Evidence in Conservation Teaching Initiative

Uma introdução à conservação suportada por evidência
Conteúdo adaptado para cientistas

Traduzido para português por Ricardo Rocha

An Introduction to evidence-based conservation (content tailored for research scientists)

By Harriet Downey, Tatsuya Amano and Jessica Walsh

2020

Translated to Portuguese by Ricardo Rocha

https://www.britishecologicalsociety.org/applied-ecology-resources/about-aer/additional-resources/evidence-in-conservation-teaching/

Outline

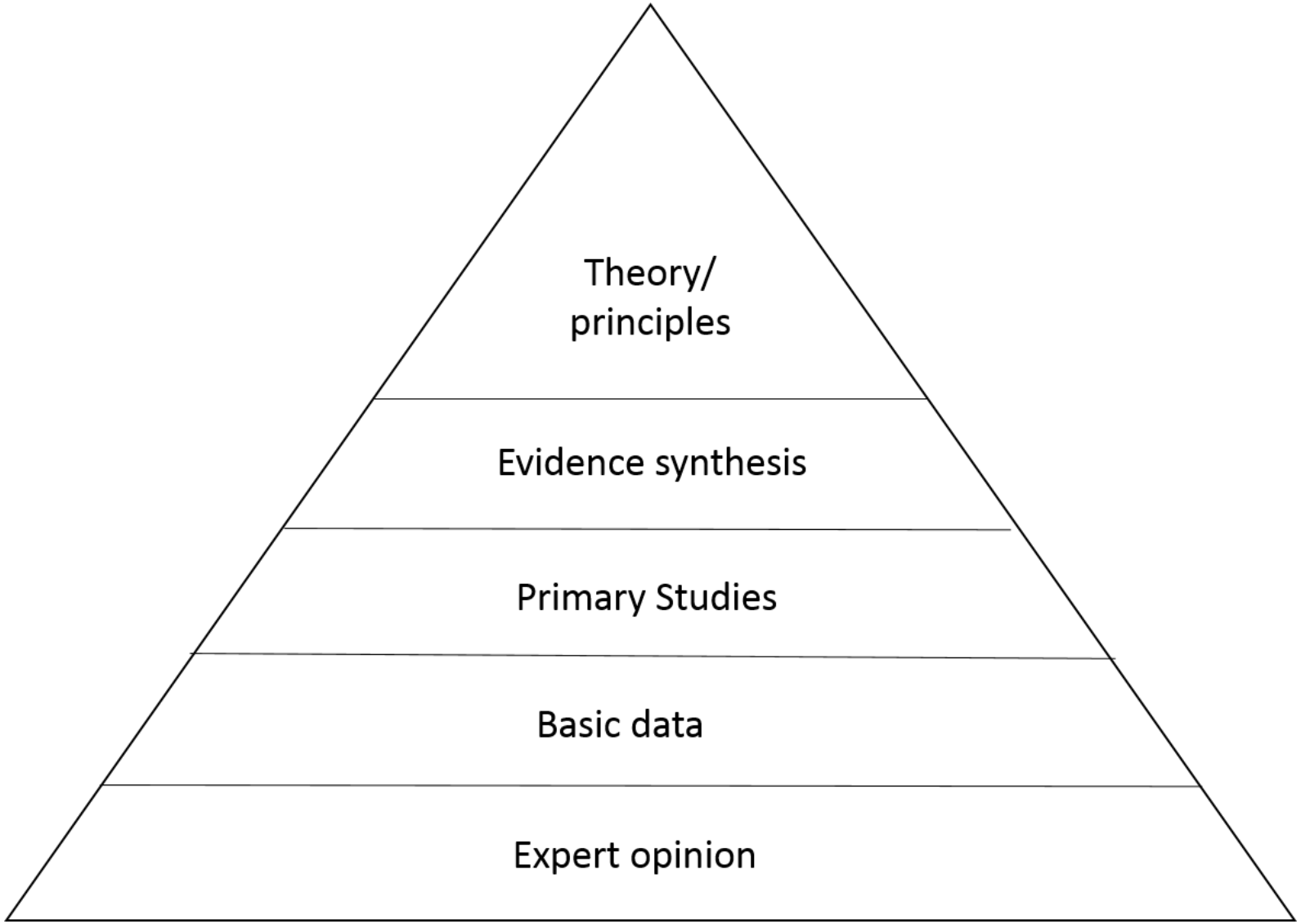
- O que é evidência científica e qual a sua relevância?
- Como pode evidência científica ser usada na conservação?
- Quais são as barreiras para o uso de evidência científica na conservação?
- Como essas barreiras estão a evoluir?
- Síntese de evidência
  - Revisões sistemáticas
  - Mapas sistemáticos
  - Sínteses / resumos
  - Ferramentas de apoio à decisão
- Desafios da síntese de evidências

O que é evidência?

- *Informação* relevante usada para avaliar uma ou mais hipóteses relacionadas a uma questão de interesse.
- *Evidência científica* referem-se especificamente às informações coletadas por meio de um método científico. Isso inclui estudos publicados, revistos por pares e estudos não publicados em teses ou relatórios.

Salafsky et al. 2019; Walsh et al. 2015

Será toda a evidência equivalente?

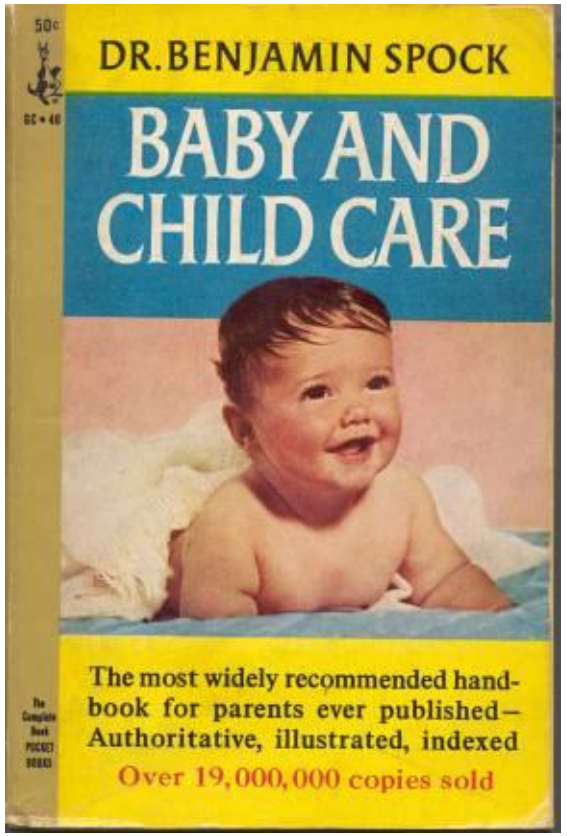


Salafsky et al. 2019.

Por que usar evidência científica é importante?

Dakota Corbin

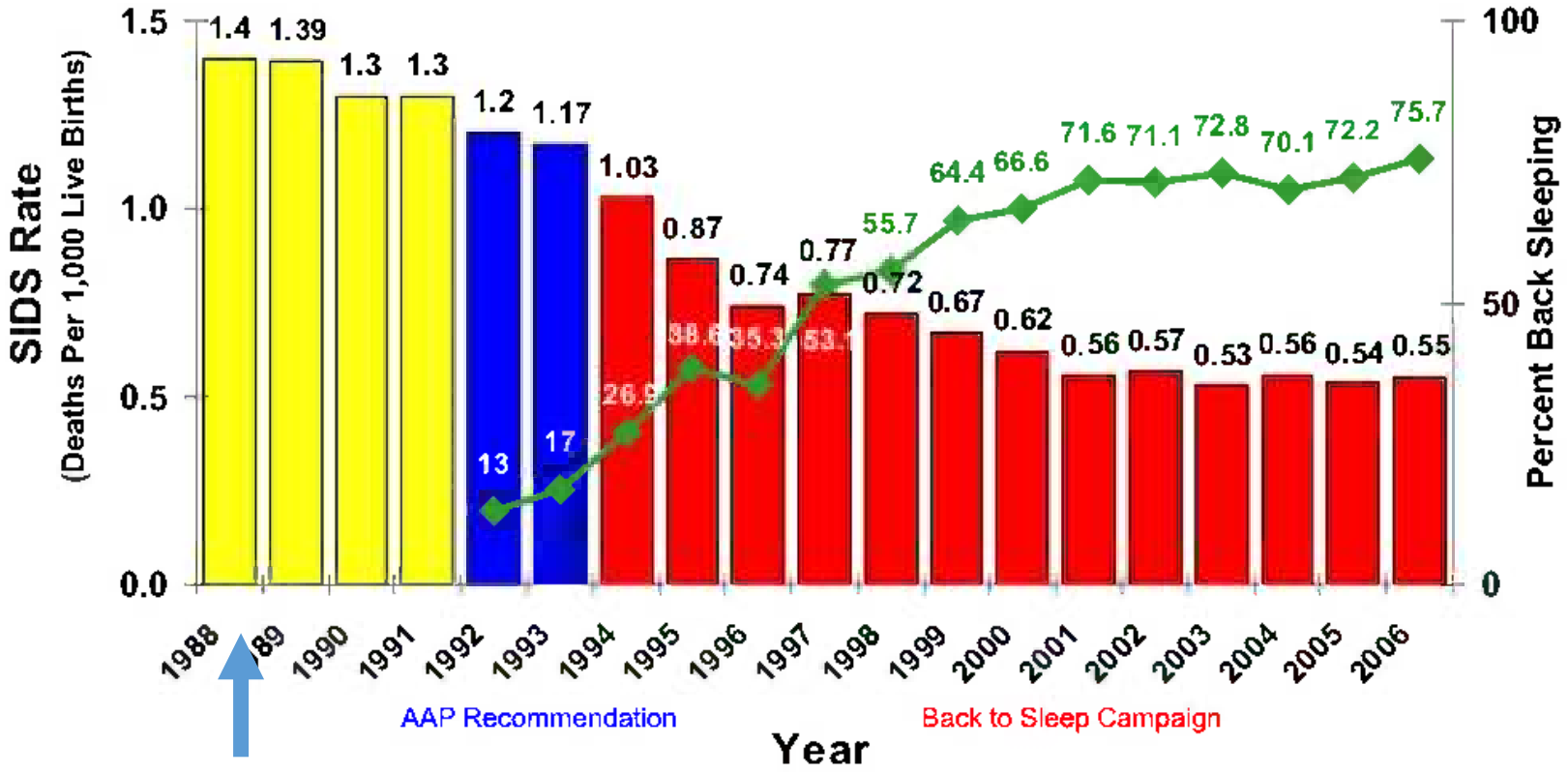
- O síndrome da morte súbita infantil tornou-se uma epidemia nos anos 1960 e 70
- No auge da epidemia, bebés em países ricos morriam a uma taxa de 1 em 250 nascidos vivos



- No início dos anos 1980, o Dr. Peter Flemming começou a entrevistar pais afetados e percebeu que um fator comum era que todos esses pais colocavam seus bebés a dormir de barriga para a frente
- Pesquisa detalhada foi realizada comprovando a ligação
- MAS foi uma luta fazer o sistema de saúde do Reino Unido mudar sua orientação

SIDS Rate and Back Sleeping

(1988 – 2006)



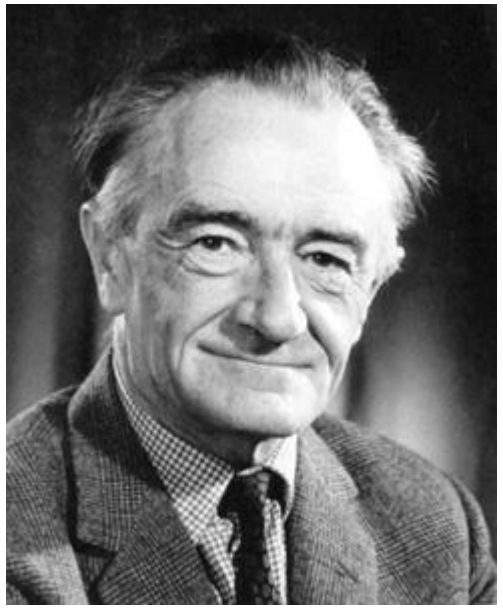
Evidence published

SIDS Rate Source: CDC, National Center for Health Statistics,
Sleep Position Data: NICHD, National Infant Sleep Position Study.

- Seguindo novas recomendações, a morte por SIDs (sigla para síndrome da morte súbita infantil em inglês) caiu de 1 em 250 para 1 em 3.000

Tomada de decisão baseada em evidência

- facilitar a comparação sistemática e síntese de evidência
- aumentar a qualidade de evidência disponível para decisões
- reduzir o enviesamento e a escolha seletiva
- aumentar a transparência das decisões
- aumentar a eficácia da gestão
- identificar lacunas no conhecimento



THE ROCK CARLING FELLOWSHIP

1971

EFFECTIVENESS AND EFFICIENCY

RANDOM REFLECTIONS ON HEALTH SERVICES

A. L. Cochrane

CBE, FRCP

Director
MRC Epidemiology Unit
Cardiff

THE NUFFIELD PROVINCIAL HOSPITALS TRUST

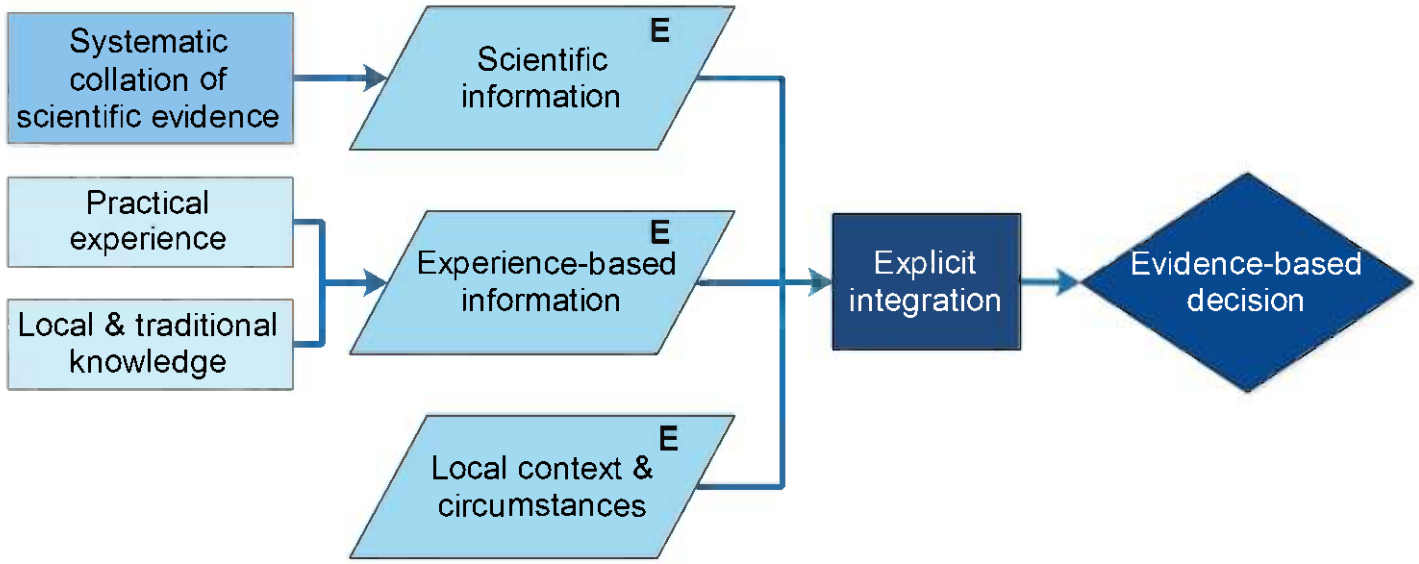
1972

(Sutherland *et al.* 2004)

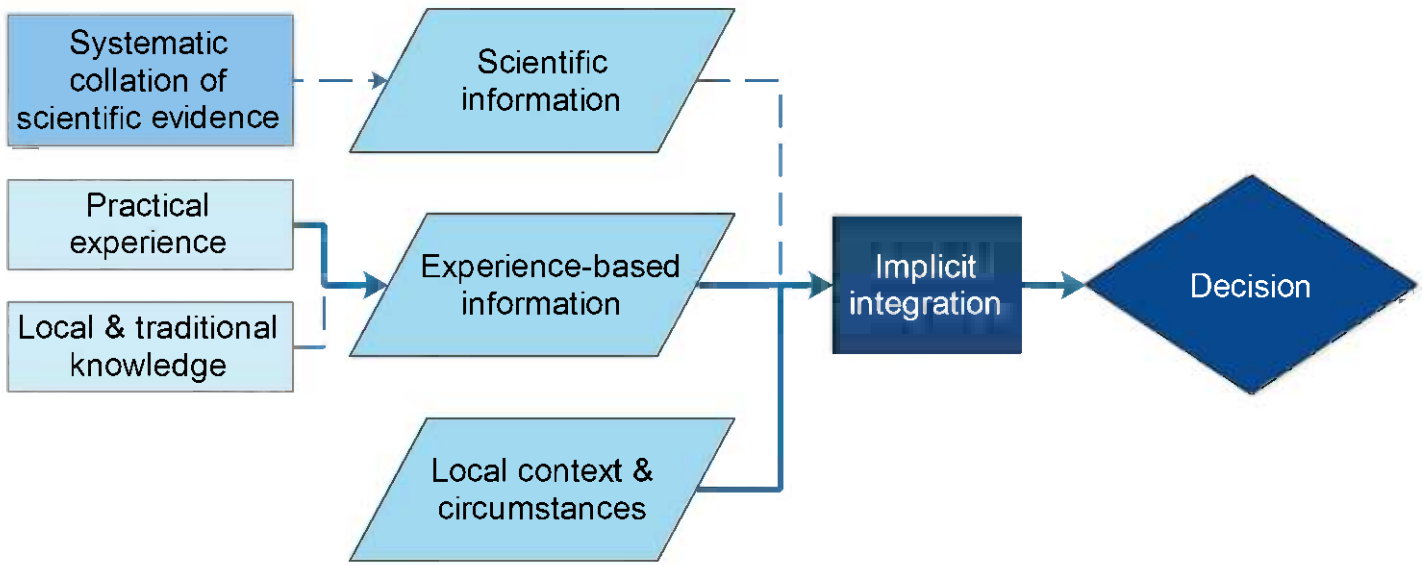
But what else do we need to consider in decision making?

- Local knowledge
- Indigenous and traditional knowledge
- Experiential knowledge and expert opinion
- Social values and cultures
- Economic costs
- Resources
- Feasibility

a) Revised model for evidence-based conservation

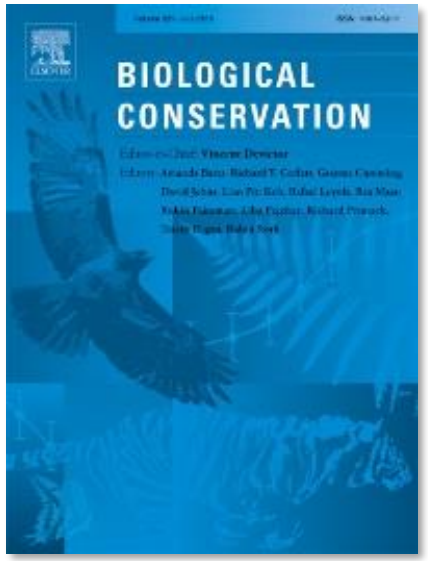


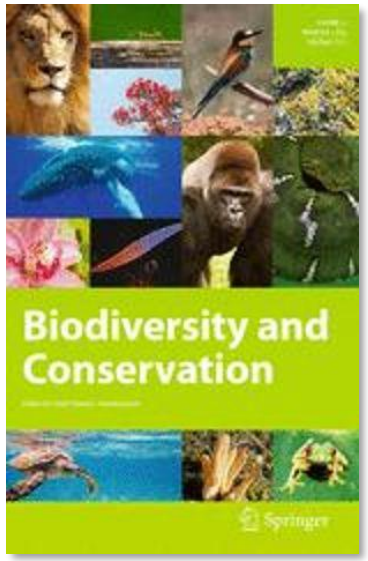
b) Model of current conservation practice

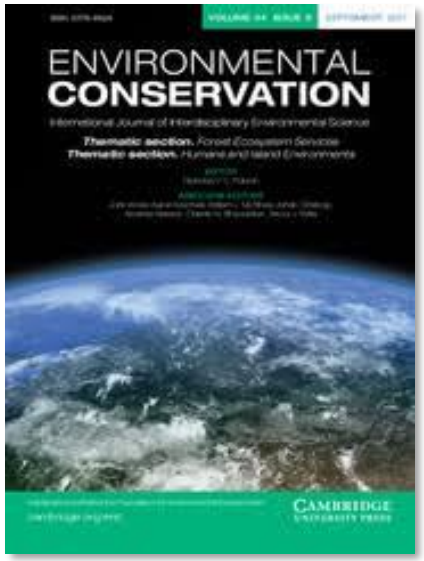


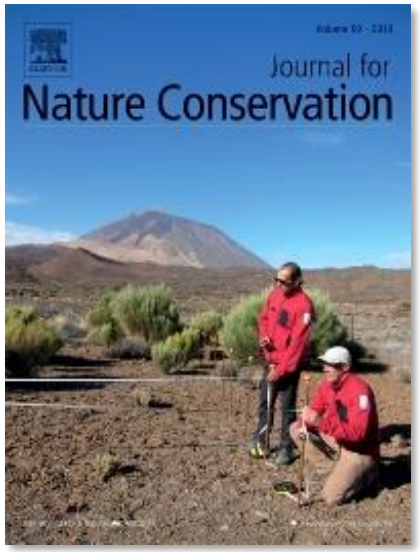
Evidência científica em conservação

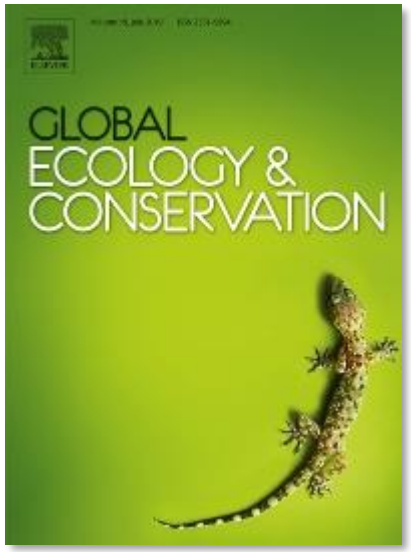
Acumulação de evidência científica sobre conservação

