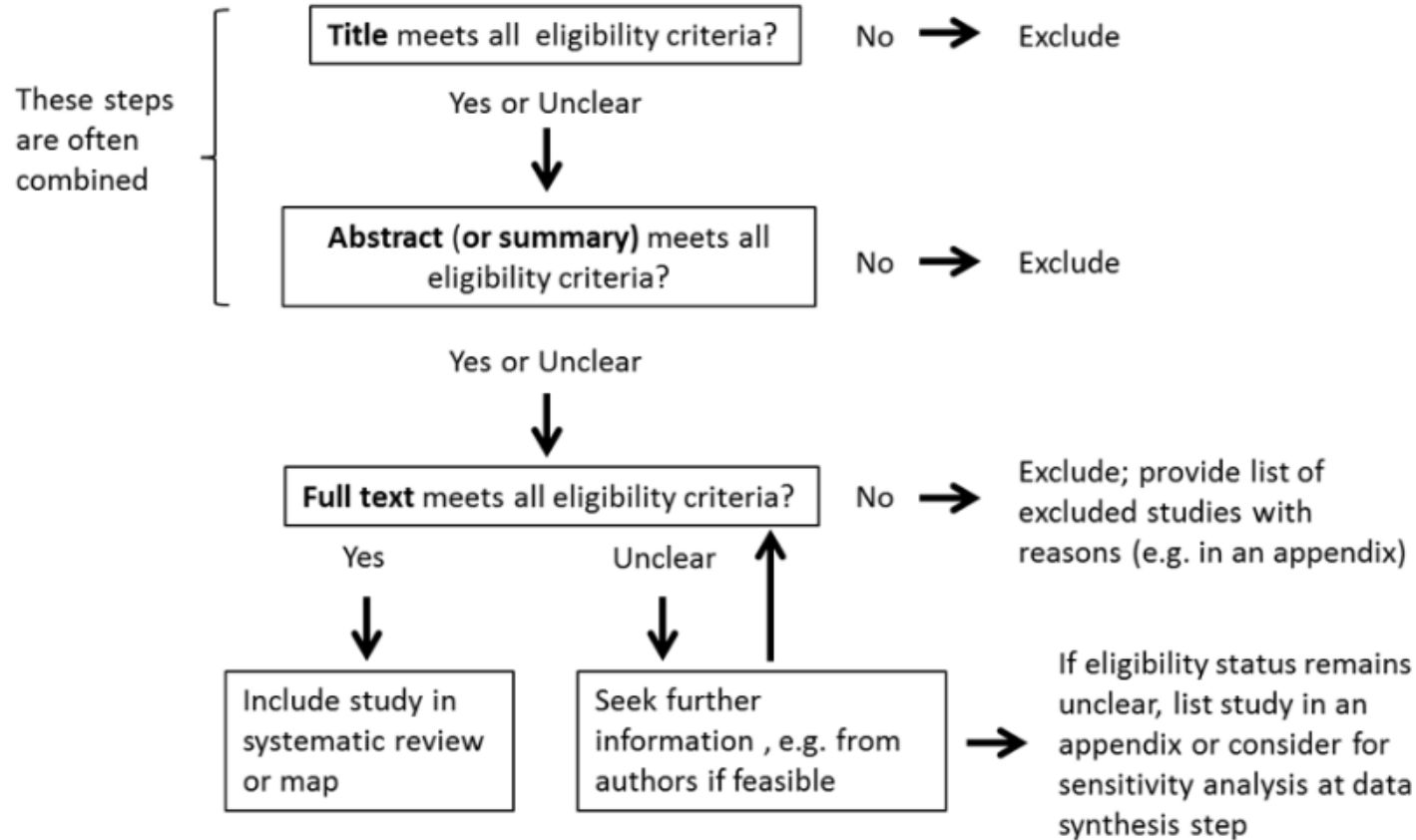
Example Boolean Search

Salmon **AND** "large wood" **OR** "woody debris" **OR** "habitat restoration" **OR** "stream channel"

Selected Bibliographies

In addition to the databases and catalogues searched, selected bibliographies of recent, relevant papers and book chapters recognized by experts as seminal or important can be reviewed for further references. This **can serve as a starting point**, help identify additional references, and/or reinforce the validity of the initial search results.

What - Eligibility Criteria



Relevance: Criteria developed around population, intervention, comparator, outcomes (PICO)

Date: Literature after a particular date

Geography: Pacific Northwest

Type and source: Peer-reviewed, gray literature

Study design

Example: PICO

What are the environmental and socioeconomic effects of the China Cropland to Forest Programme (CCFP) after the first 15 years of implementation?