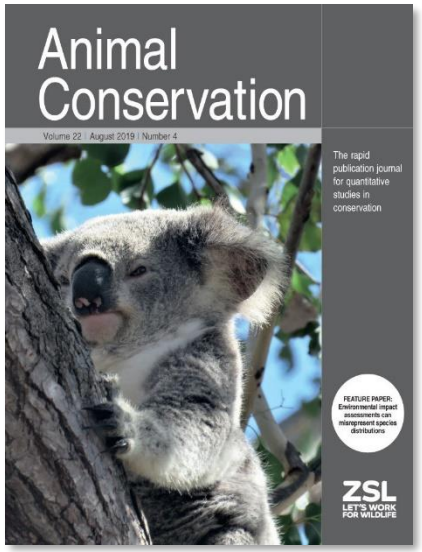


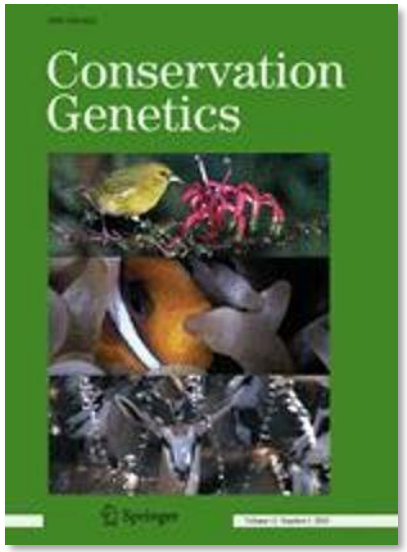






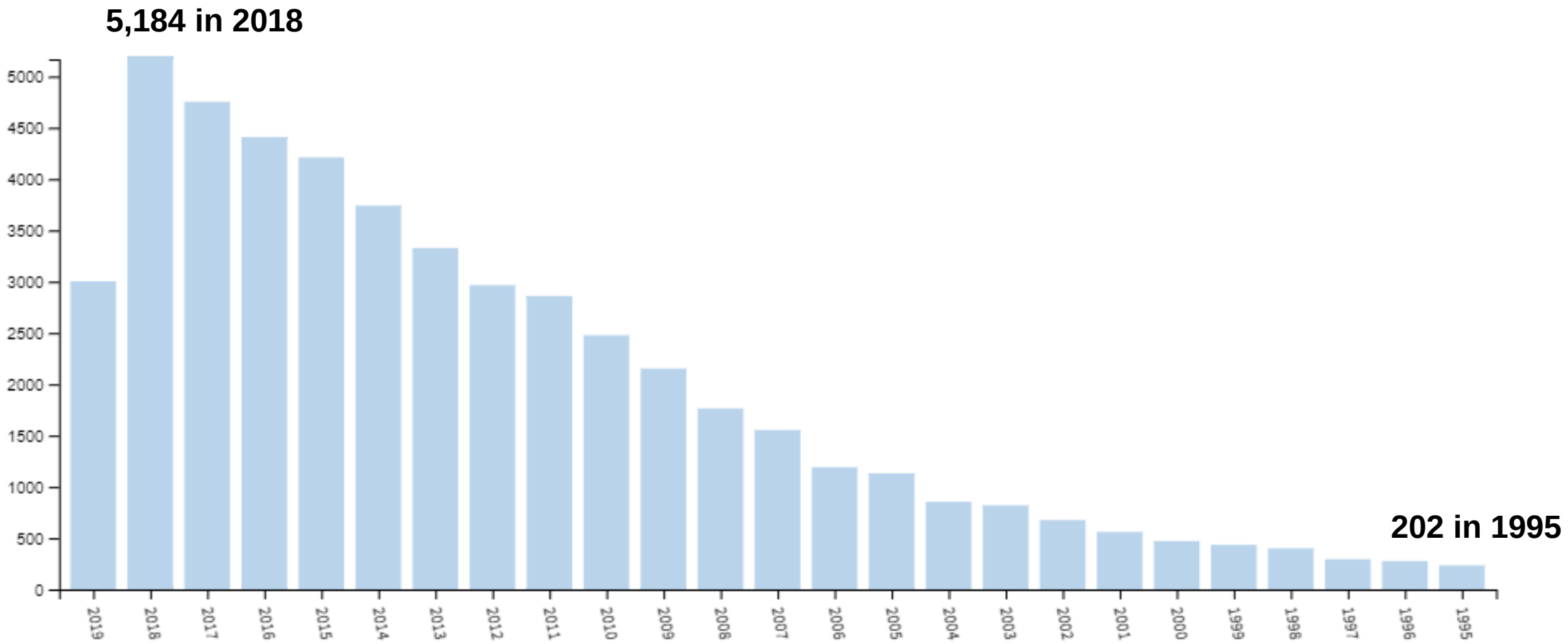






Acumulação de evidência científica sobre conservação

Número de estudos encontrados na *Web of Science* com “biodiversidade” e “conservação”



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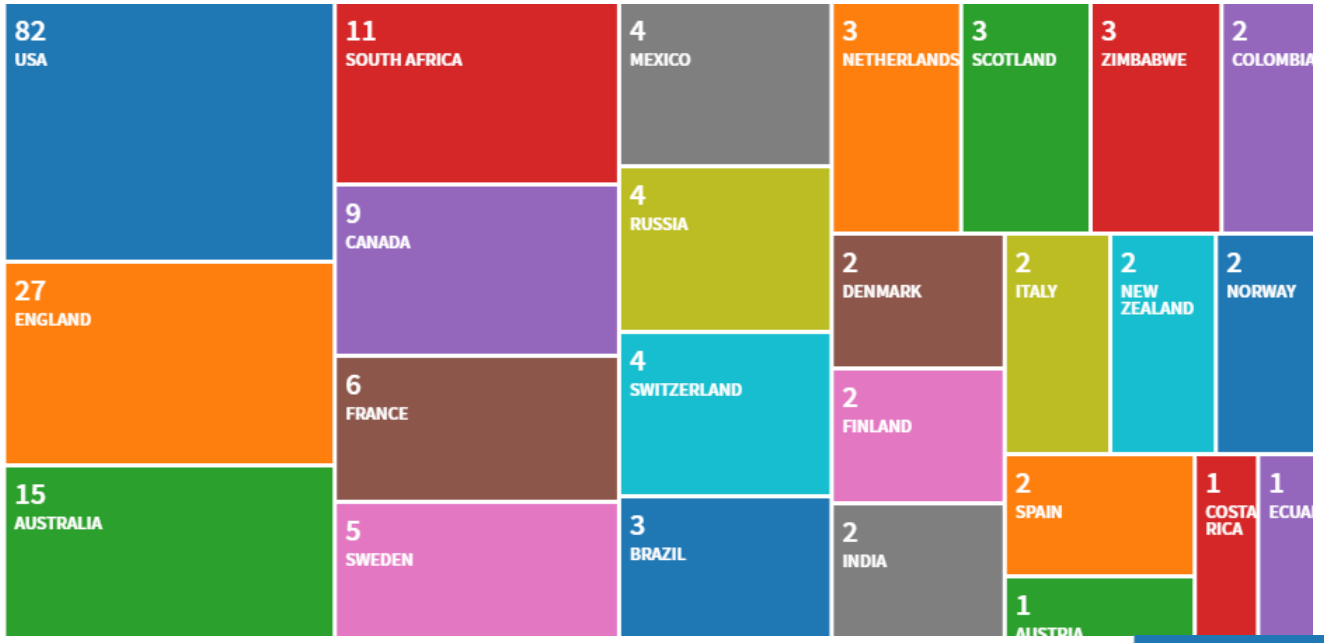
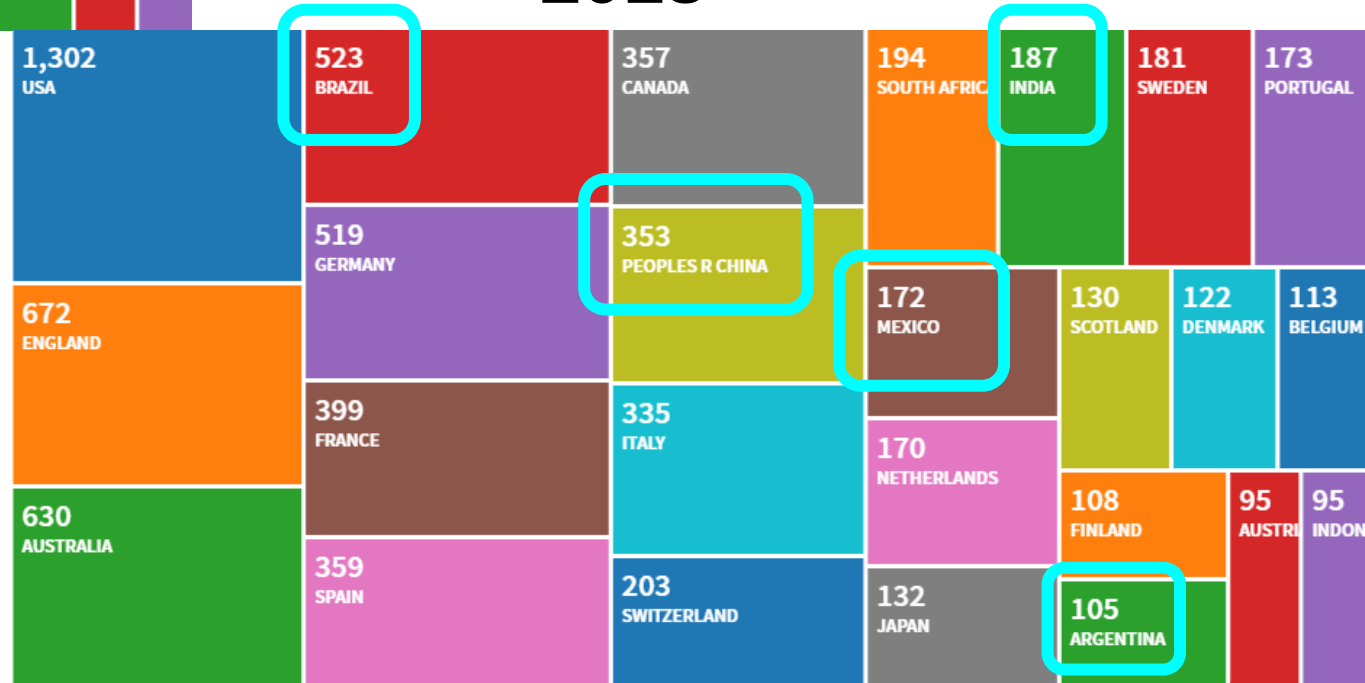


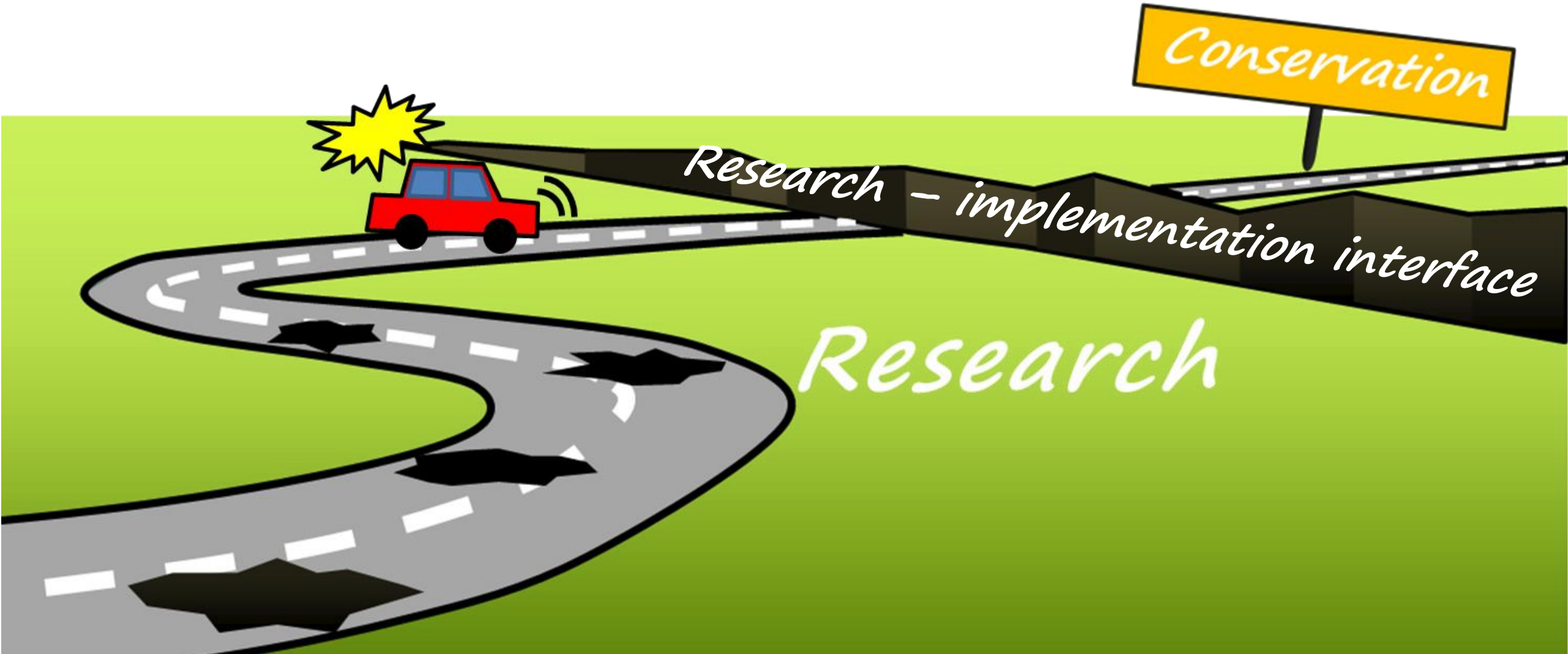
1995

Número de estudos encontrados na *Web of Science* com “biodiversidade” e “conservação”

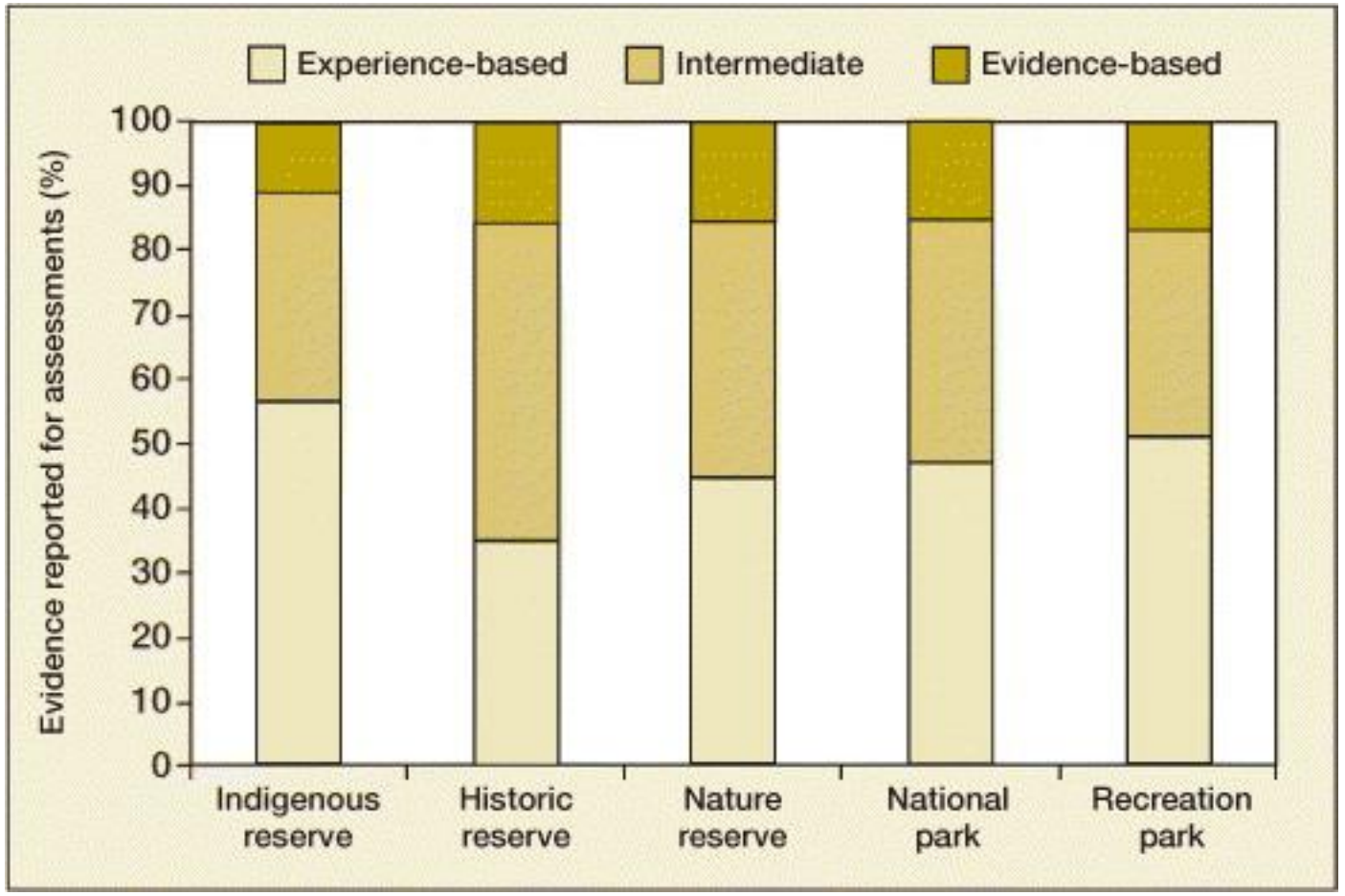
2018



Será o conhecimento acumulado realmente utilizado em conservação?



Ausência de evidência científica na tomada de decisões



Fontes de informação dos conservacionistas

Cook et al. 2010

Interface investigação-implementação

Apenas 33% dos 88 artigos científicos sobre avaliações de conservação entre 1998 e 2002 levaram à implementação de alguma ação (Knight et al 2008 Cons Biol)

Apenas 23% dos decisores usaram artigos científicos ao elaborar Planos de Gestão de Reservas Naturais no Reino Unido (Pullin et al 2004 Biol Conserv)

Apenas 10% das decisões de gestão de conservação na Austrália usam evidência científica (Cook et al 2010 Front Ecol Environ)

Cerca de 66% dos gestores de recursos da Califórnia usam informação publicada em revistas revistas por pares na obter informações sobre invasões de plantas (Matzek et al 2014 Cons Lett)

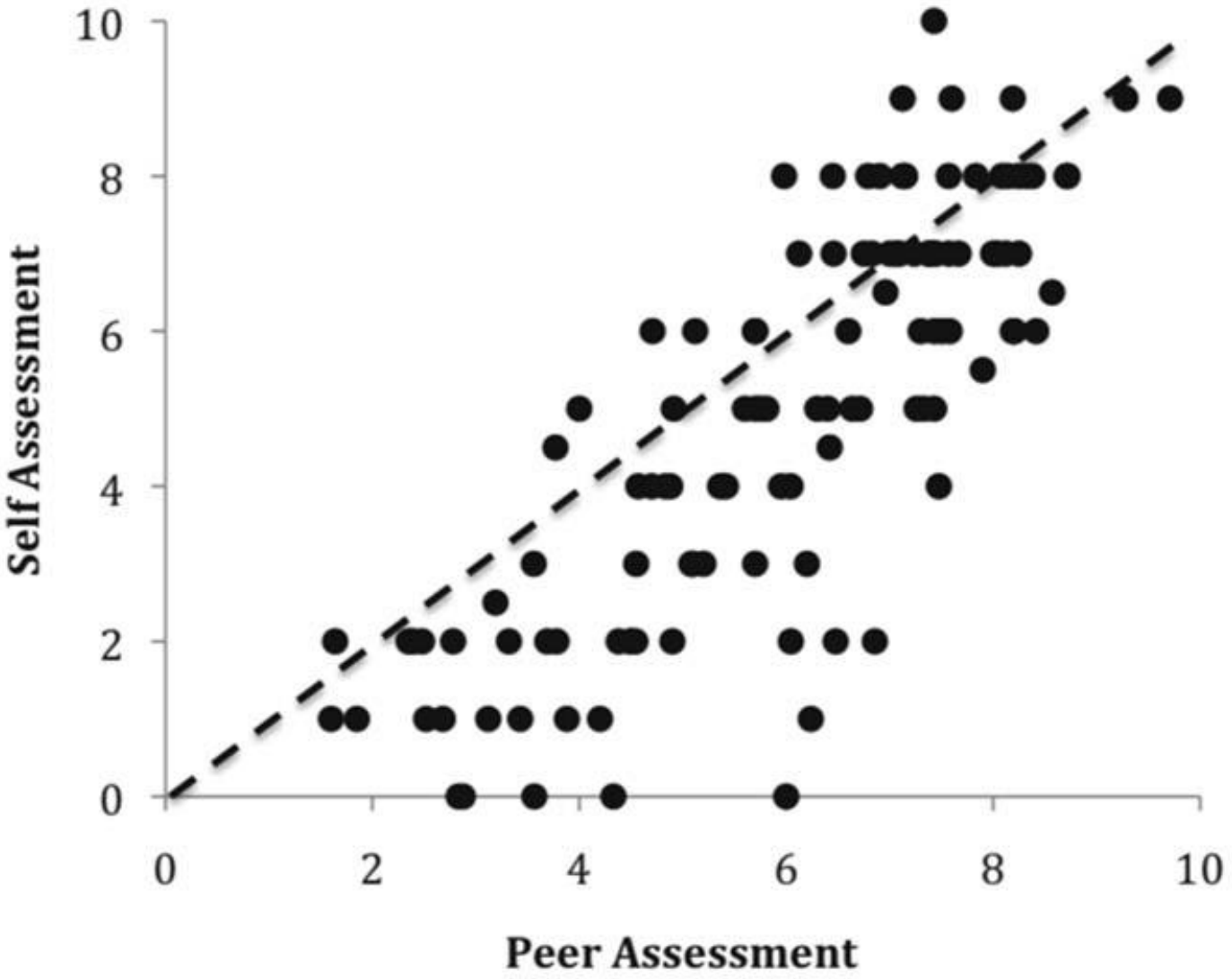
A literatura científica constitui apenas 2,4% das fontes de informação utilizadas por profissionais de conservação em Broadland, Reino Unido (Sutherland et al 2004 TREE)

Apenas 20% dos profissionais de conservação na Suíça usam revistas científicas internacionais para suportar as suas decisões (Fabian et al 2019 Biol Conserv)

Por que é importante usar evidência científica?

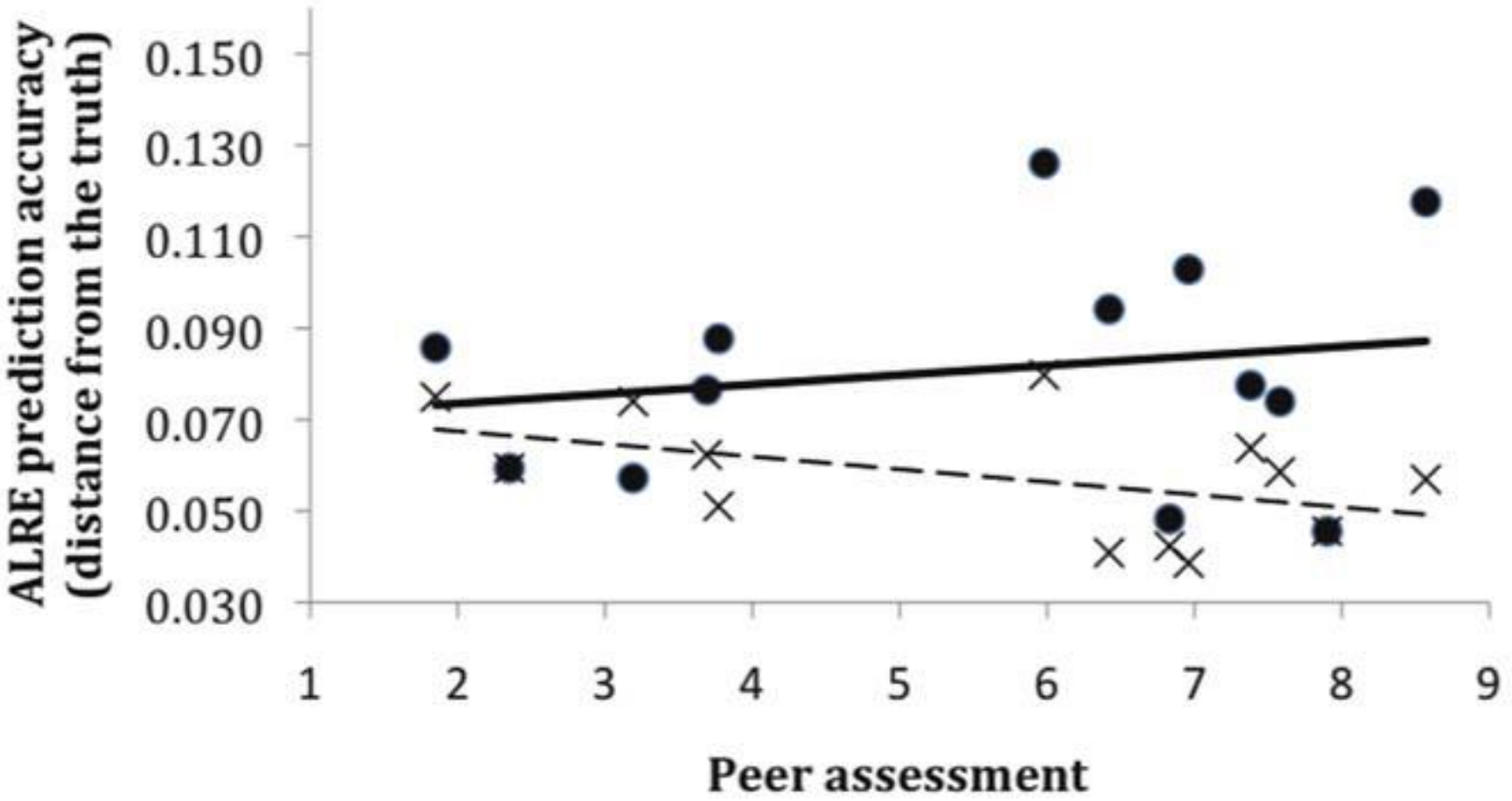
- Aumentar a qualidade da evidência disponíveis para decisões
- Reduzir o enviesamento e a escolha seletiva
- Aumentar a transparência na tomada de decisões
- Aumentar a eficácia da gestão
- Identificar lacunas no conhecimento

Mas por que não podemos simplesmente perguntar aos especialistas?



Classificação clara e consistente de experiência por especialistas e seus pares Burgman et al. (2011)

Autoavaliação versus avaliação de experiência por pares. Dados de todas os workshops (correlação geral, r = 0,85). A avaliação dos pares é a média das pontuações na escala de 11 pontos fornecida pelos pares de cada pessoa no dia do workshop. A forte relação foi consistente entre os cinco grupos, onde as correlações variaram de 0,67 a 0,94. A linha tracejada é a paridade (onde a autoavaliação e a avaliação pelos pares são iguais).



MAS nenhuma correlação entre classificação e desempenho!

Figura 2. Avaliação por pares do conhecimento de especialistas em relação ao desempenho real. A precisão da previsão é calculada como ALRE (ver Burgman et al 2011). Valores pequenos para precisão de previsão são melhores. Os círculos fechados e a linha contínua são estimativas da ronda 1 (r = 0,19). Os x e a linha tracejada são estimativas da ronda 2 (r = 20,47). As estimativas mais próximas do eixo x indicam que as respostas estão mais próximas da verdade.

Por que é importante usar evidência científica


Sutherland and Wordley (2017) Nat Ecol Evol

Pontes para morcegos, usadas no Reino Unido há mais de uma década, representam um investimento de cerca de £ 2,5 milhões para reduzir a mortalidade de morcegos nas estradas. São conhecidos por serem ineficazes mas continuam a ser construídas.

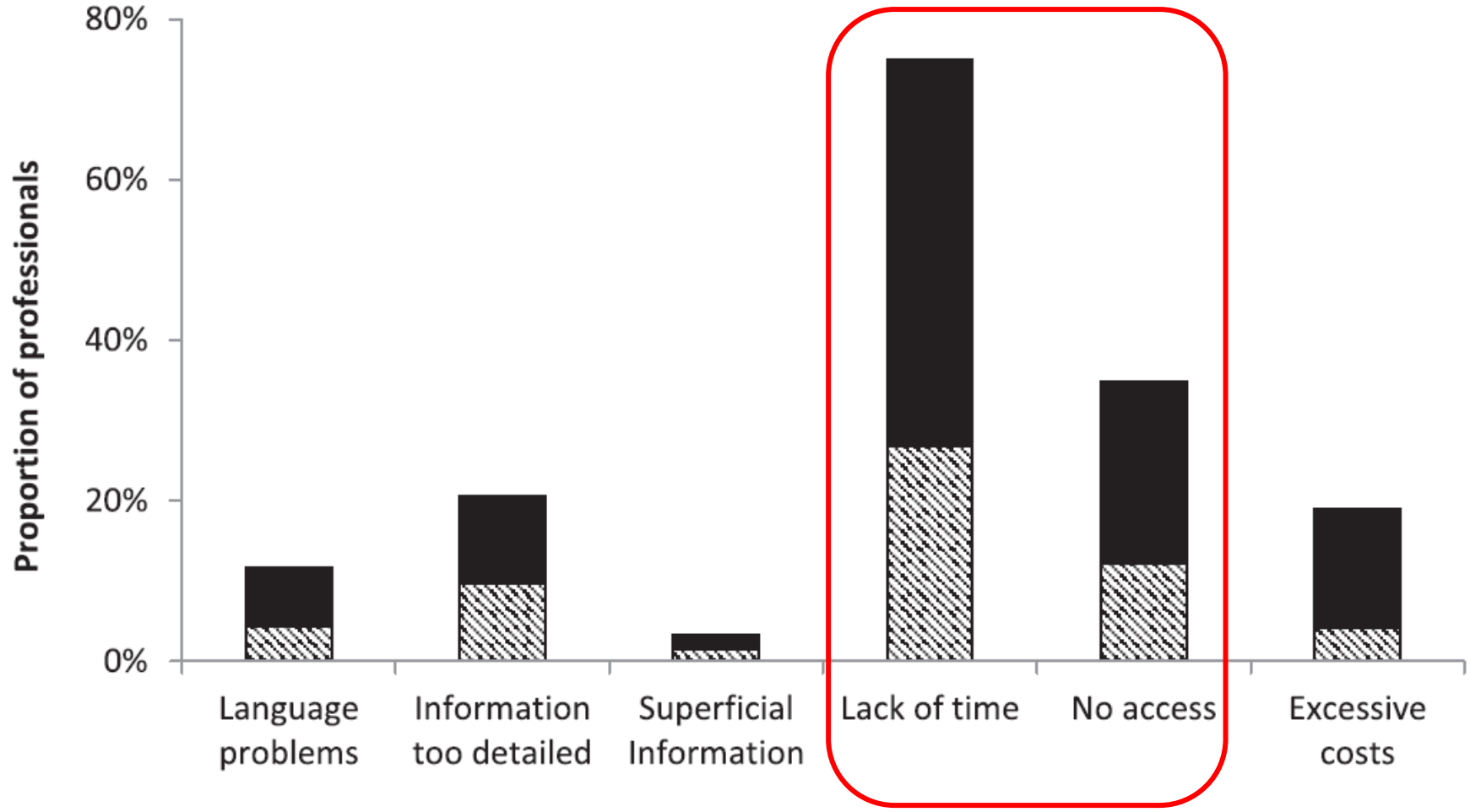
Caixas-ninho, instaladas em densidades excepcionais de acordo a Política Agrícola Comum da EU.


Pe'er et al (2014) Science

Se é importante, por que não está a ser usada?

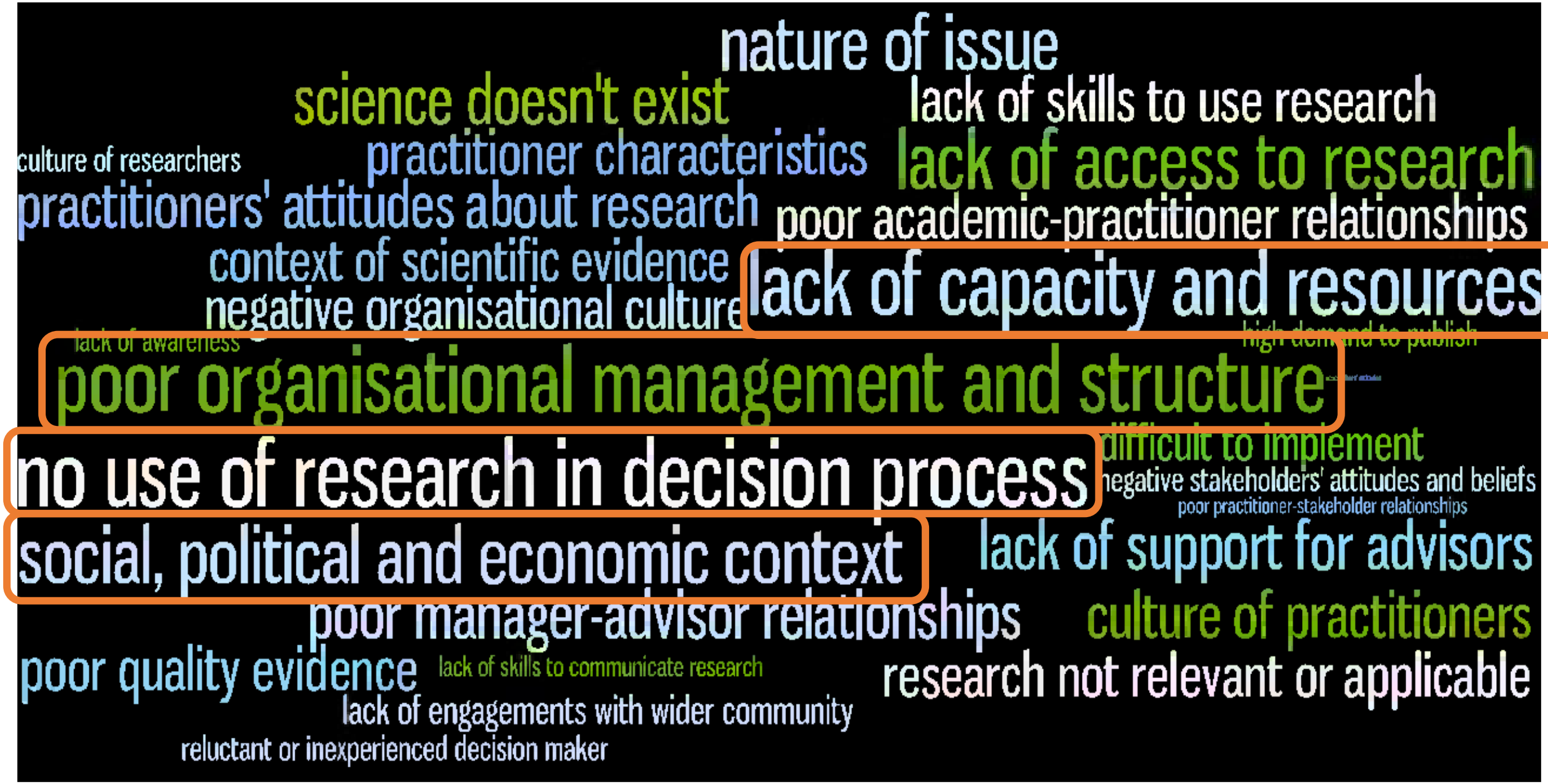
Por que a evidência científica não é usada na prática

Razões pelas quais as revistas científicas não são lidas por profissionais de conservação na Suíça



Fabian et al 2019 Biol Conserv


nature of issue
science doesn't exist
lack of skills to use research
culture of researchers
practitioner characteristics
lack of access to research
practitioners' attitudes about research
poor academic-practitioner relationships
context of scientific evidence
lack of capacity and resources
negative organisational culture
lack of awareness
high demand to publish
poor organisational management and structure
difficult to implement
no use of research in decision process
negative stakeholders' attitudes and beliefs
poor practitioner-stakeholder relationships
social, political and economic context
lack of support for advisors
poor manager-advisor relationships
culture of practitioners
poor quality evidence
lack of skills to communicate research
research not relevant or applicable
lack of engagements with wider community
reluctant or inexperienced decision maker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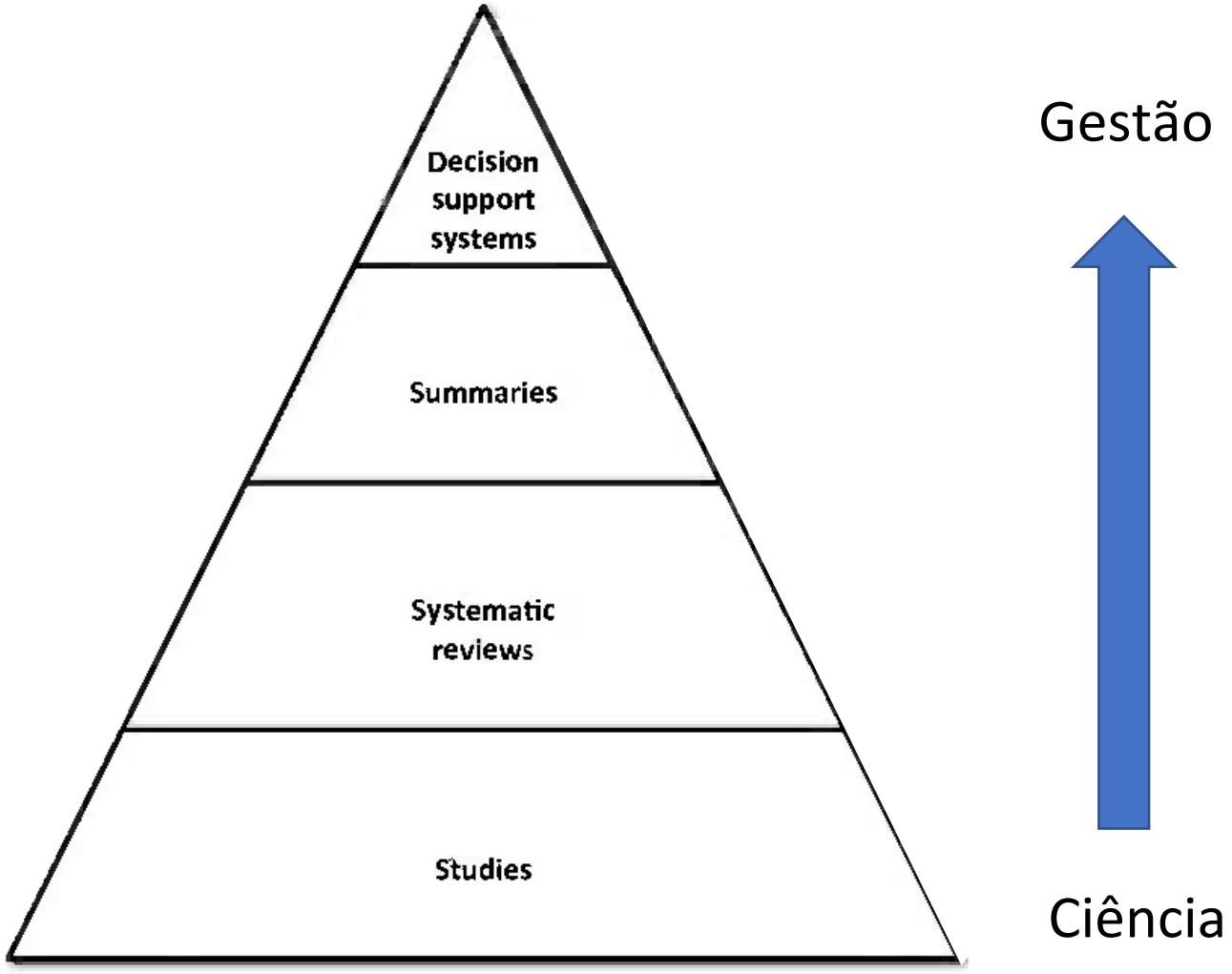
Uma solução para melhorar o uso da investigação

Organização da evidência científica usando a pirâmide de evidências '4S' Dicks et al. 2014 TREE



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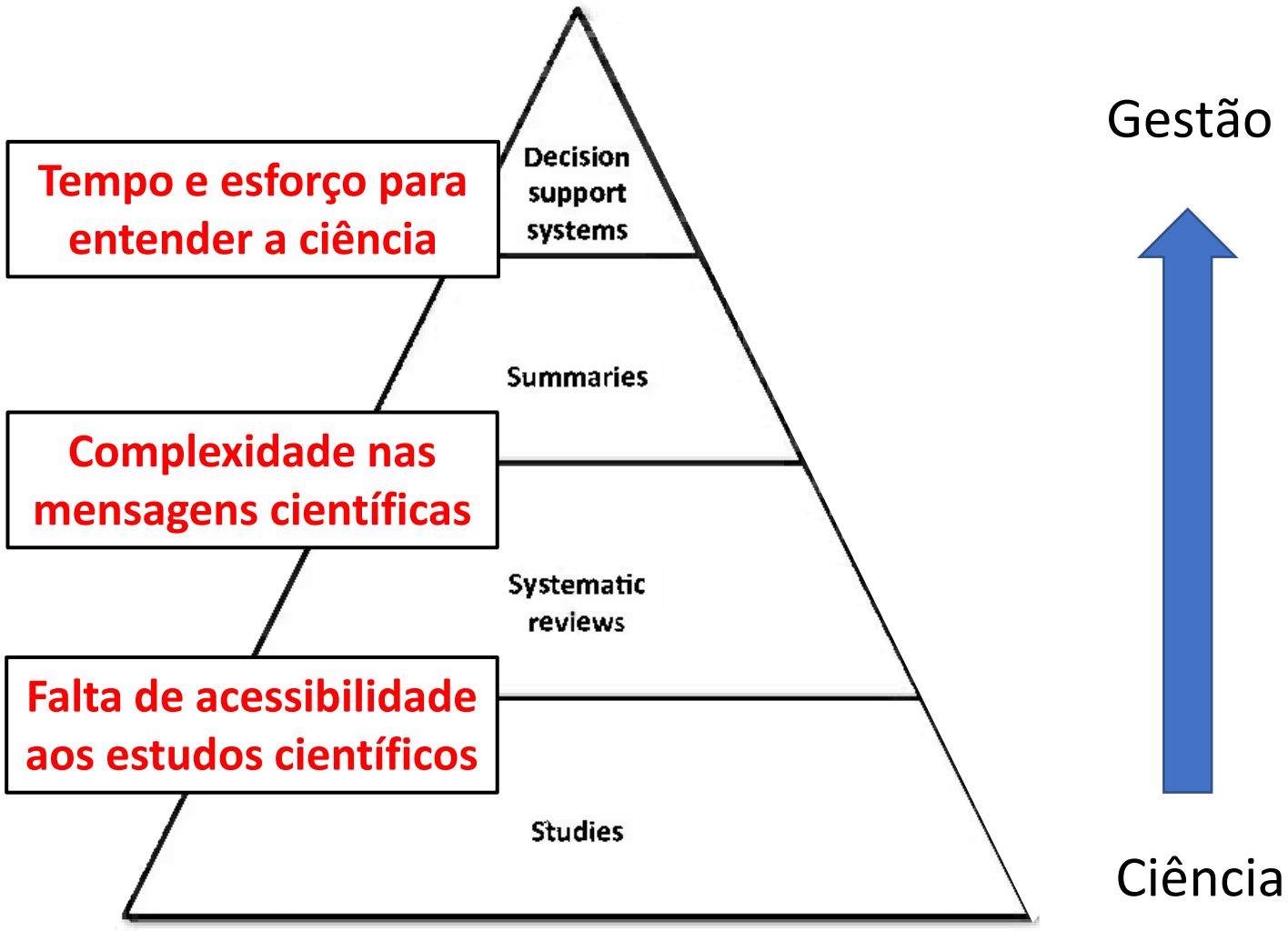