(From Rodriguez et al. 2016)

| Question key elements | Eligibility criteria |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Populations (P):</p> <ul style="list-style-type: none"> • CCFP enrolled lands (cropland/ wasteland/ ecological trees/ economic trees) • CCFP households and their individual members | <p>Included: Both human populations and land resources, including CCFP participant households, their individual members and their CCFP enrolled lands (cropland, wasteland, ecological trees, and economic trees).</p> <p>Excluded: Grasslands, since they no longer form part of the CCFP and because they contribute to significantly different environmental outcomes as compared with forests.</p> |
| <p>Interventions (I):</p> <ul style="list-style-type: none"> • CCFP (subsidies, skill-training, and enforcement with field checks) | <p>Included: CCFP compensation subsidies, skill training for local farmers, and enforcement work with field checks, and all information on other types of subsidies that might have an impact on household livelihoods and the environment.</p> <p>Excluded: Natural Forest Protection Programme, as this does not overlap with the CCFP.</p> |
| <p>Comparators (C):</p> <ul style="list-style-type: none"> • Non-enrolled sloping lands, and lands prior to CCFP implementation • Non-participant households, and households prior to CCFP implementation | <p>Included: Non-enrolled sloping lands, and lands prior to CCFP implementation; and non-participant households, and households prior to CCFP implementation. Included 'before-and-after' comparators in both human populations (i.e. the socioeconomic status of both participant and non-participant households before and after the CCFP interventions) and land resources (i.e. the environmental status of both enrolled and non-enrolled lands before and after the CCFP intervention).</p> |
| <p>Outcomes (O):</p> <ul style="list-style-type: none"> • Environmental outcomes (changes in water discharge, soil erosion, flood risk, local biodiversity, etc.) • Socioeconomic outcomes (changes in household income structure, migration, etc.) | <p>Included: Soil erosion and flood prevention, reconversion of forestland to cropland, land-use and forest cover change, tree survival rates, biomass and carbon storage, and biodiversity.</p> <p>Income, employment, food security, land access and social equality, and migration.</p> <p>Excluded: Studies assessing potential or future outcomes of the CCFP, including model projections or other predictions of program impact, as the review only sought to assess the actual impacts of CCFP implementation (i.e. those which have already taken place).</p> |

Study Summaries

Study Summary

Study date

Citation

Abstract

Study size

Location

Summary of experimental/study design

Outcome(s) measured

Findings

Potential sources of bias or inferential error

Search Strategy Summary

Date found

Source

Search engine

Keyword string

Example: Trees to Tap Project

| C | D | E | F | G | H | I | | J | K | L | M |
|------------------------------|--------------|-----------------------|------------------------|---------------|-----------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-------------------------|----------------------------------|---|
| Search | ng for the | erence | | | | General Reference Information | | | | | |
| Person searching or entering | Date entered | Source of document | Source NOTES | Database | Keywords used to locate reference | Reference Citation eg., Gaines, L and J. Behan. 2018. Article name. Journal Name vol(issue):page-page. (DOI or URL) | URL | Publication Type | Publication date (year) | Location, Geographic Area | |
| Jeff | 4/27/2018 | G1: systematic search | | GoogleScholar | "forest engineering" "municipal water" "oregon" [since 2000] | Lang, A.J., Aust, W.M., Bolding, M.C., McGuire, K.J. and Schilling, E.B., 2017. Comparing sediment trap data with erosion models for evaluation of forest haul road stream crossing approaches. Transactions of the ASABE, 60(2), pp.393-408. | https://elibrary.asabe.org/abstract.asp?aid=47715 | Proceedings paper | 2017 | | |
| Jeff | 4/19/2018 | G1: systematic search | | GoogleScholar | "forest operations" "community water" | Grace, J.M. and Davis, E.L., 2010. Efficacy of Buffer Zones in Disconnecting Roads and Streams in the Coastal Plain. In 2010 Pittsburgh, Pennsylvania, June 20-June 23, 2010 (p. 1). American Society of Agricultural and Biological Engineers. | https://elibrary.asabe.org/abstract.asp?aid=29621 | Proceedings paper | 2010 | National Forests in Alabama, USA | |
| Jeff | 4/17/2018 | | See note in Column S>> | GoogleScholar | | Edwards, P.J., Wang, J. and Stedman, J.T., 2009. Recommendations for constructing forest stream crossings to control soil losses. American Water Resources Association. 2009 AWRA Summer Specialty | http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.556.4013&rep=rep1&type=pdf | Proceedings paper | 2009 | north central West Virginia | |

Example of Quality Assessment

Hierarchy of different study designs to assess stream rehabilitation projects

| Relative quality level | Study design | Example outcome | Relative confidence level |
|------------------------|-------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|
| 1 | Replicated sampling, replicated controls, sampling before and after rehabilitation | 'The increase in the frequency of pools in the treated reach was greater than any increase at either control reach' | Very high |
| 2 | Unreplicated, controlled, sampling before and after rehabilitation | 'The number of salmon increased after rehabilitation in the treated reach, but not in the control reach' | High |
| 3 | Unreplicated, uncontrolled, sampling before and after rehabilitation; OR Unreplicated, controlled, sampling after rehabilitation | 'There were more salmon after the work than before'; OR 'After rehabilitation there were more salmon in the control reach than in the treated reach' | Moderate |
| 4 | Unreplicated, uncontrolled, sampling after rehabilitation | 'There was a gradual increase in the number of salmon in the two years after the work' | Low |
| 5 | Unreplicated, uncontrolled, anecdotal observation after rehabilitation | 'I saw lots of salmon after we had done the work' | Very low |

QUESTION

Does the IRST want to use a systematic search strategy (a protocol) to help conduct its literature reviews?