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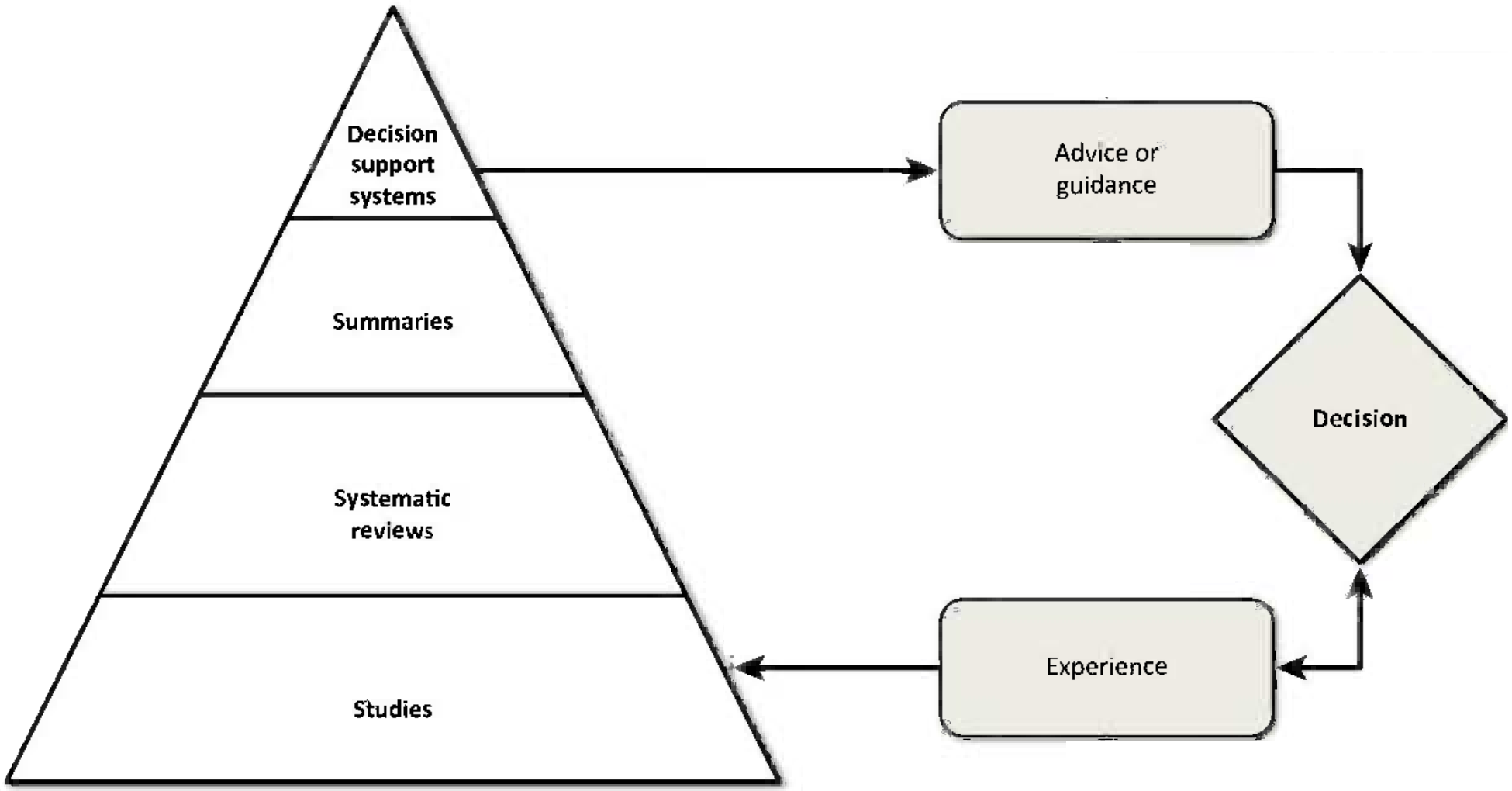
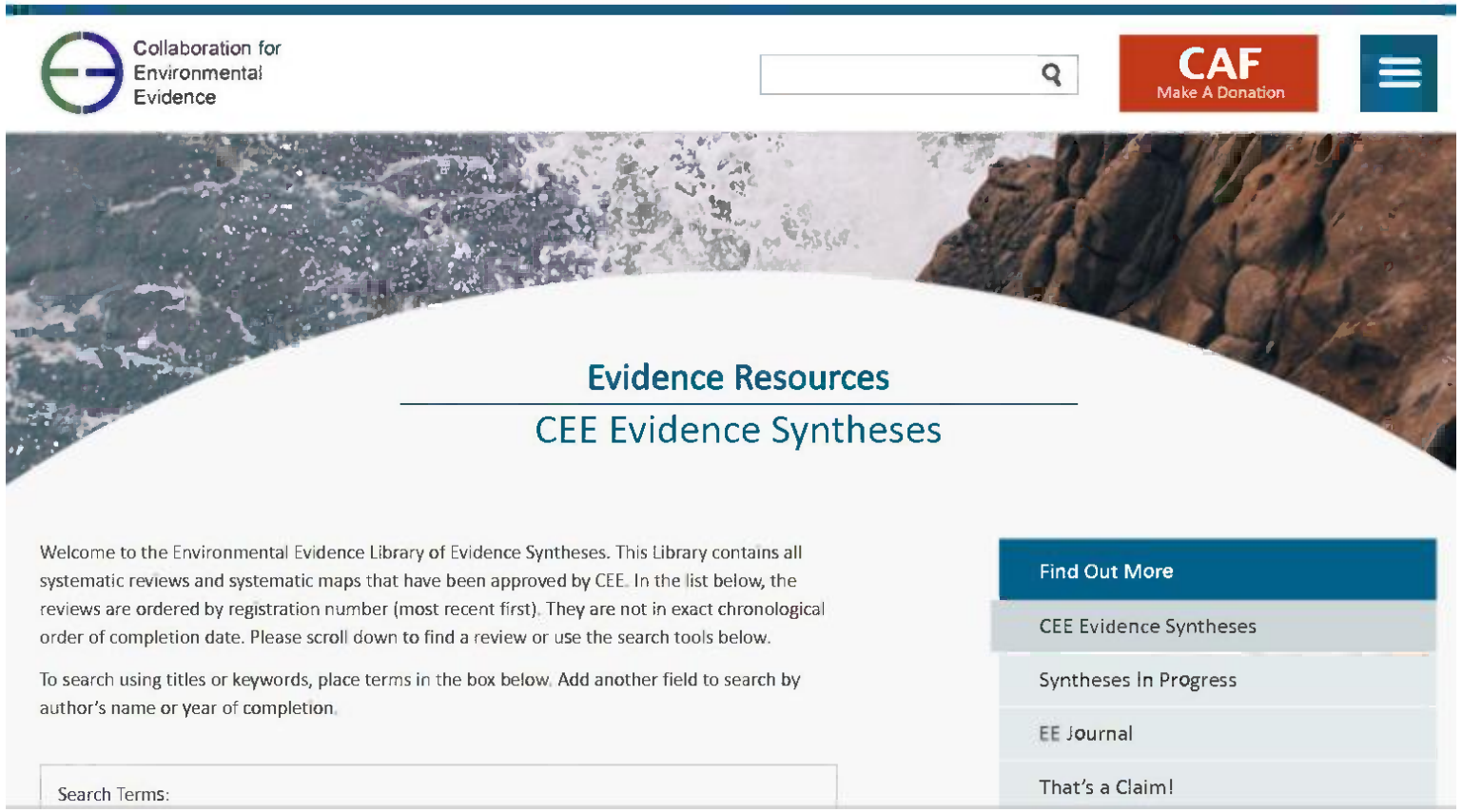


Revisão sistemática

Uma revisão sistemática reúne, avalia de forma critica e sintetiza toda a evidência disponível relevante para uma pergunta. Os revisores usam métodos predefinidos para minimizar o enviesamento e, assim, fornecer resultados mais fidedigno que podem informar a tomada de decisão.



Revisão sistemática: um exemplo

Jakobsson *et al. Environ Evid (2018) 7:17*
https://doi.org/10.1186/s13750-018-0129-z

Environmental Evidence

SYSTEMATIC REVIEW Open Access

How does roadside vegetation management affect the diversity of vascular plants and invertebrates? A systematic review

Simon Jakobsson[1*], Claes Bernes[2], James M. Bullock[3], Kris Verheyen[4] and Regina Lindborg[1]

Revisão sistemática: um exemplo

Primary question

How does roadside maintenance and restoration implementing non-chemical vegetation removal affect the diversity of vascular plants and invertebrates?

Components of the primary question

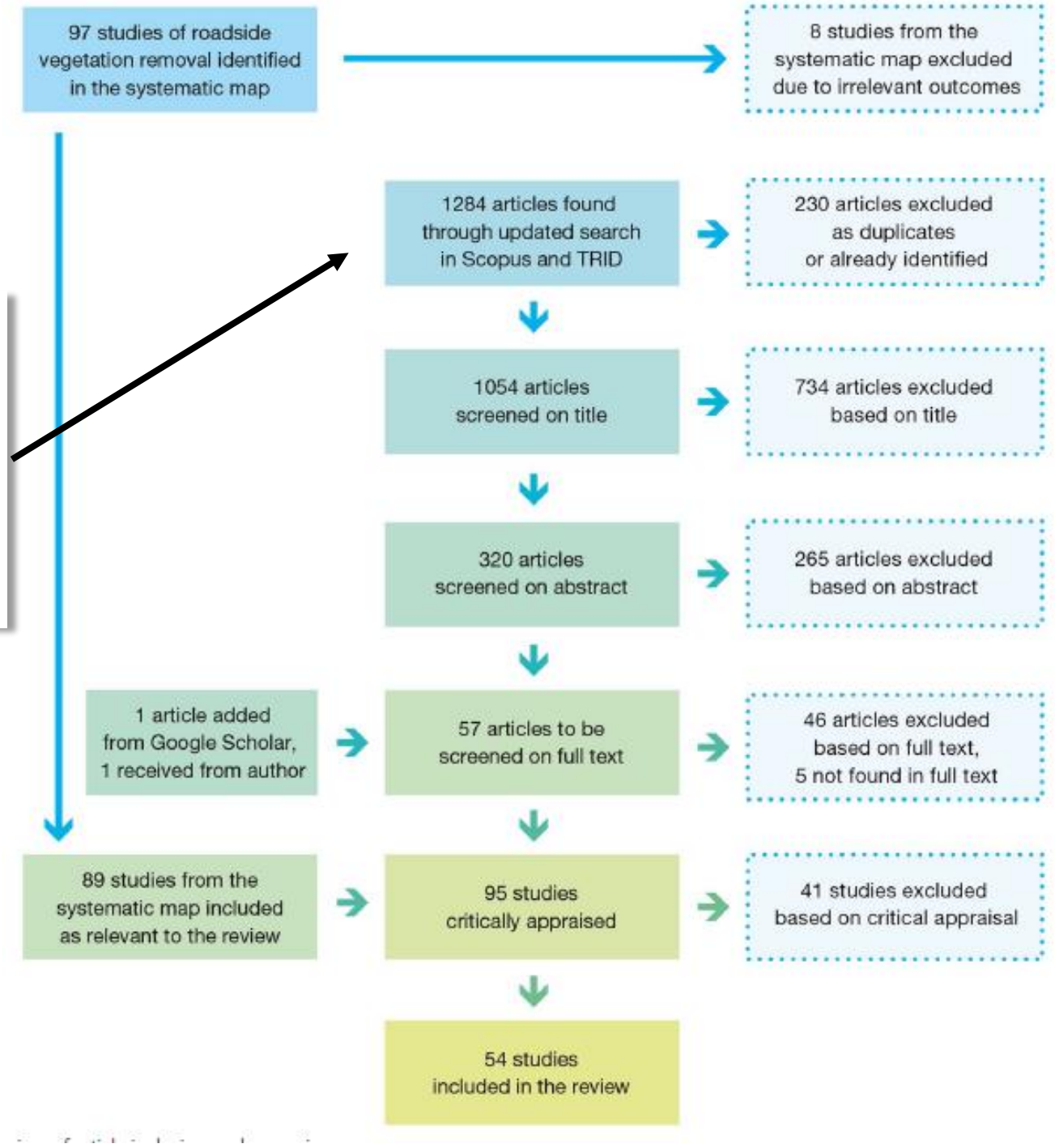
Population:	roadside habitats and the species of vascular plants and invertebrates found within them.
Intervention:	maintenance or restoration of roadside habitats based on non-chemical vegetation removal such as mowing, grazing, burning, clearance of shrubs and saplings, coppicing, pruning, or mechanical removal of invasive plants.
Comparator:	non-intervention or alternative forms of the interventions.
Outcomes:	measures of functional/taxonomic diversity (including abundance) of vascular plants or invertebrates.

http://www.lgam.info/roadside-mowing CC BY-SA 3.0

Jakobsson et al (2018) Environ Evid

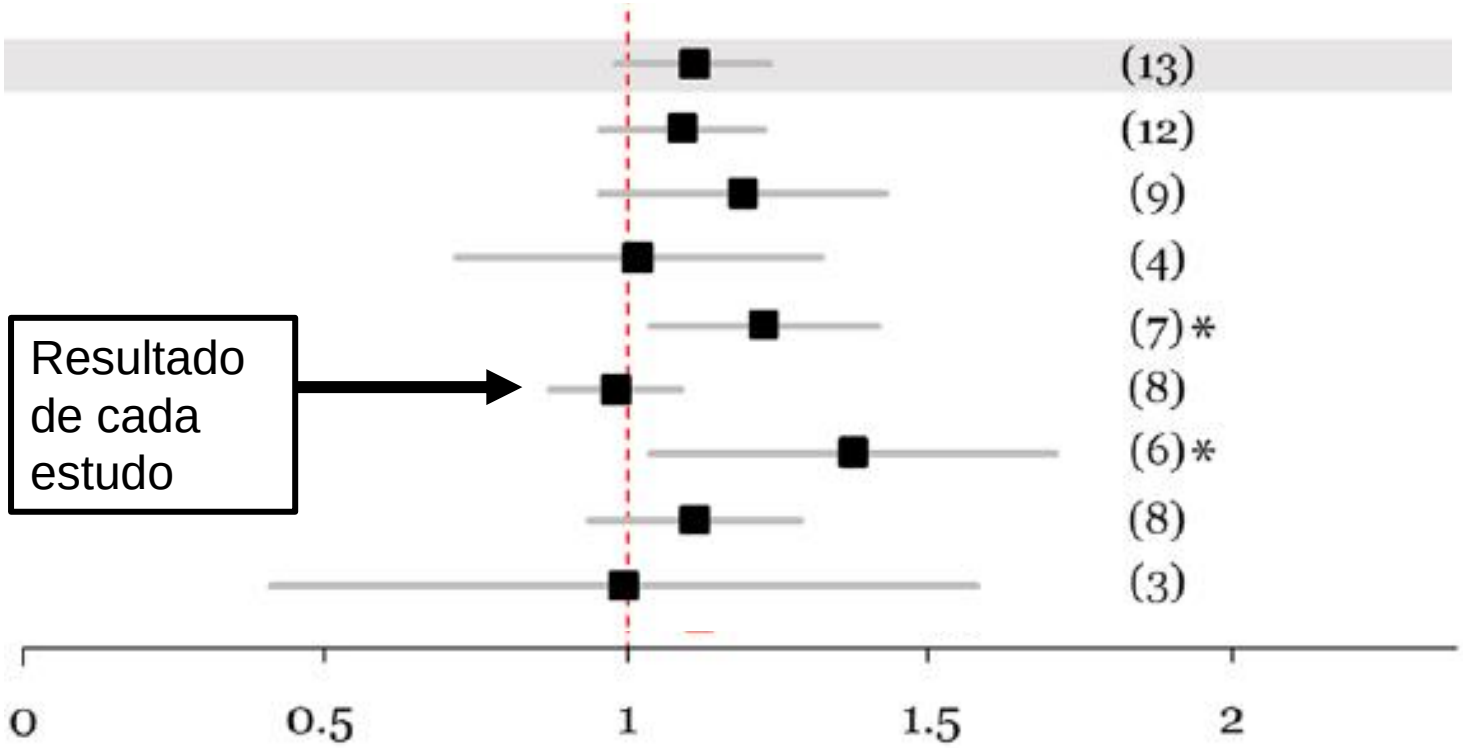
Revisão sistemática: um exemplo

Population:	roadside*, "road side*", (road* AND (verge* OR edge*)), roundabout*, "traffic island*", "median strip*", "central reservation*", boulevard*, parkway*, (avenue* AND tree*).
Outcomes:	*diversity, species, abundance, vegetation.



Jakobsson et al (2018) Environ Evid

Revisão sistemática: um exemplo



Resultado de cada estudo

Menos espécies de plantas nas margens das estradas onde a vegetação foi cortada

Mais espécies de plantas cortadas nas margens das estradas

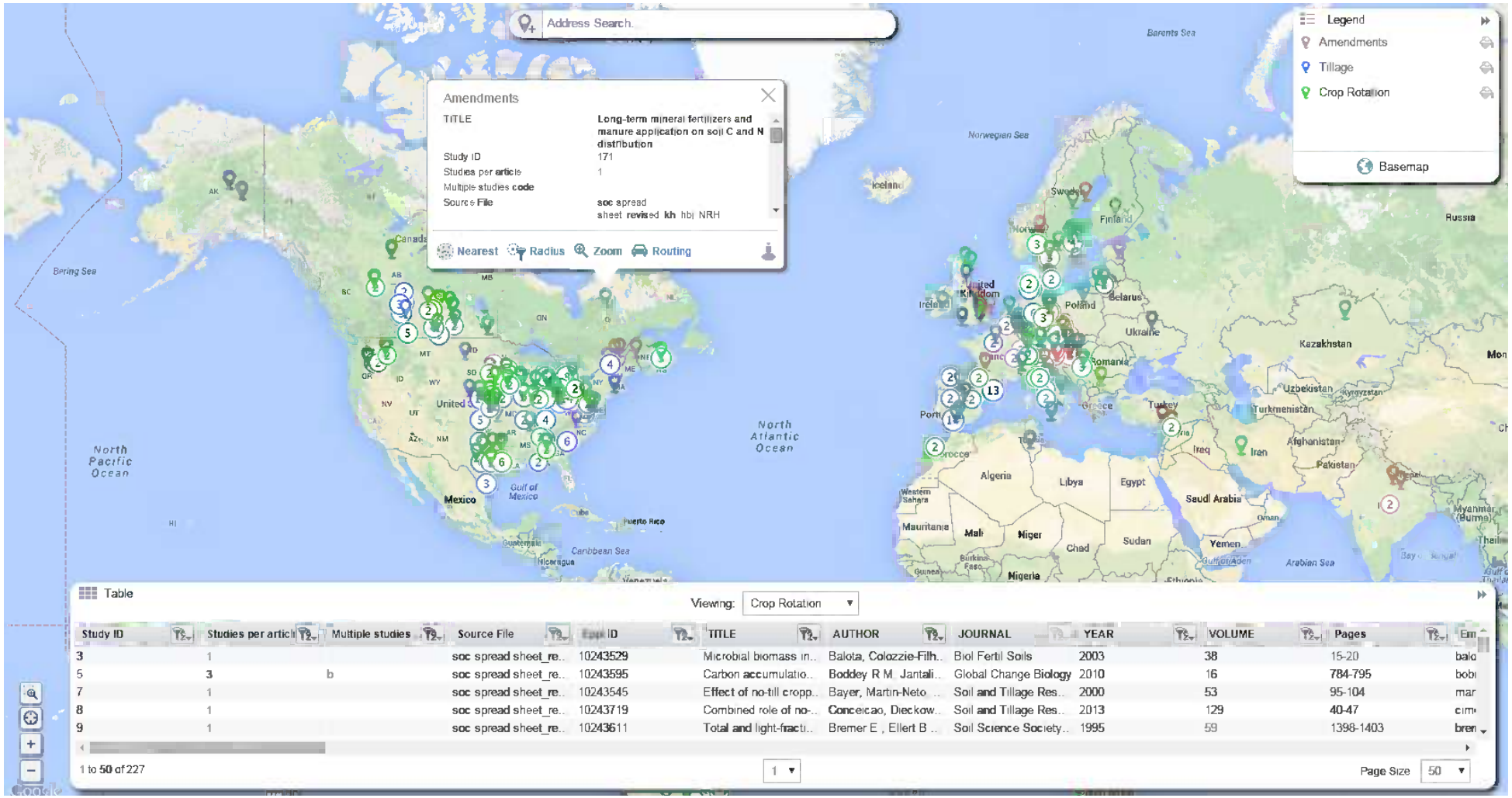
Os efeitos do corte eram dependentes da interação entre a frequência de corte e a remoção do feno. Portanto, não houve efeito geral estatisticamente significativo do corte vs. não corte.

Jakobsson et al (2018) Environ Evid

Mapeamento sistemático

- Metodologicamente muito parecido com a revisão sistemática, mas visa identificar quais pesquisas foram conduzidas sobre um tópico
- Descreve a natureza na base da evidência
- Ponto de partida para a realização rápida de várias revisões sistemáticas
- Principais resultados:
  - Base de dados interativo que descreve estudos
  - Visualizações / narrativas que descrevem a evidência: mapas de calor, atlas de evidências

Exemplo de mapa sistemático



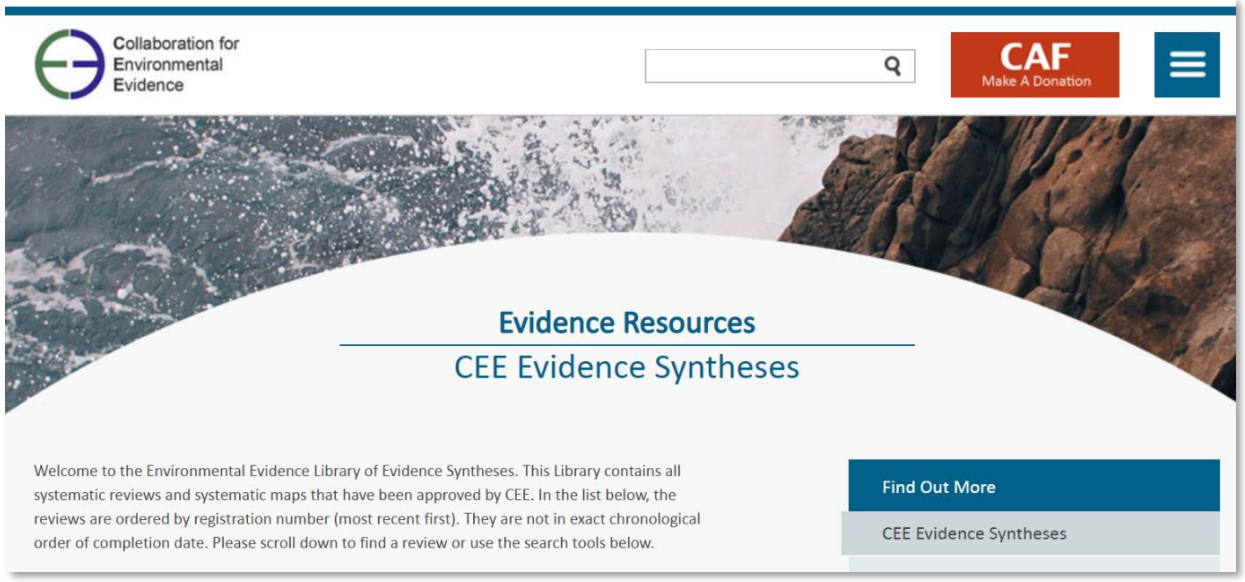
Haddaway, N.R., Hedlund, K., Jackson, L.E. *et al.* What are the effects of agricultural management on soil organic carbon in boreo-temperate systems?. *Environ Evid* **4,** 23 (2015). https://doi.org/10.1186/s13750-015-0049-0

Collaboration for Environmental Evidence (CCE)
Colaboração para Evidência Ambiental

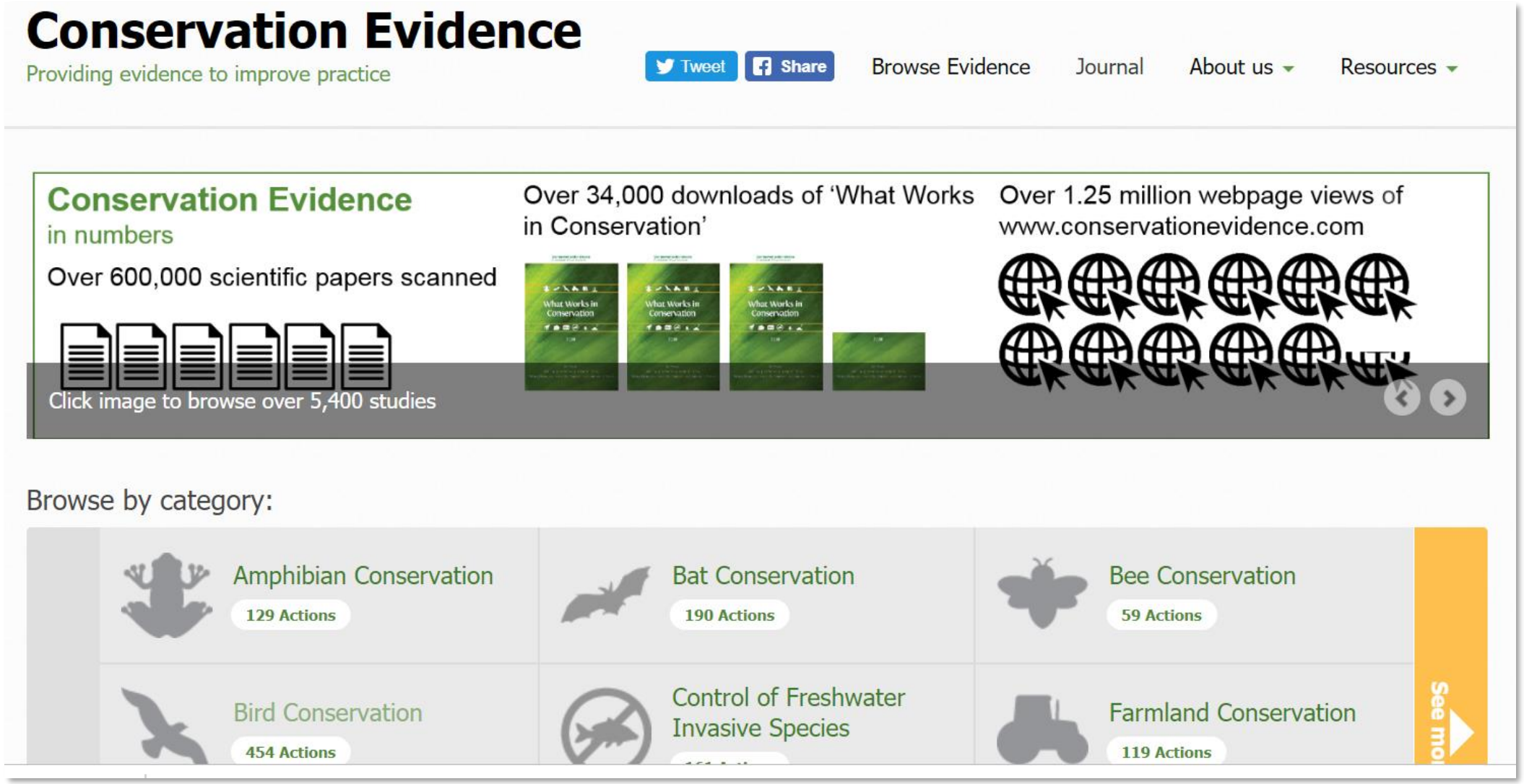
- CEE coordena a orientação metodológica e publicação de revisões sistemáticas rigorosas e mapas sistemáticos (incluindo protocolos)
- Os trabalhos baseiam-se na transparência, abrangência, objetividade processual

The Cochrane Collaboration

THE CAMPBELL COLLABORATION
What helps? What harms? Based on what evidence?



Projecto “Conservation Evidence”



https://www.conservationevidence.com/

Projecto “Conservation Evidence”

Actions

Can't find what you're looking for? You can also search Individual Studies.

Not sure what Actions are? Read a brief description.

Refine results

454 actions found

Sort by: Number of studies ▲ Relevance Title

Category

- [x] Bird Conservation (454)

Keywords

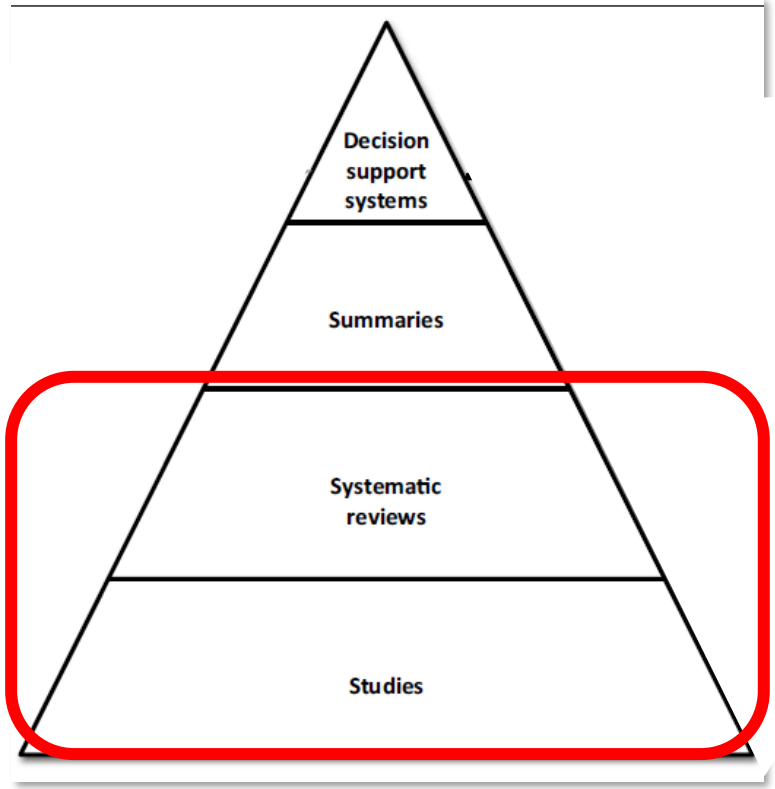
Habitat

- [ ] Artificial Habitats
- [ ] Forest & Woodland
- [ ] Coastal

More ▾

Threat

- [ ] Provide artificial nesting sites for songbirds
  Beneficial | Based on: 65 studies
- [ ] Plant wild bird seed or cover mixture
  Beneficial | Based on: 40 studies
- [ ] Provide supplementary food for songbirds to increase reproductive success
  Likely to be beneficial | Based on: 37 studies
- [ ] Provide supplementary food for songbirds to increase adult survival
  Beneficial | Based on: 34 studies
- [ ] Pay farmers to cover the costs of bird conservation measures
  Likely to be beneficial | Based on: 30 studies



https://www.conservationevidence.com/data/studies?path=data%2Findex&terms=

Projecto “Conservation Evidence”

Supporting evidence from individual studies

1

A replicated study in 1945-6 in garden habitats in Ohio, USA (Calhoun 1948), found that American robins *Turdus migratorius* nesting in artificial nests had lower success rates than those natural nests (33% success for 24 nesting attempts in artificial nests vs. 50% of 48 in natural nests). Fourteen pairs of robins used the nests, but only seven successfully raised chicks. Nests consisted of cones of black or green roofing paper 17.8 cm at the widest and 5.1 cm deep. This study also examines nest use by mourning doves *Zenaida macroura* (formerly *Zenaidura macroura*), and the effect of different coloured nests in ‘Use differently-coloured artificial nests’.

2

A controlled study in mixed farmland in north-east Scotland in 1971 (Yom-Tov 1974) found that carrion crows *Corvus corone* did not nest in artificial trees, irrespective of whether they were provided with supplementary food or not. In one experiment, a line of 15 artificial trees (3-6 m branches tied to fence posts and provided with an old crow’s nest) were set up, approximately 70 m apart. Two pairs of crows established territories, but neither attempted to breed. A second experiment provided a single artificial tree in two occupied territories, 70 m from the tree used by the resident pair. Neither artificial tree was used, as the resident pairs successfully defended their territories. This study also investigated the effects of supplementary feeding on crow reproduction, discussed in ‘Provide supplementary food to increase reproductive success’.

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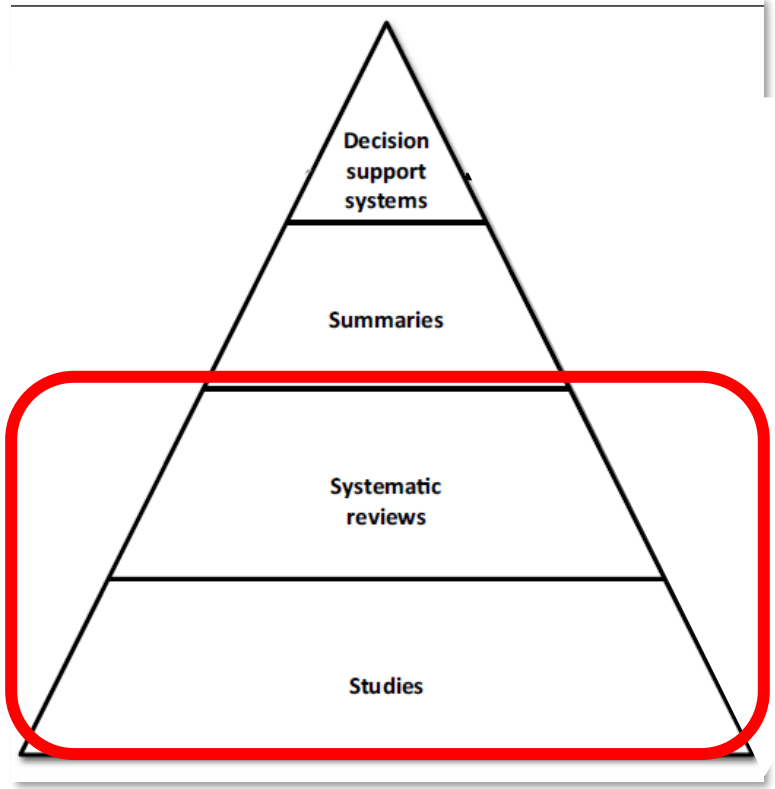
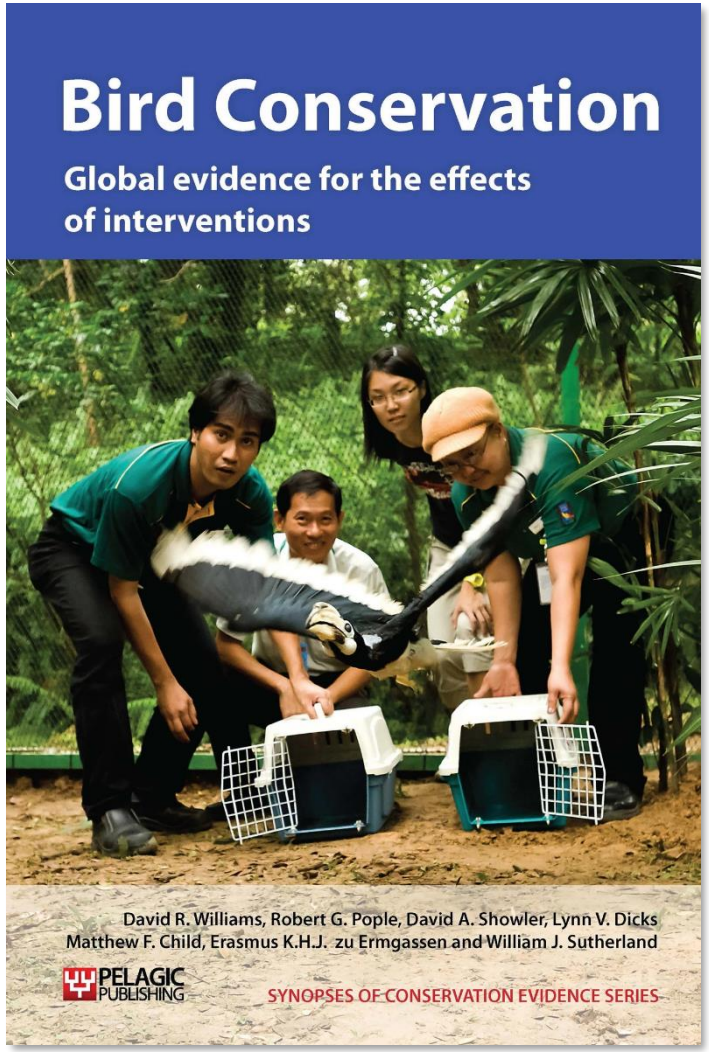
A small study in 1976-9 in three scrub and grassland habitats in Idaho, USA (Howard & Hilliard 1980), found that common ravens *Corvus corax* nested on nesting platforms provided, with four pairs using them in 1976, but only a single attempt in 1979. An average of 2.8 chicks/nest were produced. Twenty four platforms were provided in shaded/un-shaded pairs, with 23 out of 29 young fledged from shaded platforms. This study also discusses platform use by ferruginous hawks *Buteo regalis*, discussed in



https://www.conservationevidence.com/actions/498

Projecto “Conservation Evidence”

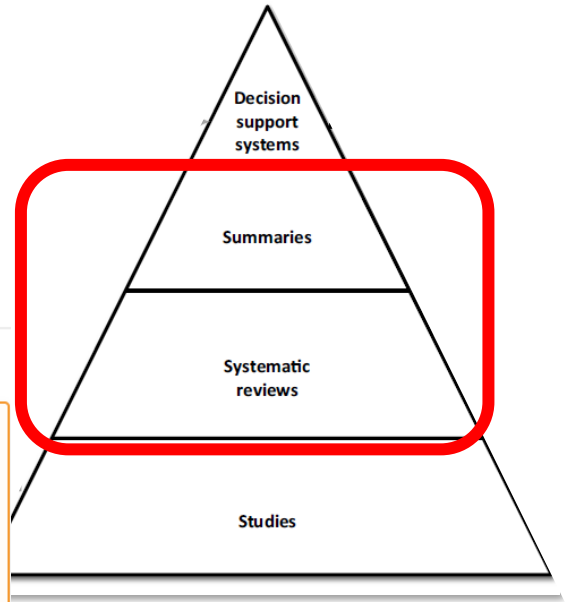
Synopses



Action: Provide artificial nesting sites for songbirds

Key messages Read our guidance on Key messages before continuing

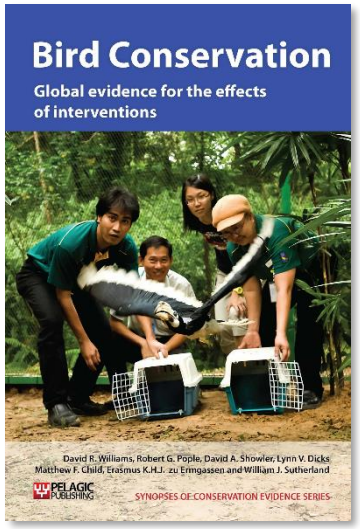
- Only three studies out of 66 from across the world found low rates of nest box occupancy, although this may be partially the result of publishing biases. Thrushes, crows, swallows and New World warblers were the target species with low rates of use. Thrushes, crows, finches, swallows, wrens, tits, Old World and tyrant flycatchers, New World blackbirds, sparrows, waxbills, starlings and ovenbirds all used nest boxes. One study from the USA found that wrens used nest boxes more frequently than natural cavities.
- Five studies from across the world found higher population densities or population growth rates in areas with nest boxes, whilst one study from the USA found higher species richness in areas with nest boxes. One study from Chile found that breeding populations (but not non-breeding populations) were higher for two species when next boxes were provided.
- Twelve studies from across the world found that productivity of birds in nest boxes was higher or similar to those in natural nests. One study found there were more nesting attempts in areas with more nest boxes, although a study from Canada found no differences in behaviour or productivity between areas with high or low densities of nest boxes. Two studies from Europe found lower predation of some species using nest boxes. However, three studies from the USA found low production in nest boxes, either in absolute terms or relative to natural nests.
- Thirteen studies from across the world founds that use, productivity or usurpation varied with nest box design, whilst seven found no difference in occupation rates or success with different designs.
- Similarly, fourteen studies found different occupation or success rates depending on the position or orientation of artificial nest sites. Two studies found no difference in success with different positions.



https://www.conservationevidence.com/actions/498

Projecto “Conservation Evidence”

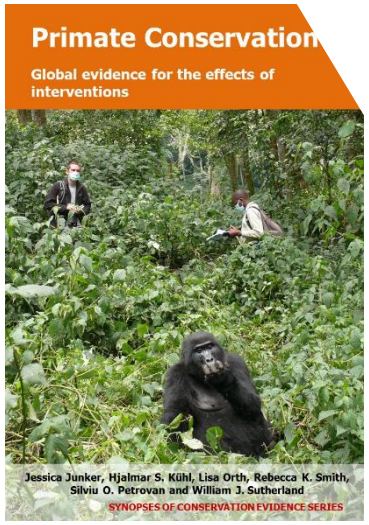
454 actions

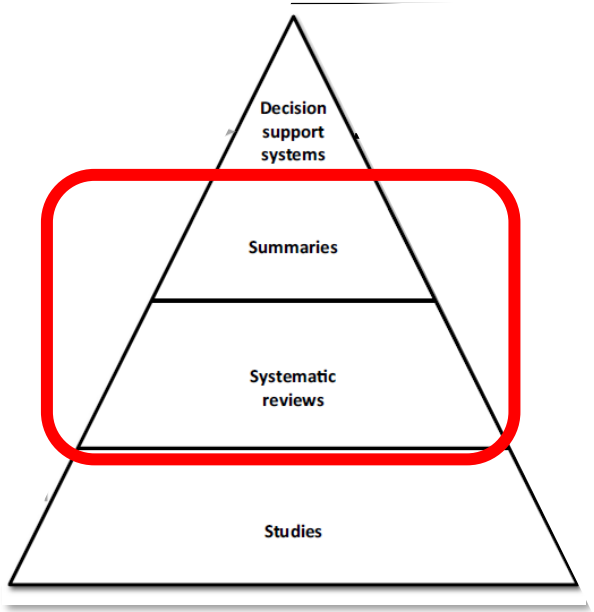


129 actions

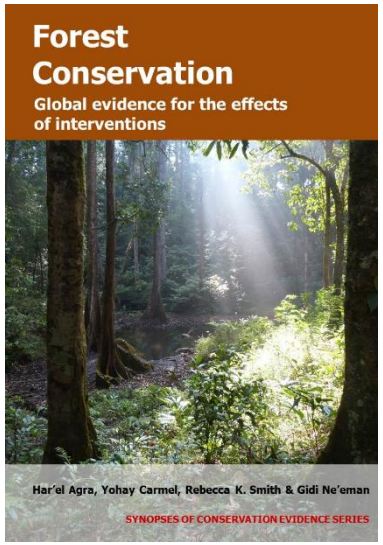
190 actions

162 action.

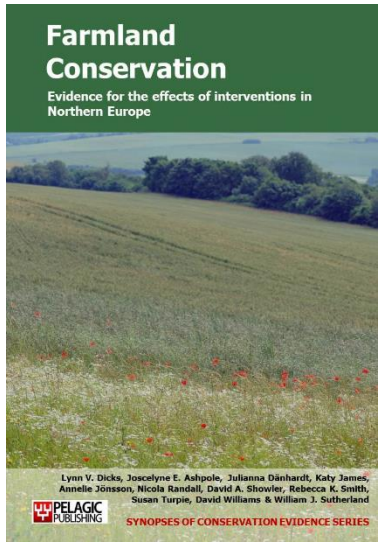




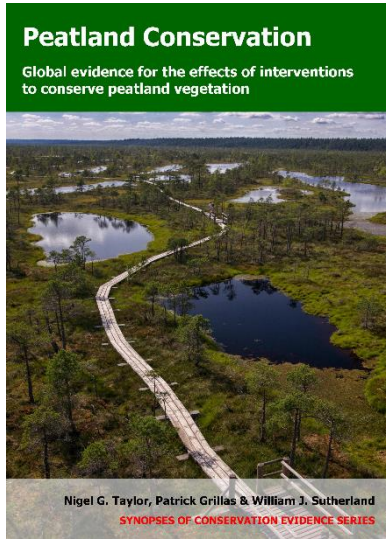
122 actions



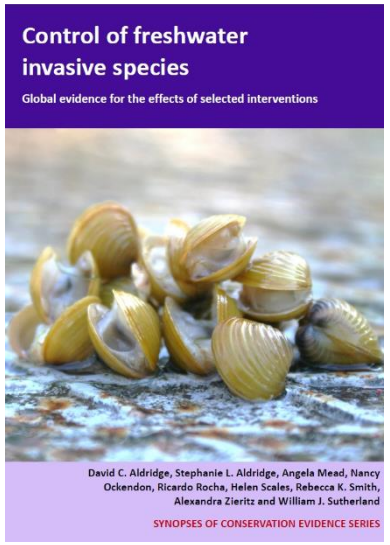
119 actions



125 actions

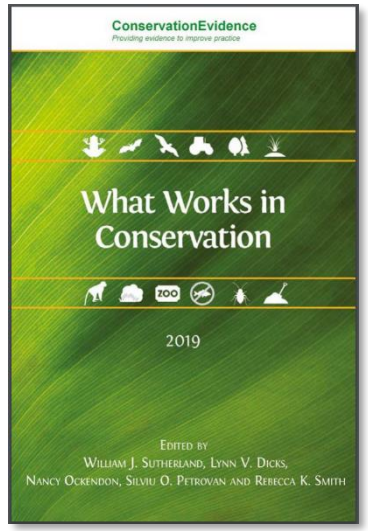


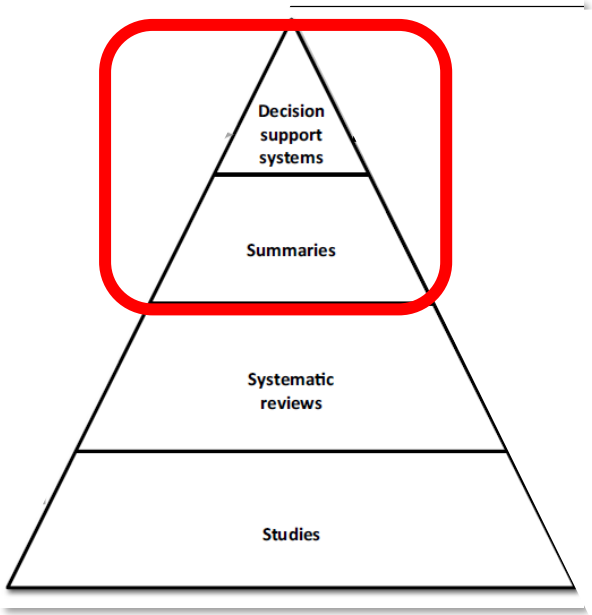
161 actions



… pretende cobrir todos os principais tipos de habitat e táxons nos próximos quatro anos.

Projecto “Conservation Evidence”





Action: Provide artificial nesting sites for songbirds

66 estudos apresentando evidência

Supporting evidence from individual studies

1
A replicated study in 1945-6 in garden habitats in Ohio, USA (Calhoun 1948), found that American robins *Turdus migratorius* nesting in artificial nests had lower success rates than those natural nests (33% success for 24 nesting attempts in artificial nests vs. 50% of 48 in natural nests). Fourteen pairs of robins used the nests, but only seven successfully raised chicks. Nests consisted of cones of black or green roofing paper 17.8 cm at the widest and 5.1 cm deep. This study also examines nest use by mourning doves *Zenaida macroura* (formerly *Zenaidura macroura*), and the effect of different coloured nests in ‘Use differently-coloured artificial nests’.

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Avaliação por especialisatas através do método Delphi

Effectiveness: 67%

Certainty: 85%

Harms: 0%

Categories	Effectiveness score	Certainty score	Harms score
Beneficial	>60	>60	<20
Likely to be beneficial	>60	40 – 60	<20
OR	40 - 60	≥40	<20
Trade-offs between benefits & harms	≥40	≥40	≥20
Unknown effectiveness	Any score	<40	Any score
Unlikely to be beneficial	<40	40-60	<20
Likely to be ineffective or harmful	<40	>60	Any score
OR	<40	≥40	≥20

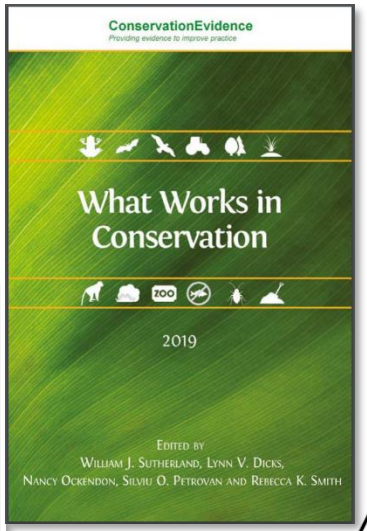
https://www.conservationevidence.com/

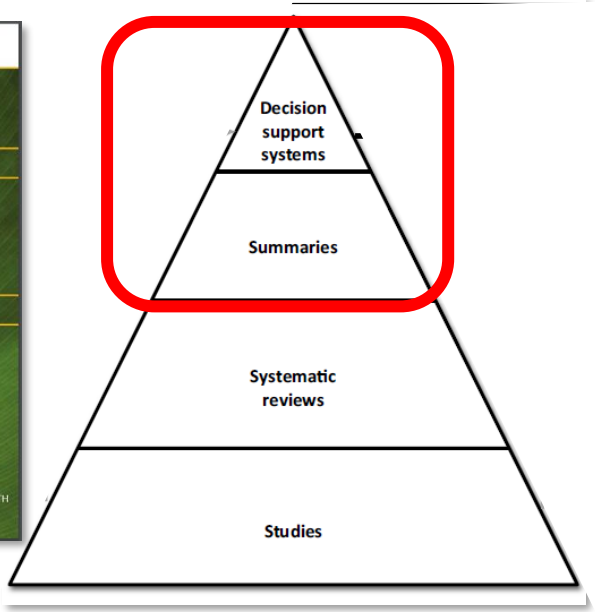
Projecto “Conservation Evidence”

56 actions found

Sort by: Number of studies | Relevance | Title

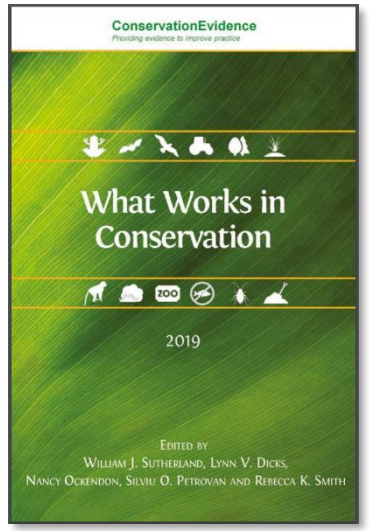
- Provide artificial nesting sites for songbirds
  Beneficial | Based on: 65 studies
- Provide artificial nesting sites for raptors
  Likely to be beneficial | Based on: 9 studies
- Provide artificial nesting sites for woodpeckers
  Unknown effectiveness (limited evidence) | Based on: 11 studies
- Use vocalisations to attract birds to safe areas
  Likely to be beneficial | Based on: 10 studies
- Provide artificial nesting sites for wildfowl
  Beneficial | Based on: 27 studies
- Provide supplementary food for songbirds to increase reproductive success
  Likely to be beneficial | Based on: 37 studies

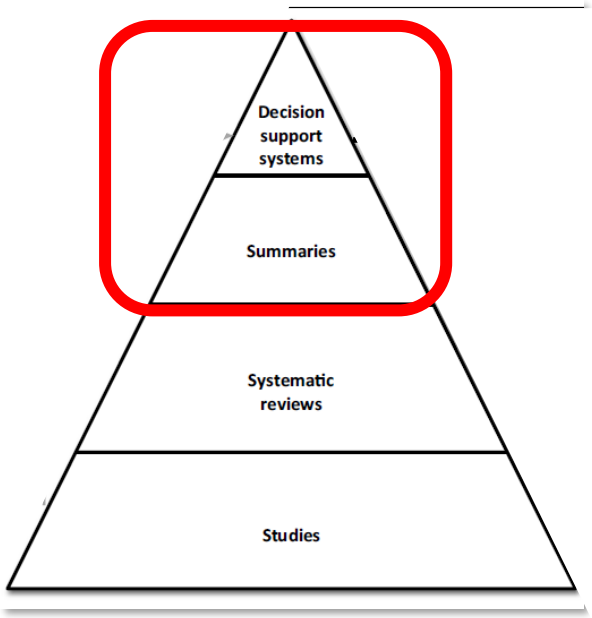




https://www.conservationevidence.com/

Projecto “Conservation Evidence”





Actions

Can't find what you're looking for? You can also search Individual Studies.

Not sure what Actions are? Read a brief description.

Refine results

Category

Bird Conservation (3)

Keywords

little tern

Habitat

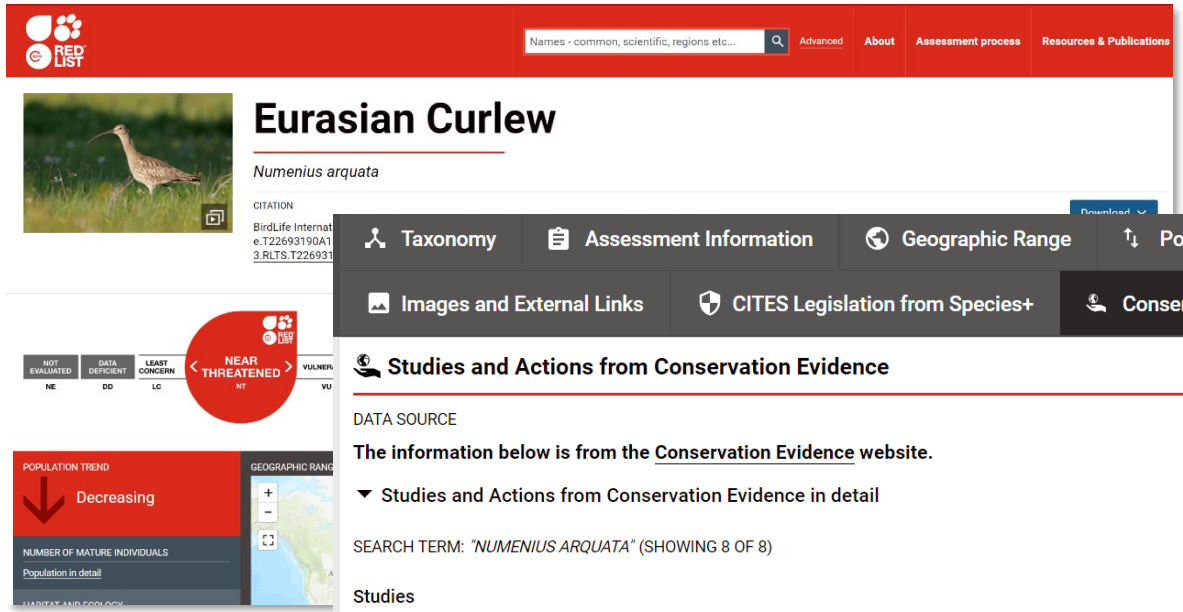
3 actions found

Sort by: Number of studies

- Physically protect nests with individual exclosures/barriers or provide shelters for chicks of ground nesting seabirds
  Likely to be beneficial | Based on: 4 studies
- Provide artificial nesting sites for ground and tree-nesting seabirds
  Likely to be beneficial | Based on: 11 studies
- Use signs and access restrictions to reduce disturbance at nest sites
  Likely to be beneficial | Based on: 10 studies

https://www.conservationevidence.com/data/index?synopsis_id%5B%5D=8&terms=little+tern&country%5B%5D=&result_type=interventions#search-results

Projecto “Conservation Evidence”



Taxonomy | Assessment Information | Geographic Range | Population | Habitat and Ecology | Threats | Use and Trade | Conservation Actions | Bibliography

Images and External Links | CITES Legislation from Species+ | Conservation Evidence | *Expand all*

Studies and Actions from Conservation Evidence

DATA SOURCE

The information below is from the Conservation Evidence website.

▼ **Studies and Actions from Conservation Evidence in detail**

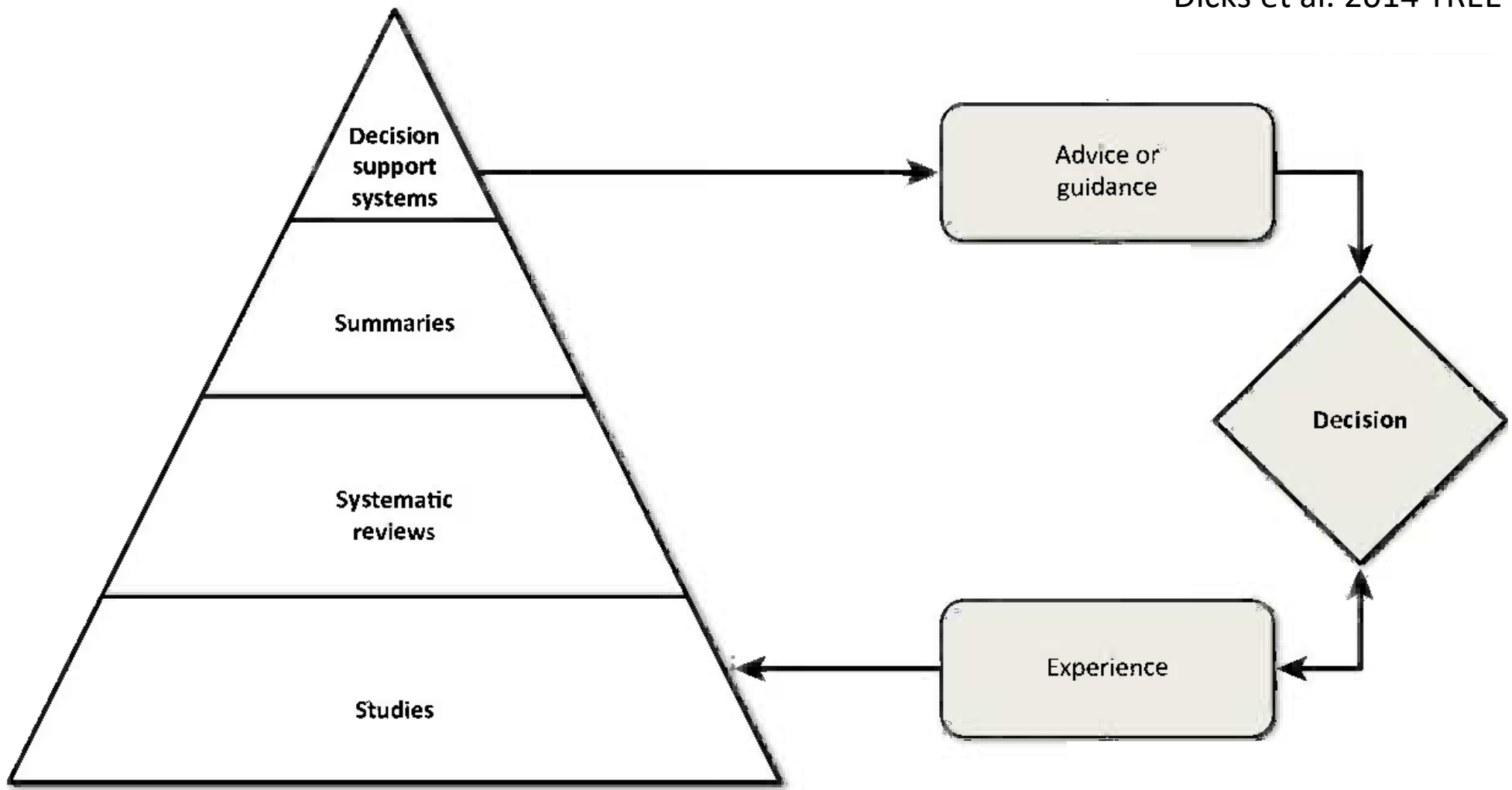
SEARCH TERM: *"NUMENIUS ARQUATA"* (SHOWING 8 OF 8)

Studies	Actions
Nest predation and numbers of golden plovers *Pluvialis apricaria* and other moorland waders Show	• Control predators not on islands for waders Show
Artificial feeding to attract wild birds close to a viewing area at Belfast Lough RSPB Reserve, Antrim, Northern Ireland Show	• Provide supplementary food for waders to increase adult survival Show • Provide supplementary food for wildfowl to increase adult survival Show
Botanical monitoring of restored lowland wet grassland at Campfield Marsh RSPB Reserve, Cumbria, England Show	• Raise water levels in ditches or grassland Show • Raise water levels in ditches or grassland Show
Rush cutting to create nesting patches for lapwings *Vanellus vanellus* and other waders, Lower Lough Erne RSPB reserve, County Fermanagh, Northern Ireland Show	• Mow or cut semi-natural grasslands/pastures Show
The effectiveness of different methods to deter large gulls *Larus* spp. from competing with nesting terns *Sterna* spp. on Coquet Island RSPB reserve, Northumberland, England Show	• Reduce inter-specific competition for nest sites of ground nesting seabirds by removing competitor species Show
The recent declines of farmland bird populations in Britain: an appraisal of causal factors and conservation actions Show	• Pay farmers to cover the cost of conservation measures (as in agri-environment schemes) Show • Pay farmers to cover the costs of bird conservation measures Show
Some effects of set-aside on breeding birds in northeast Scotland Show	• Provide or retain set-aside areas in farmland Show • Provide or retain set-aside areas in farmland Show
Habitat restoration for curlew *Numenius arquata* at the Lake Vyrnwy reserve, Wales Show	

https://www.iucnredlist.org/species/22693190/117917038

Resumo da síntese de evidência

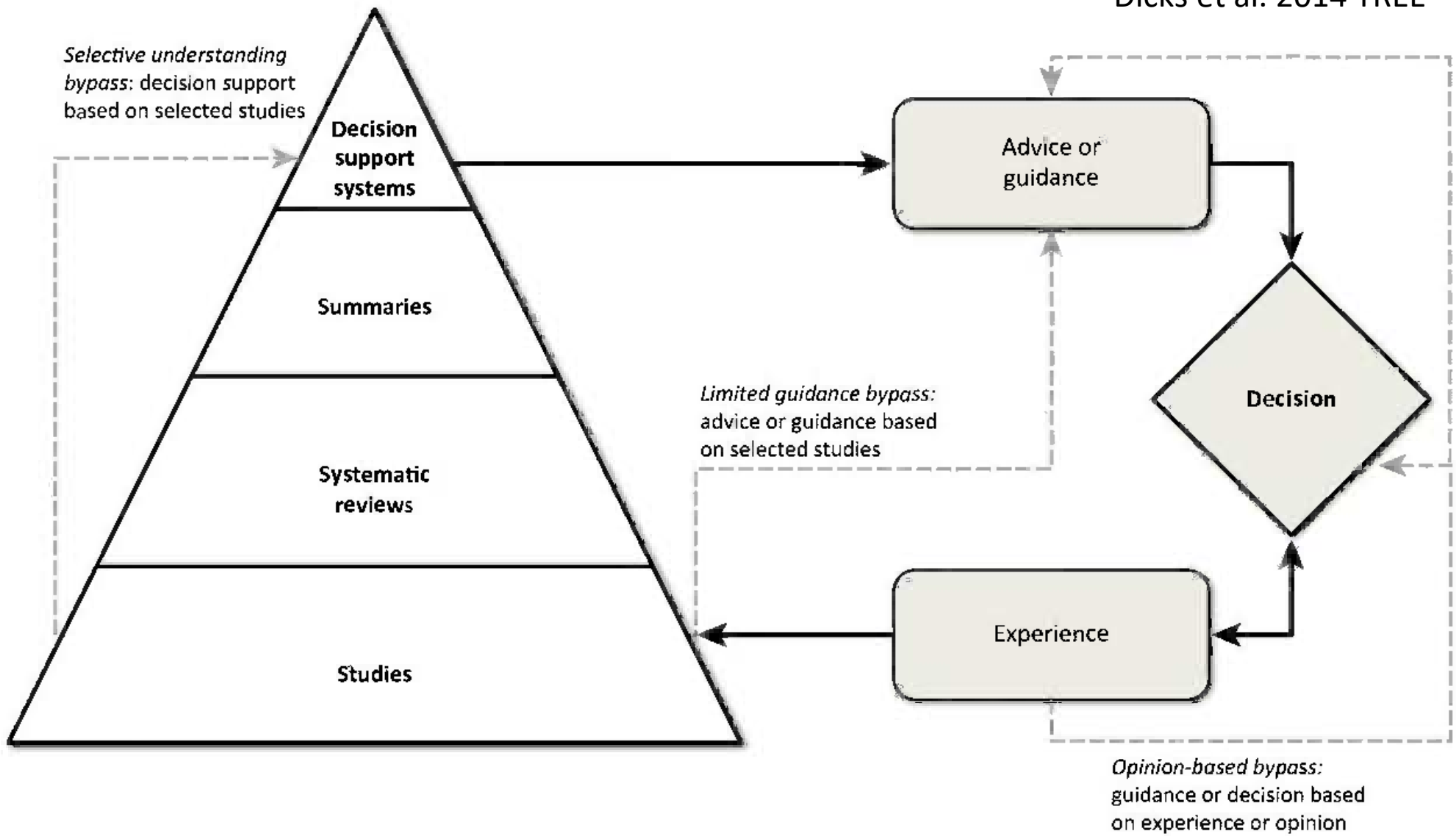
Dicks et al. 2014 TREE



Resumo da síntese de evidência

(e alguns desvios para evitar)

Dicks et al. 2014 TREE



Resumo da síntese de evidência

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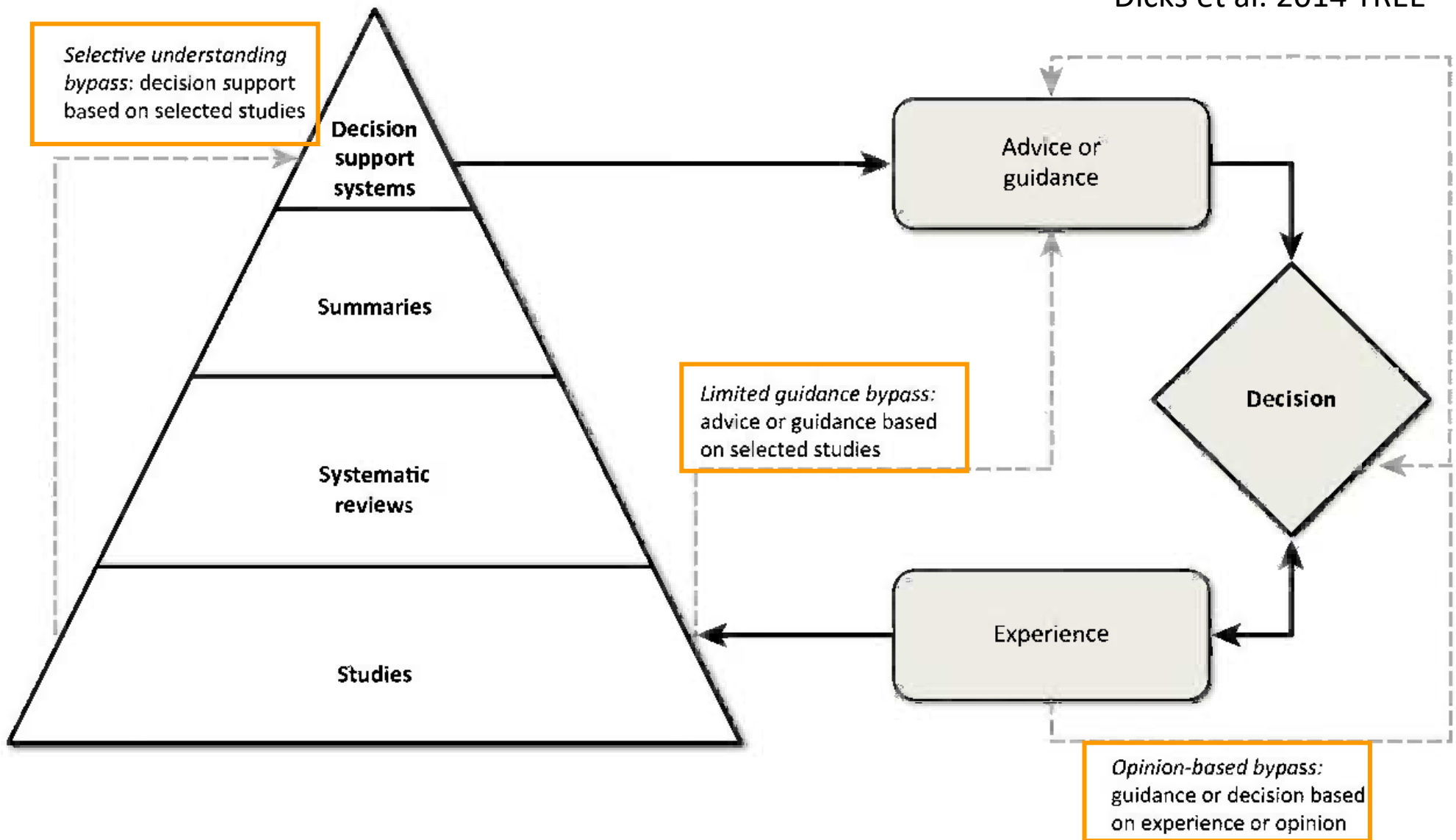
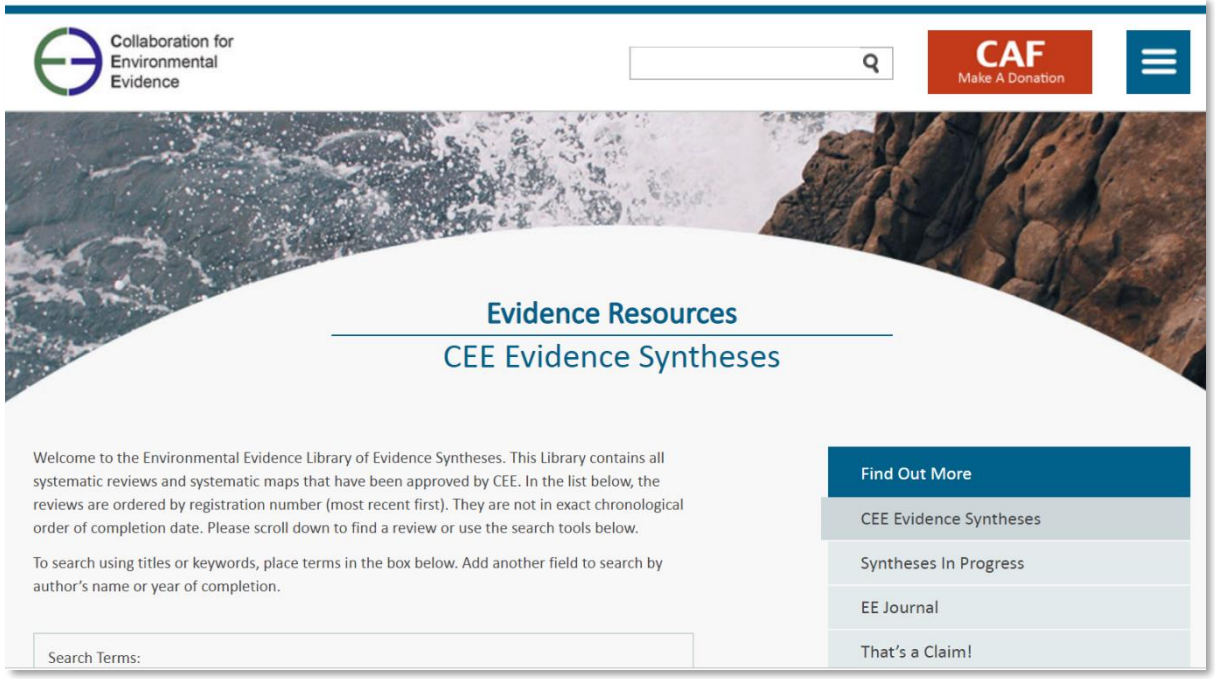
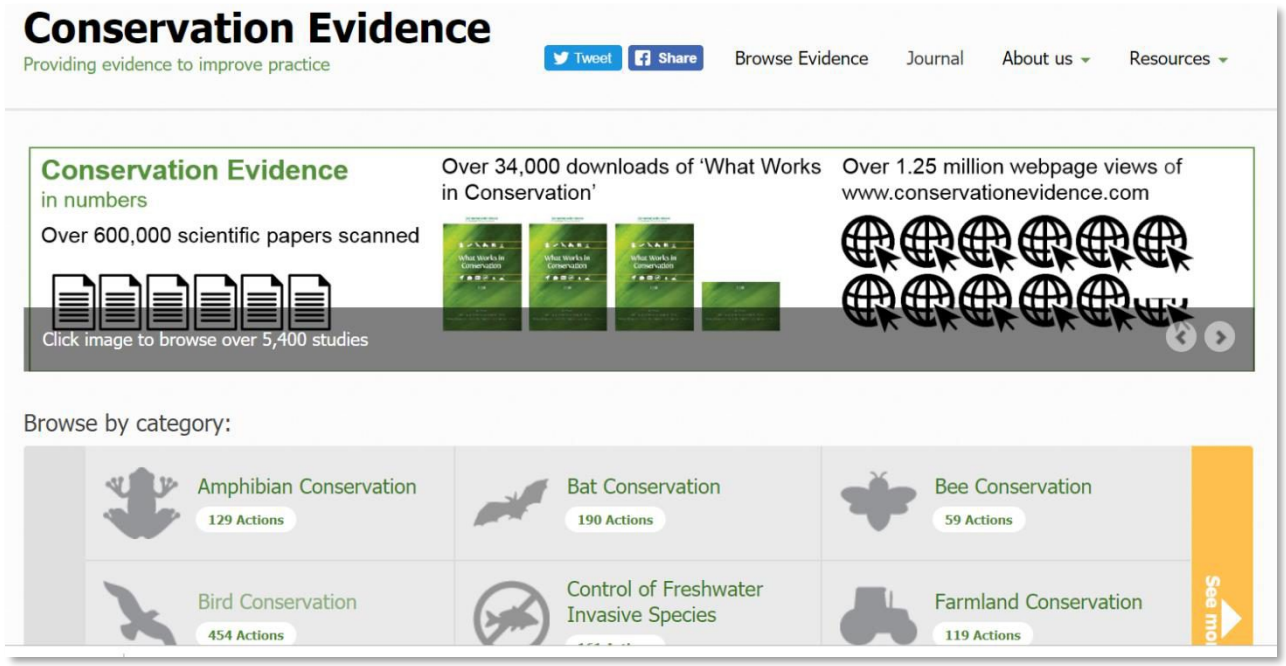
Dicks et al. 2014 TREE



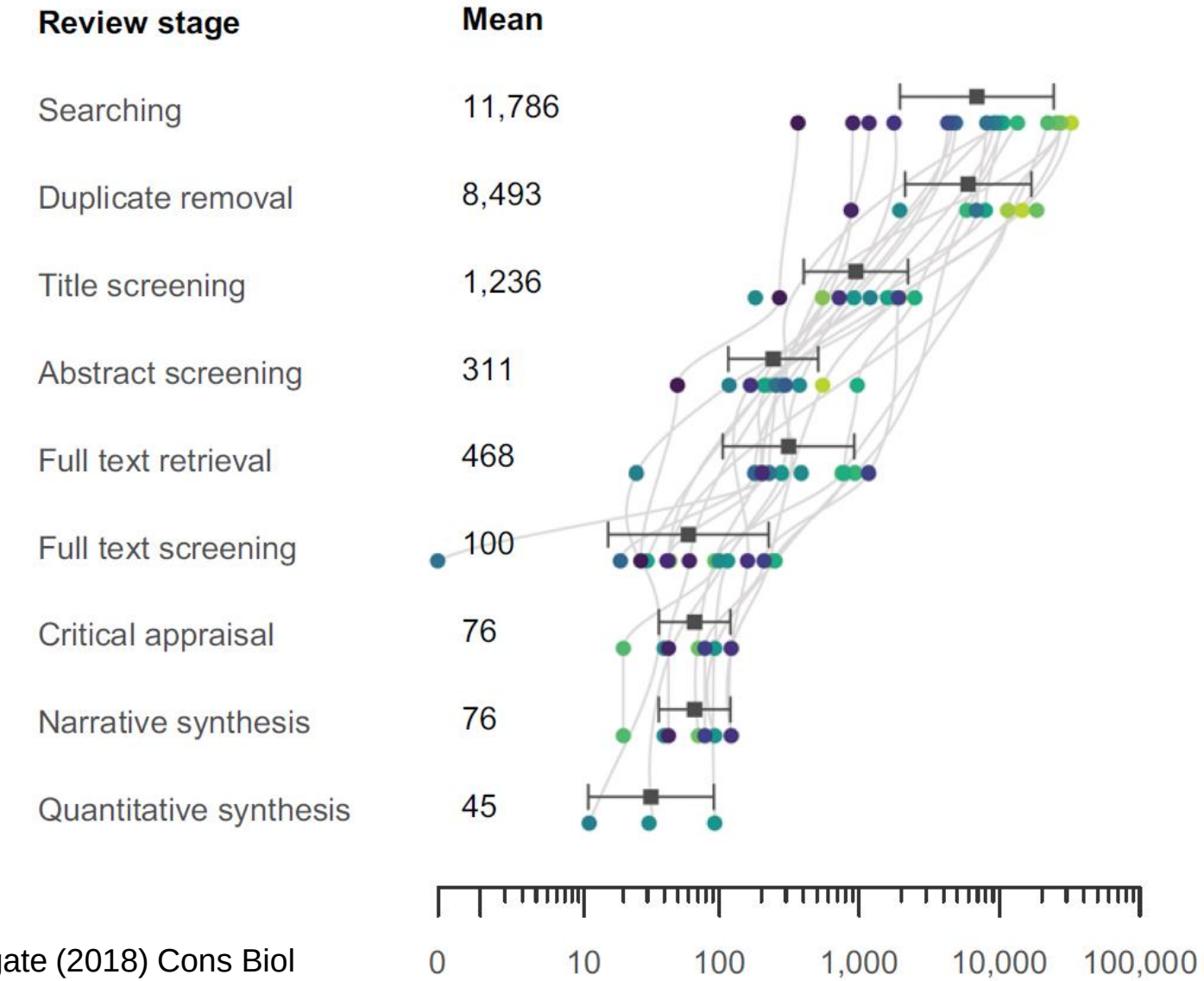
Desafios no processo de sínteses de evidência





Desafios: tempo e esforço

Número de artigos processados em cada fase de uma revisão sistemática

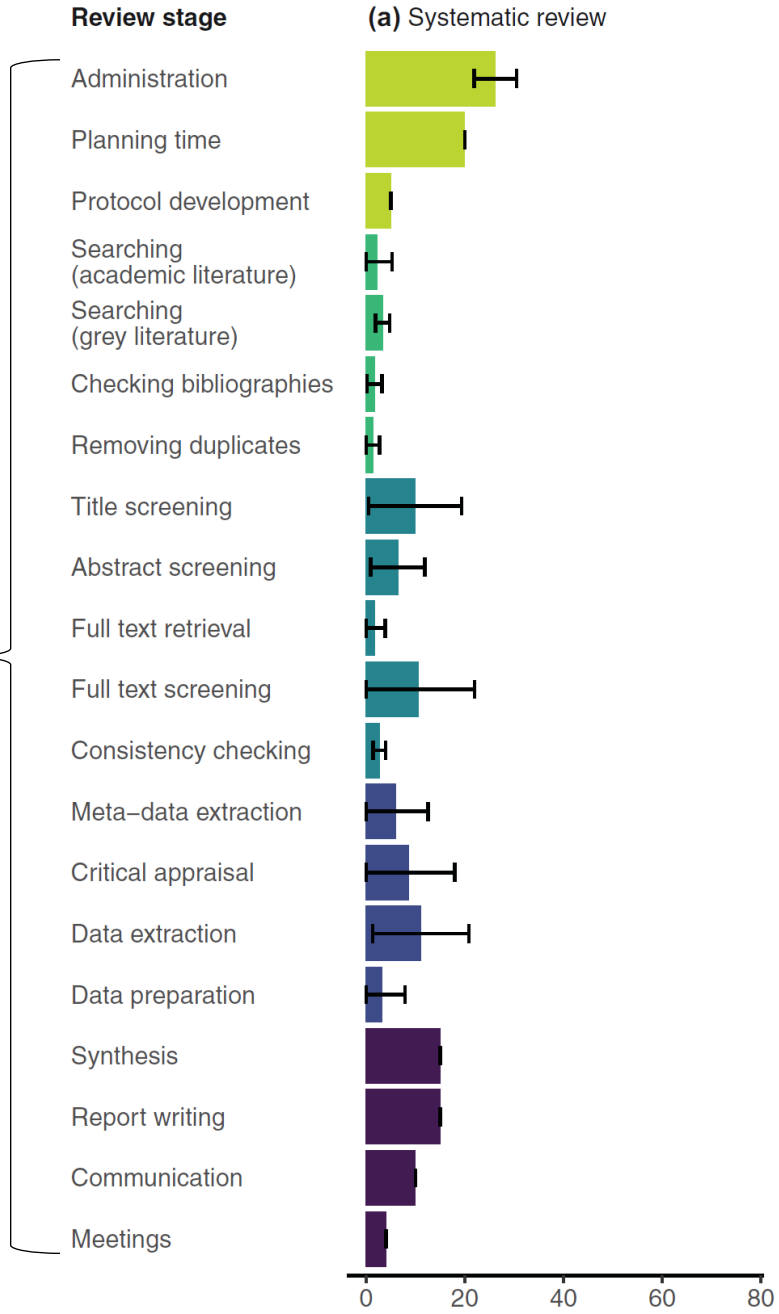


Haddaway and Westgate (2018) Cons Biol

Desafios: tempo e esforço

Número de dias necessários para cada fase de uma revisão sistemática

164 dias por pessoa em tempo integral
para responder a uma pergunta como:
A gestão da vegetação nas margens das estradas afeta a biodiversidade?

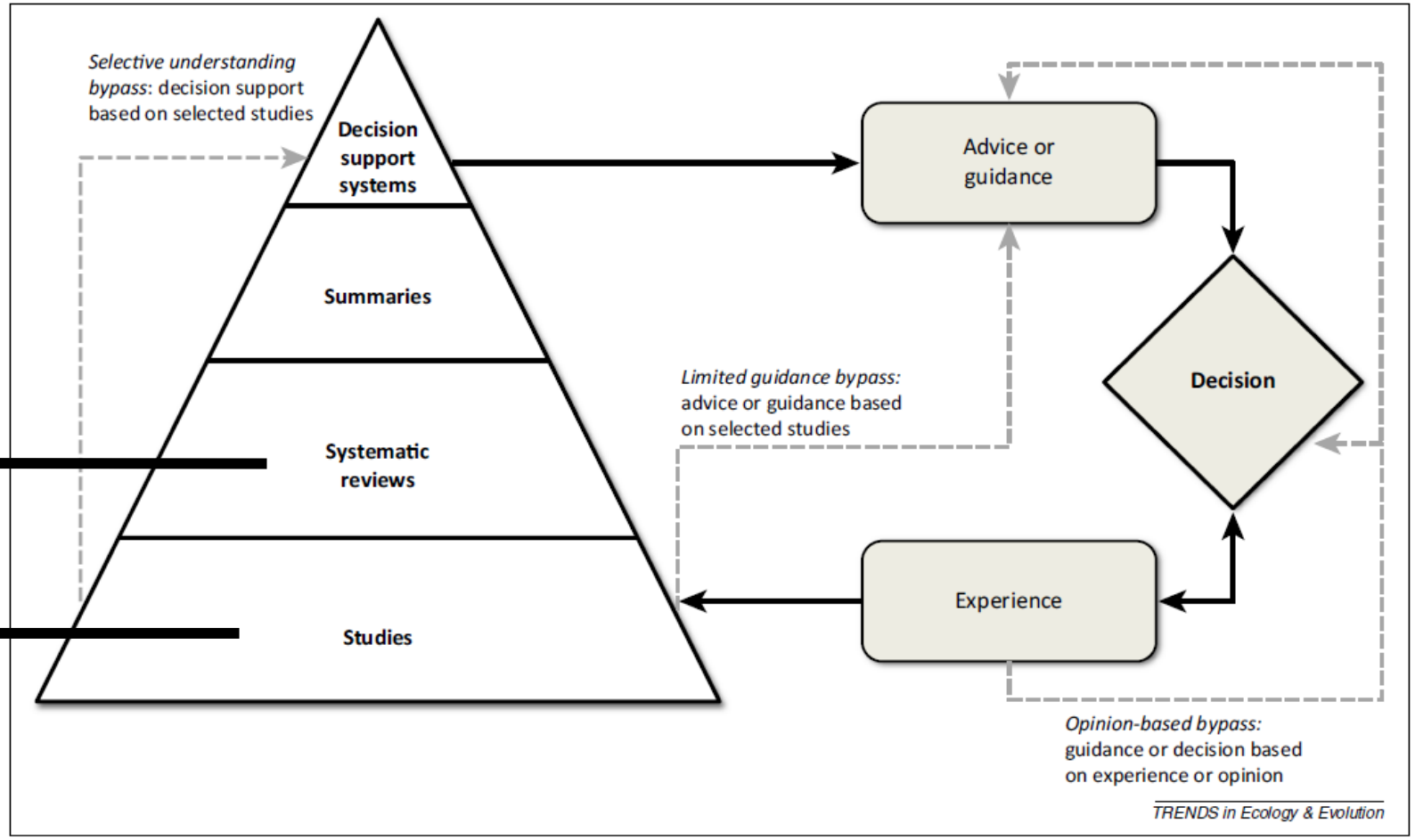


Haddaway and Westgate (2018) Cons Biol

Desafios: tempo e esforço

US$30,000 – 300,000 / revisão
0.5 – 3 years / revisão

US$0 – 21 milhões / estudo
Menos de 1 ano – decada / estudo



Dicks et al (2014) TREE

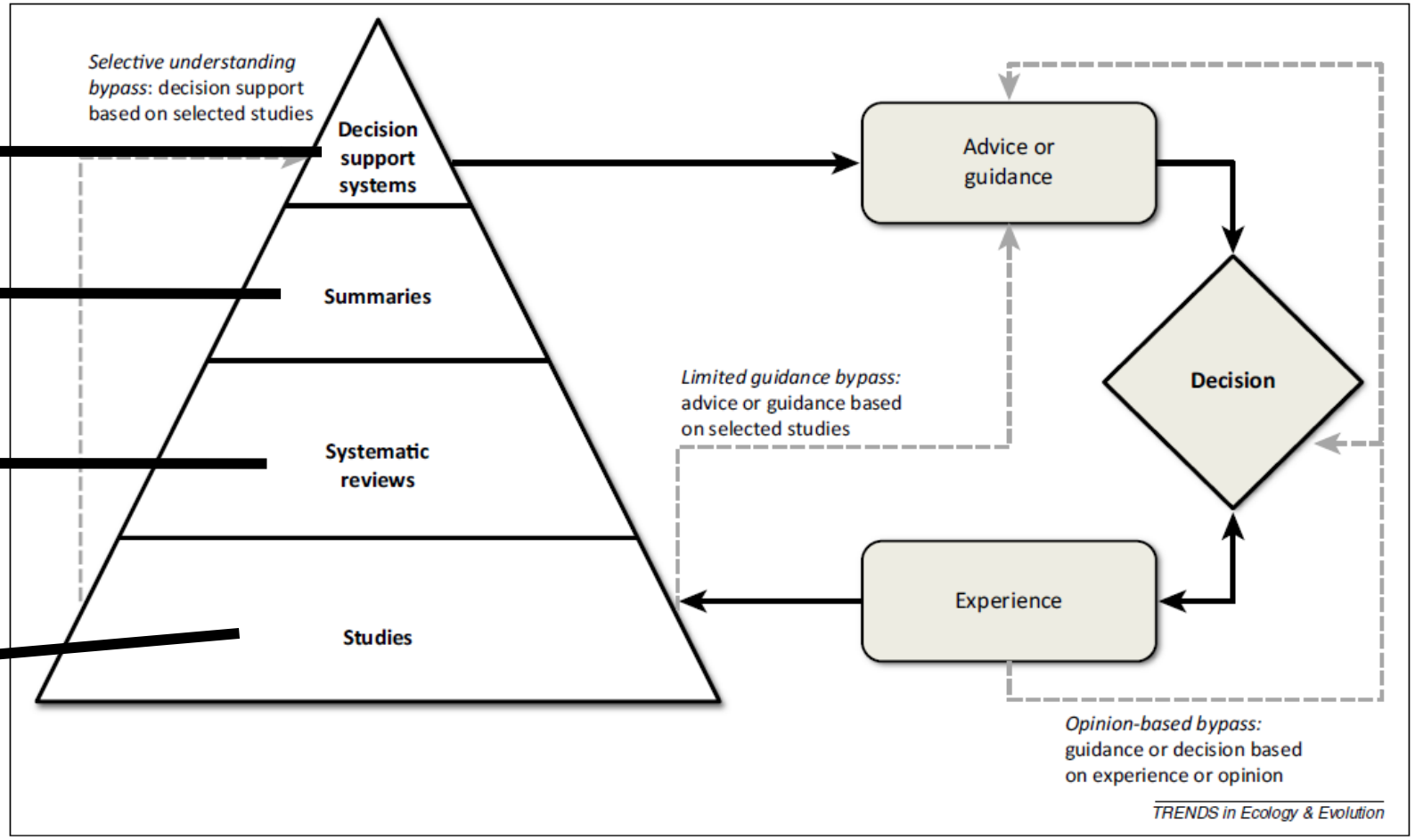
Desafios: tempo e esforço

US$540,000 – 5.6 milhões

US$70,000 – 750,000 / tema
1 – 5 anos / tema

US$30,000 – 300,000 / revisão
0.5 – 3 anos / revisão

US$0 – 21 million / study
Menos de 1 ano – decadas / estudo



Dicks et al (2014) TREE

Desafios: lacunas geográficas de informação

Action: Provide artificial nesting sites for songbirds

Key messages

Read our guidance on Key messages before continuing

- Only three studies out of 66 from across the world found low rates of nest box occupancy, although this may be partially the result of publishing biases. Thrushes, crows, swallows and New World warblers were the target species with low rates of use. Thrushes, crows, finches, swallows, wrens, tits, Old World and tyrant flycatchers, New World blackbirds, sparrows, waxbills, starlings and ovenbirds all used nest boxes. One study from the USA found that wrens used nest boxes more frequently than natural cavities.
- Five studies from across the world found higher population densities or population growth rates in areas with nest boxes, whilst one study from the USA found higher species richness in areas with nest boxes. One study from Chile found that breeding populations (but not non-breeding populations) were higher for two species when next boxes were provided.
- Twelve studies from across the world found that productivity of birds in nest boxes was higher or similar to those in natural nests. One study found there were more nesting attempts in areas with more nest boxes, although a study from Canada found no differences in behaviour or productivity between areas with high or low densities of nest boxes. Two studies from Europe found lower predation of some species using nest boxes. However, three studies from the USA found low production in nest boxes, either in absolute terms or relative to natural nests.
- Thirteen studies from across the world founds that use, productivity or usurpation varied with nest box design, whilst seven found no difference in occupation rates or success with different designs

Overall Effectiveness Category: Beneficial

Effectiveness: 67%

Certainty: 85%

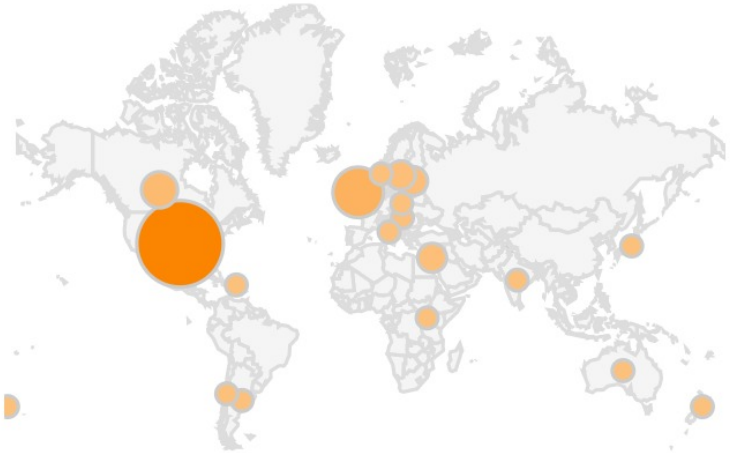
Harms: 0%

Where has this evidence come from?

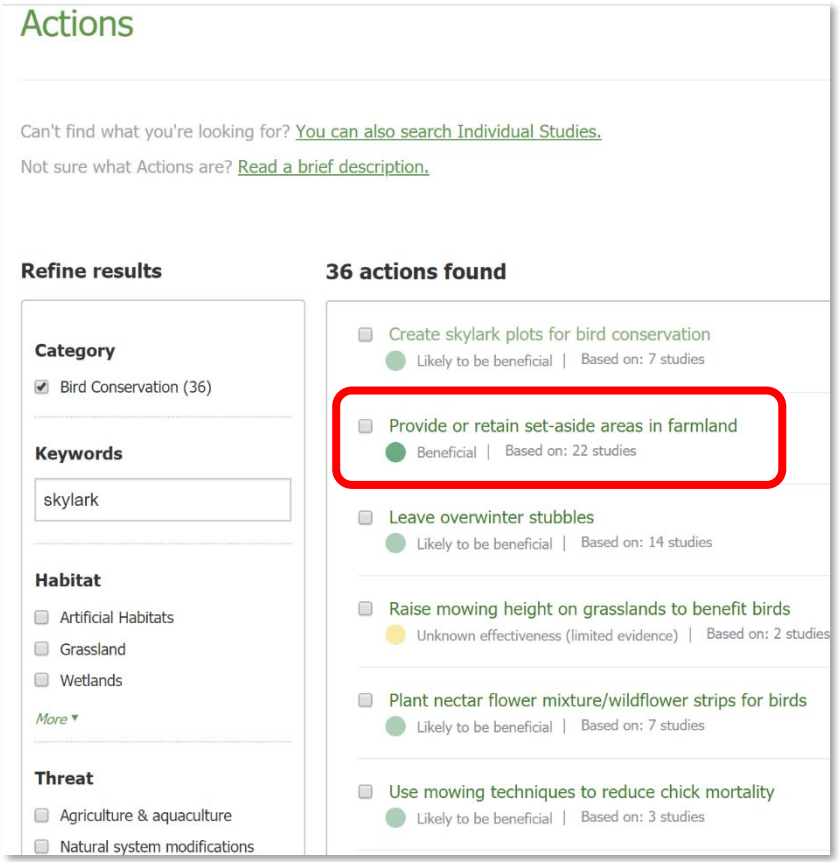
Bird Conservation
View all

Click here to see the list of journals searched for this synopsis, and here to see all the journals searched for all synopses.

Source countries



Desafios: lacunas geográficas de informação



Desafios: lacunas geográficas de informação

Actions

Can't find what you're looking for? You can also search Individual Studies.

Not sure what Actions are? Read a brief description.

Refine results

Category

- [x] Bird Conservation (36)

Keywords

skylark

Habitat

- [ ] Artificial Habitats
- [ ] Grassland
- [ ] Wetlands

More

Threat

- [ ] Agriculture & aquaculture
- [ ] Natural system modifications

36 actions found

- [ ] Create skylark plots for bird conservation
  Likely to be beneficial | Based on: 7 studies
- [ ] Provide or retain set-aside areas in farmland
  Beneficial | Based on: 22 studies
- [ ] Leave overwinter stubbles
  Likely to be beneficial | Based on: 14 studies
- [ ] Raise mowing height on grasslands to benefit birds
  Unknown effectiveness (limited evidence) | Based on: 2 studies
- [ ] Plant nectar flower mixture/wildflower strips for birds
  Likely to be beneficial | Based on: 7 studies
- [ ] Use mowing techniques to reduce chick mortality
  Likely to be beneficial | Based on: 3 studies

Action: Provide or retain set-aside areas in farmland

Key messages

Read our guidance on Key messages before continuing

- Three replicated studies and a review of five studies from Europe and North America examining species richness or diversity found that more species were found on set-aside than on crops. One found fewer species on set-aside than other agricultural habitats.
- All 21 studies, including a systematic review, 12 replicated experiments and two reviews, from Europe and North America that investigated population trends or habitat associations found that some species were found at higher densities or used set-aside more than other habitats, or were found on set-aside. Four studies (three replicated) from the UK found that some species were found at lower densities on set-aside compared to other habitats.
- Three of four replicated studies from the UK found that waders and Eurasian skylarks had higher productivities on set-aside, compared to other habitats. One study found that skylarks nesting on set-aside had lower productivity compared to those on cereal crops, and similar productivities to those on other crops.
- One replicated paired study from the UK found that rotational set-aside was used more than non-rotational set-aside, a replicated paired study found no differences between rotational and non-rotational set-aside. A review from Europe and North America found that naturally regenerated set-aside held more birds and more species than sown set-aside.

Overall Effectiveness Category: Beneficial

Effectiveness: 70%

Certainty: 75%

Harms: 0%

Where has this evidence come from?

Bird Conservation
View all

Click here to see the list of journals searched for this synopsis, and here to see all the journals searched for all synopses.

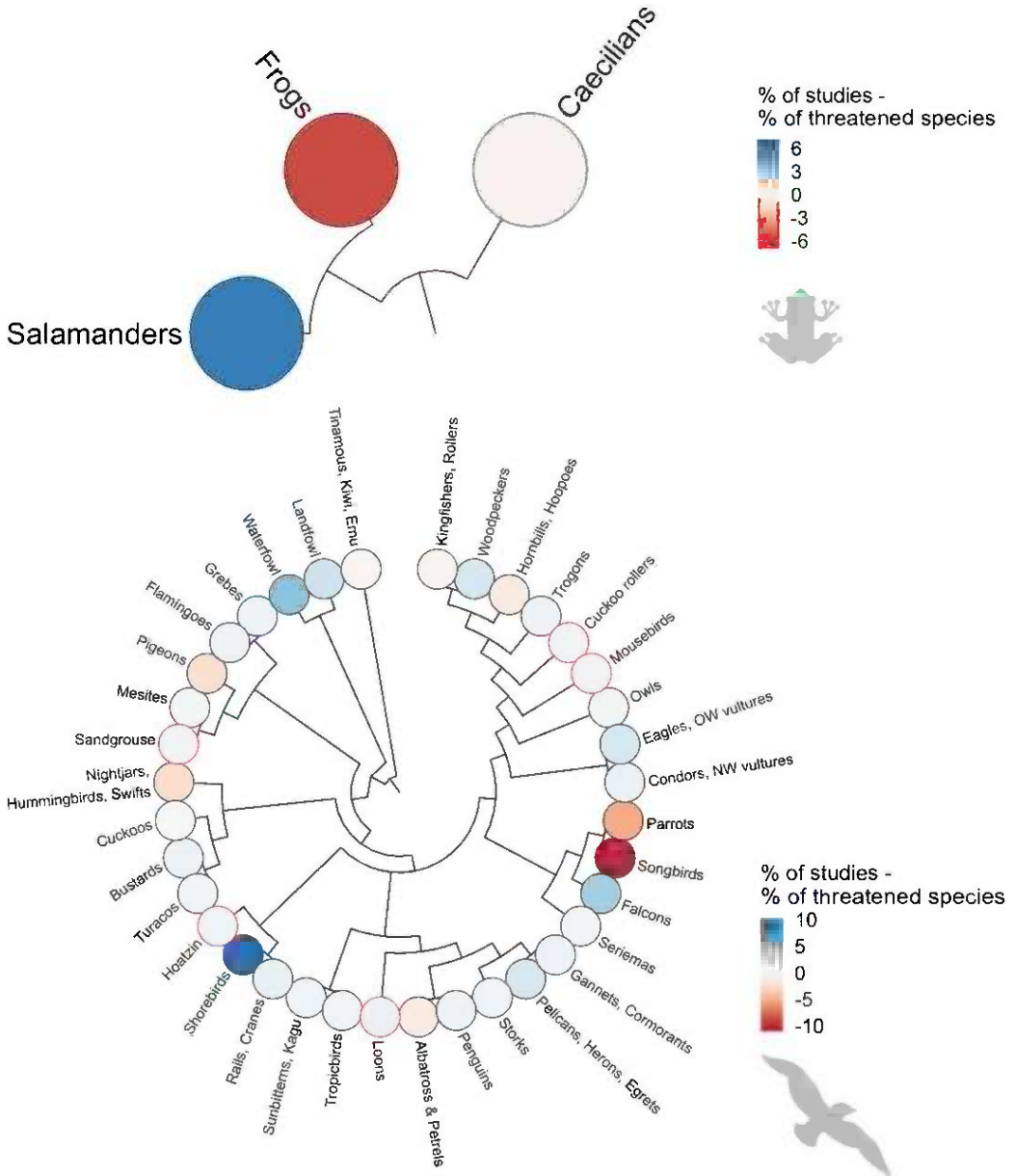
Source countries

Background information and definitions

Allocation of some farmland to 'set-aside' (fields taken out of production) was compulsory under European agricultural policy from 1992 until 2008. Originally intended as a method of reducing production, set-aside has also been promoted as a way of protecting on-field biodiversity. Set-aside fields can be sown with fallow crops or left to naturally regenerate. Set-aside can be rotational (in a different place every year) or long term (retained for 5–20 years).

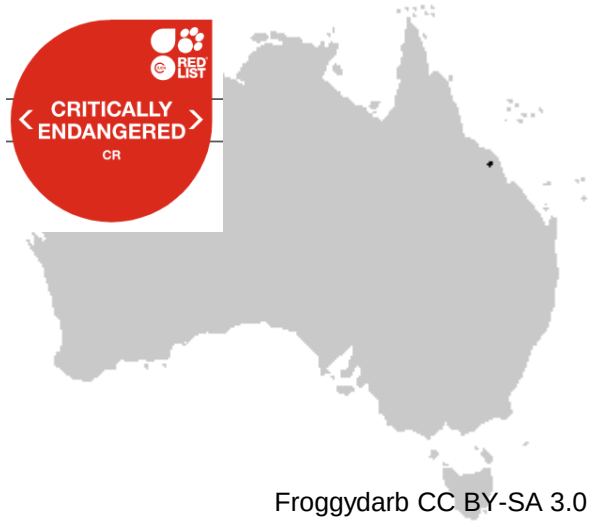
A 2008 literature review of the Environmental Stewardship programme, particularly Entry Level Stewardship (ELS) in the UK (Vickery *et al.* 2008) found that the population trends of all Farmland Bird Index species were positively correlated with the availability of set-aside in that year and that Entry Level Stewardship may not be able to effectively replace set-aside.

Desafios: lacunas taxonómicas de informação



Christie et al (in press) *Conservation Biology*

Desafios: lacunas taxonómicas de informação



Froggydarb CC BY-SA 3.0

Eungella Torrent Frog (*Taudactylus eungellensis*)

Actions

Can't find what you're looking for? You can also search Individual Studies.

Not sure what Actions are? Read a brief description.

Refine results

Category

Keywords

Taudactylus eungellensis

Habitat

Threat

Action type

0 actions found

No action results

Sorry, your search didn't return any action pages. Please consider the following tips:

- Start with broad search terms, refining your search using the panel on the left
- If you're looking for evidence about a particular species, try searching at the genus or family level
- Check your spelling
- You can also search Individual Studies.
- Bear in mind that the Conservation Evidence project is a **work in progress**. We have actively collected evidence on a range of specific topics, as shown on the Synopses page. Beyond these subjects our coverage may be less thorough.

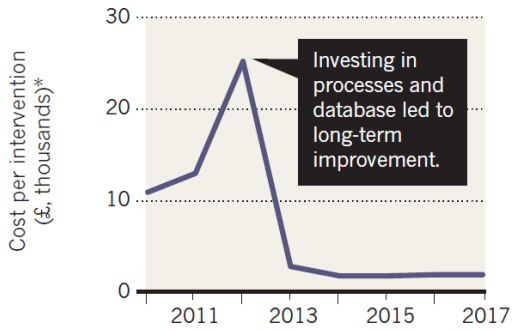
Results per page 25

Overcoming challenges in evidence synthesis

COST-EFFECTIVE

Manually searching journals to find studies on actions designed to conserve species is costly at first. But as the searches accumulate, subsequent evidence syntheses require fewer resources.

Spending per intervention



New journals searched and conservation actions accessed

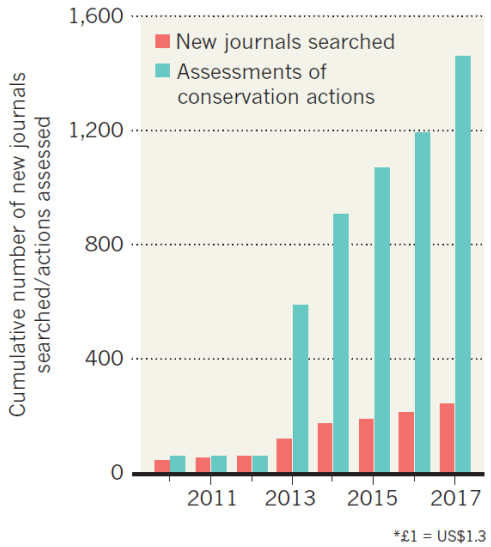


Table 1 | Emerging methods for rigorous and efficient research synthesis

Stage	Problem	Description	Solution
Planning	Planning workflow	Large numbers of software tools are available, but their relative strengths and weaknesses are unclear	Online databases of relevant tools[15]
Searching	Data collection	Sources of 'grey literature' such as organizational websites often lack convenient download functions	Web scraping[27]
	Search record extraction	Downloading information from academic databases is slow and labour-intensive	No user-based solution: provider-dependent
	Incomplete search results	Downloading information from academic databases is slow and labour-intensive	Semantic analysis of key texts to locate additional search terms (synonyms)
Screening	Duplicates	Same content repeated many times in the dataset because of multiple databases searched	Duplicate detection algorithms[28]
	Classification	Need for overview of broad trends to ensure only relevant topics are included	Simple machine-learning approaches such as topic modelling[11]
	Inclusion of irrelevant material	Non-target subjects included in search results	Dynamic classification using machine learning[21]
	Locating full text articles	Download of full-text documents often requires manual searching and downloading	Built in to some software platforms[29]. Limited by copyright and access issues
Synthesis	Data extraction	Information located in a combination of text, tables and figures, requiring manual checking	Automated image and natural language processing[30,31]
	Meta-analysis	Appropriate statistical models, methods and workflows can be complex, particularly for new users	Many tools available[29,32]
	Data visualization	Presenting complex data for broad audiences is difficult	Open source/access to data. Interactive diagrams, such as evidence atlases, heat maps and visualizations[8]

Sutherland and Wordley (2018) Nature

Westgate et al (2018) Nat Ecol Evol

A necessidade de avaliação crítica

- Nem todos os estudos são igualmente válidos
- Algumas pesquisas são mais válidas que outras
- Validade interna (qualidade) e validade externa (generalização)
- Toda a síntese de evidência rigorosa deve avaliar a validade dos estudos incluídos E levar em conta a variabilidade de validade na síntese
  - por exemplo. focando mais em estudos de maior validade
  - Incluindo apenas estudos de alta validade em síntese detalhada (por exemplo, meta-análise)
  - Incluindo avaliação de validade como moderador na síntese

Superando desafios na síntese de evidência

Conservation Evidence

Providing evidence to improve practice

Tweet Share Browse Evidence

The journal, *Conservation Evidence*

Our online journal publishes research, monitoring results and case studies on the effects of conservation interventions. All papers include some monitoring of the effects of the intervention and are written by, or in partnership with, those who did the conservation work. It includes interventions such as habitat creation, habitat restoration, translocations, reintroductions, invasive species control, and education or integrated conservation development programmes, from anywhere around the world.

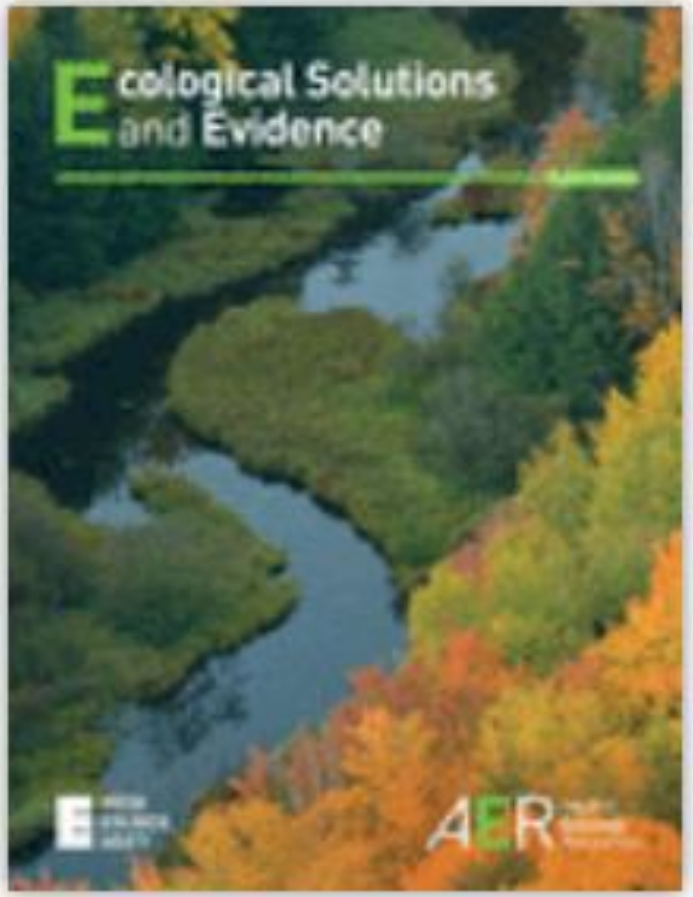
Watch a brief video on our journal here.

A *volume* is created each year with peer-reviewed papers published throughout the year. We now accept Short Communications as well as standard papers.

Special issues contain new papers on a specific topic.

Virtual collections collate papers published in the journal on specific topics such as management of particular groups of species.

To search for papers on a specific topic within the journal select Advanced search, enter your keyword(s) and within the Source box type: "conservation evidence". This will take you to a list of actions that contain *Conservation Evidence* papers. In order to see the list of individual *Conservation Evidence* papers on the topic, please click on 'You can also search Individual Studies' at the top of this page.



Resumo

O conhecimento científico para a conservação foi acumulado rapidamente em todo o mundo, mas a interface investigação-prática precisa de ser fortalecida

A conservação baseada em evidência visa resolver isso por meio de:

- Síntese de evidência e avaliação crítica (revisões sistemáticas, sinopses)
- Apresentar evidência de uma forma facilmente compreensível e acessível (sinopses e ferramentas de apoio à decisão)
- A tomada de decisões baseada em evidências ajuda a evitar enviesamento, aumentar a transparência e aumentar a eficácia.

Referências

- Sutherland, W. W. J., Pullin, A. A. S., Dolman, P. P. M., & Knight, T. M. (2004). The need for evidence-based conservation. *Trends in Ecology & Evolution*, *19*, 305–308. https://doi.org/10.1016/j.tree.2004.03.018
- Cook, C. N., Mascia, M. B., Schwartz, M. W., Possingham, H. P., & Fuller, R. A. (2013). Achieving conservation science that bridges the knowledge-action boundary. *Conservation Biology*, *27*, 669–678. https://doi.org/10.1111/cobi.12050
- Dicks, L. V., Walsh, J. C., & Sutherland, W. J. (2014). Organising evidence for environmental management decisions: a “4S” hierarchy. *Trends in Ecology & Evolution*, *29*, 607–613. https://doi.org/10.1016/j.tree.2014.09.004
- Salafsky, N., Boshoven, J., Burivalova, Z., Dubois, N. S., Gomez, A., Johnson, A., … Wordley, C. F. R. (2019). Defining and using evidence in conservation practice. Conservation Science and Practice, 1, e27. doi: 10.1111/csp2.27
- Sutherland et al. (2020). *Conservation Research, Policy and Practice*. Cambridge University Press. https://doi.org/10.1017/9781108638210 Open Access book.
- Walsh, J. C., Dicks, L. V., Raymond, C. M., Sutherland, W. J. (2019) A typology of barriers and enablers of scientific evidence use in conservation practice. *Journal of Environmental Management,* 250, 109481*.* https://doi.org/10.1016/j.jenvman.2019.109481

Recursos

- Conservation Evidence www.conservationevidence.com
- Collaboration of Environmental Evidence www.environmentalevidence.org/
- Campbell Collaboration https://campbellcollaboration.org/
- Biodiversity Knowledge Network www.vliz.be/projects/biodiversityknowledge/
- Guide to influencing decision-making – Science to Action
  - http://seaknowledgebank.net/e-library/science-action-guidebook-scientists-guide-influencing-decision-making-decision-makers

Glossário de termos (retirado de Dicks et al. 2014)

Aconselhamento ou orientação: recomendações, escritas ou fornecidas verbalmente a um decisor. Isso pode resultar da interpretação de evidência sintetizada ou do resultado de um sistema de suporte à decisão num determinado contexto.

Sistema de apoio à decisão: uma ferramenta, geralmente baseada em software, projetada para auxiliar os decisores numa decisão específica, muitas vezes ilustrando diferentes resultados possíveis visualmente ou numericamente, ou conduzindo os usuários por etapas lógicas de decisão.

Experiência: informações obtidas por tentativa e erro ou conhecimento experimental não documentado sobre um determinado local, ambiente ou alvo de gestão. A experiência informa as decisões e o desenho de estudos individuais.

Estudo: um relatório de uma única investigação científica testando o efeito de uma determinada intervenção ou variável. Para fins de síntese, os estudos devem ser divididos em experiências individuais ou comparações. Os estudos podem ser qualitativos ou quantitativos.

Resumo: uma descrição concisa e padronizada dos resultados fornecida pelos melhores estudos e revisões sistemáticas disponíveis, em toda uma área da prática ambiental, regularmente atualizada e geralmente com recomendações baseadas em evidência. Os resumos cobrem uma gama de opções ou efeitos possíveis e, de preferência, usam um processo de revisão explícito.

Sinopse: uma descrição breve e simples dos resultados de um estudo ou revisão sistemática. As sinopses geralmente estão disponíveis em bases de dados ou revistas dirigidas a profissionais. Quando comparados em uma área de prática e avaliados para extrair mensagens ou recomendações para os tomadores de decisão, sinopses podem formar as unidades básicas de resumos.

Mapa sistemático: um catálogo ou base de dados de evidência disponível numa área definida da ciência ambiental, obtida através de um protocolo de pesquisa e seleção revisado por pares. Os mapas sistemáticos não extraem e analisam dados para responder a uma pergunta específica, mas podem fornecer uma avaliação semiquantitativa ou qualitativa da qualidade da evidência e dos resultados se o texto completo dos estudos selecionados tiver sido lido.

Revisão sistemática: uma revisão, avaliação crítica e análise de resultados científicos quantitativos ou qualitativos relacionados a uma questão específica, com base num protocolo de pesquisa e avaliação revisto por pares. Os dados extraídos podem ser sintetizados qualitativamente, quantitativamente, usando síntese narrativa ou uma combinação delas.